Howard Bend Floodplain
Draft Environmental Impact Statement for Purposes of Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act

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Executive Summary

ES.1 Project Description

This Draft Environmental Impact Statement (DEIS) has been prepared in consideration of past, present and reasonably foreseeable future actions that may occur within the Howard Bend floodplain area of St. Louis County, Missouri. The DEIS outlines how actions within the study area that pertain to Section 404 of the Clean Water Act (CWA) will be administered by the U.S. Army Corps of Engineers (USACE). The study area is located within the floodplain of the Missouri River and comprises approximately 8,624 acres of land and encompasses lands from the low bank of the Missouri River to the base of the surrounding bluff line. The study area begins at approximately Missouri River Mile (RM) 38.4 at the mouth of Bonhomme Creek and runs upstream to the Interstate 70 Blanchette Memorial Bridge at approximately RM 29. The boundaries fall within the city limits of the City of Maryland Heights with a small portion of the study area located in the City of Chesterfield. Most of the land use is agricultural; however, major developed features within the Howard Bend floodplain study area include:

- Interstate 70;
- Riverport Mixed Use Development;
- Harrah's Casino complex;
- City of Maryland Heights Expressway;
- Page Avenue Extension;
- Howard Bend Levee;
- The Missouri River Wastewater Treatment Plant;
- The Missouri American Water Treatment Plant;
- The City of St. Louis Water Treatment Plant; and
- Creve Coeur Airport.

Prominent natural features within the study area include the following:

- The Missouri River;
- Creve Coeur Lake Memorial Park (CCLMP);
- 1,852 acres of undeveloped open lands; and
- Fee Fee and Creve Coeur creeks.

ES.2 Purpose and Need

The Howard Bend EIS was promulgated by a series of regulatory and legal mandates related to Section 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899. The USACE has regulatory authority to administer permits that pertain to waters of the United States. This agency has issued permits on a project-by-project basis within the Howard Bend floodplain study area since 1984. This has resulted in 31 separate permit actions and a series of incremental, mitigative measures.

Legal Mandates

The preparation of this document was also undertaken to fulfill several legal mandates that require the preparation of an EIS. Each of these mandates and the needs they represent are described below.

Need: Assess Secondary and Cumulative Impacts. By mutual agreement between the USACE (St. Louis District), Missouri Department of Transportation (MoDOT), Federal Highway Administration (FHWA), and the City of Maryland Heights, this DEIS is being prepared pursuant to Subpart "r" of the Section 404 permit issued for the Page Avenue Extension in 1993.

However, this EIS will not reevaluate previously approved projects including the Page Avenue Extension project, the Riverport or Harrah's Casino levees, or any other previously approved or USACE-permitted projects located in or in proximity to the study area such as the Monarch-Chesterfield Levee project.

Potential Future Need: Provide Additional Flood Control. It is recognized that the ongoing construction of the 500-year +3 feet levee by the Howard Bend Levee District (HBLD) is a non-Federal activity that, to date, has not required the issuance of any Federal permit. Construction of the primary 500-year levee by the HBLD is an action anticipated to be completed in 2004. The presence of this levee, therefore, must be assumed as a base condition of the affected environment, and not part of the proposed action. However, as is discussed in Section 2.2.1, future phases of levee construction are being considered that may entail the construction of flank levees along Fee Fee and Creve Coeur creeks and would likely require the issuance of a Section 404 permit from the USACE. At this time, the construction of flank levees is an action that is a "reasonably foreseeable future" action and as such, will be evaluated in detail in this EIS. Therefore, in anticipation of this potential future action, this EIS will effectively meet the legal need for an EIS as stated in Paragraph 5.a. of the Riverport Consent Decree

Consequently, alternatives to these levee improvements, their varying degrees of interior flood protection, and their resultant effects will be given consideration in this EIS in a manner that is consistent with the NEPA process.

Area of Study

In consideration of the aforementioned issues and needs, the scope of this EIS will focus on the section of Missouri River floodplain between the Monarch-Chesterfield Levee (RM 38.4, Bonhomme Creek) north to I-70 at the Blanchette Memorial Bridge (RM 29.6) and will encompass Riverport and Harrah's Casino complex (Figure 1-2). Because the floodplain is the primary resource affected by the alternatives under study, the study area shall furthermore be limited to that area from the St. Louis County bank of the Missouri River to the base of the bluffs. The study area will include the Creve Coeur Creek valley to the intersection of Olive Boulevard with the proposed relocated Route 141 (Woods Mill Road), and Creve Coeur Mill Road. Although some agencies have commented that the USACE (St. Louis District) should extend the reach of this study to encompass a much larger region, the USACE believes that the study area, as defined, adequately gives consideration to cumulative impacts in a manner consistent with the intent of the regulatory and legal mandates presented.

