III.B.

5/21/12

Memorandum

Department of Planning, Public Works & Parks

To: Michael Herring, CA

From: Mike Geisel, DPPW & P

Date: 5/17/2012

Re: Wetland Mitigation Permits

Chesterfield Parks & Recreation

City of Chesterfield EST. 1988 Planning Engineering Maintenance Development DEPT. OF PLANNING AND PUBLIC WORKS

As you know, the City proactively addressed environmental permitting for Chesterfield Valley immediately following the flood of 1993. The City cooperated and coordinated with the Monarch Chesterfield Levee District to permit impacts to the identified wetlands within Chesterfield Valley through the Corps of Engineers and concurrently create a wetland mitigation bank in conjunction with the borrow of earthen materials used for levee improvements. City Council has been actively and consistently involved in this project since its inception in 1994. Staff has diligently pursued creation of the wetland mitigation areas and satisfying the Corps requirements. The City has received more than $730,000 from wetland mitigation sums paid by developers. In addition, the TIF Special Project accounts have a current balance in excess of $930,000, with more than $3,423,000 fixed sums due from reimbursement contracts, and an estimated additional $4,932,216 amount due in reimbursements that are dependent on outside factors. In total, the Special Projects Accounts which were originally established for the sole purpose of wetland mitigation and funding of Valley infrastructure projects, has expected sums due of more than $8,355,000 in addition to the current balance of $934,929.

I recommend and request that the City Contract with MITICO in an amount not to exceed $1,080,000, for the purpose of meeting the remaining wetland mitigation permit requirements, funded through the Special Projects Fund, including a temporary transfer of $250,000 from the General Fund – Fund Reserve which will be reimbursed as funds are received from the existing reimbursement agreements and wetland mitigation deposits. Further, I request that this recommendation be forwarded to the Planning and Public Works Committee for review and recommendation to the full City Council.

Inasmuch as this is a milestone in both the recovery of Chesterfield Valley and in the ultimate disposition of our original Corps of Engineers permit, and

inasmuch as this effort has been ongoing since 1994, I have provided a rather lengthy and detailed explanation, along with providing a voluminous amount of supporting documentation for those interested in a full description. Although this represents a good deal of information, it does not represent a full or complete description of the many advances and milestones along the way. Although extensive, it is not comprehensive. If you, or any other individual desires a more detailed compendium on the process, I would be happy to share our files.

As you may remember, in the early 1990's then President George H. W. Bush had issued a "no net loss" policy for America's wetlands. As a result, prior to the great flood of 1993, environmental permitting associated with development in Chesterfield Valley had come to a standstill. The Corps of Engineers required that the "cumulative and reasonably anticipated impacts" of development be reviewed prior to issuance of any water quality\jurisdictional wetland permits (401\404 permits). In essence, the regulations prevented any single property owner from obtaining a development permit without a comprehensive review of the ultimate anticipated development in Chesterfield Valley and the resultant impacts of such development on water quality and jurisdictional wetlands.

Immediately after the Monarch-Chesterfield levee was breached, resulting in the inundation of Chesterfield Valley by Missouri River flood waters, the City of Chesterfield pledged $1 million towards a new and improved 500 year levee and internal drainage systems. The City and Monarch-Chesterfield Levee District became integral partners in coordinating levee improvements and insuring safe redevelopment of Chesterfield Valley. A series of intergovernmental cooperation agreements followed. A $930,000 Federal Disaster Grant was obtained to construct the first three storm water pump stations in Chesterfield Valley.

Immediately after the flood, the City was able to obtain a $56,000 Economic Disaster Assistance Planning grant for the purpose of funding a Valley Wide Jurisdictional Wetland inventory. Basically, we contracted with Black and Veatch, a professional services firm, to physically inspect and test approximately 3,000 acres of Chesterfield Valley to identify, categorize, map, and report all jurisdictional wetlands in Chesterfield Valley with the notable exception of the Spirit Airport area which was being done concurrently by St. Louis County. Approximately 70 acres of wetlands were identified and included

in the City's original permit request submission to the Corps of Engineers. This amount was subsequently increased by more than 10 acres due to the inclusion of wetland impacts related to the Boone's Crossing Interchange.

