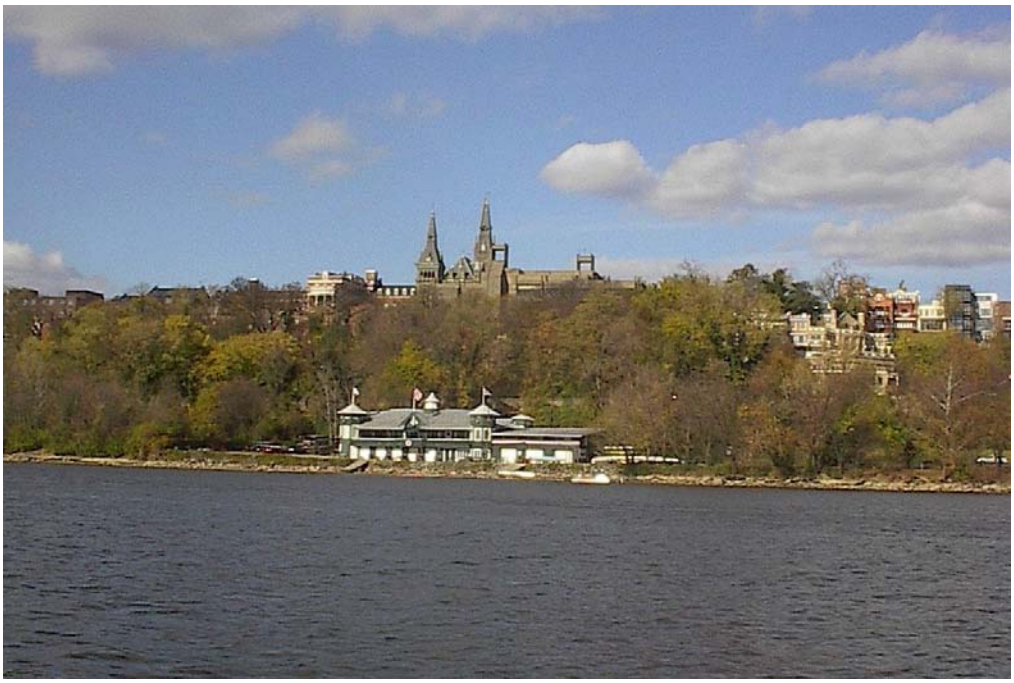
Wetlands Delineation and SAV Report
Non-motorized Boathouse
Georgetown University
Washington, D.C.



Project 04121197 **February 4,2005**

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February 4, 2005

Mr. Christopher Jordan
Georgetown University
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Basement New South Building
Washington, D.C. 20057

Subject: **Wetlands Delineation and SAV Report, Non-motorized Boathouse, Georgetown University, Washington, D.C. (Schnabel Project 04121197, Tasks 01 & 02)**

Dear Mr. Jordan:

Schnabel Engineering North, LLC (Schnabel), is pleased to submit this report for a wetlands delineation and Submerged Aquatic Vegetation (SAV), assessment for the above referenced project as described in Schnabel's proposals to Georgetown University, and in fulfillment of Georgetown University's Purchase Orders C000451030 and C000451166.

EXECUTIVE SUMMARY

The site planned for Georgetown University's Non-motorized Boathouse is approximately one acre in size and contains approximately ⅓ acre of vegetated wetlands. An artificial hydrology source is believed to feed these wetlands. The leaking C&O Canal located directly upgradient from the site is believed to be the leaking hydrology source. Due to the artificial source, the Corps has verbally stated that it will not exert its regulatory authority under Section 404 of the Clean Water Act. The boathouse site is located on the Potomac River. The possible location of bank-stabilizing structures necessitated the identification of the Ordinary High Water Mark (OHWM): the extent to which the Corps of Engineers regulates tidal, navigable waters. This OHWM is located at approximately four feet MSL (NAVD29). There were no Submerged Aquatic Vegetation (SAV) beds identified within the Potomac in the vicinity of the proposed boathouse. The validity of these findings is dependent on the jurisdictional determination by the U.S. Corps of Engineers, Baltimore District.

1.0 PROJECT DESCRIPTION

The subject site is located along the Potomac River, on Georgetown University property in northwest Washington, D.C. The subject property is located at the end of K Street, N.W., along the Park Service's Capital Crescent Trail. The area of study (approximately 1.0 acre, 400 x 100 feet) is planned for the construction of an 18,000 square foot non-motorized boathouse to be used by the

Georgetown University (the University) rowing team. The University is interested in the subject property because the location is close to its campus, and within easy access of transportation routes. The Chesapeake & Ohio Canal, a National landmark, lies upgradient of the area of study. The subject site is located between the Canal and the Potomac River. In addition to the boathouse, approximately 300 to 400 feet of bank stabilization will be installed at or below the ordinary high water (OHWM) of the Potomac River. This bank stabilization will be constructed with minimal disruption to the aesthetics of the area's waterfront.

This property, owned by the National Park Service (NPS), is committed for a land swap with another piece of property owned by the University. It is our understanding that the property planned for land swap is located farther upstream along the Potomac River, within an area that is not developed and which possesses extensive, relatively undisturbed, on-site wetlands.

The objective of this study is to assist with assessing the site for vegetated wetlands and "waters of the U.S.," as defined by the Clean Water Act. To this end, we evaluated conditions at the site according to the U.S. Army Corps of Engineers' 1987 Wetland Delineation Manual. This manual describes the methodology required by the U.S. Army Corps of Engineers to identify and delineate wetlands that may come under their regulatory jurisdiction (Section 404 of the Clean Water Act). The U.S. Environmental Protection Agency (EPA), as well as the District of Columbia's Department of Health, Bureau of Environmental Quality, Water Quality Division, accepts this methodology for wetland delineation. In addition, we studied the riverfront and submerged areas proposed for impact for the presence of and type of Submerged Aquatic Vegetation.

2.0 EXPECTED CONDITIONS

We understood, prior to our site visit, that jurisdictional opinions expressed by the Baltimore District Corps of Engineers (Corps) in 1995 described possible wetlands on the site as having formed due to leakage of the C&O Canal, and subsequent subsurface damming caused by an 84-inch sewer main beneath the site, running parallel to the river, and therefore any site wetlands was considered to be in their jurisdiction. Recently the Corps was consulted regarding their jurisdictional determination of these wetlands, and once again informed the University that these wetlands do not come under Corps' jurisdiction due to an artificial hydrologic source (leaking upgradient of the C&O Canal). Though the Corps apparently did not find this area within their jurisdiction in 1995, the District of Columbia (District) believes the area may fall within their environmental interest. Due to the age of the Corps' decision (more than 5 years old) and the concerns expressed by the District, Schnabel was retained to provide a delineation.

The Soil Survey of the District of Columbia, prepared by the USDA Soil Conservation Service (1976), indicates variable soils in the vicinity of the site including Urban land and Udorthents, which are non-geologic classifications due to filling that has taken place along the Potomac Waterfront in this general area. Our understanding is that the area was once open river and now is underlain by an 84-inch sewer line. The artificial circumstances of fill soils, water leakage from off-site, and disturbed vegetated cover indicated to us that the area would be highly disturbed, and the soils would be somewhat transitional between upland and hydric soils because of consistent leakage of the Canal. According to the District's Wetland Conservation Plan (1997) (Attachment 2), there are no mapped, known wetlands within this area. A copy of the US Fish and Wildlife "Wetland Mapper" is

included in Attachment 2, and shows no aerially detected wetlands at or in the vicinity of the subject site.

The second area of potential jurisdiction was of the Potomac River. Consideration was given to the use of either shoreline high water markings or the use of tidal data elevations to determine the extent of the Corps' jurisdiction. Work performed below the Corps' jurisdictional line (ordinary high water mark, or mean high tide) will require a permit from the Corps. The wetland boundary and estimation of the OHWM are depicted on the Wetland Boundary Plan (Attachment 3).

3.0 METHODS

A routine wetland field investigation includes establishing points along the transition to mapped hydric soils, or soils that may have hydric inclusions. In addition to soil data, vegetation and hydrologic indicators of wetlands are recorded. Accepted soil sampling procedure advises boring a 16-inch deep hole with a tile spade (Environmental Laboratory, 1987). Soils are observed, and their colors and consistency noted at a series of depths, with 10 inches below the soil surface (just below the A Horizon) being the most significant. For purposes of this study, soil is defined as "unconsolidated, natural material that supports, or is capable of supporting plant life" (*Ibid*., 1987).

The soil probe is the center of the data point used for vegetation investigation and data collection. We probed in several locations along the transition from obvious upland to obvious wetland. We consulted the District's Soil Survey for descriptions of mapped soil types on the project site in order to compare our findings.

The dominant vegetation within a five-foot diameter of the soil probe was recorded for the herbaceous, shrub or understory tree layer, and within a 30-foot diameter for trees. We then categorized each plant species by its status as shown in Table 1, according to Reed (1988).

Table 1 - Wetland Plant Status

CATEGORY	ABBREVIATION	DEFINITION
Not Listed	NL	Not listed in Reed, 1988
No Indicator	NI	Insufficient information available to determine indicator status
Obligate upland	UPL	Occurs <1% of the time in wetlands
Facultative upland	FACU	Occurs 1% to 33% of the time in wetlands
Facultative	FAC	Occurs 34% to 66% of the time in wetlands
Facultative wetland	FACW	Occurs 67% to 99% of the time in wetlands
Obligate wetland	OBL	Occurs >99% of the time in wetlands

If 50% or more of the sampling area is dominated by plants that are categorized as FAC, FACW, or OBL, the site's vegetative parameter is considered positive for hydrophytic or wetland vegetation.

Indicators of positive site hydrology (e.g., water logging, saturation, ponding/inundation, and physiological adaptations of plants to flooding) were noted. "Waters" are noted either by observing

scour marks (ordinary high watermarks), if existing for water bodies, from "top of bank" to "top of bank" for small channels; or delimited according to existing tidal range data for the year (spring high tide). Observations for each wetland data point are recorded on data forms approved by the Corps' 1987 Wetlands Delineation Manual (*Ibid.,* 1987), and are included as Attachment 4.

For tidal and/or Navigable Waters, the mean high water mark (maximum height of Diurnal tide for purposes of Rivers and Harbors Act) was found by analyzing the gauge heights of the USGS Station 01647600 located at the end of Wisconsin Avenue, N.W., in the tidal Potomac, at Latitude 38°54'08.4", Longitude 77°03'45.9" NAD83. The tidal data at the USGS website is provided in Washington Mean Low (WML).

Submerged Aquatic Vegetation (SAVs)

As a part of a separate contract with the University, Schnabel provided a review of historic data and a field intensive study related to potential SAV beds located in the vicinity of the University Boathouse's new dock, within the Potomac River. We reviewed data maintained by the Chesapeake Bay Program to find historic locations of SAV beds. We also conducted field sampling using a 15-foot skiff and a straight road rake with a 12-inch head. The skiff was anchored within about five feet of the shore, and held perpendicular to the shoreline. The river bottom was raked on both sides of the skiff, raking the top three inches of the bottom sediment by pulling the rake toward the boat, and then lifting up on the rake to study the materials removed from the bottom. The skiff was then moved 10 feet downstream, and the process was repeated until the entire length of shoreline was raked to some degree. Also, the intertidal zone was observed, and an indication of plant growth was noted.

After raking the sediments in front of the proposed boathouse location, the shorelines and coves within the vicinity of the site were observed, as well as the C&O Canal, for presence of SAVs. Finally, contact was made with river "users" and government agencies acquainted with the Potomac River to gather additional information, discuss findings of our study, and substantiate our opinions regarding the site. Photographs are included in Attachment 5.

4.0 FINDINGS AND RESULTS

The site is located at approximately 38º53'60" Latitude and 77º4'12" Longitude. Generally, conditions expected were substantiated during the site visit on September 22 and November 9, 2004. The shape of the site is rectangular, with its long access running perpendicular to the Potomac River. The study area borders the Potomac and appears to consist of fill, which abruptly extends from the bottom of the bank vertically three to five feet. Vegetative cover included a combination of mature and immature hardwoods, as well as herbaceous plants, around the perimeter, and generally herbaceous plant cover within the central portions of the study area.

Vegetation

The site consisted of the following plant cover types: mowed turf grass, wet meadow, hardwood shrub dominated, and hardwood tree dominated. The site appeared to be largely dominated by invasive exotic plant species, interspersed with mature native trees and some native saplings.

Three data points were established. One was located in the dry, mowed turf grass area next to the fence placed by the Washington Canoe Club. The second data point was located directly north of the first, approximately 30 feet away. We believe that this data point is the approximate transition area between wetland and upland. The third data point was located well into the wetland, where conditions were noted to be saturated with a dominance of hydrophytic plants. Due to the time of year and the condition of most plants, flowering parts of most plants were not available for evaluation. Therefore identification of some plants is preliminary. Please see the Wetland Boundary Plan (Attachment 3) for the location of data points, the wetland boundary and the general site features.

Generally, dominant plants located in the wetland portion of the site consisted of the following:

Table 2

Plant Name	Indicator Status
♦ *Ulmus americana*-American elm	FACW
♦ *Cyperus strigosus*-Flat sedge	FACW
♦ Unidentified grass (*Agrostis alba*?)	FACW?
♦ *Echinochloe crusgalli*-Barnyard grass	FACU
♦ *Fraxinus nigra*	FAC
♦ *Lonicera maackii*-Amur honeysuckle	(Not listed)

The most dominant plant in the uplands and along the upland/wetland transition was *Lonicera maackii*- (Amur honeysuckle-NL). Thickets of *L. maackii*-covered large sections of the site and most of the understory consisted of the same. *Morus alba* (White mulberry-UPL) also dominated sections of the upland. The site, both upland and wetland areas, appeared to consist mostly of invasive, non-native vegetation. Only one obligate wetland plant was identified: *Typha latifolia* (Cattail-OBL).

The vegetative structure appeared to occur in linear bands, progressing parallel to the edge of the walking path to the riverbank. The first vegetative cover type, starting from the path, consisted of about a 25-foot wide section of native, mature trees, in both wetland and upland areas. Many of the trees in this first band were native, quite mature, and somewhat large, with one *Acer saccharinum* (Silver maple-FACW) of approximately 24 inches dbh (diameter of tree about 4 feet up from the ground), with wetter areas in the central and southern sections of the band. The next consistent band of vegetation was about 30 feet in width and was dominated by herbaceous plants, mostly grasses, in both upland and wetland areas (drier at either end). There were a few, scattered woody seedlings (*Salix sp.*-Willow-OBL*)* within this band. The final band extended out about 30 feet, ending at the bank of the Potomac, and was dominated by a growth of saplings four to six inches dbh (mostly *M. alba*) and areas of honeysuckle (*L. maackii*) thickets. Ground cover in this waterfront band included *Hedera helix* (English Ivy-NL). The wetland area extended mostly within the herbaceous growth band, but also extended into the mature wooded area and the sapling band to some extent.

It may be that these "bands" of vegetation represent the development activity that has taken place at the site. The band of mature trees running along the hiking path was most likely the previous frontage on the Potomac River. The hiking path was once the Baltimore & Ohio Railroad, but has been converted to a hiking and biking path. In the early 1960s, the District of Columbia Water and Sewer Authority installed an 84-inch sewer main along this previous shoreline by bringing in fill material, burying the pipe, and creating a new shoreline of the Potomac River. The herbaceous cover may persist due to long-term saturation and unsuitable soils for tree establishment. There may have also been maintenance efforts made within the easement to eliminate woody trees from the pipeline corridor.

Submerged Aquatic Vegetation (SAVs)

Although records of SAV beds exist for the University Boathouse area historically (Attachment 6), there were no root systems or remnants of stems/leaves observed in the vicinity of the shoreline. Concern that the date of the assessment was too late in the year (November 9, 2004) to detect SAVs indicated that a review of the tidal flats in the vicinity of the site was merited. Flats across the river and down the Little River and the Georgetown Channel were observed from the water at low tide. Also, interviews with river users and government agencies working on the river took place. SAVs were found in one location (west side of Roosevelt Island), but generally the lack of SAVs was remarkable for the extensive tidal flats and shallows present in the river, as well as historical locations. Of note during sediment raking at the University Boathouse site were numerous shellfish. There were some rakings that brought up at least 10 or 15 individual living organisms at a time, mostly the Asiatic clam *Corbicula fluminea.* In addition, there were two Gastropod species found.

It is general knowledge to both frequent river users and the Chesapeake Bay Program that SAV beds have drastically reduced in size and number over the past two to three years. There are records that beds of *Hydrilla* had been located off the shoreline of the University Boathouse site in 2002; however, no current remnants of these beds remain. Within the C&O Canal, upgradient of the boathouse site, thick growth of SAV (*Hydrilla)* remains and was observed on the day of the SAV assessment (See Photo 14, Attachment 5).

Soils

Site soils have been severely impacted from past human activities. Although the area historically was presumably within the tidal range of the Potomac, filling activities over the past 50 to 75 years have resulted in the site's conversion from intertidal freshwater flats to upland. It appears that filling first occurred for the purposes of construction of the Baltimore & Ohio Railroad. Later, filling to install the 84-inch sewer main by the District of Columbia Water and Sewer Authority resulted in further elevation of the site above the Potomac River.

The Soil Survey for the District of Columbia (1976) shows the existence of both U1 (Udorthents) and Ub (Urban) soils. Both of these soils are not in their natural condition, and are variable in their makeup. Consistent between the soils is that they have been moved by machinery in some way. The permeability of the soil is variable, as is the drainage class. Alluvial deposits underlie these disturbed soils.

Soil borings advanced during the wetland assessment revealed the disturbed nature of the soils. It was very difficult to dig below about six inches beneath the ground surface. Below six inches appeared to be compacted gravel. Relatively recent disturbance, due to the sewer installation, may be the reason for the consistent location of gravel in the surface soils.

Hydrology

The influence of water on the site is obvious, but apparently not of natural origin. The water that saturates the surface soils comes not from wetting by the river, but from subsurface discharge. Observation of the hydrologic conditions revealed a saturated soil, and in some cases, surface ponding. There are no visible surface sources that drain to the wetland area. However, directly upgradient (30 feet in elevation above the site), the C&O Canal flows through a hand-placed block wall. The mortar between the blocks has long since deteriorated, and the water level within the canal is very low through this section. Please see photos of this section of the canal in Attachment 5. It appears that the water that flows through the canal may have found a seepage way downgradient and now, due to hydraulic head, discharges at the boathouse site. Just downstream of the "dry" canal, water again fills the canal. Please see Photos 13 and 14 in Attachment 5.

Records to estimate monthly tidal/flow heights were obtained from a USGS tidal gauge located at Wisconsin Avenue, N.W. (http://waterdata.usgs.gov/nwis/nwisman/?site_no=01647600&agency_cd=USGS). The gauge data included gauge elevation heights, in feet above Washington Mean Low (WML). Feet above mean sea level (MSL) is calculated by subtracting 1.41 feet from WML. The average high elevation at the proposed non-motorized boathouse site is 4.03 MSL. Because MSL is in datum NVGD29 and the topography on the plan in Attachment 3 is in the Washington, D.C., surveyors' datum (0.7 feet lower), the OHWM is marked at 3.33 feet. The topographic location of this elevation will be used as the location of Ordinary High Water (OHW). Please see raw data in Attachment 7.