ES.3 Alternatives

Based upon the legal mandates as set forth by the Page Avenue Extension 404 permit, the Riverport Consent Decree, and regulatory authority granted to the USACE to administer Section 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899, alternatives are being considered in this DEIS to the proposed action. The alternatives are (1) No Action (Alternative 1) or (2) the Special Area Management Plan (SAMP) (Alternative 2). The two alternatives are considered primary actions.

The No Action Alternative (Alternative 1), for purposes of this action, will be considered for permits under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 under the CWA of 1977 as exists currently under the constraints of the USACE Regulatory Program. The No Action Alternative would entail continuing the current regulatory policy of reviewing permit applications on an individual, case-by-case basis under the current individual permit practices for permitting.

The SAMP (Alternative 2) would provide for the issuance of permits in accordance with a plan specifically developed to address the long-range resource protection of the Howard Bend

floodplain. The SAMP would provide guidance and regulatory administrative requirements for managing wetland and surface water resources in the Howard Bend floodplain. This would provide a more cohesive approach with respect to the conversion of waters of the United States as well as the mitigation of unavoidable adverse impacts. Permitting for projects that could potentially impact these resources will be covered under the provisions of a General Permit in a manner consistent with the SAMP. The SAMP will allow developers to plan with a higher level of predictability and assure resource agencies and other interested parties that individual and cumulative environmental impacts will be analyzed in the context of ecosystem needs. The lead agency responsible for the SAMP development for the Howard Bend floodplain is the USACE St. Louis District. The overall goal of the SAMP is to minimize impacts of future projects to aquatic resources in the Howard Bend floodplain and to develop a General Permit for specified types of permit actions that will streamline the permitting process. In addition to resource protection, the SAMP will incorporate the proposed goals and objectives of (1) the Future Land Use Plan as adopted by the City of Maryland Heights for the Howard Bend floodplain, (2) wetland protection and preservation, and (3) wetland mitigation.

Regulatory alternatives considered in this DEIS, therefore, meet a need to assert a more comprehensive and cohesive approach toward the regulation of waters of the United States within the Howard Bend study area, thereby avoiding the inadvertent effects of a case-by-case regulatory approach.

Other Reasonably Foreseeable Actions

A number of proposed improvements are planned within the Howard Bend floodplain study area. These improvements include:

- Future land use development;
- Future roadway development; and
- Stormwater management improvements and other miscellaneous improvements to the existing water and sewer treatment plants and Creve Coeur Lake Memorial Park.

This DEIS defines reasonably foreseeable future actions as those items either planned or formally adopted by the City of Maryland Heights or the City of Chesterfield through building or grading permits, zoning, comprehensive land use planning, or planned improvements by respective utility agencies. An overview of these major reasonably foreseeable actions is provided in Table ES-1.

Table ES-1. Reasonably Foreseeable Future Actions in the Howard Bend Floodplain

Description of Action	Purpose
Flank Levee systems for Creve Coeur and Fee Fee creeks	Enhance stormwater management control
Maryland Heights Expressway (MHE) Extension from Page Avenue to Olive Boulevard (four lanes expandable to six lanes)	Improve roadway linkage
Baxter Road Extension (I-64 to MHE)	Improve roadway linkage
Hog Hollow Road Relocation	Improve security at Missouri American Water Plant
MSD Plant Expansion	Expand treatment capacity at waste treatment plant to meet future needs of entire serviceable watershed
Build-out of City of Maryland Heights Future Land Use Plan for the Howard Bend Floodplain	Provide guidance for future development land use and economic development characteristics
Terra Vista Estates (City of Chesterfield)	Provide 32-unit residential subdivision
Mill Ridge Villas (City of Chesterfield)	Provide 46-unit residential town home development
Dredging of Creve Coeur Lake	Improve recreational value and flood storage of lake and compliance with Page Avenue 404 permit

The analysis of impacts from these reasonably foreseeable future actions, coupled with the impacts of past and present actions, provides a means to assess the cumulative effect of all actions on the natural and human environment of the Howard Bend floodplain study area.