Concurrently with these activities, the City of Chesterfield created the Chesterfield Valley Tax Increment Financing District, providing more than $70 million of funding for public infrastructure and levee improvements. That funding provided the impetus to initiate significant levee improvements. As you can imagine, the levee improvements involved massive earth quantities and the Levee District sought locations to obtain large quantities of borrow materials to widen and raise the levee, along with construction of interior seepage berms throughout the valley. As such, the City and Levee District cooperated in developing a plan to use the borrow sites in conjunction with construction of wetland mitigation areas.

The benefit of having the wetland's identified, catalogued, and mapped allowed the City and the Levee District to submit an application to mitigate the 80 acres of interior jurisdictional wetlands, through the dedication of conservation easements and constructing more than 120 acres of new wetlands. Once constructed, these areas would then be added to the City's park system. Wetland Area One exists on a 43 acre tract immediately behind the Chesterfield Valley Athletic complex, and is situated between the Monarch-Chesterfield Levee and the Agricultural Levee. Wetland Mitigation Two exists behind what is the current proposed site of the Taubman Outlet Mall proposal, and is more than 100 acres, including a 30 acre deep water lake. Area Two is also situated between the Monarch-Chesterfield Levee and the Agricultural Levee. Both sites were designed with hydrophytic plantings, graded for periodic inundation, and boardwalks were constructed for the future public use by Chesterfield Park users.

The Corps of Engineers ultimately approved permit #2032 to the benefit of the City of Chesterfield, providing for the City to offer the mitigated wetlands and allowing developers to deal directly with the City as opposed to requiring individual 401\404 permits with each development. In physical terms, by constructing more than 120 acres of consolidated and high quality wetlands, landowners were freed from the regulatory constraints of dealing with jurisdictional wetlands and the environment was enhanced through

consolidating 80 acres of isolated, low quality wetlands, some of which were as small as 20' x 20'. The City acted as a steward of the environment, while fostering high quality development and business.

Ordinance #1386 passed in April, 1998, officially established the City's wetland mitigation bank, and directed proceeds to be deposited into the Wetlands Fund to offset the costs of development and administration of establishing the area wide wetland permit. Developers were now able to deposit the sum of $25,000 directly to the City of Chesterfield, for each acre of wetland mitigation required from impacts of their development activities. It should be recognized that such practice continues, and development ordinances routinely include requirements that petitioners reimburse the City for wetland mitigation on their site. As a current example, the ordinance governing the Blue Valley development requires that they reimburse the City in excess of $77,000 for wetland impacts. To date, the City of Chesterfield has received in excess of $730,000 in wetland mitigation funds from land owners impacting wetlands.

Once the permit was issued, the City and Levee District physically moved forward to construct the wetland mitigation areas in accordance with the approved plan. As required by the permit, once constructed, the mitigation areas are inspected and reviewed annually for permanent establishment and determination as to whether or not the physical changes to the soil, vegetation and hydrology have taken place as designed to actually convert these areas to wetlands. Unfortunately, as previously discussed with Council, the originally designed areas for wetland mitigation purposes did not fully perform and the areas did not meet the permit requirements after the initial five year permit window. Subsequently, the permit was renewed and extended in 2002, providing for a second five year period of monitoring and wetland establishment. In 2007, we once again found the mitigation areas to have not yet fully met the original 120 acre wetland conversion requirement and the City was left with a deficit. Although Wetland Mitigation Area One, behind the CVAC, was generally acceptable, a determination was made that the site hydrology and soil sub-strata at Wetland Mitigation Area Two simply was not suitable and it was unlikely that there would be further progression towards wetland establishment. Another wetland site or mitigation alternative would have to be provided. Again, the City sought a time extension to determine how we could best meet our permit obligations.

Also, by 2002, the wetland definition and permitting requirements had evolved slightly. As such, the Corps of Engineers required the City to perform an updated inventory and identify the extent of the original wetlands that had been impacted to that date and to identify any new wetlands that had not yet been permitted with the prior permits. As such, the City Council subsequently approved a contract with Midwest Testing for professional services related to preparing a permit modification and wetland inventory evaluation in February of 2008.