5.0 GENERAL AND LIMITATIONS

The conclusions and recommendations of this report are based on the information revealed by this exploration. Be advised that the findings of this report are for the day the assessments were performed at the locations indicated, and may be limited by a number of factors, including but not limited to, the time of year, human impacts, climatic factors, and the like. The wetland boundary depicted on the Wetland Boundary Plan represents our professional opinion and must be verified by the U.S. Army Corps of Engineers, Baltimore District. Once obtained, a Corps' jurisdictional determination is acceptable for a five-year period, unless otherwise determined by the Corps.

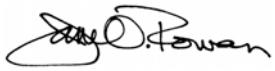
This project was conducted by a Professional Wetland Scientist certified by the Society of Wetland Scientists, the only current, nationally recognized certification program in the United States (see www.wetlandcert.org). The resume of our key scientist involved in this project is included in Attachment 1.

We have endeavored to prepare this report in accordance with generally accepted ecological practice and make no warranties, either express or implied, as to the professional advice provided under the terms of our agreement and included in this report

We appreciate working with Georgetown University and look forward to continued involvement with this project. If you have any questions or comments regarding the findings of this report, please call.

Very truly yours,

SCHNABEL ENGINEERING NORTH, LLC



Jane O. Rowan, P.W.S.
Senior Associate

JOR:JMS:hcf

Attachments:

(1) Resume of Personnel
(2) Published Wetlands Maps
(3) Wetland Boundary Plan
(4) Corps Data Sheets
(5) Photographs
(6) SAV Maps 2000-2003
(7) Tidal Gauge Information
(8) References

Distribution:

Georgetown University (3)
Attn: Mr. Christopher Jordan

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Corps of Engineers - Baltimore District (2)
Attn: Mr. George Harrison

District of Columbia Department of Health (1)
Attn: Ms. Diane Douglas

ATTACHMENT 1

Resume of Personnel

Schnabel Engineering

Jane Offringa Rowan, P.W.S., LEED®
Senior Associate

EXPERTISE Wetland Delineation, Habitat Restoration; Environmental Impact Analysis, Permitting, Stream Restoration Design, Sustainable Design

EDUCATION Post Graduate Work/Botany/Drexel University
M.S./1982/Environmental Science/SUNY College of Environmental Science and Forestry, Syracuse
B.S./1978/Biology and Chemistry/University of Massachusetts, Dartmouth

REGISTRATION Certification as a Professional Wetland Scientist by the Society of Wetland Scientists
LEED® 2.0 Professional Accreditation

SUMMARY

Ms. Rowan has experience with multi-level government efforts to regulate wetland resources. She has served at the local level as an Environmental Consultant to a coastal township Conservation Commission as well as an Ecologist for the U.S. Environmental Protection Agency. At Schnabel Ms. Rowan has managed and completed permit applications and obtained permits in multiple states on the east coast.

Ms. Rowan provides multidisciplinary management and expertise in natural and water resources, and wetlands projects; where she assesses existing conditions of habitats, watersheds, wetlands, lakes and streams; considering and minimizing damages and impacts; and designing restoration plans. Ms. Rowan works with a team of Schnabel engineers, hydrologists, and geologists to provide designs for wetland mitigation including restoration and creation, and stream rehabilitation and relocation designs. Ms. Rowan has provided watershed and stream restoration designs that focus on a combination of physical and biological integrity. Finally, Ms. Rowan provides Best Management Practice (BMP) designs and has provided numerous consultations regarding mitigation of impacts and sustainable ecological design strategies.

SPECIALIZED EXPERIENCE

- **Little Crum Creek Implementation, Swarthmore College, Swarthmore, Pennsylvania:** Ms. Rowan was the Project Manager and Associate Scientist for the development of scenarios at two sites selected by Swarthmore College to serve as wetland and riparian zone restoration. These restoration areas were developed to control sediment laden stormwater input into Little Crum Creek. She worked with Swarthmore college students, the Swarthmore Borough, as well as a local high school to maximize the educational and public benefit for the project. The project involved delineating wetlands and the installation of groundwater wells in both sites. Double ring infiltrometers were installed at one of the sties in order to approximately measure the infiltration rates of surface water within the riparian zone. A wetland planting restoration plan was developed in order to maximize a diverse habitat and improve water quality. Ms. Rowan also coordinated with the US Army Corps of Engineers and the PA Department of Environmental Protection (PADEP) regarding permitting issues, although extra effort was made to avoid the need for a permit. This project was funded by the PADEP through a Growing Greener Grant.

- **Crum Creek Watershed and Sourcewater Initiative, Chester and Delaware Counties, Pennsylvania:** Schnabel was a consultant for the Delaware County Conservation District. Ms. Rowan was the Project Manager and lead Technical Scientist for this $150K study. Project partners included the PADEP, the Chester Ridley Crum Watersheds Association, Philadelphia Suburban Water Company, and both the Delaware County Planning Commission and the Chester

County Water Resources Authority. The plan included a watershed and sourcewater (Springton Reservoir) assessment for the purpose of maintaining and improving water quality in the 29 square mile watershed and 300 acre reservoir. The study was completed in December of 2001 and included extensive public input. Results will be used by the PADEP to develop Total Maximum Daily Loads (TMDL's) for the watershed, as well as provide watershed stakeholders with the tools to implement Best Management Practices (BMP's).

- **Kentucky American Water Company, Water Supply Study, Kentucky:** Ms. Rowan was the Project Manager in the analysis of several reservoirs and other locations along the Kentucky River for future water supply development. The project employed a variety of existing resources, along with the development of an ArcView GIS project in order to view and analyze the topography within the river basin. The location of wetlands and other potentially complex issues that could result in difficulty during future permitting were identified and noted.

- **Wetland Delineation and Floodplain Study, Gaston Mall, Gastonia, Gaston County, North Carolina:** The owners of the Gaston Mall were interested in expanding their mall into a contiguous, undeveloped parcel of land. This undeveloped land was mapped as a 100-year floodplain and contained two streams and bottomland wetlands. Ms. Rowan provided a detailed delineation of the wetlands and waters on the site, as well as an analysis of the streams' water chemistry and biological health. As a result of the study it was recognized that severe impacts have occurred to one of the smaller streams resulting in a lack of a biological component. The wetland area is planned for conservation and impacts to water resources of significant value will be avoided where possible in order to limit the need for permitting. Schnabel engineers have provided a detailed hydrologic analysis of the streams and re-mapped the parcel's floodplain and floodway. They have provided direction to the developers architect to locate structures in areas that will not impact either wetlands or the floodplain in order to satisfy the requirements of both local ordinances and Corps 2002 Nationwide Permit regulations.

- **Southwest Regional Jail Commission, Duffield, Virginia:** Ms. Rowan was the Project Manager for assessing wetland issues on this regional jail site in an industrial park in Southwestern Virginia. The site had almost 800 ft of stream and an associated small wetland. Ms. Rowan delineated the aquatic system, provided agency liaison for the Section 404 permit, served as the client's agent, and worked with the owner's engineer to develop an on and off-site alternatives analysis, as well as mitigation scenarios. The selected mitigation scenario included a 1.14 acre conservation area with a 2/3 acre created wetland, stream and upland buffer. Schnabel provided full design services for the wetland construction and continues to provide services during construction to assure proper grading and placement of wetland and upland plants.

- **CSX Intermodal Facility, Greenwich Yard, South Philadelphia, Pennsylvania:** Ms. Rowan was the Project Manager for the wetland delineation, environmental assessment, wetland design and monitoring at this railroad facility. The facility, covering hundreds of acres, required the filling of about seven acres of emergent (mostly Phragmites) and open water wetlands. Due to the degraded nature of these wetlands, the Commonwealth of Pennsylvania and the Corps of Engineers were open to the filling of these wetlands and their

replacement with higher quality tidal and emergent wetlands. Schnabel was retained to provide the mitigation design, monitoring plan and construction specifications. Monitoring and contractor oversight services are on-going. In addition to wetland issues, Ms. Rowan was retained to conduct a Rare and Endangered Plant Survey on the site. As a result of the survey, one endangered plant species and two proposed listed plant species were identified for the first time on or near the site. Ms. Rowan worked with the Civil Engineer and the other agencies to expedite the permitting process, while enhancing the opportunity to introduce a higher quality wetland system close to the Intermodal Facility.

- **U.S. Environmental Protection Agency, Region III, Interstate 476 Environmental Review:** Ms. Rowan was the Project Reviewer of this interstate highway project on behalf of the agency. She reviewed the Draft Environmental Impact Statement based on both the National Environmental Policy Act and Section 404 of the Clean Water Act. The project entailed about 10 miles of outer beltway in the suburbs of Philadelphia, filling about 30 acres of wetlands and replacement of about half of those wetlands within the highway alignment corridor. The other half of the wetland mitigation requirement was placed in the H. John Heinz National Wildlife Refuge in Tinicum, Pennsylvania. Ms. Rowan was involved with approving the wetland delineation boundary as well as reviewing and providing formal EPA comments on the proposed wetland mitigation design.

- **Stream Classification and Restoration, Soil Bioengineering, Wetland Creation and Permit Preparation, The Reichlin Tract, Arundel Corporation, Carroll County, Maryland:** This mining project required the relocation of 2,000 ft of stream into a newly constructed, naturally meandering stream bed with designed contiguous floodplains and wetlands. The design took into account unstable karst geology and included innovative bioengineering of the stream banks, floodplain, and wetlands to encourage native plant revegetation, yet discourage sinkhole formation and bank erosion. The project design included hydrologic and hydraulic analyses and groundwater studies in order to produce detailed engineering plans and specifications. Ms. Rowan was the Team Leader for this multi-disciplinary portion of the mining project. The final report became a part of Schnabel's larger Mining Plan and was also used in Schnabel's permit application submission to the Maryland Department of Environment.

- **Shadow Lake Expansion, Capps, Florida:** Ms. Rowan provided wetland delineation, permitting and mitigation design services on the expansion of a 16-acre lake to a 37-acre lake. The wetlands within the impact area were delineated using both the Corps Manual and the Suwannee River Water Management District Wetland Delineation Methodology. Wetland design included the construction from uplands of a 8-acre shelf at the expanded lake edge that incorporated on-site woody material for hummock construction to provide a substrate for bottomland hardwood development. Schnabel also provided hydrology and hydraulic analyses and redesigned the dam to provide improved safety and stability.

- **Wetlands Delineation, Restoration Design and Permitting, Action Impact, Elverson, Pennsylvania:** Delineation of wetlands and analysis of groundwater and geological data were used to prepare a wetland restoration design for an

impoundment expansion project. The existing impoundment was doubled in size and designed to take advantage of a zone of perched hillside seepage contiguous to the pool. Although a secondary planting design was included, the client saved significantly by employing Ms. Rowan's strategy of removing and relocating living wetland plant sod in and contiguous to the regraded littoral zone. Management of permits and interagency liaison resulted in successfully obtaining the PA permits for this project under Pennsylvania's Chapter 105, the Dam Safety and Encroachment Act. Monitoring of the restored wetland site is now in its second year. Successful revegetation contiguous to the littoral zone is 100% with native, desirable wetland plant species.

- **Wetland and Environmental Impact Services, Rapidan Service Authority Water Supply Study, Ruckersville, Virginia:** Schnabel was retained by the Service Authority to provide a major study of water supply alternatives in their service area. These alternatives included the evaluation of 22 pumped storage water supply reservoir sites for their potential to first serve the needs of the authority, and then provided needed safe yield without causing major environmental impacts. This study began by remotely evaluating these sites for their potential wetland acreage, and then studied the potential for protected species and cultural resources impacts and includes hydrologic evaluation of each site. Ms. Rowan is responsible for the next phase of the study, which recently commenced, and includes the coordination of interagency scoping meetings, presentation of the top five sites to the resource agencies and consultation support to the client.

- **Stream Classification and Restoration, Soil Bioengineering, Wetland Creation and Permit Preparation, The Reichlin Tract, Arundel Corporation, Carroll County, Maryland:** This mining project required the relocation of 2,000 ft of stream into a newly constructed, naturally meandering stream bed with designed contiguous floodplains and wetlands. The design took into account unstable karst geology and included innovative bioengineering of the stream banks, floodplain, and wetlands to encourage native plant revegetation, yet discourage sinkhole formation and bank erosion. The project design included hydrologic and hydraulic analyses and groundwater studies in order to produce detailed engineering plans and specifications. Ms. Rowan was the Team Leader for this multi-disciplinary portion of the mining project. The final report became a part of Schnabel's larger Mining Plan and was also used in Schnabel's permit application submission to the Maryland Department of Environment.

- **Wetland Identification, Wetland and Stream Classification, USDA National Center for Cool and Cold Water Aquaculture, Leetown, West Virginia:** A water transmission line was proposed for installation through a linear construction corridor running parallel to a stream on this government fishery facility. Aerial photography, County Soil Surveys and field verification were used to determine the existing location of wetlands along more than a mile of a major stream and three tributaries contributing to a series of fishery ponds. The wetlands and streams contiguous to this construction corridor were classified according to Cowardin, et al. (1979) and Level I Rosgen (1994). The site was evaluated for potential wetland mitigation areas. Applicable regulations were reviewed and recommendations made.

PROFESSIONAL AFFILIATIONS

American Water Resources Association-Board of Directors
Finance Committee
Society of Wetland Scientists: Member, Chair, Professional Certification Committee
Philadelphia Botanical Club
Association of State Wetland Managers
Society of Ecological Restoration
Commercial Real Estate Women

PUBLICATIONS AND LECTURES

Presentation, 2003. Pennsylvania Society of Land Surveyors. "Wetland Identification and Delineation Methodology", Valley Forge, PA.

Presentation, 2002. American Water Resources Association Annual Conference. "The Crum Creek Watershed Assessment." Philadelphia, PA.

Presentation, 2001. Society of Wetland Scientists Annual Conference. Oasis in the City: The Success of Wetland Creation at the CSXI Intermodal Facility in South Philadelphia, PA. Chicago, IL.

Symposium Coordinator, 1993. "Wetland Plants: Diversity, Function, Importance - A Symposium." Solicited lecturers and coordinated events at the Philadelphia Botanical Club's Centennial Year celebration. Proceedings published by the Academy of Natural Sciences of Philadelphia 144:239-340, 1993.

February 1987. "The Flora of Pennsylvania Peat Bogs." Oral Presentation to the Philadelphia Botanical Club given at the Academy of Natural Sciences of Philadelphia.

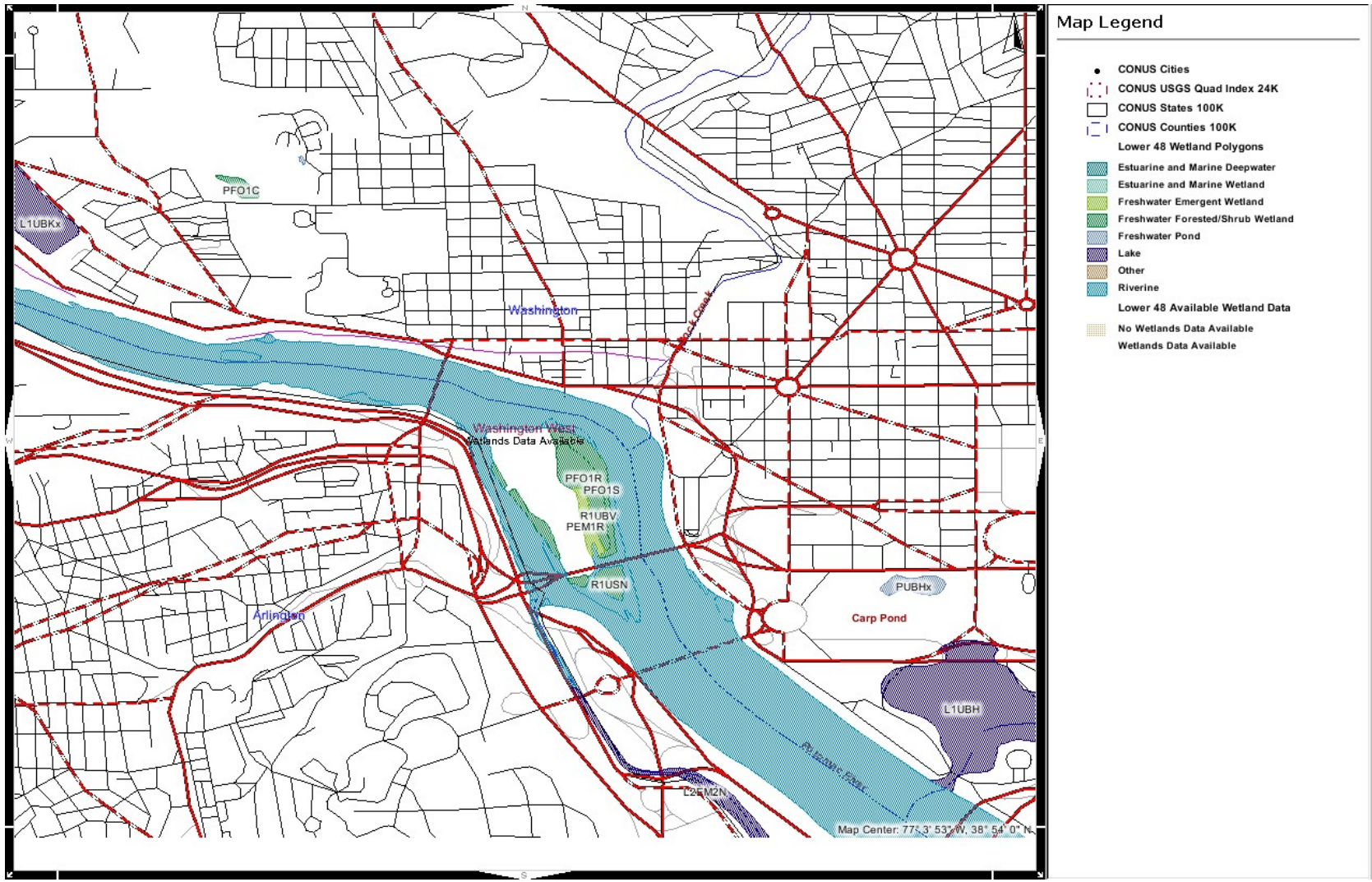
Offringa, J. and K. Wolper, 1986. "Working to Save Pennsylvania Peat Bogs." EPA Journal. 12:1. Jan/Feb, USEPA, Office of Public Affairs, Washington, DC, p. 18.

Offringa, J. and K. Wolper, 1985. "EPA Region III Develops Policy for Regulating Peat Mining." National Wetland Newsletter. 7:6:4. Environmental Law Institute, Washington, D.C.