ES.4 Environmental Setting

The Affected Environment section of this DEIS describes the existing environmental setting and constitutes the base line for which the impact of potential future actions will be assessed. The Howard Bend study area comprises approximately 8,624 acres. The study area is comprised of a variety of land uses, socioeconomic characteristics, and cultural, ecological, and water resources.

Existing Land Use

Predominant land use within the Howard Bend study area is comprised of dedicated green space, recreation areas, agricultural lands, offices, warehouses, and various other industrial uses. An overview of existing land use within the study area is provided on Table ES-2.

Table ES-2. Distribution of Existing Land Uses, 2002

Land Use	Acres	Percent
Agriculture	3,906.85	45.3
Parks and Recreation	1,960.13	22.73
Vacant	845.36	9.8
Utility and Public Service	609.65	7.07
Commercial	569.3	6.6
Transportation	542.01	6.29
Arts and Entertainment	116.73	1.35
Residential	39.44	0.46
Industrial	28.78	0.33
Accommodation/Hospitality	5.52	0.06
Total	8,623.77	100.0

Source: City of Maryland Heights Land Use and City of Chesterfield Zoning Map modified to reflect existing land use.

Of the 8,624 acres in the Howard Bend study area, 1,852 acres are located riverside of the levee. Residential use within the study area is comprised of approximately 22 detached residences and 282 apartment units. Most of these units are located in the extreme southern portion of the study area along Creve Coeur Mill Road. The total appraised value of property within the study area is $300,241,320, generating an estimated $8,477,550 in taxes annually. The preponderance of the property value and tax generation is attributed to the Riverport Development and the Harrah's Casino complex.

Cultural Resources

A total of 18 archaeological investigations have been conducted in the Howard Bend study area. Of these resource investigations, 16 sites were identified within the study area that were determined to be ineligible for inclusion on the National Register of Historic Places (NRHP) or were not formally evaluated for eligibility (Figure 3-4).

A survey of potential historic architectural resources was conducted as part of this study. Twelve locations were identified as containing buildings that appear to be at least 50 years of age. The preponderance of these architectural resources was old farmsteads. However, other resources could include the industrial building and structure associated with the Missouri American Water

Company Treatment Plant and would most likely include the City of St. Louis Howard Bend Water Plant.

Ecological Resources

The ecological resources constitute a variety of land cover types, mammals, birds and fish typically found within the Missouri River floodplain environs of east central Missouri. Many of these floodplains contain large expanses of open land dedicated predominantly to agricultural use and protected by levees, which provide various levels of flood protection. Additionally, large deciduous stands of trees and various wetland communities are found on the river side of these levee systems. The Howard Bend floodplain typifies this type of environment but also contains large expanses of non-agricultural and recreational open space as well as areas of existing office, warehouse, and industrial development. A summary of cover types by area for the entire Howard Bend study area is provided in Table ES-3.

Table ES-3. Summary of Land Cover

Land Cover Type	Acres	Percent
Cultivated Field	3,182	36.9
Developed Lands	1,284	14.9
Grassland	1,178	13.7
Deciduous Forest	934	10.8
Old Field	817	9.5
Wetlands	708	8.2
Water	516	6
Mud/Sand	4	<0.1
Total	8,623	100.0

Source: MACTEC, 2003.

Wetlands

This DEIS addresses the existence of wetland communities throughout the study area, defines their functional classification, and provides an in-depth view of the various resources and techniques utilized to inventory the wetland types within the Howard Bend study area. A total of approximately 708 acres of wetlands were identified within the Howard Bend study area and are presented in Table ES-4.

Table ES-4. Wetlands within the Howard Bend Study Area

Wetland Type	Acres	Percent
Palustrine Forested (PFO)	461.3	65.2
Farmed Wetland (FW)	95.2	13.4
Palustrine Emergent (PEM)	57.3	8.1
Palustrine Emergent/Scrub Shrub Complex (PEM/PSS)	39.2	5.5
Palustrine Scrub Shrub (PSS)	27.8	3.9
Palustrine Scrub Shrub/Forested Complex (PSS/PFO)	24	3.4
PEM/PSS/PFO	3.2	0.5
Total	**708.0**	**100**

Water Resources

Surface water resources within the study area consist of both flowing water systems (i.e., streams and rivers) and non-flowing systems (i.e. lakes and ponds). The dominant surface water resources within the Howard Bend floodplain include the Missouri River, Bonhomme,

Creve Coeur, Fee Fee and Louiselle creeks, (and their associated floodplains) and Creve Coeur Lake. Additional surface water resources include a 64-acre siltation basin, the lakes associated with the Crystal Springs Quarry Golf Course, and borrow areas for the construction of the 500-year levee that subsequently filled with water.