The Corps of Engineers has been extremely cooperative and desires to resolve our permit deficiencies in a positive way. They have been helpful in determining that an additional 60 acres of wetland mitigation is required. Public Works Staff has been working diligently over the last several years attempting to identify opportunities for meeting our remaining permit obligations. Recently, we have been negotiating with a local soil scientist, whose company creates wetland mitigation areas. He has, in turn, **negotiated a contingent contract with a private land owner which will ultimately meet the City's 60 acre wetland mitigation permit deficit at a cost of $18,000 per acre, or a total cost of $1,080,000. A copy of the tentative contract is provided hereto and is currently being reviewed by City Attorney, Rob Heggie.**

Concurrently, in conjunction with our efforts to resolve the remaining wetland permit obligations, **the City has also formally requested that the Monarch-Chesterfield Levee District transfer title to the land which has been heretofore described as Wetland Mitigation Area Two, for inclusion and incorporation into the City's parks system. This would result in more than 100 acres of protected habitat as well as to provide a fishing lake for our residents. As previously described, this is the area between the Monarch-Chesterfield Levee and the Agricultural levee, north of the current Taubman Premium Outlet Mall Proposal.**

As previously described, a funding source was originally established for this purpose. In addition, there are a number of account receivables in this account that become due upon development in the Valley, as a result of various forward funding agreements. **At the present time, the cash value of this funding source is $934,929. We have minor existing obligations for professional services from these funds and would recommend maintaining**

a balance of approximately $100,000, thus necessitating a temporary fund transfer of $250,000 from the General Fund – Fund reserve, which would be reimbursed as deposits are made into the TIF Special Projects Account. At the present time, there are fixed, contractual reimbursement agreements totaling $3,423,152. In addition, there are additional deposits that are expected, but not fixed amounts, currently estimated at $4,932,216. As such, anticipated future deposits into the TIF Special Project Fund, which was established for the sole purpose of wetland mitigation and to fund future Chesterfield Valley infrastructure improvements, are expected in a cumulative amount in excess of $9,290,295. Again, the fixed contract reimbursements of this amount are in excess of $3,423,000.

Accordingly, I recommend and request that the City Contract with MITICO in an amount not to exceed $1,080,000, for the purpose of meeting the remaining wetland mitigation permit requirements, funded through the Special Projects Fund, including a temporary transfer of $250,000 from the General Fund – Fund Reserve which will be reimbursed as funds are received from the existing reimbursement agreements and wetland mitigation deposits. Further, I request that this recommendation be forwarded to the Planning and Public Works Committee for review and recommendation to the full City Council.

If you have any questions or require additional information, please advise.

Concurrence: Brian Whittle

Brian Whittle, Finance Director, Assistant City Administrator

attachments

Cc Brian McGownd, Public Works Director\City Engineer

Statement on TIF Assets as of April 30, 2012

Available Cash:	
Special Projects Fund Available Balance	$ 715,137
Designated Funds for TIF Projects in General Fund(forward funding)	219,792
Total Available Cash	934,929
Accounts Receivable	
Reimbursement Agreements:	
Sanitary Sewer Pump Station #4	194,062
Sanitary Sewer Pump Station #5	441,600
Danna Parkway Improvements	2,787,490
Total Reimbursement Agreements	3,423,152
Aniticipated Funds (Estimated):	
West Reservoir Land Acquisition	1,200,000
West End Infrastructure Abatement	3,000,000
TDD Reimbursement Legal Expenses	250,000
Wetland Reimbursements	482,216
Total Anticipated Funds (Estimated)	4,932,216
Total Accounts Receivable	8,355,368
Total TIF Assets	$ 9,290,297

CONTRACT TO PERFORM MITIGATION SERVICES

THIS CONTRACT, dated this _____ day of May, 2012, by and between The City of Chesterfield, Missouri, 690 Chesterfield Parkway West, Chesterfield, Missouri 63017-0760, hereinafter called "the City", and MITICO, LLC, 1008 West Highway 24, Moberly, Missouri 65270 hereinafter called "MITICO".

Whereas, the City has a requirement for compensatory mitigation as required by the United States Army Corps of Engineers (Corps) for the required acreage as set forth in United States Army Corps of Engineers 404 Permit (File Number ---------- - -----) and,

Whereas, MITICO has identified and assessed sites, that in the opinion of MITICO are suitable to fulfill the compensatory mitigation needs of the City; and,

Whereas, the City wishes to engage the services of Contractor to assist the City in meeting the compensatory mitigation requirements of the Corps;

Now Therefore, in consideration of the mutual obligations found herein and under the terms and conditions set forth below, the City hereby agrees to retain the services of MITICO and MITICO covenants and agrees to perform the services of procurement, design and engineering, construction management, maintenance and monitoring of the wetland requirements of the Corps as set forth in the United States Army Corps of Engineers 404 Permit (File Number ----- - ------) as well as provide the financial assurances as required by the Corps, more completely listed in the "Scope of Services" below:

SCOPE OF SERVICES (Paragraphs 1. through 5.)