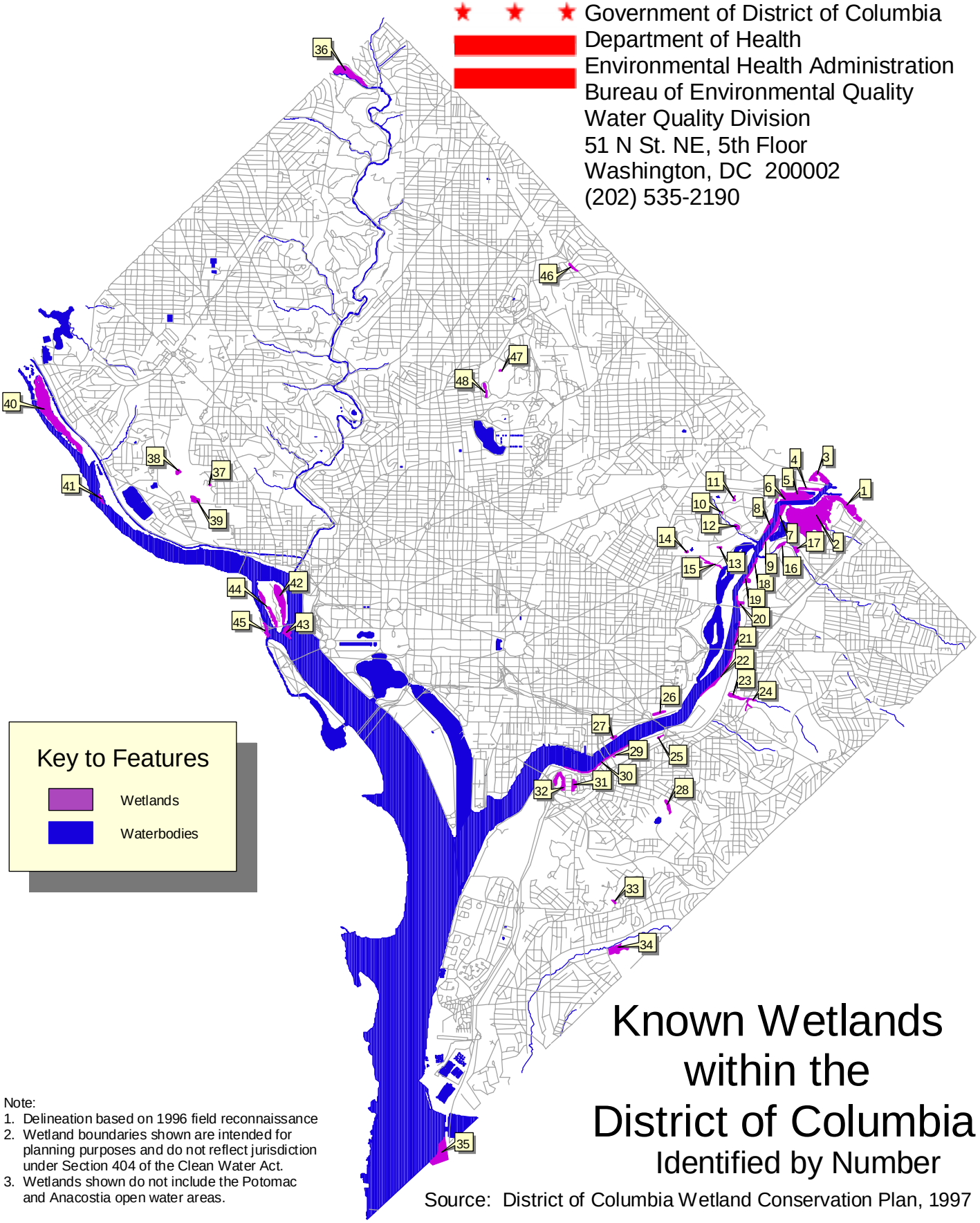
ATTACHMENT 2

Published Wetlands Maps

USFWS Wetlands Map for the District of Columbia
D.C. Wetland Map



Schnabel Engineering	GEORGETOWN UNIVERSITY, PROPOSED BOATHOUSE, WASHINGTON, DC	04121197 - USFWS WETLANDS MAPPER



Note:
1. Delineation based on 1996 field reconnaissance
2. Wetland boundaries shown are intended for planning purposes and do not reflect jurisdiction under Section 404 of the Clean Water Act.
3. Wetlands shown do not include the Potomac and Anacostia open water areas.

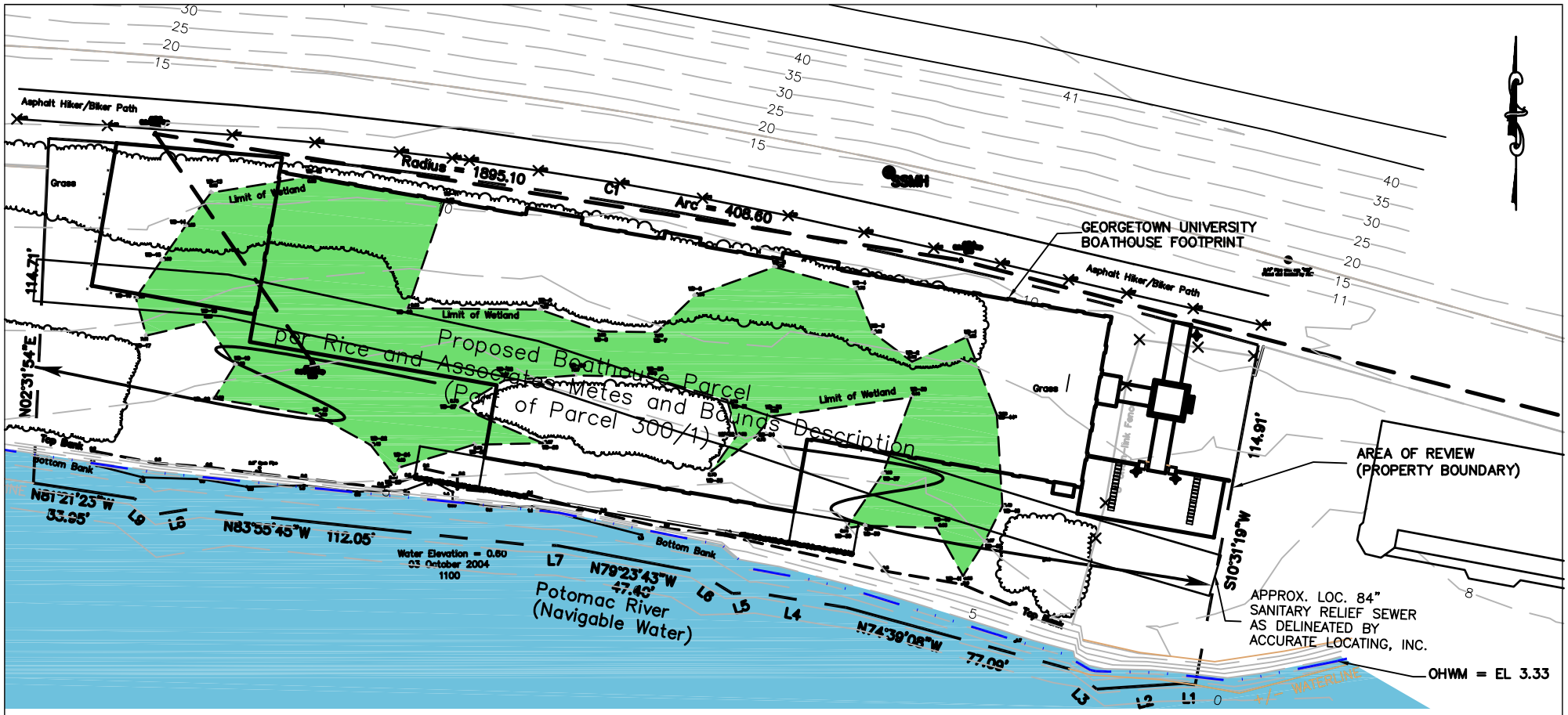
The following is a list of the **KNOWN** wetlands in the District of Columbia based on the District of Columbia Wetland Conservation Plan (1997). There are many wetlands within the city that are not listed here including the open water areas of the Potomac and Anacostia.

Wetland No.	Location	ADC Grid	Longitude	Latitude
1	Beaverdam Creek at Kenilworth Courts	11-D11	76-56'-38"/56'06"	38-54'-56"/54'-39"
2	Kenilworth Aquatic Gardens	11-B,C12	76-57'-00"/56'-28"	38-54'-54"/54'-30"
3	Fort Lincoln New Town between Rt. 50 and Fort Lincoln cemetery	11-C9	76-56'-39"	38-55'-02"
4	Fort Lincoln between Rt. 50 and RR tracks	11-C10	76-56'-46"	38-55'-02"
5	Fort Lincoln between Rt. 50 and Anacostia	11-B,C11	76-57'-12"/56'-44"	38-54'-59"/54'-48"
6	West bank of Anacostia opposite Kenilworth Marsh Inlet	11-B,C11	76-57'-06"	38-54'-51"
7	East bank of Anacostia, immediately south of Kenilworth Marsh inlet	11-B11,12	76-57'-10"	38-54'-49"
8	West bank of Anacostia, 1000 ft. north of Hickey Run	11-B11,12	76-57'-12"	38-54'-37"
9	East bank of Anacostia, 800 feet north of Watts Branch	11-B12	76-57'-15"	38-54'-28"
10	National Arboretum Pond at Beechwood Road	10-K11	76-57'-54"	38-54'-45"
11	National Arboretum Pond at Eagle Nest Drive	10-K10	76-57'-45"	38-54'-53"
12	National Arboretum Pond at Crabtree Road	11-A11	76-57'-40"	38-54'-36"
13	National Arboretum south of Crabtree Road nature center	10-K11	76-57'-56"	38-54'-23"
14	National Arboretum along Rhododendron Valley Road	10-J11	76-58'-16"	38-54'-20"
15	Langston Golf Course	16-K11	76-58'-01"	38-54'-12"
16	Watts Branch Park	11-B13	76-57'-08"	38-54'-22"
17	Watts Branch Park	11-B,C12	76-56'-55"	38-54'-21"
18	East bank of Anacostia south of Watts Branch	11-A13	76-57'-31"	38-54'-17"/54'-06"
19	East bank of Anacostia opposite Kingman Island	11-A13	76-57'-34"	38-54'-02"
20	East bank of Anacostia immediately north of Benning Road Bridge	17-A1	76-57'-38"	38-53'-52"
21	East bank of Anacostia between East Capitol Street and Benning Road	17-A2	76-57'-42"	38-53'-43"/53'-19"
22	East bank of Anacostia between East Capitol Street and railroad bridge	16-K3,4/17-A3	76-58'-11"/57'-16"	38-53'-18"/52'-53"
23	Fort Dupont Park near rehabilitation center	17-A4	76-57'-42"	38-52'-53"
24	Fort Dupont Park along F-Street parking area	17-A4	76-57'-20"	38-52'-52"
25	Anacostia Park at Nicholson Street parking area	16-H,J5	76-58'-39"	38-52'-28"
26	Barney Circle and Water Street	16-H5	76-58'-39"	38-52'-44"
27	Between Water Street and Anacostia, 700 feet north of Sousa Bridge	16-G5	76-59'-18"	38-52'-29"
28	Fort Stanton Park, Good Hope Road opposite 22nd Place	16-J7	76-58'-35"	38-51'-50"

29	Anacostia Park at 11th Street Bridge	16-H5	76-59'-16"	38-52'-16"
30	East bank of Anacostia River opposite Washington Navy Yard	16-E,F,G6	77-00'-09"/59'-07"	38-52'-24"/52'-11"
31	Anacostia Park near old greenhouses	16-F7	76-59'-47"	38-51'-58"
32	Anacostia Park near old greenhouses	16-E7	77-00'-04"/59'-56"	38-52'-06"/51'-55"
33	St. Elizabeths Hospital along western property boundary	16-G10	76-59'-15"	38-50'-47"
34	Floodplain of Oxon Run east of Valley Avenue	16-G12	76-59'-17"/58'-58"	38-50'-17"
35	Oxon Creek at I-295 bridge	22-A,B5	77-01'-24"	38-48'-14"
36	Rock Creek Park between Beach and Parkside Drive	3-H11	77-03'-11"/02'-39"	38-59'-10"/58'-54"
37	Whitehaven Park	9-C11	77-04'-33"	38-54'-53"
38	Glover-Archibald Park at Whitehaven Tributary	9-C10	77-04'-55"	38-55'-03"
39	Glover-Archibald Park at Reservoir Road	9-C11	77-04'-43"	38-54'48+"
40	C&O Canal Park at Chain Bridge	8-H8,9	77-06'-53"/06'-12"	38-56'-03"/55'-15"
41	C&O Canal Park south of Fletchers Boathouse	8-K11	77-06'-03"	38-54'-49"
42	East side of Roosevelt Island	15-E1	77-03'-41"/03'-32"	38-53'-56"/53'-12"
43	Roosevelt Island south of Memorial Bridge	15-E1	77-03'-33"	38-53'-26"
44	West side of Roosevelt Island	15-E1	77-03'-51"	38-53'-43"
45	Potomac River at Boundary Channel and Memorial Bridge	15-E2	77-03'-48"	38-53'-27"
46	South Dakota & Hamilton Avenue at Riggs Plaza Apts.	10-E4	77-00'-00"	38-57'-15"
47	Soldiers and Sailors Home	10-C7	77-00'-58"	38-56'-12"
48	Soldiers and Sailors Home	10-B8	77-01'-04"	38-55'-59"

ATTACHMENT 3

Wetland Boundary Plan



BOATHOUSE – PLAN VIEW

SCALE 1" = 50'-0"

"This plat identifies as wetlands all areas of wetlands and waters of the U.S. pursuant to Section 404 of the Clean Water Act as delineated by the undersigned on September 22, 2004. Unless there is a change in the law or published regulations, the Corps of Engineers generally accepts delineation for a period not to exceed five years from this date. This determination was made utilizing the 1987 Corps of Engineers Wetlands Delineation Manual." The boundary line has not yet been approved by the Baltimore District.

(name)

(title)

(date)

GRAPHIC SCALE

0 25 50

1 inch = 50 ft.

"All point and contour elevations shown are on DC Surveyors Datum. The OHWM was obtained by averaging the daily high water measured at a real-time USGS Tidal Gauge 01647600 located on the Potomac at Wisconsin Avenue in Washington DC. Data from the tidal gauge is provided in DC Mean Low Water. Water elevations were converted to Mean Sea Level (MSL) NGVD 29 by subtracting 1.41 feet from DC Mean Low Water. Topographic elevations (vertical datum) provided by A. Morton Thomas as shown on this drawing were provided in DC Surveyors Datum which is 0.7 feet lower than MSL NGVD 29. Therefore the OHWM is 4.03 MSL and 3.33 feet on DC Surveyor datum."

LEGEND

- AREA OF REVIEW
- ORDINARY HIGH WATER (OHWM) = 3.33 DC SURVEYORS DATUM OR 4.03 MSL NGVD 29
- WETLAND BOUNDARY FLAG (44 TOTAL)
- SOIL PROBE (SP-1 THROUGH SP-3)
- PHOTO LOCATION
- WETLAND AREA (= 0.31 ACRES)
- NAVIGABLE WATERS OF THE U.S.

REFERENCE: The wetland points were surveyed by A. Morton Thomas, Inc. on October 3, 2004. The information was obtained from their drawing dated Oct. 2004 and titled Georgetown University Boathouse Site. Additional information for the proposed design was provided by Georgetown University and from a plan developed by MUSE ARCHITECTS.

NOTES:
1. A. Morton Thomas surveyed this property NAD 83/93 Maryland State Plane on October 3, 2004
* Flag WD-44 had been inappropriately moved before surveying. This flag location has been estimated.

REV.	DESCRIPTION	DATE

DELINEATED BY: JOR | DRAWN BY: NSF | CHECKED BY: JOR/PIW

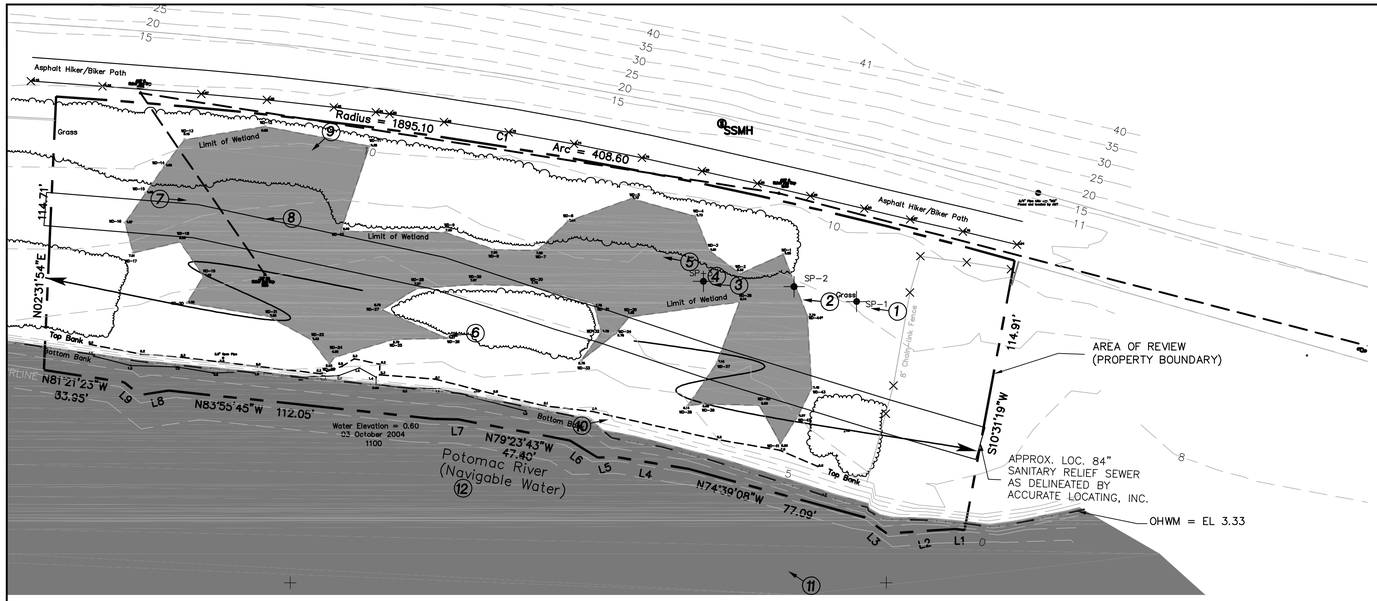
JANE O. ROWAN, P.W.S.
DATE: 2/4/05
PROFESSIONAL WETLAND SCIENTIST
000170

Schnabel Engineering
656 Quince Orchard Road
Suite 700
Gaithersburg, MD 20870
Phone: 301-417-2400

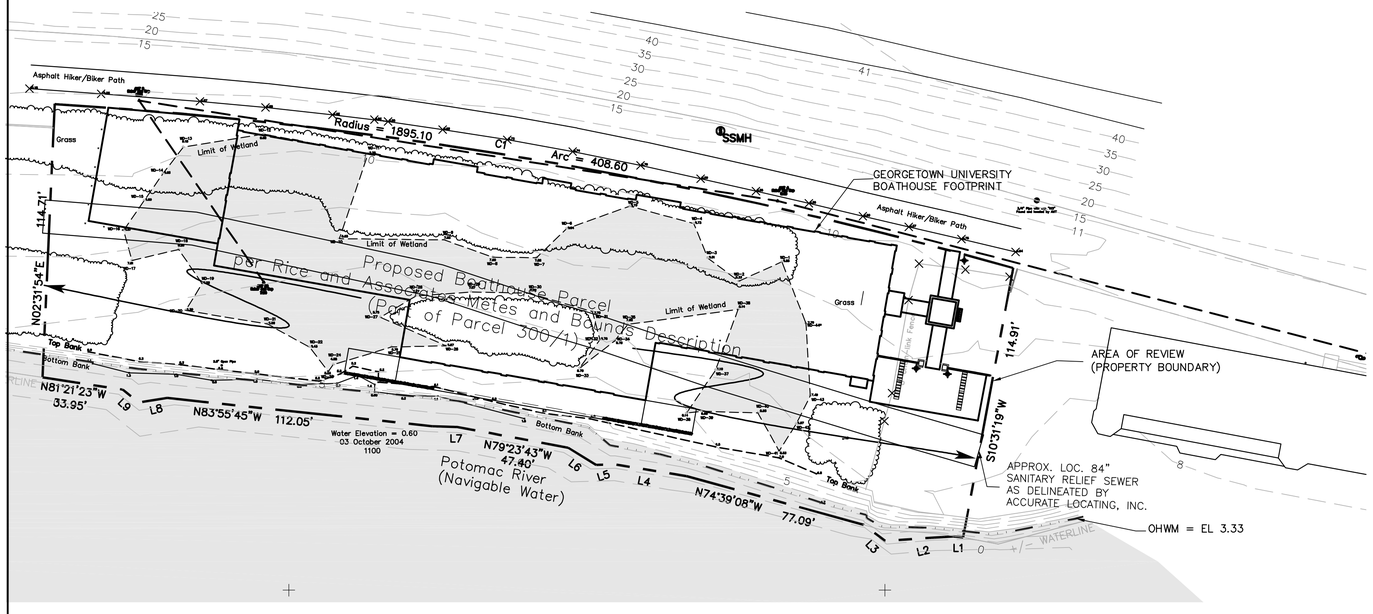
WETLANDS DELINEATION AND SAV REPORT
NON-MOTORIZED BOATHOUSE
GEORGETOWN UNIVERSITY
WASHINGTON, D.C.