The predominant groundwater resource in the study area is the Missouri River alluvial aquifer, which is a widely used water source in the area. The alluvial aquifer is directly connected to the Missouri River in some areas.

Agricultural Resources

Detailed agricultural statistics were not readily available for use in characterizing the agricultural resources within the study area; however, agricultural land constitutes the predominant land use within the study area. Approximately 3,907 acres (or 45 percent) of land in the study area is used for agricultural purposes.

Prime farmland within the study area was quantified using soil types and slopes specified as prime by the USDA and NRCS. Prime farmland occurred within cropland, forested areas, old field areas, and pastures. Total prime farmland within the study area is estimated to be 3,303 acres.

ES.5 Summary of Environmental Impacts

The Howard Bend study area is an expansive area of the Missouri River floodplain that at one time provided a rich mosaic of bottomland forest, wetland, and open water habitats. As a result of a long-term trend analysis, it was determined that a long history of agricultural use has resulted in significant and long lasting effects on the function and value of the study area for wildlife (due to land cover alteration) and for flood storage (due to agricultural levee construction in the 1940s). In recent years (i.e., since 1985), the Howard Bend floodplain has demonstrated a notable and increasing shift in character as a result of the construction of large-scale developments (e.g., Riverport and Harrah's) and a significant expansion of the transportation infrastructure (e.g., Page Avenue and MHE). These improvements, coupled with a significant increase in flood protection due to the construction of the 500-year primary levee and the adoption of a Future Land Use Plan for the area by the City of Maryland Heights, and the stated intentions of the HBLD to construct an interior flank levee system, have set the floodplain on a course that will entail a continued alteration of its character to that of developed uses. In total, approximately 2,100 acres of additional lands may be subject to future development. Altered environmental conditions as a result of these actions will create a future study area that will be characterized by increased traffic, altered visual landscapes, and increased noise.

In spite of this prevailing trend toward future land development, the Howard Bend study area also entails the integration of planned land areas dedicated to open space, wildlife habitat, and recreation. CCLMP, coupled with the open lands of the Missouri Riverfront (i.e., lands outside the 500-year levee), account for approximately 4,200 acres that will remain undeveloped wildlife habitat or that will be available for recreational uses. These areas will provide for sustained recreational use, the maintenance of wildlife habitat, and continued wetland support functions. Due to the proximity of these areas to existing and future transportation facilities, these areas will, however, be subject to on-going visual and noise impacts.

Evaluation of the Regulatory Action Alternatives

A synopsis of the relative effects (consequences, including benefits) of each regulatory alternative under consideration are summarized in Table ES-5. In summary, the regulatory

actions under consideration represent differences in the policy and process by which potential projects affecting waters of the United States are evaluated for issuance of CWA Section 404 permits (see Section 2.0). Additionally, because the very intent and purpose of Section 404 of the CWA is to regulate waters of the United States, the resources that may be most affected by a change in the program are expectedly those that have some relationship to wetlands, aquatic ecosystems, or water quality.