1. Securing of the Mitigation Land. MITICO has, simultaneously with obtaining signature on this agreement and accepting payment from the City, secured an agreement to establish a perpetual conservation easement and establish a restrictive covenant, in a form and substance as set forth by the Corps, over a site determined by Corps to be acceptable for the specific mitigation purposes of the City.

2. Development & Approval of the Mitigation Plan. Create a mitigation plan to be approved in writing by the Corps. Continue to meet the requirements of the Corps regarding mitigation goals and objectives for similarly situated projects as follows:

Mitigation Goals & Objectives;

A. Baseline information

B. Mitigation site selection and jurisdiction

C. Mitigation work plan

D. Performance standards

E. Site protection and maintenance

F. Monitoring plan

G. Adaptive management plan

H. Financial assurances

3. Implementation of the Mitigation Plan. Implementing a plan approved in writing by the Corps on site to include:

A. Tree plantings

B. Herbaceous plantings

C. Water level control structures

D. Grading and earthwork

E. Outflow structures

4. Completion Phase. Final construction of the Project to be approved in writing by the Corps.

5. Monitoring, Management & Maintenance Phase (as per mitigation plan).

A. Monitor for success and survivability of trees and herbaceous plantings.

B. Develop a format for reporting monitoring data and assessing mitigation success.

C. Conduct an annual survey of the site during the growing season and not later than the 30th of September of each year to determine survival rates of planted vegetation.

D. Determine the health of each tree by conducting tree counts during the monitoring period and periodic site reviews.

E. Document the survey(s) in a written report in accordance with the Regulatory Guidance Letter No. 08-03 which also includes a photographic summary and provide copies of the report to the Customer and to the US Army Corps of Engineers for distribution to all members of the Inter-Agency Review Team.

The five year monitoring period will begin when construction at each site is complete. Monitoring insures that the performance standards for each year have been met and may be certified in writing. MITICO will furnish the City with a final letter of confirmation from the Corps that the project has met the required performance standards at the end of the monitoring period.

6. Financial Assurances. Financial assurances are the responsibility of MITICO,. Acceptable forms of financial assurances include performance bonds, escrow accounts, casualty insurance, letter of credit or other appropriate instruments approved by the Corps. Financial assurances ensure a high level of confidence that the compensatory mitigation project will be successfully completed and managed for the long-term, in accordance with the required ecological performance standards for a minimum of five (5) years. A financial assurances escrow or insurance product, in a form and amount deemed to be

suitable by the Corps and as approved in the mitigation plan will be held in place with a escrowee approved by the City and MITICO until such time that the final letter of confirmation from the Corps that the project has met the required performance standards is received.

7. Compensation. In return for the services provided to the City by MITICO, the City agrees to pay the amount of $_____ (_____) mitigation acres times $18,000.00 per mitigation acre) . This compensation shall be paid as follows:

A. 60% at the time of signing of this Agreement, covering the costs of acquisition of a conservation easement, over the mitigation land and development of the mitigation plan; and,

B. 40% at the time of approval of the mitigation plan and at which time that the financial assurances escrow will be established.

8. Term of Agreement. The term of this agreement will begin on the date of signature is obtained on the this Contract and will remain in full force and effect until completion of the 5 year monitoring phase or any extensions thereto, agreed upon in writing, by the City and MITICO. This Agreement shall fully culminate at upon receipt by the City and MITICO upon receipt of the final letter from the Corps that the project has met the required performance standards.

9. Titles/Headings. Paragraph titles and headings are inserted for the convenience of the parties only and are not to be considered when interpreting this Contract.

10. Capacity/Independent Contractor. It is expressly agreed that the MITICO is acting as an independent contractor and not as an employee in providing the services hereunder. MITICO and the City acknowledge that this Contract does not create a partnership or joint venture between them.