WETLAND BOUNDARY PLAN

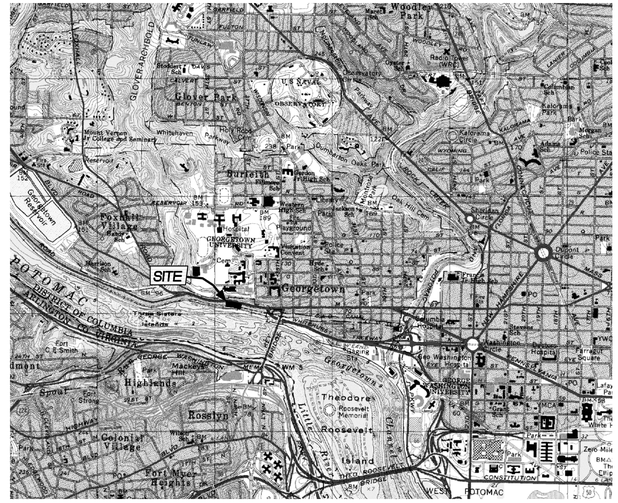
SCALE:	DATE:	DRAWING NO.	ATTACHMENT
AS SHOWN	2/4/05	04121197.01	3



WETLAND AND WATERS OF THE U.S. – PLAN VIEW
SCALE 1" = 30'-0"



BOATHOUSE – PLAN VIEW
SCALE 1" = 30'-0"



REFERENCE: USGS 7.5 MINUTE QUADRANGLE WASHINGTON WEST, DC–MD–VA 1965, PHOTOREVISED 1983 AND BATHYMETRY ADDED 1982

VICINITY MAP
SCALE 1" = 2000'

LEGEND

- AREA OF REVIEW
- ORDINARY HIGH WATER (OHWM) = 3.33 DC SURVEYORS DATUM OR 4.03 MSL NGVD 29
- WD–6 8.54 — WETLAND BOUNDARY FLAG (44 TOTAL)
- SP–1 — SOIL PROBE (SP–1 THROUGH SP–3)
- PHOTO LOCATION
- WETLAND AREA (= 0.31 ACRES)
- NAVIGABLE WATERS OF THE U.S.

"All point and contour elevations shown are on DC Surveyors Datum. The OHWM was obtained by averaging the daily high water measured at a real–time USGS Tidal Gauge 01647600 located on the Potomac at Wisconsin Avenue in Washington DC. Data from the tidal gauge is provided in DC Mean Low Water. Water elevations were converted to Mean Sea Level (MSL) NGVD 29 by subtracting 1.41 feet from DC Mean Low Water. Topographic elevations (vertical datum) provided by A. Morton Thomas as shown on this drawing were provided in DC Surveyors Datum which is 0.7 feet lower than MSL NGVD 29. Therefore the OHWM is 4.03 MSL and 3.33 feet on DC Surveyor datum."

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

NOTES:
1. A. Morton Thomas surveyed this property NAD 83/93 Maryland State Plane on October 3, 2004

* Flag WD–44 had been inappropriately moved before surveying. This flag location has been estimated.

"This plat identifies as wetlands all areas of wetlands and waters of the U.S. pursuant to Section 404 of the Clean Water Act as delineated by the undersigned on September 22, 2004. Unless there is a change in the law or published regulations, the Corps of Engineers generally accepts delineation for a period not to exceed five years from this date. This determination was made utilizing the 1987 Corps of Engineers Wetlands Delineation Manual." The boundary line has not yet been approved by the Baltimore District.

(name)

(title)

(date)

REFERENCE: The wetland points were surveyed by A. Morton Thomas, Inc. on October 3, 2004. The information was obtained from their drawing dated Oct. 2004 and titled Georgetown University Boathouse Site. Additional information for the proposed design was provided by Georgetown University and from a plan developed by MUSE ARCHITECTS.

REV.	DESCRIPTION	DATE

DELINEATED BY:	DRAWN BY:	CHECKED BY:
JOR	NSF	JOR/PIW

JANE O. ROWAN, P.W.S.
DATE:
PROFESSIONAL WETLAND SCIENTIST
000170

Schnabel Engineering
656 Quince Orchard Road
Suite 700
Gaithersburg, MD 20870
Phone: 301–417–2400

WETLANDS DELINEATION AND SAV REPORT
NON–MOTORIZED BOATHOUSE
GEORGETOWN UNIVERSITY
WASHINGTON, D.C.

WETLAND BOUNDARY PLAN

SCALE:	DATE:	DRAWING NO.	ATTACHMENT
AS SHOWN	2/4/05	04121197.01	3

ATTACHMENT 4

Corps Data Sheets

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Georgetown University Boathouse	Date:	Sept. 22, 2004
Applicant/Owner:	Georgetown University	County:	DC
Investigator:	J. Rowan	State:	DC

Do Normal Circumstances exist on the site?	Yes	☑	No	☐	Community ID:
Is the site significantly disturbed (Atypical Situation)?	Yes	☐	No	☑	Transect ID:
Is the area a potential problem area?	Yes	☑	No	☐	Plot ID: SP-1
(If needed, explain on reverse.) mowed grass and fill					

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Digitaria sanguinalis	G	FACU-	9.		
2. Grass sp.	G	---	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 0?/1

Remarks: ~20 feet away from Cyperus strigosus and Typha latifolia

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☑ No Recorded Data Available

Field Observations:

Depth of Surface Water: --- (in.)

Depth to Free Water in Pit: none (in.)

Depth to Saturated Soil: --- (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): Urban land

Drainage Class:

Field Observations
Confirm Mapped Type? ☑ Yes ☐ No

Taxonomy (Subgroup): Udorthents

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4	A	7.5 YR 3/2	--		clay/silt, hard underneath

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: Refusal at 4 inches----Compacted Soil in this area is most likely fill.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☐ Yes	☑ No
Wetland Hydrology Present?	☐ Yes	☑ No
Hydric Soils Present?	☐ Yes	☑ No

Is this Sampling Point Within a Wetland? ☐ Yes ☑ No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Georgetown University Boathouse	Date:	Sept. 22, 2004
Applicant/Owner:	Georgetown University	County:	DC
Investigator:	J. Rowan	State:	DC
Do Normal Circumstances exist on the site?	Yes ☑ No ☐	Community ID:	
Is the site significantly disturbed (Atypical Situation)?	Yes ☑ No ☐	Transect ID:	
Is the area a potential problem area?	Yes ☐ No ☑	Plot ID:	SP-3
(If needed, explain on reverse.)			

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cyperus strigosus	G	FACW	9.		
2. Phalaris arundinacea	G	FACW+	10.		
3. Agrostis alba	G	FACW	11.		
4. Setaria viridis	G	NL	12.		
5. Grass sp.	G	---	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 3/5 60%

Remarks: hummocks, shaded, Rubus sp. near edge, no woody seedlings

HYDROLOGY

☐ Recorded Data (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☑ No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)

Depth to Free Water in Pit: 6 (in.)

Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: water filled into hole from beneath

SOILS

Map Unit Name (Series and Phase): Urban land

Drainage Class: poorly drained

Field Observations
Confirm Mapped Type? ☑ Yes ☐ No

Taxonomy (Subgroup): Udorthents

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	2.5Y 3/1	---		

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☑ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: Refusal at 12 inches---May be over 84 inch sewer main

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☑ Yes	☐ No
Wetland Hydrology Present?	☑ Yes	☐ No
Hydric Soils Present?	☑ Yes	☐ No

Is this Sampling Point Within a Wetland? ☑ Yes ☐ No

Remarks:

ATTACHMENT 5

Photographs

PHOTO 1 – Location of SP-1. 9/04

PHOTO 2 – Location of SP-2. 9/04

PHOTO 3 – Location of SP-3. 9/04

PHOTO 4 – Example of general hydric soils on the site (SP-3). 9/04

PHOTO 5 – Location of wetland and sewer line. 9/04

PHOTO 6 – View of wetland area at WD-26. 9/04

PHOTO 7 – View of wetland, looking south. 9/04

PHOTO 8 – Northern end of wetland on the sewer line. 9/04

PHOTO 9 – Wet, swampy conditions just off the hiking path. 9/04

PHOTO 10 – Southern shoreline of the Potomac River. 9/04

PHOTO 11 – Proposed boathouse location. 11/04

PHOTO 12 – Submerged Aquatic Vegetation (SAV) assessment. 11/04

PHOTO 13 – C&O Canal, upgradient of the site. 11/04

PHOTO 14 – C&O Canal, upgradient and downstream of the site. 11/04

PHOTO 15 – Off-site SAV assessment (Spatterdock). 11/04

ATTACHMENT 6

SAV Maps 2000-2003

Species and Ground Surveyor Key
SAV Bed 2000 Site
Key for 2000 Comparison
SAV Bed 2001 Site
Key for 2001 Comparison
SAV Bed 2002 Site
2002 Verbal Account
SAV Bed 2003 Site
Key for 2003 SAV Comparison

Species and Ground Surveyor Key

* Abbreviations under column "Species" are as follows:

Zm - *Zostera marina* (eelgrass)
Rm - *Ruppia maritima* (widgeon grass)
C - *Chara* sp. (muskgrass)
Cd - *Ceratophyllum demersum* (coontail)
Cl - *Callitriche* sp. (water-starwort)
Ec - *Elodea canadensis* (common elodea)
Ed - *Egeria densa* (water-weed)
Hd - *Heteranthera dubia* (water stargrass)
Hv - *Hydrilla verticillata* (hydrilla)
Ms - *Myriophyllum spicatum* (Eurasian watermilfoil)
N - *Najas* sp. (naiad)
Nfl - *Najas flexilis* (northern naiad)
Ngr - *Najas gracillima* (slender naiad)
Ngu - *Najas guadalupensis* (southern naiad)
Nm - *Najas minor* (no common name)
Nt - *Nitella* sp. (muskgrass)
Pcr - *Potamogeton crispus* (curly pondweed)
Pe - *Potamogeton epihydrus* (leafy pondweed)
Pn - *Potamogeton nodosus*
Ppc - *Stuckenia pectinata* (sago pondweed)(*Potamogeton pectinatus*)
Ppf - *Potamogeton perfoliatus* (redhead-grass)
Ppu - *Potamogeton pusillus* (slender pondweed)
S - *Sparganium* sp. (bureed)
Tn - *Trapa natans* (water chestnut)
Va - *Vallisneria americana* (wild celery)
Zp - *Zannichellia palustris* (horned pondweed)
U - Unknown species composition

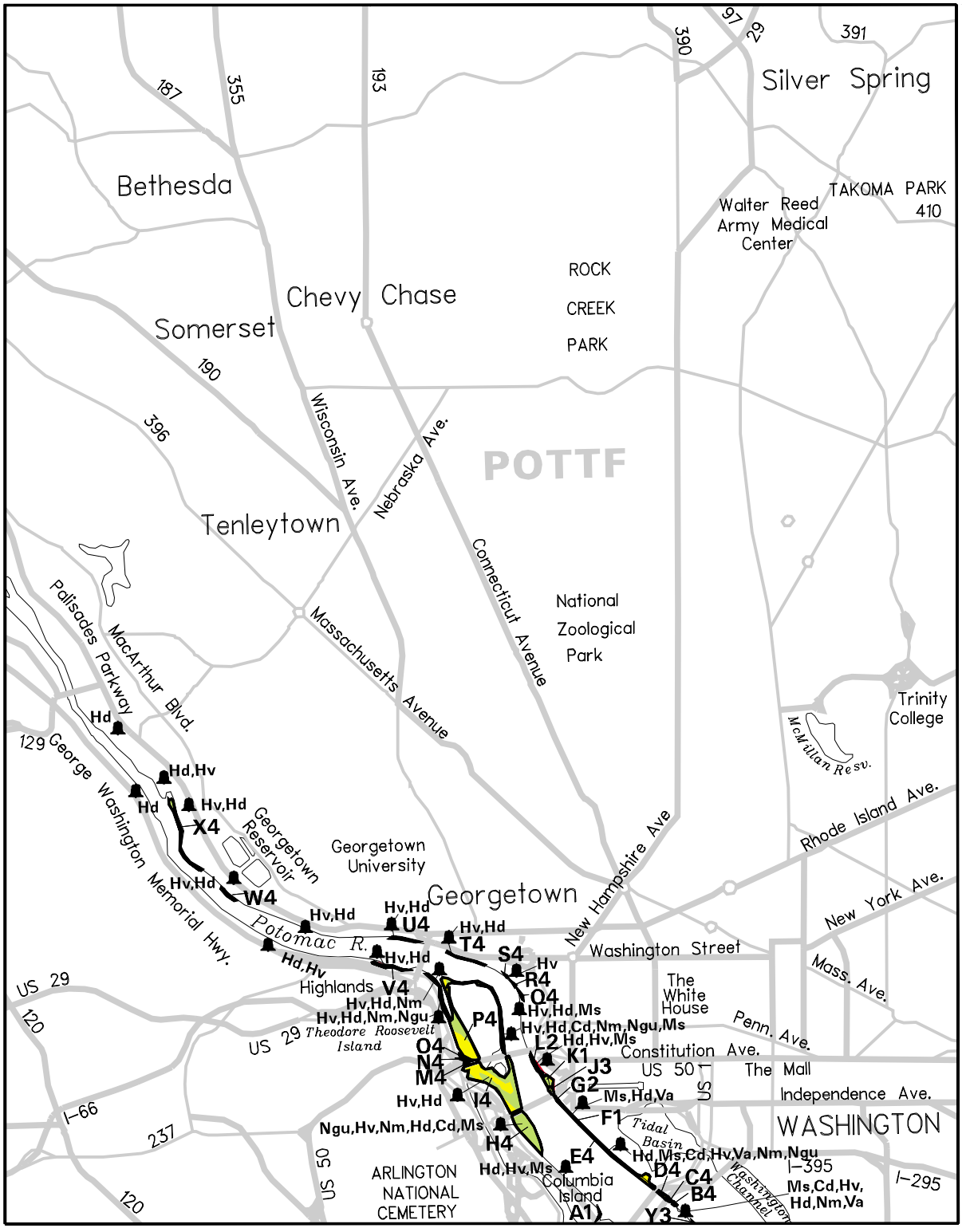
** Abbreviations under column "Surveyor" are as follows:

APG - Aberdeen Proving Ground
BCDEPRM - Baltimore County Department of Environmental Protection and Resource Management

CBF	-	Chesapeake Bay Foundation
CBL	-	University of Maryland Center for Environmental Science-Chesapeake Biological Laboratory
Citizen	-	Citizens Field Observation
COG	-	Metropolitan Washington Council of Governments
DCFWD	-	D.C. Fisheries and Wildlife Division
HPEL	-	University of Maryland Center for Environmental Science-Horn Point Lab
MD-DNR	-	Maryland Department of Natural Resources
NOAA	-	National Oceanic and Atmospheric Administration
NPS	-	National Park Service
SMCM	-	St. Mary's College of Maryland
USGS	-	United States Geological Survey
VIMS	-	Virginia Institute of Marine Science

Submerged Aquatic Vegetation 2000

(028) Washington West, Md.- D.C.- Va



Hectares of SAV: 94.00

Date Flown: 09/22

1000 0 1000 2000 meters

2000 SAV 1999 SAV Both years

Sources: VIMS,USGS

Washington West, Md.- D.C.- Va. -----2000
(VIMS Map # 028)

Key for 2000 Comparison

SAV Bed	Area (m^2)
A1	1,460
B4	1,491
C4	1,530
D4	4,735
E4	29,908
F1	4,643
G2	2,766
H4	68,270
I4	152,463
J3	4,244
K1	11,834
L2	6,296
M4	1,090
N4	2,188
O4	848
P4	131,964
Q4	1,385
R4	788
S4	653
T4	5,551
U4	4,401
V4	7,880
W4	4,793
X4	18,534
Y3	298

Density	Area (m^2)
(1) 0-10%	17,937
(2) 10-40%	9,062
(3) 40-70%	4,543
(4) 70-100%	438,471
Total:	470,013