Table ES-5. Summary of Impacts of the Regulatory Alternatives

Resource Area	Category	
	Case by Case Permitting (No Action)	Special Area Management Plan (SAMP)
Social/Economic Characteristics	No Impact*	No Impact
Land Use	No Impact	• Increased degree of habitat preservation • Requires dedication of land for wetland bank creation • Need for vegetative buffers
4(f)/6(f) Lands	No Impact	No Impact
Cultural Resources	Requires coordination with SHPO for compliance with Section 106 NHPA	Requires coordination with SHPO for compliance with Section 106 NHPA
Air Quality	No Impact	No Impact
Noise	No Impact	No Impact
Mineral Resources/Soils	Requirements for erosion control to be issued as conditions of permit	• Requirements for erosion control to be issued as conditions of permit • More comprehensive BMPs for erosion control can be utilized • More extensive buffer requirements will increase protection of receiving waters
Land Cover	• Management of remaining natural resources within CCLMP only; limited or little management of other areas • Mitigation for project impacts may be in small isolated areas and out of study area.	• Comprehensive management of remaining natural resources using buffers, tree mitigation and wetland mitigation policies • Mitigation (wetland, tree) will be required to occur within the study area
Wildlife	Management of remaining natural resources within CCLMP only; limited or little management of other areas	• Comprehensive management of remaining natural resources using buffers, tree mitigation and wetland mitigation policies • Ensures greater habitat availability and connectivity in the future
Sensitive Species	Management of remaining natural resources within CCLMP only; limited or little management of other areas	• Comprehensive management of remaining natural resources using buffers, tree mitigation and wetland mitigation policies • Ensures greater habitat availability and connectivity in the future
Wetlands	• Protection of 153 acres of wetlands in CCLMP • Isolated project-specific wetland mitigation • Potential loss from the Howard Bend ecosystem	• Protection of 483 acres of wetlands in CCLMP • Comprehensive and consolidated approach to wetland mitigation • Wetland mitigation to occur within the Howard Bend ecosystem

Table ES-5. Summary of Impacts of the Regulatory Alternatives

Resource Area	Category	
	Case by Case Permitting (No Action)	Special Area Management Plan (SAMP)
Surface Water Resources	• Isolated project-specific stream mitigation • Potential loss from the Howard Bend ecosystem	• Comprehensive and consolidated approach to stream mitigation • Stream mitigation to occur within the Howard Bend ecosystem
Ground Water Resources	No Impact	Greater degree of protection of groundwater recharge areas (wetlands)
Floodplains	No Impact	No Impact
Agricultural Resources	No Impact	No Impact
Special Waste	No Impact	No Impact
Visual Environment	Incremental degradation of visual environment due to reduced need for buffers, reduced level of comprehensive land planning	• Improved visual environment due to the use of landscape buffers around sensitive natural resources including protected wetlands, mitigation acres, agricultural fields, and golf courses. • Greater opportunity for comprehensive land planning in environmentally sensitive resources.
* "No impact" relates to the effects of the regulatory alternative rather than other non-Federal actions that may occur in the study area. Such actions in the study area may have an effect on the environment in such a way as to impact or alter the listed resources.		

Primary differences in the consequences of each of the regulatory alternatives include the following:

- **Wetland Preservation** – The SAMP alternative expands on the preservation of existing wetlands over that which exists currently. At present, a total of 153 acres of wetlands are preserved with CCLMP and other mitigation lands as compared to a total of 483 acres of wetlands that would be preserved under the SAMP alternative.
- **Comprehensive and Consolidated Mitigation** – Potential unavoidable adverse impacts to waters of the United States will be mitigated under each alternative. However, the SAMP alternative will ensure a more cohesive approach that will ensure that mitigation will take place within the study area (Case-by-Case Permitting has resulted in historical net losses within the study area). Additionally, the establishment of a wetland and stream bank(s) will ensure that the mitigation wetlands and streams are functional and well managed.
- **Water Quality Protection and Enhancement** – The SAMP alternative provides features that further ensure the protection and enhancement of water quality. These measures include the mitigative measures discussed above as well as added requirements for the establishment of vegetative buffers that will reduce erosion and pollutant loading to (or within) receiving waters.

  Additionally, the preservation of wetland habitats (under each alternative, but expanded upon by the SAMP) will also provide benefits related to the protection of groundwater resources (filtering function of recharge zones).
- **Wildlife Habitat Enhancement and Preservation** – The preservation and creation of wetland habitats and vegetative buffers in conjunction with the SAMP will provide added benefit to the wildlife and sensitive species within the study area via a more comprehensive approach to threatened and endangered species coordination, and by increasing available habitats and improving habitat connectivity.

ES.6 Areas of Controversy

There are currently no known areas of public controversy with respect to the proposed project.

ES.7 Issues to be Resolved

There are no known unresolved issues that would affect this project.

ES.8 Other Federal and State Actions (Permits)

The nature of the proposed action is one that relates to the policy and procedures of the USACE's Regulatory Program within the Howard Bend study area. As such, no specific permits are required to implement the selected alternative. Future actions taken within the limits of the study area shall be required to follow all appropriate procedures to obtain applicable permits from Federal, state, and local agencies including the USACE, MDNR, St. Louis County, the City of Maryland Heights, and the City of Chesterfield.