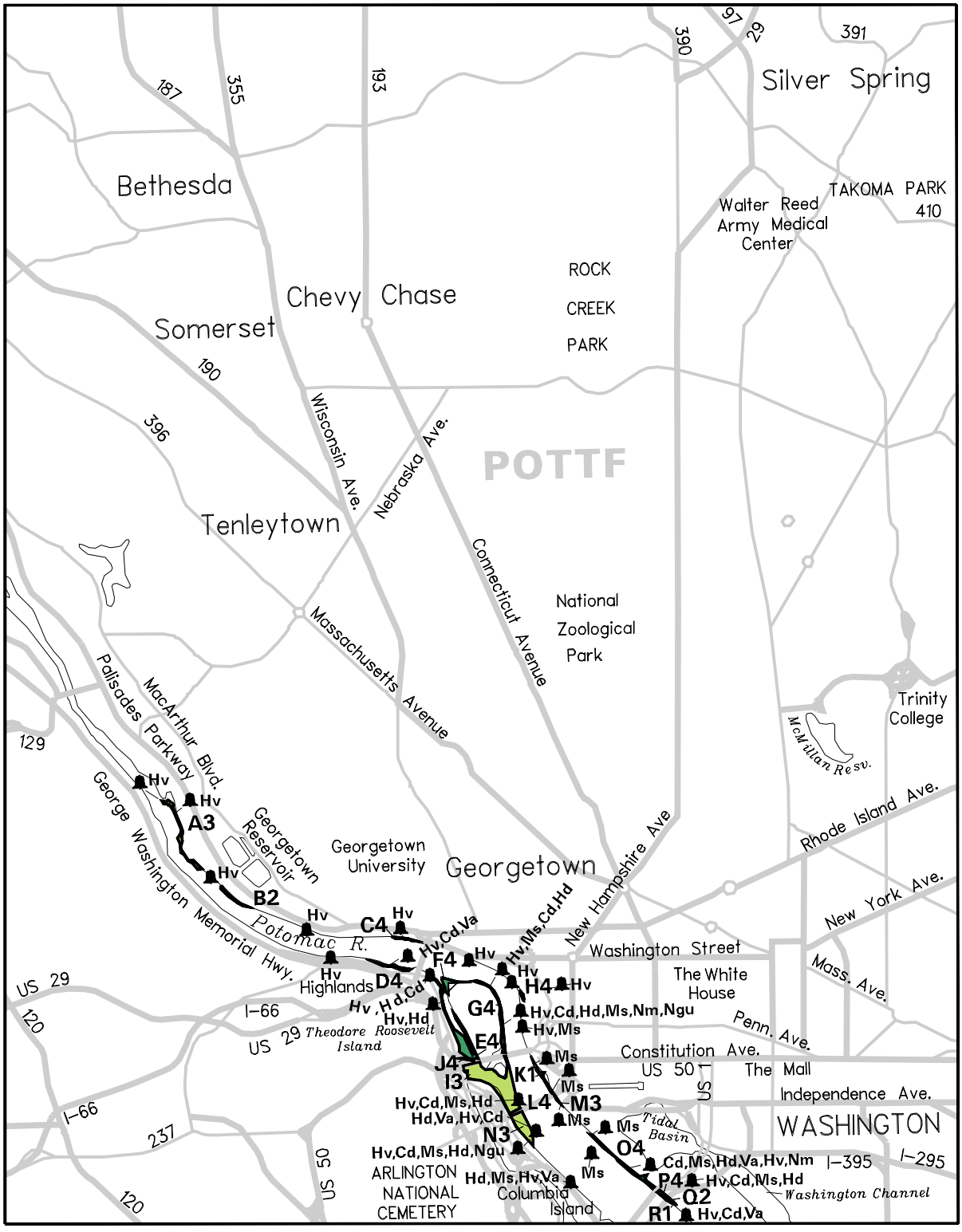
Species Reported: ***C. demersum, H. dubia, H. verticillata, M. spicatum, N. guadalupensis, N. minor, V. americana***

Segment	2000 Bed	Species	Surveyor	Survey Date
POTTF	Northwest A1	Hd, Hv, Ms	DCFWD	09/13/00
	H4	Ngu, Hv, Nm, Hd, Cd, Ms	DCFWD	09/13/00
	I4	Hv, Hd	DCFWD	09/13/00
	P4	Hv, Hd, Cd, Nm, Ngu, Ms	DCFWD	09/13/00
	P4	Hv, Hd, Nm, Ngu	DCFWD	09/13/00
	P4	Hv, Hd, Nm	DCFWD	09/13/00

	O4	Hv, Hd	DCFWD	09/12/00
	Southeast of W4	Hd, Hv	DCFWD	09/12/00
	Northwest of X4	Hd	DCFWD	09/12/00
	Northwest of X4	Hd	DCFWD	09/12/00
	Northwest of X4	Hd, Hv	DCFWD	09/12/00
	East of X4	Hv, Hd	DCFWD	09/12/00
	North of W4	Hv, Hd	DCFWD	09/12/00
	West of U4	Hv, Hd	DCFWD	09/12/00
	U4	Hv, Hd	DCFWD	09/12/00
	T4	Hv, Hd	DCFWD	09/12/00
	S4	Hv	DCFWD	09/12/00
	South of Q4	Hv, Hd, Ms	DCFWD	09/12/00
	L2	Hd, Hv, Ms	DCFWD	09/12/00
	F1	Ms, Hd, Va	DCFWD	09/12/00
	E4	Hd, Ms, Cd, Hv, Va, Nm, Ngu	DCFWD	09/12/00
	B4	Ms, Cd, Hv, Hd, Nm, Va	DCFWD	09/12/00

Submerged Aquatic Vegetation 2001

(028) Washington West, Md.- D.C.- Va



Hectares of SAV: 34.54
Date Flown: 09/08

1000 0 1000 2000 meters

2001 SAV Density Class

0-10%	10-40%	40-70%	70-100%

Sources: VIMS,USGS

Alexandria, Va.- D.C.- Md.
(VIMS Map # 034)

Key for 2001 Comparison

SAV Bed	Area (m^2)
A4	16,605
B3	17,320
C4	34,597
D4	60,837
E4	621,942
F4	31,395
G4	11,193
H4	8,260
I4	1,971
J4	46,256
K4	6,401
L4	60,892
M2	9,959
N4	3,599
O4	5,284
P2	79,228
Q4	41,195
R4	180,261
S4	63,397
T4	1,145,084
U4	29,558
V4	12,028
W4	3,134
X4	41,066
Y3	5,563
Z3	24,583
AA4	4,553
BA4	5,272
CA4	4,054
DA4	29,603
EA4	7,608
FA3	344,937
GA4	816,993
HA2	297,964
IA4	509,336
JA4	959,640
KA4	12,894
LA4	34,299
MA4	10,427
NA4	207,186
OA2	11,895
PA1	30,775

Density	Area (m^2)
(1) 0-10%	30,775
(2) 10-40%	399,045
(3) 40-70%	392,403
(4) 70-100%	5,026,821
Total:	5,849,044

Species Reported: ***C. demersum, H. dubia, H. verticillata, M. spicatum, N. guadalupensis, N. minor, V. americana***

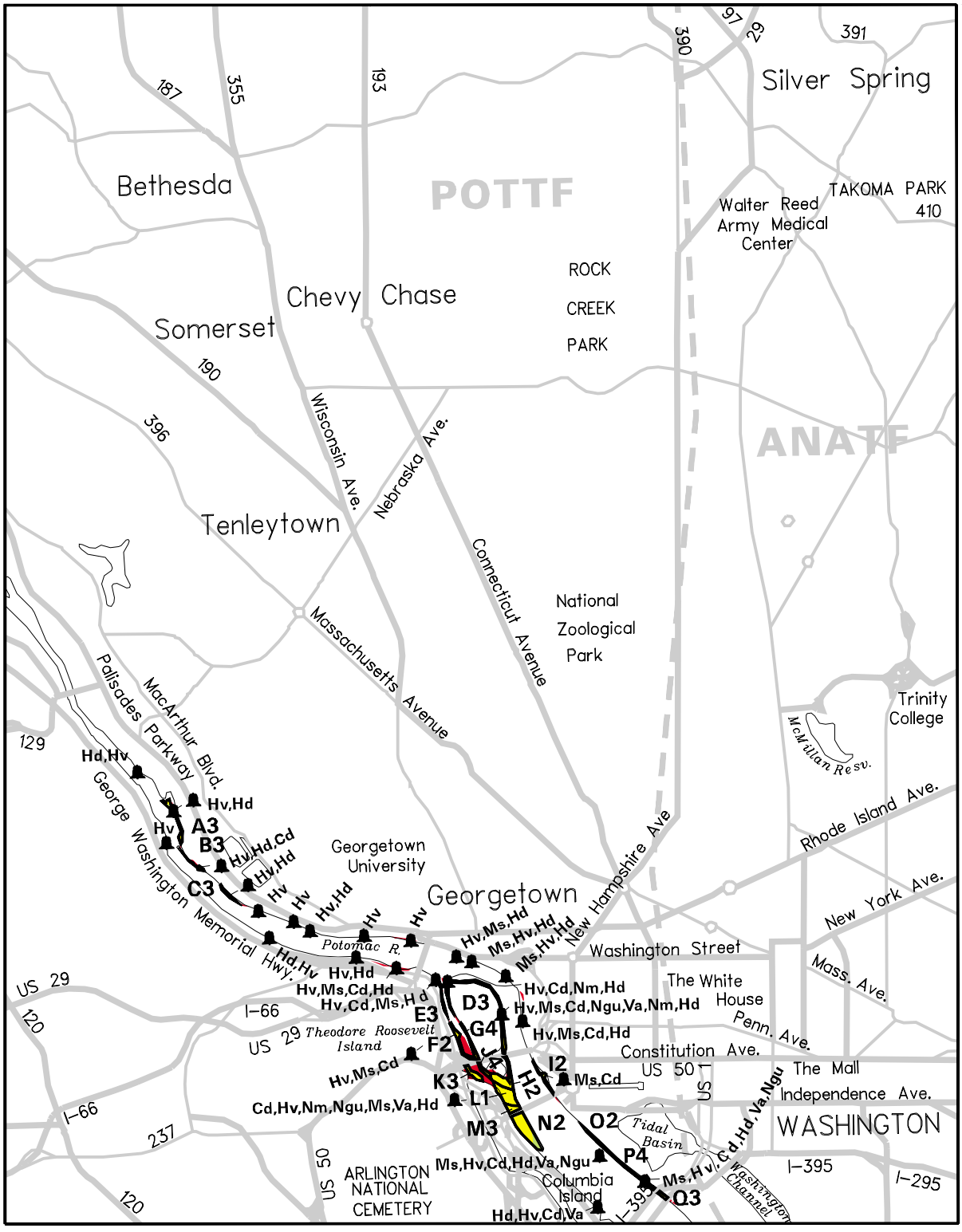
Segment	2001 Bed	Species	Surveyor	Survey Date
POTTF	T4	Cd, Ms, Hv, Va	DCFWD	10/10/01, 10/15/01
	West of T4	Cd, Ms, Hv, Hd, Va, Ngu	DCFWD	10/10/01, 10/15/01
	T4	Ms, Hv, Cd	DCFWD	10/10/01, 10/15/01
	T4	Cd, Ms, Hv, Hd, Va, Ngu	DCFWD	10/10/01, 10/15/01
	East of T4	Va, Hv, Cd, Ms, Ngu	DCFWD	10/10/01, 10/15/01
	East of T4	Cd, Ms, Hv, Va	DCFWD	10/10/01, 10/15/01
	West of CA4	Hv, Ms, Cd, Va	DCFWD	10/10/01, 10/15/01
	Slightly west of CA4	Hv, Ms	DCFWD	10/10/01, 10/15/01
	West of AA4	Hv, Ms, Cd, Va	DCFWD	10/10/01, 10/15/01
	X4	Hv, Hd, Va, Ms, Cd	DCFWD	10/10/01, 10/15/01
	Slightly west of AA4	Hv, Hd, Va, Ms, Cd	DCFWD	10/10/01, 10/15/01
	Border of W4	Hv	DCFWD	10/10/01, 10/15/01
	East of W4	Hv	DCFWD	10/10/01, 10/15/01
	East of U4	Hv, Cd, Ms, Hd, Va	DCFWD	10/10/01, 10/15/01
	U4	Hv, Cd, Ms, Hd, Va	DCFWD	10/10/01, 10/15/01
	R4	Ms, Hv, Cd	DCFWD	10/10/01, 10/15/01
	R4	Ms, Hv	DCFWD	10/10/01, 10/15/01
	L4	Ms, Cd, Hv, Hd, Va	DCFWD	10/10/01, 10/15/01
	Slightly west of L4	Va, Ms, Hv, Hd, Cd	DCFWD	10/10/01, 10/15/01
	L4	Hv, Va, Cd, Ms	DCFWD	10/10/01, 10/15/01
	West of F4	Va, Hd, Cd, Hv, Ms	DCFWD	10/10/01, 10/15/01
	West of F4	Va, Ms, Hv, Hd	DCFWD	10/10/01, 10/15/01
	North of F4	Va, Ms, Hv, Hd	DCFWD	10/10/01, 10/15/01
	South shore of Anacostia River	Va, Hd	DCFWD	10/10/01, 10/15/01
	South shore of Anacostia River	Va	DCFWD	09/28/01
	South shore of Anacostia River	Va	DCFWD	09/28/01
	North shore of Anacostia River	Hv	DCFWD	09/28/01
	North shore of Anacostia River	Hv, Cd	DCFWD	09/28/01
	North shore of Anacostia River	Va, Hv	DCFWD	09/28/01

	North shore of Anacostia River	Va, Hv	DCFWD	09/28/01
	Mouth of Anacostia River	Hv	DCFWD	09/26/01
	West of bed B3	Va, Hv, Cd	DCFWD	09/28/01
	Upper portion of Potomac River	Va	DCFWD	09/26/01
	Upper portion of Potomac River	Va	DCFWD	09/26/01
	West of C4	Cd, Ms, Hv, Va, Hd	DCFWD	09/26/01
	West of E4	Hv, Hd, Cd	DCFWD	09/26/01
	West of E4	Hv, Hd, Ms, Cd	DCFWD	09/26/01
	West of E4	Ms, Hd, Hv, Cd, Va, Ngu	DCFWD	09/26/01
	E4	Cd, Ms, Hv, Hd, Va, Ngu	DCFWD	10/10/01, 10/15/01
	E4	Cd, Ms, Hv	DCFWD	10/10/01, 10/15/01
	E4	Cd, Hv, Hd, Ms, Ngu	DCFWD	10/10/01, 10/15/01
	West of E4	Hv, Cd	DCFWD	10/10/01, 10/15/01
	West of J4	Hv, Ms, Cd, Va	DCFWD	10/10/01, 10/15/01
	West of K4	Hv, Cd, Va	DCFWD	10/10/01, 10/15/01
	West of O4	Hv, Va, Cd, Hd	DCFWD	10/10/01, 10/15/01
	Q4	Ms, Hv, Cd, Va	DCFWD	10/10/01, 10/15/01
	West of Q4	Ms, Va, Hv, Cd, Ngu, Hd	DCFWD	10/10/01, 10/15/01
	North of S4	Va, Ms, Hd	DCFWD	10/10/01, 10/15/01
	West of S4	Ms, Cd, Hv, Hv, Ngu, Va, Hd	DCFWD	10/10/01, 10/15/01
	S4	Hv, Hd, Ms	DCFWD	10/10/01, 10/15/01
	West of V4	Hd, Va, Ms, Hv, Ngu	DCFWD	10/10/01, 10/15/01
	West of Y3	Hv, Ms, Va	DCFWD	10/10/01, 10/15/01
	Between beds Z3 and FA3	Ms, Hv, Va, Cd	DCFWD	10/10/01, 10/15/01
	North of FA3	Ms, Hd	DCFWD	10/10/01, 10/15/01
	Between beds NA4 and IA4	Ms, Cd	DCFWD	10/10/01, 10/15/01
	IA4	Hv, Ms, Cd, Nm, Ngu, Hd	USGS	08/29/01
	IA4	Hv, Ngu, Ms, Va, Cd, Hd	USGS	08/29/01
	OA2	Hv, Nm, Ngu, Ms, Cd, Va, Hd	USGS	08/29/01
	West of IA4	Hv, Ngu, Va, Nm, Ms, Cd, Hd	USGS	08/29/01
	IA4	Hv, Ms, Va, Cd, Nm, Ngu, Hd	USGS	08/29/01
	IA4	Hv, Va, Nm, Ngu, Hd, Ms, Cd	USGS	08/29/01
	West of IA4	Nm, Va, Hv, Ngu, Cd, Ms, Hd	USGS	08/29/01
	West of IA4	Hv, Nm, Ngu, Ms, Va, Cd, Hd	USGS	08/29/01
	IA4	Hv, Nm, Cd, Ngu, Va, Hd, Ms	USGS	08/29/01
	West of IA4	Va, Nm, Hv, Hd, Cd, Ms, Ngu	USGS	08/29/01
	IA4	Va, Hv, Cd, Nm, Ngu, Ms, Hd	USGS	08/29/01
	West of IA4	Cd, Hv, Ngu, Ms, Hd, Va, Nm	USGS	08/29/01
	GA4	Cd, Hv, Ms, Va, Ngu, Hd	USGS	08/29/01
	IA4	Hv, Ms, Cd, Ngu, Hd	USGS	08/29/01

	West of IA4	Hv, Ms, Ngu, Cd, Va, Nm, Hd	USGS	08/29/01
	West of IA4	Ms, Ngu, Hv, Cd, Hd	USGS	08/29/01
	North of IA4	Ngu, Hv, Hd, Ms	USGS	08/29/01
	West of DA4	Hv, Ngu, Cd, Ms, Hd	USGS	08/29/01
	West of EA4	Hv, Ngu, Cd, Hd, Nm	USGS	08/29/01
	Between beds T4 and GA4	Cd, Hv, Nm, Ngu, Ms, Hd	USGS	08/29/01
	GA4	Cd, Hv, Ms, Va, Ngu, Hd	USGS	08/29/01
	GA4	Cd, Hv, Ms, Va, Ngu, Hd	USGS	08/29/01
	Border of GA4	Ms, Va, Hv, Cd, Hd, Nm, Ngu	USGS	08/29/01
	Border of GA4	Hv, Ms, Va, Cd, Nm, Ngu, Hd	USGS	08/29/01
	Off southwest tip of GA4	Nm, Va, Hv, Ms, Cd, Hd, Ngu	USGS	08/29/01
	Off southwest tip of GA4	Va, Nm, Ngu, Hv, Hd, Ms, Cd	USGS	08/29/01
	Slightly west of IA4	Ms, Hv, Cd, Ngu, Va, Nm	USGS	08/29/01
	JA4	Hv, Ngu, Ms, Hd, Va, Cd	USGS	08/29/01
	JA4	Hv, Ms, Cd, Hd	USGS	08/29/01
	West of KA4	Hv, Cd, Nm, Ms	USGS	08/29/01
	NA4	Ngu, Nm, Cd, Hv, Ms, Hd	USGS	08/29/01
	NA4	Hv, Cd, Ngu, Nm, Ms	USGS	08/29/01
	Border of NA4	Ngu, Cd, Hv, Nm, Hd, Va, Ms	USGS	08/29/01
	NA4	Va, Hv, Ngu, Ms, Hd	USGS	08/29/01
	NA4	Cd, Hv, Va, Nm, Ms, Ngu	USGS	09/04/01
	NA4	Ngu, Cd, Hv, Nm, Hd, Va, Ms	USGS	08/29/01
	South of NA4	Va, Hv, Ngu, Ms, Hd	USGS	08/29/01

Submerged Aquatic Vegetation 2002

(028) Washington West, Md.- D.C.- Va



Hectares of SAV: 27.26
Date Flown: 11/03

1000 0 1000 2000 meters

2002 SAV | 2001 SAV | Both years

Sources: VIMS,USGS

Verbal Account for 2002

In 2002, 1,483.71 ha was mapped for POTTF. This segment accounted for 6.9% of the Middle Bay Zone and 4.1% of the Bay total. The 2010 restoration goal (1,768.29 ha) was not met for POTTF.

Due to flight restrictions following the events of September 11, only a portion (40%) of the area mapped in 2002 for POTTF was mapped in 2001. When comparing the same regions for both years SAV decreased 5%, from 619.45 ha reported in 2001 to 589.77 ha reported in 2002. In 2002, in the section of POTTF below Swan Creek, SAV decreased 5% from the 2000 levels (1,569.84 ha), the last time this segment was fully mapped.

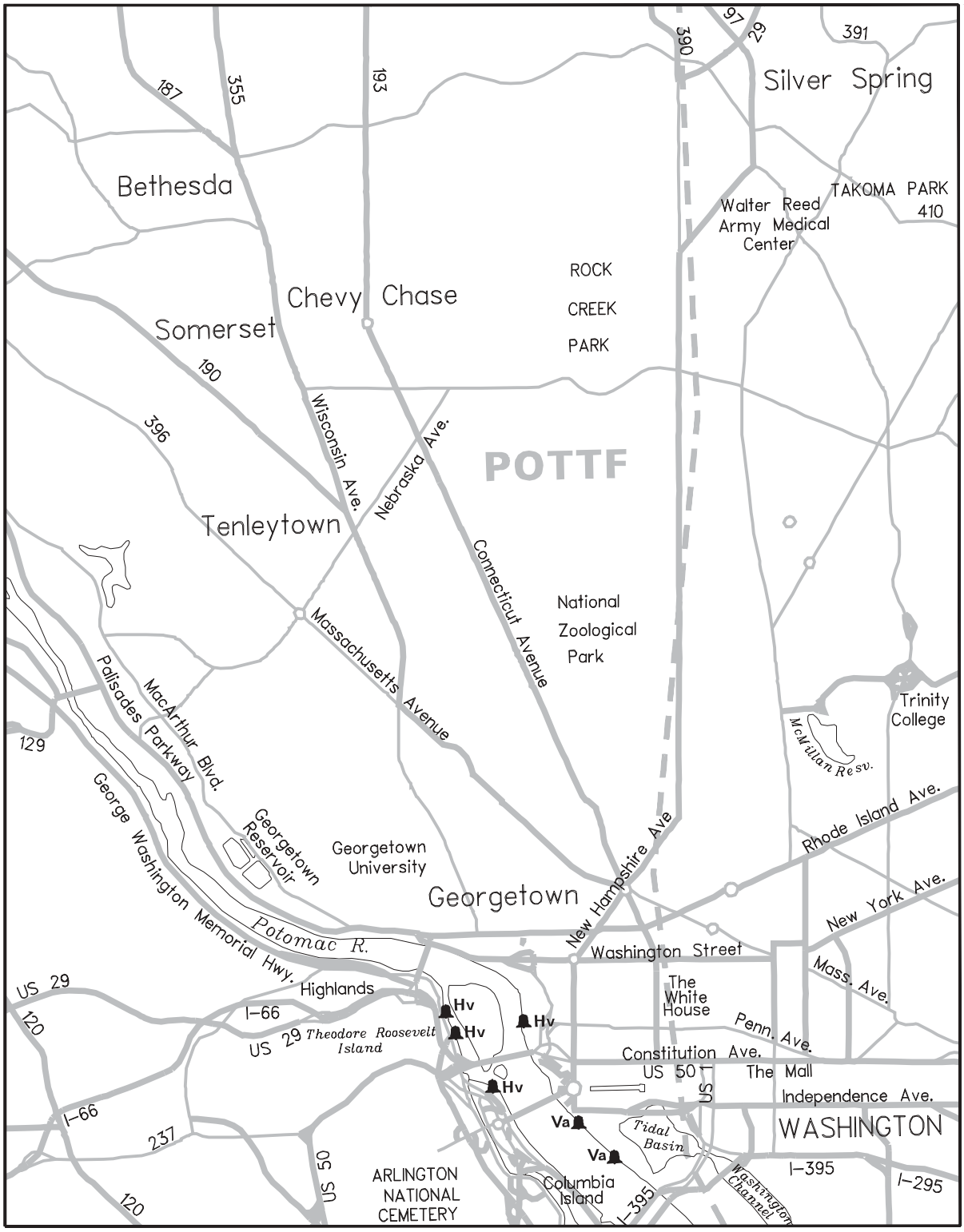
In 2002, SAV decreased from the 2001 levels on the west side of Theodore Roosevelt Island (Map 028); in the waterfowl sanctuary near Washington National Airport (Map 034); off Daingerfield Island (Map 034); and in Broad Creek (Map 040). SAV increased in portions of Broad Creek and in portions of Swan Creek (Map 040). No photography was available for either shore of the Potomac River below Swan Creek in 2001.

In 2002, SAV decreased from the 2000 levels in portions of Accotink Bay (Map 039); at the mouth of Dogue Creek (Map 040); to the north of Neabsco Creek (Map 047); and in Quantico and Chicamuxen creeks (Maps 047, 048).

SAV increased over the 2000 levels on the western shore of the Potomac River in Gunston Cove and to the north of Whitestone Point (Map 039); in Accotink Bay (Map 039); above and below Hallowing Point (Map 039); in Belmont Bay (Map 039); and south of Cockpit Point and in Quantico Creek (Map 047). New SAV beds were mapped in Little Hunting Creek, at the mouth of Little Hunting Creek, and in Powell Creek (Maps 040, 047). On the eastern shore of the Potomac River, SAV expanded in 2002 over 2000 levels from Swan Creek to Pomonkey Point and in Pomonkey Creek (Map 040).

Submerged Aquatic Vegetation 2003

(028) Washington West, Md.- D.C.- Va



Hectares of SAV: 0.00

Date Flown: 11/04

1000 0 1000 2000 meters

2003 SAV Density Class

0-10%	10-40%	40-70%	70-100%

Sources: VIMS,USGS

Washington West, Md.- D.C.- Va. -------2003
(VIMS Map # 028)

No SAV Beds were mapped.

Species Reported: *H. verticillata, V. americana*

Key for 2003 Comparison

Segment	2003 Bed	Species	Surveyor	Survey Date
POTTF	West of Tidal Basin	Va	DCFWD	10/7/2003
	West of Tidal Basin	Va	DCFWD	10/7/2003
	East of Theodore Roosevelt Island	Hv	DCFWD	10/7/2003
	West of Theodore Roosevelt Island	Hv	DCFWD	10/7/2003
	West of Theodore Roosevelt Island	Hv	DCFWD	10/7/2003
	South of Theodore Roosevelt Island	Hv	DCFWD	10/7/2003

ATTACHMENT 7

Tidal Gauge Data

Tide Gauge Details
Monthly Maximum
Daily Maximum

USGS 01647600 POTOMAC RIVER AT WISCONSIN AVE, WASHINGTON, DC

GO

STATION.--01647600 POTOMAC RIVER AT WISCONSIN AVE., WASHINGTON, D.C.

LOCATION.--Lat 38°54'08.4", long 77°03'45.9", District of Columbia, Hydrologic Unit 02070010, on left bank at foot of Wisconsin Ave. (Georgetown), 0.35 mi upstream from mouth of Rock Creek, 0.4 mi downstream from Key Bridge, and at river mile 112.2.

DRAINAGE AREA.--N/A.

PERIOD OF RECORD.--April 1935 to current year.

GAGE.--Water-stage recorder. Datum of gage is Washington Mean Low Water (Washington Mean Low Water = Mean Sea Level + 1.41 ft).

EXTREMES FOR PERIOD OF RECORD.--Maximum tidal gage height, 17.72 ft (D.C. MLW), Oct. 17, 1942.

COOPERATION.--Funding for the operation of this station is provided by the U.S. Army Corps of Engineers, and the U.S. Geological Survey.

MONTHLY MAXIMUM MSL
1/15/2003 to 1/15/2005

DATE	MAXIMUM MSL(WML-1.41=MSL)
2/1/2003	2.46
3/9/2003	3.83
3/22/2003	4.92
4/19/2003	3.77
5/18/2003	4.56
7/11/2003	3.75
7/30/2003	3.34
9/13/2003	4.32
9/19/2003	9.86
10/29/2003	3.63
12/12/2003	5.44
12/24/2003	3.53
2/9/2004	3.04
3/12/2004	3.57
4/4/2004	3.55
5/9/2004	2.73
6/5/2004	3.70
7/4/2004	3.00
7/27/2004	3.34
9/15/2004	3.38
9/30/2004	5.15
10/24/2004	3.78
12/11/2004	4.30
1/13/2005	3.76
AVERAGE	**4.029583333**