In most cases, potential unavoidable adverse impacts to waters of the United States will qualify for authorization under the provisions of the General Permit issued for the SAMP area.

Potential actions with impacts that exceed the limits prescribed under the General Permit shall require processing as an Individual Permit and shall require Public Notice Review.

Table of Contents

Table of Contents
(continued)

Section **Page**

Table of Contents
(continued)

Section **Page**

Table of Contents
(continued)

Page

List of Tables

Table of Contents
(continued)

Table of Contents
(continued)

List of Figures (Figures are located at the end of each respective section)

Table of Contents (continued)

List of Abbreviations and Acronyms

AADT	average annual daily traffic
ACHP	Advisory Council of Historic Places
AIRS	Aerometric Information Retrieval System
APCD	Air Pollution Control Department
AQL	Protection of Warm Water Aquatic Life and Human Health – Fish Consumption
ARG	American Resource Group
AST	aboveground storage tank
ASTM	American Society of Testing Materials
BMPs	best management practices
BTG	Boating and Canoeing
Ca	calcium
CAAA	Clean Air Act and Amendments
CBB	Crawford Bunte Brammeier
CCLMP	Creve Coeur Lake Memorial Park
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERC/NFRAP	CERCLIS No Further Remedial Action Planned
CFR	Code of Federal Regulations
cfs	cubic feet per second
CLOMR	Conditional Letter of Map Revision
CO	carbon monoxide
CWA	Clean Water Act
cy	cubic yard
dB	decibel
dBA	decibels, time weighted average
dbh	diameter at breast height
DOH	Department of Health
DWS	Drinking Water Supply
EIS	Environmental Impact Statement
EWGCC	East-West Gateway Coordinating Council
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRMs	Flood Insurance Rate Maps
FPPA	Farmland Protection Policy Act
FTA	Federal Transit Administration
FTTS	FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act) Tracking System
FW	forested wetland
GIS	Geographic Information System
gpm	gallons per minute
HBLD	Howard Bend Levee District
HEL	highly erodible lands
I-64	Interstate 64
IMOP	Inventory of Mines, Occurrences, and Prospects (MDNR)
IND	Industrial
IP	individual permit
IRR	Irrigation
LOMR	Letter of Map Revision
LUST	leaking underground storage tank
LWCF	Land and Water Conservation Fund
LWW	Livestock and Wildlife Watering
MASS	Missouri Agriculture Statistic Service
MCLD	Monarch-Chesterfield Levee District
MDC	Missouri Department of Conservation
MDNR	Missouri Department of Natural Resources
Mg	manganese
mgd	million gallons per day
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
$\mu g/m^3$	micrograms per square meter
MHE	City of Maryland Heights Expressway
MOBIL6	USEPA Air Quality Model
MoDOT	Missouri Department of Transportation
MOP	Mines, Occurrences, and Prospects
MPO	Metropolitan Planning Organization
MSD	Metropolitan St. Louis Sewer District
msl	mean sea level
MWQS	Missouri Water Quality Standards
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NI	Not Inventoried
NPS	National Park Service
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Properties
NW	Non-Wetland
NWI	National Wetland Inventory
O3	ozone
PAH	polynuclear aromatic hydrocarbon
Pb	lead
PC	prior converted wetland
PCB	polychlorinated biphenyl
PCS	Permit Compliance System
PEM	palustrine emergent wetland
PFO	palustrine forested wetland

Table of Contents
(continued)

PHEL	potential highly erodible lands
$PM_{2.5}$	particulate matter less than or equal to 2 microns in diameter
PM_{10}	particulate matter less than or equal to 10 microns in diameter
ppm	parts per million
PSS	palustrine scrub shrub wetland
RCRA	Resource Conservation and Recovery Act
RCRIS-SQG	Resource Conservation and Recovery Index System-Small Quantity Generator
RGL	Regulatory Guidance Letter
RGP	Regional General Permit
RM	River Mile
SAMP	Special Area Management Plan
SCS	Soil Conservation Service (now NRCS)
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SQG	small quantity generator
SR	State Route
TAZ	Transportation Analysis Zone
TDS	total dissolved solids
TIP	Transportation Improvement Plan
TPH	total petroleum hydrocarbons
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USDOI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
VOC	volatile organic compound
WW	wooded wetland