USGS 01647600 POTOMAC RIVER AT WISCONSIN AVE, WASHINGTON, DC

Data is in Washington Mean Low

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS					1.54		
USGS					1.65		
USGS					1.69		
USGS					1.38		
USGS					2.4		
USGS					1.91		
USGS					1.42		
USGS					1.07		
USGS					0.11		
USGS							
USGS							
USGS					2.29		
USGS					0.63		
USGS					1.61		
USGS					2.06		
USGS					1.49		
USGS	1647600	1/31/2003	3.55	0.24	1.84		
USGS	1647600	2/1/2003	3.87	0.58	2.21		2.46
USGS	1647600	2/2/2003	3.78	0.66	2.16		
USGS	1647600	2/3/2003	3.46	0.38	1.97		
USGS	1647600	2/4/2003	3.21	0.27	1.71		
USGS	1647600	2/5/2003	2.68	-0.1	1.27		
USGS	1647600	2/6/2003	2.53	-0.23	1.14		
USGS	1647600	2/7/2003	2.58	-0.05	1.23		
USGS	1647600	2/8/2003	2.88	0.46	1.62		
USGS	1647600	2/9/2003	3.1	0.39	1.71		
USGS	1647600	2/10/2003	2.69	0.17	1.38		
USGS	1647600	2/11/2003	2.98	-0.11	1.52		
USGS	1647600	2/12/2003	2.72	-0.13	1.32		
USGS	1647600	2/13/2003	2.18	-0.26	1		
USGS	1647600	2/14/2003	2.72	-0.43	1.07		
USGS	1647600	2/15/2003	2.94	-0.4	1.31		
USGS	1647600	2/16/2003	3.48	-0.24	1.68		
USGS	1647600	2/17/2003	3.98	0.79	2.41		
USGS	1647600	2/18/2003	4.4	0.71	2.43		
USGS	1647600	2/19/2003	4.25	0.86	2.54		
USGS	1647600	2/20/2003	3.73	0.5	2.09		
USGS	1647600	2/21/2003	3.57	0.33	1.94		
USGS	1647600	2/22/2003	4.54	0.61	2.66		
USGS	1647600	2/23/2003	5	2.03	3.39		
USGS	1647600	2/24/2003	4.88	2.49	3.49		
USGS	1647600	2/25/2003					
USGS	1647600	2/26/2003	3.82	1.87	2.81		
USGS	1647600	2/27/2003	4.39	1.81	3.02		
USGS	1647600	2/28/2003	4.38	1.76	3.01		
USGS	1647600	3/1/2003	4.7	1.8	3.2		
USGS	1647600	3/2/2003	4.39	1.49	2.94		
USGS	1647600	3/3/2003	3.49	0.75	2.29		
USGS	1647600	3/4/2003	4.13	1.32	2.69		
USGS	1647600	3/5/2003	3.97	1.42	2.66		
USGS	1647600	3/6/2003	4.16	1.4	2.68		
USGS	1647600	3/7/2003	5.23	1.83	3.61		
USGS	1647600	3/8/2003	5.22	3.35	4.37		
USGS	1647600	3/9/2003	5.24	2.72	3.8		3.83
USGS	1647600	3/10/2003	4.27	2.58	3.34		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS	1647600	3/11/2003	4.67	2.97	3.91		
USGS	1647600	3/12/2003	4.06	2.06	3.16		
USGS	1647600	3/13/2003	3.49	1.36	2.49		
USGS	1647600	3/14/2003	4.14	1.32	2.7		
USGS	1647600	3/15/2003	5.05	2.63	3.75		
USGS	1647600	3/16/2003	4.35	1.91	3.12		
USGS	1647600	3/17/2003	4.53	1.81	3.18		
USGS	1647600	3/18/2003	4.86	1.86	3.36		
USGS	1647600	3/19/2003	5.5	2	3.76		
USGS	1647600	3/20/2003	6.28	2.63	4.24		
USGS	1647600	3/21/2003	6.27	3.47	4.77		
USGS	1647600	3/22/2003	6.33	4.19	5.18		4.92
USGS	1647600	3/23/2003	5.45	2.77	4.1		
USGS	1647600	3/24/2003	4.68	2.17	3.43		
USGS	1647600	3/25/2003	4.56	2.03	3.27		
USGS	1647600	3/26/2003	4.4	1.5	3.27		
USGS	1647600	3/27/2003	3.9	1.25	2.56		
USGS	1647600	3/28/2003	4.16	1.55	2.89		
USGS	1647600	3/29/2003	4.34	1.63	3.04		
USGS	1647600	3/30/2003	3.64	0.54	1.93		
USGS	1647600	3/31/2003	2.43	-0.11	1.09		
USGS	1647600	4/1/2003	3.69	0.81	2.32		
USGS	1647600	4/2/2003	3.6	0.95	2.23		
USGS	1647600	4/3/2003	3.9	0.94	2.51		
USGS	1647600	4/4/2003	4.45	1.58	2.98		
USGS	1647600	4/5/2003	4.8	2.03	3.43		
USGS	1647600	4/6/2003	4.03	1.37	2.67		
USGS	1647600	4/7/2003	4.23	1.39	2.84		
USGS	1647600	4/8/2003	3.99	1.57	2.75		
USGS	1647600	4/9/2003	4.91	2.58	3.63		
USGS	1647600	4/10/2003	5.79	2.85	3.96		
USGS	1647600	4/11/2003	6.13	3.44	4.77		
USGS	1647600	4/12/2003	4.86	2.79	3.76		
USGS	1647600	4/13/2003	5.6	2.97	4.37		
USGS	1647600	4/14/2003	4.77	2.3	3.59		
USGS	1647600	4/15/2003	4.58	1.79	3.26		
USGS	1647600	4/16/2003	4.29	1.19	2.73		
USGS	1647600	4/17/2003	4.04	0.74	2.52		
USGS	1647600	4/18/2003	4.88	1.6	3.32		
USGS	1647600	4/19/2003	5.18	1.76	3.29		3.77
USGS	1647600	4/20/2003	4.69	1.42	2.95		
USGS	1647600	4/21/2003	4.89	1.56	3.16		
USGS	1647600	4/22/2003	4.78	1.62	3.17		
USGS	1647600	4/23/2003	3.7	0.65	1.98		
USGS	1647600	4/24/2003	3.2	1.06	2.03		
USGS	1647600	4/25/2003	4.2	1.42	2.69		
USGS	1647600	4/26/2003	4.51	1.57	3.23		
USGS	1647600	4/27/2003	4.35	1.53	2.89		
USGS	1647600	4/28/2003	4.21	1.35	2.74		
USGS	1647600	4/29/2003	4.05	1.14	2.55		
USGS	1647600	4/30/2003	3.76	0.88	2.35		
USGS	1647600	5/1/2003	4.24	1.35	2.85		
USGS	1647600	5/2/2003	4.52	1.35	2.86		
USGS	1647600	5/3/2003	4.19	1.01	2.62		
USGS	1647600	5/4/2003	4.59	1.79	3.09		
USGS	1647600	5/5/2003	4.38	1.78	3.06		
USGS	1647600	5/6/2003	4.51	1.5	2.93		
USGS	1647600	5/7/2003	4.04	1.33	2.67		
USGS	1647600	5/8/2003	4.19	1.64	2.78		
USGS	1647600	5/9/2003	4.37	1.87	3.02		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS	1647600	5/10/2003	4.33	1.67	3.01		
USGS	1647600	5/11/2003	4.84	2.09	3.43		
USGS	1647600	5/12/2003	4.8	2.71	3.91		
USGS	1647600	5/13/2003	4.81	1.52	3.16		
USGS	1647600	5/14/2003	4.48	1.3	2.85		
USGS	1647600	5/15/2003	4.92	1.41	3.24		
USGS	1647600	5/16/2003	5.73	2.16	4.07		
USGS	1647600	5/17/2003	5.95	3.38	4.7		
USGS	1647600	5/18/2003	5.97	3.04	4.4		4.56
USGS	1647600	5/19/2003	4.83	2.03	3.4		
USGS	1647600	5/20/2003	4.64	1.91	3.22		
USGS	1647600	5/21/2003	4.63	1.98	3.22		
USGS	1647600	5/22/2003	4	1.54	2.73		
USGS	1647600	5/23/2003	4.25	1.9	3.05		
USGS	1647600	5/24/2003	4.36	1.84	3.14		
USGS	1647600	5/25/2003	4.64	2.32	3.6		
USGS	1647600	5/26/2003	5.14	2	3.62		
USGS	1647600	5/27/2003	4.46	1.87	3.26		
USGS	1647600	5/28/2003	4.76	1.99	3.2		
USGS	1647600	5/29/2003	4.35	1.74	3.04		
USGS	1647600	5/30/2003	4.2	1.66	2.93		
USGS	1647600	5/31/2003	4.71	1.83	3.4		
USGS	1647600	6/1/2003	3.46	0.04	2.01		
USGS	1647600	6/2/2003	3.86	1.02	2.41		
USGS	1647600	6/3/2003	4.25	1.6	2.88		
USGS	1647600	6/4/2003	4.68	1.94	3.28		
USGS	1647600	6/5/2003	5.23	3.19	4.12		
USGS	1647600	6/6/2003	4.83	2.36	3.66		
USGS	1647600	6/7/2003	5.14	2.55	3.72		
USGS	1647600	6/8/2003	4.85	2.93	3.86		
USGS	1647600	6/9/2003	5.42	2.95	4.32		
USGS	1647600	6/10/2003	5.29	2.61	4		
USGS	1647600	6/11/2003	5.11	2.36	3.67		
USGS	1647600	6/12/2003	4.8	1.98	3.44		
USGS	1647600	6/13/2003	5.06	1.95	3.47		
USGS	1647600	6/14/2003	5.07	1.89	3.61		
USGS	1647600	6/15/2003	5.06	2.15	3.58		
USGS	1647600	6/16/2003	4.87	2.02	3.45		
USGS	1647600	6/17/2003	5.29	2.29	3.72		
USGS	1647600	6/18/2003	5.02	2.03	3.47		
USGS	1647600	6/19/2003	4.84	2.2	3.47		
USGS	1647600	6/20/2003	5.01	2.4	3.6		
USGS	1647600	6/21/2003	4.64	2.16	3.28		
USGS	1647600	6/22/2003	4.46	2.91	3.65		
USGS	1647600	6/23/2003	4.98	2.44	3.73		
USGS	1647600	6/24/2003	4.68	1.99	3.35		
USGS	1647600	6/25/2003	4.57	1.76	3.19		
USGS	1647600	6/26/2003	4.54	1.74	3.11		
USGS	1647600	6/27/2003	4.62	1.73	3.08		
USGS	1647600	6/28/2003	4.2	1.4	2.78		
USGS	1647600	6/29/2003	4.61	1.61	3.05		
USGS	1647600	6/30/2003	4.49	1.32	2.8		
USGS	1647600	7/1/2003	4.23	0.97	2.59		
USGS	1647600	7/2/2003	4.51	1.28	2.85		
USGS	1647600	7/3/2003	5.03	1.66	3.31		
USGS	1647600	7/4/2003	4.22	1.15	2.67		
USGS	1647600	7/5/2003	4.28	1.18	2.67		
USGS	1647600	7/6/2003	4.05	0.84	2.35		
USGS	1647600	7/7/2003	4	1.25	2.6		
USGS	1647600	7/8/2003	4.17	1.06	2.61		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS	1647600	7/9/2003	4.29	1.22	2.77		
USGS	1647600	7/10/2003	4.3	1.21	2.79		
USGS	1647600	7/11/2003	5.16	1.74	3.55		3.75
USGS	1647600	7/12/2003	5.09	1.5	3.12		
USGS	1647600	7/13/2003	4.67	1.12	2.79		
USGS	1647600	7/14/2003	4.39	1.11	2.79		
USGS	1647600	7/15/2003	4.44	1.09	2.78		
USGS	1647600	7/16/2003	4.74	1.39	3.03		
USGS	1647600	7/17/2003	3.91	0.63	2.27		
USGS	1647600	7/18/2003	4.28	1.07	2.57		
USGS	1647600	7/19/2003	3.99	1.22	2.55		
USGS	1647600	7/20/2003	4.14	1.3	2.72		
USGS	1647600	7/21/2003	4.37	1.96	3.16		
USGS	1647600	7/22/2003	4.47	1.69	2.98		
USGS	1647600	7/23/2003	3.79	1.37	2.51		
USGS	1647600	7/24/2003	4.02	1.02	2.54		
USGS	1647600	7/25/2003	3.49	0.58	2.04		
USGS	1647600	7/26/2003	3.7	0.84	2.41		
USGS	1647600	7/27/2003	3.95	1	2.36		
USGS	1647600	7/28/2003	3.53	0.7	2.06		
USGS	1647600	7/29/2003	4	0.58	2.31		
USGS	1647600	7/30/2003	4.75	1.36	3.02		3.34
USGS	1647600	7/31/2003	4.25	0.93	2.56		
USGS	1647600	8/1/2003	4.75	1.26	2.94		
USGS	1647600	8/2/2003	4.42	1.08	2.77		
USGS	1647600	8/3/2003	4.6	1.22	2.81		
USGS	1647600	8/4/2003	4.6	1.07	2.77		
USGS	1647600	8/5/2003	4.51	1.05	2.65		
USGS	1647600	8/6/2003	4.2	1.08	2.56		
USGS	1647600	8/7/2003	4.45	1.2	2.78		
USGS	1647600	8/8/2003	4.4	0.98	2.62		
USGS	1647600	8/9/2003	4.32	0.98	2.87		
USGS	1647600	8/10/2003	4.7	1.36	2.97		
USGS	1647600	8/11/2003	4.54	1.1	2.82		
USGS	1647600	8/12/2003	4.54	1.07	2.76		
USGS	1647600	8/13/2003	4.44	1.02	2.71		
USGS	1647600	8/14/2003	4.23	0.93	2.54		
USGS	1647600	8/15/2003	3.9	0.71	2.27		
USGS	1647600	8/16/2003	4.32	1.04	2.66		
USGS	1647600	8/17/2003	4.54	1.42	2.88		
USGS	1647600	8/18/2003	4.56	1.27	2.64		
USGS	1647600	8/19/2003	4.64	1.81	3.06		
USGS	1647600	8/20/2003	4.44	1.48	2.78		
USGS	1647600	8/21/2003	3.93	1.19	2.54		
USGS	1647600	8/22/2003	3.92	1.3	2.66		
USGS	1647600	8/23/2003	3.74	0.7	2.19		
USGS	1647600	8/24/2003	3.59	0.96	2.45		
USGS	1647600	8/25/2003	4.36	1.2	2.79		
USGS	1647600	8/26/2003	4.02	0.63	2.31		
USGS	1647600	8/27/2003	4.55	0.97	2.71		
USGS	1647600	8/28/2003	4.48	0.8	2.64		
USGS	1647600	8/29/2003	4.6	0.91	2.76		
USGS	1647600	8/30/2003	4.48	0.98	2.6		
USGS	1647600	8/31/2003	4.19	0.55	2.25		
USGS	1647600	9/1/2003	4.72	1.21	2.87		
USGS	1647600	9/2/2003	4.71	1.02	2.65		
USGS	1647600	9/3/2003	5	1.18	2.97		
USGS	1647600	9/4/2003	5.25	2.08	3.49		
USGS	1647600	9/5/2003	4.97	0.9	2.8		
USGS	1647600	9/6/2003	4.13	1.1	2.77		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS	1647600	9/7/2003	4.79	1.5	3.25		
USGS	1647600	9/8/2003	4.75	1.39	3.07		
USGS	1647600	9/9/2003	4.87	1.31	3.21		
USGS	1647600	9/10/2003	5.12	1.89	3.51		
USGS	1647600	9/11/2003	4.98	1.77	3.38		
USGS	1647600	9/12/2003	4.76	1.46	3.03		
USGS	1647600	9/13/2003	5.73	2.25	3.85		4.32
USGS	1647600	9/14/2003	4.9	1.63	3.31		
USGS	1647600	9/15/2003	4.66	1.38	2.9		
USGS	1647600	9/16/2003	4.46	0.95	2.42		
USGS	1647600	9/17/2003	4.29	1.41	2.71		
USGS	1647600	9/18/2003	8.65	1.6	3.46		
USGS	1647600	9/19/2003	11.27	4.5	7.06		9.86
USGS	1647600	9/20/2003	5.88	3.75	4.75		
USGS	1647600	9/21/2003	7.23	4.53	6.39		
USGS	1647600	9/22/2003	5.79	3.5	4.62		
USGS	1647600	9/23/2003	7.13	3.48	6.1		
USGS	1647600	9/24/2003	6.37	4.71	5.55		
USGS	1647600	9/25/2003	5.94	3.11	4.65		
USGS	1647600	9/26/2003	5.46	2.32	3.96		
USGS	1647600	9/27/2003	5.66	2.2	3.91		
USGS	1647600	9/28/2003	5.31	1.71	3.57		
USGS	1647600	9/29/2003	4.89	1.59	3.1		
USGS	1647600	9/30/2003	4.6	1.46	2.99		
USGS	1647600	10/1/2003	4.54	1.44	2.79		
USGS	1647600	10/2/2003	4.49	0.76	2.42		
USGS	1647600	10/3/2003	3.86	1.05	2.57		
USGS	1647600	10/4/2003	4.69	1.64	3.23		
USGS	1647600	10/5/2003	4.41	1.02	2.5		
USGS	1647600	10/6/2003	4.33	1.14	2.77		
USGS	1647600	10/7/2003	4.49	1.04	2.88		
USGS	1647600	10/8/2003	4.46	1.26	2.87		
USGS	1647600	10/9/2003	4.08	0.81	2.47		
USGS	1647600	10/10/2003	4.43	0.9	2.59		
USGS	1647600	10/11/2003	4.96	1.2	3.07		
USGS	1647600	10/12/2003	5.1	1.81	3.45		
USGS	1647600	10/13/2003	4.56	1.6	3.05		
USGS	1647600	10/14/2003	5.49	1.27	2.99		
USGS	1647600	10/15/2003	4.92	0.88	2.91		
USGS	1647600	10/16/2003	3.66	0.71	1.97		
USGS	1647600	10/17/2003	3.66	0.79	1.92		
USGS	1647600	10/18/2003	3.8	1.2	2.23		
USGS	1647600	10/19/2003	4.04	1.88	3.02		
USGS	1647600	10/20/2003	4.16	1.55	2.87		
USGS	1647600	10/21/2003	4.67	1.26	3.12		
USGS	1647600	10/22/2003	3.3	-0.21	1.39		
USGS	1647600	10/23/2003	3.4	-0.21	1.87		
USGS	1647600	10/24/2003	4.29	0.87	2.62		
USGS	1647600	10/25/2003	4.48	0.89	2.72		
USGS	1647600	10/26/2003	4.63	0.87	2.78		
USGS	1647600	10/27/2003	4.58	0.98	2.91		
USGS	1647600	10/28/2003	4.66	1.25	2.84		
USGS	1647600	10/29/2003	5.04	1.58	3.04		3.63
USGS	1647600	10/30/2003	4.99	1.54	3.09		
USGS	1647600	10/31/2003	4.45	1.16	2.56		
USGS	1647600	11/1/2003	4.15	1.27	2.67		
USGS	1647600	11/2/2003	4.04	1.18	2.6		
USGS	1647600	11/3/2003	4.21	1.34	2.79		
USGS	1647600	11/4/2003	4.16	1.33	2.81		
USGS	1647600	11/5/2003	4.82	1.29	3.12		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS	1647600	11/6/2003	4.92	1.89	3.35		
USGS	1647600	11/7/2003	4.3	1.29	2.78		
USGS	1647600	11/8/2003	3.58	0.84	2.28		
USGS	1647600	11/9/2003	3.76	0.97	2.33		
USGS	1647600	11/10/2003	4.05	1.17	2.49		
USGS	1647600	11/11/2003	4.12	1.07	2.57		
USGS	1647600	11/12/2003	4.24	1.47	2.73		
USGS	1647600	11/13/2003	3.73	-0.23	1.62		
USGS	1647600	11/14/2003	2.12	-1.25	-0.11		
USGS	1647600	11/15/2003	2.58	-0.13	1.12		
USGS	1647600	11/16/2003	3.57	0.73	2.12		
USGS	1647600	11/17/2003	3.87	1.48	2.63		
USGS	1647600	11/18/2003	4.31	1.77	3.08		
USGS	1647600	11/19/2003	5.76	2.43	4.09		
USGS	1647600	11/20/2003	5.36	1.71	3.16		
USGS	1647600	11/21/2003	6.18	1.71	4.46		
USGS	1647600	11/22/2003	5.24	2.72	4.15		
USGS	1647600	11/23/2003	5.58	2.25	3.88		
USGS	1647600	11/24/2003	5.57	2.27	3.85		
USGS	1647600	11/25/2003	4.92	1.45	3.13		
USGS	1647600	11/26/2003	4.87	1.55	3.21		
USGS	1647600	11/27/2003	4.84	1.47	3.03		
USGS	1647600	11/28/2003	4.57	1.59	3.15		
USGS	1647600	11/29/2003	4.52	0.02	1.62		
USGS	1647600	11/30/2003	2.61	0.33	1.43		
USGS	1647600	12/1/2003	2.6	0.05	1.2		
USGS	1647600	12/2/2003	1.99	-0.3	0.78		
USGS	1647600	12/3/2003	2.35	-0.28	1.18		
USGS	1647600	12/4/2003	3.82	0.82	2.34		
USGS	1647600	12/5/2003	4.34	1.05	2.64		
USGS	1647600	12/6/2003	3.24	0.85	2.02		
USGS	1647600	12/7/2003	2.28	-0.37	1		
USGS	1647600	12/8/2003	3.91	0.44	1.99		
USGS	1647600	12/9/2003	4.83	1.39	3.07		
USGS	1647600	12/10/2003	4.87	1.6	3.15		
USGS	1647600	12/11/2003	6.2	3.56	4.87		
USGS	1647600	12/12/2003	6.85	4.66	5.49		5.44
USGS	1647600	12/13/2003	6.79	3.08	4.64		
USGS	1647600	12/14/2003	4.94	2.49	3.86		
USGS	1647600	12/15/2003	4.57	1.76	3.04		
USGS	1647600	12/16/2003	4.02	1.65	2.8		
USGS	1647600	12/17/2003	3.52	1.27	2.39		
USGS	1647600	12/18/2003	3.48	1.15	2.21		
USGS	1647600	12/19/2003	3.75	0.85	2.38		
USGS	1647600	12/20/2003	3.21	0.77	2.03		
USGS	1647600	12/21/2003	4.11	0.65	2.3		
USGS	1647600	12/22/2003	3.97	1.01	2.55		
USGS	1647600	12/23/2003	3.62	0.52	1.93		
USGS	1647600	12/24/2003	4.43	0.75	2.63		3.53
USGS	1647600	12/25/2003	4.19	1.29	2.63		
USGS	1647600	12/26/2003	4.1	1.44	2.75		
USGS	1647600	12/27/2003	3.45	0.7	2.01		
USGS	1647600	12/28/2003	4.29	0.97	2.52		
USGS	1647600	12/29/2003	4.42	1.8	3.05		
USGS	1647600	12/30/2003	4.19	1.18	2.55		
USGS	1647600	12/31/2003	3.27	0.75	2.03		
USGS	1647600	1/1/2004	3.02	0.47	1.9		
USGS	1647600	1/2/2004	3.41	0.47	1.93		
USGS	1647600	1/3/2004	4.12	1.26	2.61		
USGS	1647600	1/4/2004	3.84	1.48	2.61		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average Max. MSL from 15th to 15th (WML-1.41=MSL)	
USGS	1647600	1/5/2004	4.11	1.12	2.53		
USGS	1647600	1/6/2004	3.21	1.02	2.06		
USGS	1647600	1/7/2004	2.44	0.25	1.44		
USGS	1647600	1/8/2004	3.2	0.27	1.6		
USGS	1647600	1/9/2004	3.1	0.19	1.61		
USGS	1647600	1/10/2004	3.04	0.42	1.67		
USGS	1647600	1/11/2004	4.07	0.61	2.2		
USGS	1647600	1/12/2004	3.86	0.73	2.21		
USGS	1647600	1/13/2004	2.97	0.18	1.51		
USGS	1647600	1/14/2004	3.65	0.33	1.89		
USGS	1647600	1/15/2004	3.82	0.26	1.96		
USGS	1647600	1/16/2004	1.7	-0.97	0.46		
USGS	1647600	1/17/2004	1.9	-1.06	0.43		
USGS	1647600	1/18/2004	3.75	0.3	2.15		
USGS	1647600	1/19/2004	2.58	-0.27	1.1		
USGS	1647600	1/20/2004	2.05	-0.48	0.86		
USGS	1647600	1/21/2004	2.53	-0.7	0.88		
USGS	1647600	1/22/2004	3.03	0.05	1.58		
USGS	1647600	1/23/2004	2.92	-0.11	1.26		
USGS	1647600	1/24/2004	3.61	0.4	1.96		
USGS	1647600	1/25/2004	2.97	0.07	1.38		
USGS	1647600	1/26/2004	3.02	0.56	1.79		
USGS	1647600	1/27/2004	3.53	1.17	2.33		
USGS	1647600	1/28/2004	3.44	0.63	1.99		
USGS	1647600	1/29/2004	2.74	0.64	1.64		
USGS	1647600	1/30/2004	2.48	0.01	1.42		
USGS	1647600	1/31/2004	1.27	-0.11	0.61		
USGS	1647600	2/1/2004	2.37	0.11	1.27		
USGS	1647600	2/2/2004	3.02	0.63	1.76		
USGS	1647600	2/3/2004	3.84	1.05	2.44		
USGS	1647600	2/4/2004	3.23	1.14	2.28		
USGS	1647600	2/5/2004	3.05	0.48	1.79		
USGS	1647600	2/6/2004	3.83	0.43	2.07		
USGS	1647600	2/7/2004	4.38	1.99	3.13		
USGS	1647600	2/8/2004	4.5	2.03	3.26		
USGS	1647600	2/9/2004	4.45	2.03	3.35		3.04
USGS	1647600	2/10/2004	3.69	0.76	2.12		
USGS	1647600	2/11/2004	3.74	0.83	2.28		
USGS	1647600	2/12/2004	3.85	1.11	2.41		
USGS	1647600	2/13/2004	3.67	1.01	2.31		
USGS	1647600	2/14/2004	3.48	0.87	2.16		
USGS	1647600	2/15/2004	3	0.46	1.8		
USGS	1647600	2/16/2004	3.64	1.1	2.37		
USGS	1647600	2/17/2004	4.08	1.02	2.47		
USGS	1647600	2/18/2004	3	0.33	1.78		
USGS	1647600	2/19/2004	4.54	0.61	2.63		
USGS	1647600	2/20/2004	4.69	1.24	2.9		
USGS	1647600	2/21/2004	4.36	1.34	2.83		
USGS	1647600	2/22/2004	3.87	0.8	2.31		
USGS	1647600	2/23/2004	3.99	1.15	2.51		
USGS	1647600	2/24/2004	4.43	1.6	2.89		
USGS	1647600	2/25/2004	3.54	0.46	1.81		
USGS	1647600	2/26/2004	3.51	0.81	2.24		
USGS	1647600	2/27/2004	3.77	1.48	2.47		
USGS	1647600	2/28/2004	3.45	1.18	2.16		
USGS	1647600	2/29/2004	3.24	1.03	2.03		
USGS	1647600	3/1/2004	3.31	1.18	2.24		
USGS	1647600	3/2/2004	3.7	1.14	2.41		
USGS	1647600	3/3/2004	2.96	0.69	1.81		
USGS	1647600	3/4/2004	3.65	0.7	2.28		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS	1647600	3/5/2004	4.21	1.09	2.6		
USGS	1647600	3/6/2004	4.1	1.4	2.82		
USGS	1647600	3/7/2004	3.93	1.19	2.5		
USGS	1647600	3/8/2004	3.5	0.57	2.07		
USGS	1647600	3/9/2004	4.56	0.81	2.72		
USGS	1647600	3/10/2004	4.63	1.27	2.86		
USGS	1647600	3/11/2004	4.76	1.06	2.73		
USGS	1647600	3/12/2004	4.98	1.5	3.17		3.57
USGS	1647600	3/13/2004	3.46	0.2	1.81		
USGS	1647600	3/14/2004	2.97	0.21	1.59		
USGS	1647600	3/15/2004	3.77	0.75	2.22		
USGS	1647600	3/16/2004	3.78	0.56	2.09		
USGS	1647600	3/17/2004	4.26	0.94	2.54		
USGS	1647600	3/18/2004	4.55	1.57	3.12		
USGS	1647600	3/19/2004	4.51	0.54	2.58		
USGS	1647600	3/20/2004	4.79	0.73	2.88		
USGS	1647600	3/21/2004	4.45	0.75	2.31		
USGS	1647600	3/22/2004	2.59	-0.39	0.95		
USGS	1647600	3/23/2004	3.49	0.34	2.06		
USGS	1647600	3/24/2004	3.87	1.11	2.26		
USGS	1647600	3/25/2004	3.35	0.63	1.87		
USGS	1647600	3/26/2004	3.38	0.82	1.98		
USGS	1647600	3/27/2004	3.19	0.66	1.8		
USGS	1647600	3/28/2004	3.34	0.5	1.84		
USGS	1647600	3/29/2004	4.55	2.18	3.19		
USGS	1647600	3/30/2004	4.12	1.83	3.04		
USGS	1647600	3/31/2004	3.88	1.5	2.69		
USGS	1647600	4/1/2004	4.43	1.54	2.97		
USGS	1647600	4/2/2004	4.11	1.45	2.84		
USGS	1647600	4/3/2004	4.38	1.69	3.12		
USGS	1647600	4/4/2004	4.96	1.03	2.73		3.55
USGS	1647600	4/5/2004	1.32	-0.98	0.34		
USGS	1647600	4/6/2004	2.96	-0.44	1.23		
USGS	1647600	4/7/2004	3.89	0.66	2.21		
USGS	1647600	4/8/2004	4.13	0.81	2.51		
USGS	1647600	4/9/2004	4.26	1	2.57		
USGS	1647600	4/10/2004	4.11	1.05	2.41		
USGS	1647600	4/11/2004	3.83	0.85	2.27		
USGS	1647600	4/12/2004	3.84	0.59	2.38		
USGS	1647600	4/13/2004	4.66	1.76	3.32		
USGS	1647600	4/14/2004	4.82	2.83	3.88		
USGS	1647600	4/15/2004	3.96	2.79	3.34		
USGS	1647600	4/16/2004	4.59	2.65	3.65		
USGS	1647600	4/17/2004	4.72	2.02	3.38		
USGS	1647600	4/18/2004	4.31	1.24	2.68		
USGS	1647600	4/19/2004	3.75	0.87	2.35		
USGS	1647600	4/20/2004	3.61	0.45	1.99		
USGS	1647600	4/21/2004	3.84	0.85	2.32		
USGS	1647600	4/22/2004	4.14	1.12	2.5		
USGS	1647600	4/23/2004	3.58	0.56	2.01		
USGS	1647600	4/24/2004	3.29	0.65	1.91		
USGS	1647600	4/25/2004	3.71	1.16	2.51		
USGS	1647600	4/26/2004	4.06	1.55	2.71		
USGS	1647600	4/27/2004	3.53	0.96	2.37		
USGS	1647600	4/28/2004	2.88	1.36	2.08		
USGS	1647600	4/29/2004	4.01	1.65	2.92		
USGS	1647600	4/30/2004	3.79	1.16	2.64		
USGS	1647600	5/1/2004	3.73	1.1	2.48		
USGS	1647600	5/2/2004	4.32	1.08	2.94		
USGS	1647600	5/3/2004	3.91	1	2.3		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS	1647600	5/4/2004	3.46	0.1	1.86		
USGS	1647600	5/5/2004	4.34	0.94	2.61		
USGS	1647600	5/6/2004	4.19	0.77	2.38		
USGS	1647600	5/7/2004	4.42	0.82	2.45		
USGS	1647600	5/8/2004	4.18	0.38	2.38		
USGS	1647600	5/9/2004	4.64	1.27	2.8		2.73
USGS	1647600	5/10/2004	4.05	0.73	2.34		
USGS	1647600	5/11/2004	3.73	0.85	2.26		
USGS	1647600	5/12/2004	3.63	0.63	2.15		
USGS	1647600	5/13/2004	3.58	0.71	2.2		
USGS	1647600	5/14/2004	3.68	0.9	2.33		
USGS	1647600	5/15/2004	4.03	0.66	2.41		
USGS	1647600	5/16/2004	3.58	0.34	1.9		
USGS	1647600	5/17/2004	3.61	0.33	1.99		
USGS	1647600	5/18/2004	4.16	0.71	2.45		
USGS	1647600	5/19/2004	3.99	0.43	2.04		
USGS	1647600	5/20/2004	3.69	0.5	2.22		
USGS	1647600	5/21/2004	4.19	1.2	2.62		
USGS	1647600	5/22/2004	3.69	0.84	2.34		
USGS	1647600	5/23/2004	4.05	1.3	2.59		
USGS	1647600	5/24/2004	4.02	1.54	2.67		
USGS	1647600	5/25/2004	3.87	1.2	2.44		
USGS	1647600	5/26/2004	4.16	1.73	2.88		
USGS	1647600	5/27/2004	4.32	1.58	2.91		
USGS	1647600	5/28/2004	4.05	0.93	2.71		
USGS	1647600	5/29/2004	3.19	0.17	1.65		
USGS	1647600	5/30/2004	3.93	1	2.41		
USGS	1647600	5/31/2004	4.26	0.59	2.48		
USGS	1647600	6/1/2004	4.2	0.53	2.31		
USGS	1647600	6/2/2004	4.49	0.69	2.53		
USGS	1647600	6/3/2004	4.35	0.17	2.12		
USGS	1647600	6/4/2004	3.86	0.18	2		
USGS	1647600	6/5/2004	5.11	0.6	2.46		3.7
USGS	1647600	6/6/2004	3.91	0.58	2.16		
USGS	1647600	6/7/2004	4.42	0.92	2.62		
USGS	1647600	6/8/2004	4.06	0.6	2.25		
USGS	1647600	6/9/2004	3.62	0.49	2.01		
USGS	1647600	6/10/2004	3.38	0.17	1.75		
USGS	1647600	6/11/2004	3.23	0.31	1.94		
USGS	1647600	6/12/2004	4.29	1.24	2.74		
USGS	1647600	6/13/2004	4.32	1.15	2.64		
USGS	1647600	6/14/2004	4.21	1.15	2.7		
USGS	1647600	6/15/2004	3.93	0.77	2.29		
USGS	1647600	6/16/2004	3.53	0.45	1.96		
USGS	1647600	6/17/2004	3.54	0.49	1.99		
USGS	1647600	6/18/2004	3.67	0.67	2.15		
USGS	1647600	6/19/2004	3.48	0.33	1.8		
USGS	1647600	6/20/2004	3.19	0.25	1.67		
USGS	1647600	6/21/2004	4.09	0.92	2.39		
USGS	1647600	6/22/2004	4.17	0.86	2.39		
USGS	1647600	6/23/2004	3.25	0.49	1.87		
USGS	1647600	6/24/2004	3.69	0.9	2.2		
USGS	1647600	6/25/2004	3.65	1.02	2.31		
USGS	1647600	6/26/2004	3.87	0.13	1.94		
USGS	1647600	6/27/2004	3.24	0.34	1.77		
USGS	1647600	6/28/2004	3.63	0.39	2.01		
USGS	1647600	6/29/2004	3.46	-0.05	1.67		
USGS	1647600	6/30/2004	3.73	-0.02	2.09		
USGS	1647600	7/1/2004	4.1	0.46	2.18		
USGS	1647600	7/2/2004	4.07	0.21	2.05		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS	1647600	7/3/2004	3.9	0.12	2.01		
USGS	1647600	7/4/2004	4.41	0.58	2.63		3
USGS	1647600	7/5/2004	4.34	0.61	2.35		
USGS	1647600	7/6/2004	3.53	0.02	1.73		
USGS	1647600	7/7/2004	3.85	0.24	2.06		
USGS	1647600	7/8/2004	3.93	0.58	2.27		
USGS	1647600	7/9/2004	3.66	0.22	1.84		
USGS	1647600	7/10/2004	3.29	0.34	1.81		
USGS	1647600	7/11/2004	3.4	0.6	1.97		
USGS	1647600	7/12/2004	3.69	1.04	2.36		
USGS	1647600	7/13/2004	3.93	0.41	2.08		
USGS	1647600	7/14/2004	3.81	0.44	2.46		
USGS	1647600	7/15/2004	4.29	0.76	2.22		
USGS	1647600	7/16/2004	3.62	0.47	1.98		
USGS	1647600	7/17/2004	3.69	0.59	2.16		
USGS	1647600	7/18/2004	4.15	0.68	2.32		
USGS	1647600	7/19/2004	3.73	0.58	2.09		
USGS	1647600	7/20/2004	3.81	0.68	2.15		
USGS	1647600	7/21/2004	3.45	0.38	1.88		
USGS	1647600	7/22/2004	3.7	0.55	2.11		
USGS	1647600	7/23/2004	3.8	0.88	2.34		
USGS	1647600	7/24/2004	3.79	0.67	2.06		
USGS	1647600	7/25/2004	3.25	0.42	1.81		
USGS	1647600	7/26/2004	3.87	0.98	2.44		
USGS	1647600	7/27/2004	4.75	1.53	2.85		3.34
USGS	1647600	7/28/2004	4.51	0.53	2.43		
USGS	1647600	7/29/2004	3.78	0.42	2.13		
USGS	1647600	7/30/2004	4.19	0.45	2.42		
USGS	1647600	7/31/2004	4.54	0.88	2.64		
USGS	1647600	8/1/2004	4.44	0.53	2.48		
USGS	1647600	8/2/2004	4.3	0.47	2.3		
USGS	1647600	8/3/2004	4.22	0.77	2.5		
USGS	1647600	8/4/2004	4.14	0.91	2.51		
USGS	1647600	8/5/2004	4	0.7	2.29		
USGS	1647600	8/6/2004	3.74	0.4	1.95		
USGS	1647600	8/7/2004	3.64	0.91	2.14		
USGS	1647600	8/8/2004	4.02	0.68	2.22		
USGS	1647600	8/9/2004	3.47	0.17	1.6		
USGS	1647600	8/10/2004	3.17	0.92	2.11		
USGS	1647600	8/11/2004	3.83	0.92	2.34		
USGS	1647600	8/12/2004	3.92	0.92	2.35		
USGS	1647600	8/13/2004	4	0.96	2.47		
USGS	1647600	8/14/2004	3.22	0.57	1.8		
USGS	1647600	8/15/2004	3.47	0.14	1.83		
USGS	1647600	8/16/2004	3.98	0.59	2.2		
USGS	1647600	8/17/2004	3.91	0.42	2.24		
USGS	1647600	8/18/2004	4.03	0.78	2.41		
USGS	1647600	8/19/2004	3.86	0.52	2.23		
USGS	1647600	8/20/2004	3.59	0.32	1.86		
USGS	1647600	8/21/2004	3.55	0.27	1.92		
USGS	1647600	8/22/2004	3.45	-0.08	1.43		
USGS	1647600	8/23/2004	3.65	0.74	2.22		
USGS	1647600	8/24/2004	3.93	0.46	2.07		
USGS	1647600	8/25/2004	3.76	0.6	2.22		
USGS	1647600	8/26/2004	4.18	0.87	2.45		
USGS	1647600	8/27/2004	4.19	0.72	2.44		
USGS	1647600	8/28/2004	4	0.48	2.28		
USGS	1647600	8/29/2004	3.91	0.44	2.22		
USGS	1647600	8/30/2004	4.07	0.63	2.4		
USGS	1647600	8/31/2004	3.66	-0.05	1.95		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS	1647600	9/1/2004	4	0.17	2.06		
USGS	1647600	9/2/2004	3.81	0.55	2.11		
USGS	1647600	9/3/2004	4.2	0.81	2.4		
USGS	1647600	9/4/2004	4.07	0.78	2.33		
USGS	1647600	9/5/2004	3.83	0.92	2.25		
USGS	1647600	9/6/2004	4.77	2.06	3.35		
USGS	1647600	9/7/2004	4.8	1.62	2.95		
USGS	1647600	9/8/2004	4.02	1.43	2.89		
USGS	1647600	9/9/2004	4.76	1.73	3.44		
USGS	1647600	9/10/2004	3.47	0.89	2.26		
USGS	1647600	9/11/2004	3.89	1.36	2.69		
USGS	1647600	9/12/2004	4.19	1.44	2.87		
USGS	1647600	9/13/2004	4.15	1.07	2.69		
USGS	1647600	9/14/2004	4.07	0.72	2.44		
USGS	1647600	9/15/2004	4.79	1.33	3.07		3.38
USGS	1647600	9/16/2004	4.22	0.83	2.57		
USGS	1647600	9/17/2004	5.07	0.64	2.62		
USGS	1647600	9/18/2004	4.46	0.48	2.63		
USGS	1647600	9/19/2004	5.39	2.3	3.24		
USGS	1647600	9/20/2004	5.33	2.37	3.95		
USGS	1647600	9/21/2004	5.12	1.48	3.08		
USGS	1647600	9/22/2004	4.33	1.07	2.55		
USGS	1647600	9/23/2004	4.13	0.93	2.51		
USGS	1647600	9/24/2004	4.34	1.32	2.89		
USGS	1647600	9/25/2004	4.7	1.29	3.06		
USGS	1647600	9/26/2004	4.41	0.77	2.57		
USGS	1647600	9/27/2004	4.38	0.64	2.57		
USGS	1647600	9/28/2004	5.16	1.2	3.15		
USGS	1647600	9/29/2004	4.89	1.69	3.04		
USGS	1647600	9/30/2004	6.56	3.27	5.12		5.15
USGS	1647600	10/1/2004	5.48	2.33	4.05		
USGS	1647600	10/2/2004	4.79	1.85	3.37		
USGS	1647600	10/3/2004	4.17	1.17	2.51		
USGS	1647600	10/4/2004	4.5	1.69	3.05		
USGS	1647600	10/5/2004	4.42	1	2.29		
USGS	1647600	10/6/2004	3.61	1.48	2.55		
USGS	1647600	10/7/2004	3.67	1.01	2.22		
USGS	1647600	10/8/2004	3.22	1.09	2.15		
USGS	1647600	10/9/2004	3.64	1.13	2.48		
USGS	1647600	10/10/2004	3.59	0.28	2.05		
USGS	1647600	10/11/2004	3.14	0.05	1.69		
USGS	1647600	10/12/2004	4.02	0.87	2.54		
USGS	1647600	10/13/2004	4.75	0.99	2.91		
USGS	1647600	10/14/2004	4.81	1.33	2.99		
USGS	1647600	10/15/2004	5.24	1.04	3.21		
USGS	1647600	10/16/2004	4.07	1.12	2.67		
USGS	1647600	10/17/2004	3.09	-0.11	1.56		
USGS	1647600	10/18/2004	3.97	0.06	1.74		
USGS	1647600	10/19/2004	3.95	0.83	2.3		
USGS	1647600	10/20/2004	4.56	0.86	2.47		
USGS	1647600	10/21/2004	4.73	2.11	3.44		
USGS	1647600	10/22/2004	4.87	1.68	3.13		
USGS	1647600	10/23/2004	4.59	1.73	3.23		
USGS	1647600	10/24/2004	5.19	2.18	3.75		3.78
USGS	1647600	10/25/2004	5.3	2.07	3.68		
USGS	1647600	10/26/2004	4.88	1.54	3.27		
USGS	1647600	10/27/2004	4.5	1.08	2.84		
USGS	1647600	10/28/2004					
USGS	1647600	10/29/2004					
USGS	1647600	10/30/2004	4.73	1.39	3.06		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS	1647600	10/31/2004	4.26	1.3	2.76		
USGS	1647600	11/1/2004	3.92	0.98	2.41		
USGS	1647600	11/2/2004	4.29	1.11	2.53		
USGS	1647600	11/3/2004	4.28	1.22	2.46		
USGS	1647600	11/4/2004	4.6	1.33	2.89		
USGS	1647600	11/5/2004	4.61	0.59	1.92		
USGS	1647600	11/6/2004	3.36	0.85	2.03		
USGS	1647600	11/7/2004	3.07	0.41	1.72		
USGS	1647600	11/8/2004	2.79	0.2	1.52		
USGS	1647600	11/9/2004	3.36	0.34	1.94		
USGS	1647600	11/10/2004	4.4	0.86	2.72		
USGS	1647600	11/11/2004	4.39	1.1	2.81		
USGS	1647600	11/12/2004	4.47	0.92	2.59		
USGS	1647600	11/13/2004	3.85	0.5	2.16		
USGS	1647600	11/14/2004	4.3	0.64	2.32		
USGS	1647600	11/15/2004	4.14	0.76	2.33		
USGS	1647600	11/16/2004	4.49	0.91	2.51		
USGS	1647600	11/17/2004	4.38	1.17	2.63		
USGS	1647600	11/18/2004	4.35	1.37	2.86		
USGS	1647600	11/19/2004	4.56	1.18	2.73		
USGS	1647600	11/20/2004	4.31	1.2	2.78		
USGS	1647600	11/21/2004	4.24	1.07	2.76		
USGS	1647600	11/22/2004	4.5	1.16	2.85		
USGS	1647600	11/23/2004	4.45	1.3	2.87		
USGS	1647600	11/24/2004	4.97	1.24	3.07		
USGS	1647600	11/25/2004	4.92	0.97	3.11		
USGS	1647600	11/26/2004	3.68	0.11	1.62		
USGS	1647600	11/27/2004	4.49	0.99	2.59		
USGS	1647600	11/28/2004	4.51	1.84	3.14		
USGS	1647600	11/29/2004	4.11	1.07	2.32		
USGS	1647600	11/30/2004	4.67	1.65	3.03		
USGS	1647600	12/1/2004	4.54	1.28	3		
USGS	1647600	12/2/2004	3.75	0.82	2.13		
USGS	1647600	12/3/2004	3.5	0.93	2.12		
USGS	1647600	12/4/2004	3.86	1.43	2.6		
USGS	1647600	12/5/2004	4	1.33	2.62		
USGS	1647600	12/6/2004	3.64	1.07	2.31		
USGS	1647600	12/7/2004	4.51	1.63	3.04		
USGS	1647600	12/8/2004	4.43	1.32	3.1		
USGS	1647600	12/9/2004	4.3	1.03	2.62		
USGS	1647600	12/10/2004	4.96	1.41	3.05		
USGS	1647600	12/11/2004	5.71	2.01	3.95		4.3
USGS	1647600	12/12/2004	5	2.02	3.41		
USGS	1647600	12/13/2004	4.31	1.35	2.94		
USGS	1647600	12/14/2004	2.9	0.2	1.7		
USGS	1647600	12/15/2004	3.26	0.01	1.31		
USGS	1647600	12/16/2004	4.36	0.79	2.44		
USGS	1647600	12/17/2004	4.36	0.87	2.33		
USGS	1647600	12/18/2004	3.33	0.49	2.02		
USGS	1647600	12/19/2004	4.28	1.15	2.68		
USGS	1647600	12/20/2004	1.95	-1.21	0.06		
USGS	1647600	12/21/2004	3.64	0.69	2.32		
USGS	1647600	12/22/2004	3.38	0.66	1.99		
USGS	1647600	12/23/2004	4.91	0.68	2.78		
USGS	1647600	12/24/2004	3.27	0.51	1.92		
USGS	1647600	12/25/2004	3.73	0.87	2.25		
USGS	1647600	12/26/2004	3.54	0.98	2.23		
USGS	1647600	12/27/2004	2.26	-0.5	0.84		
USGS	1647600	12/28/2004	4.5	0.62	2.53		
USGS	1647600	12/29/2004	3.89	0.88	2.35		

Agency	Site #	Date	Max. Gauge Height (ft)	Min. Gauge Height (ft)	Mean Gauge Height (ft)	Average MSL from 15th to 15th (WML-1.41=MSL)	Max.
USGS	1647600	12/30/2004	3.32	-0.01	1.43		
USGS	1647600	12/31/2004	3.86	0.83	2.39		
USGS	1647600	1/1/2005	3.65	0.96	2.2		
USGS	1647600	1/2/2005	3.15	0.51	1.76		
USGS	1647600	1/3/2005	3.63	0.92	2.25		
USGS	1647600	1/4/2005	3.54	0.66	2.08		
USGS	1647600	1/5/2005	3.6	0.47	2.03		
USGS	1647600	1/6/2005	4.53	1.31	2.83		
USGS	1647600	1/7/2005	4.36	1.14	2.78		
USGS	1647600	1/8/2005	4.11	1.35	2.7		
USGS	1647600	1/9/2005	4.16	0.66	2.32		
USGS	1647600	1/10/2005	4.81	1.21	2.96		
USGS	1647600	1/11/2005	4.62	1.1	2.83		
USGS	1647600	1/12/2005	4.52	0.95	2.71		
USGS	1647600	1/13/2005	5.17	1.24	3.11		3.76

ATTACHMENT 8

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