11. Modification. Any amendment or modification of this Contract or additional obligation assumed by either party in connection with this Contract will only be binding if evidenced in writing, signed by each party or an authorized representative of each party.

12. Times of the Essence. Time is of the essence of this Contract and of every part hereof. No extension or variation of this Contract will operate as a waiver of this provision.

13. Entire Agreement. It is agreed that there is no representation, warranty, collateral agreement or condition affecting this Contract except as expressed herein.

14. Severability. In the event that any of the provisions of this Contract are held to be invalid or unenforceable in whole or part, all other provisions will be nevertheless continue to be valid and enforceable with the invalid or unenforceable parts severed from the remainder of this Contract.

15. Waiver. The failure of either party to enforce any provisions of this Contract shall not be deemed a waiver or limitation of that party's right to subsequently enforce and compel strict compliance with every provision of this Contract.

16. Notice. All notices, requests, demand or other communications required or permitted by the terms of this Contract will be given, in writing and either served personally or by registered mail. The addresses for any notice to be delivered to any of the parties to this Contract are contained in the first paragraph hereof.

17. Legal Expenses. In the event that legal action is brought to enforce any term of this Contract, each party shall bear its own legal costs associated with the action.

18. Governing Law. It is the intention of the parties to this Contract that this Contract and the performance under the same, or any suits or actions brought to enforce or interpret this Contract will be governed by the laws of the State of Missouri.

In witness whereof, the parties have signed this Contract in duplicate the day and year first above written.

THE CITY OF CHESTERFIELD, MISSOURI

_____

ATTEST:

_____

MITICO, LLC

_____

By. Walter S. Iman, General Manager

City of Chesterfield

690 Chesterfield Pkwy W • Chesterfield MO 63017-0760
Phone: 636-537-4000 • Fax 636-537-4798 • www.chesterfield.mo.us

May 11, 2012

David Human
Husch Blackwell Sanders LLP
190 Carondelet Plaza, Suite 600
St. Louis, MO 63105

RE: East wetland properties

Dear David;

The City of Chesterfield continues toward resolution of the wetland permit issues related to the Chesterfield Valley. We are currently considering alternatives to meet the remaining 58 acres of mitigated wetlands required by the current permit. In conjunction with resolving the permit issues, and as we have discussed on several occasions, the City would like to proceed with the transfer of the eastern property that was originally designed and constructed to meet the permit requirements. As was originally planned and conceived, the City is desirous of receiving title to these properties and incorporating them into our parks system. The boardwalks and facilities were designed for the purpose of providing an opportunity for the public to experience the natural environment and wildlife. The 30 acre lake presents an excellent opportunity for a fishing venue. We are cognizant of the Levee District's desire to retain specific access rights and protective covenants for levee purposes. We are certainly amenable to such provisions.

We would like to consummate this transaction as well as complete our wetland mitigation requirements at the earliest possible date. If you need additional information or have other questions, please let me know.

Sincerely,

Mike Geisel, P.E.
Director of Planning, Public Works and Parks

Cc Michael G. Herring City Administrator
Rob Heggie, City Attorney
Tom McCarthy, Parks and Recreation Director
Brian McGownd, Deputy Director of PW\Asst. City Engineer

BILL NO. 1516 ORDINANCE NO. 1386

AN ORDINANCE AUTHORIZING THE ISSUANCE OF UP TO $4,400,000 ORIGINAL PRINCIPAL AMOUNT TAX INCREMENT FINANCING NOTES (CHESTERFIELD VALLEY REDEVELOPMENT PROJECT) OF THE CITY OF CHESTERFIELD, MISSOURI, FOR THE PURPOSE OF PAYING A PORTION OF THE REDEVELOPMENT PROJECT COSTS IN CONNECTION WITH THE CHESTERFIELD VALLEY REDEVELOPMENT PLAN; PRESCRIBING THE FORM AND DETAILS OF SAID NOTES AND THE COVENANTS AND AGREEMENTS MADE BY THE CITY TO FACILITATE AND PROTECT THE PAYMENT THEREOF; AND PRESCRIBING OTHER MATTERS RELATING THERETO.

WHEREAS, the City of Chesterfield, Missouri (the "City"), is a third class city duly created, organized, and existing under the laws of the State of Missouri; and

WHEREAS, a Tax Increment Financing Commission (the "TIF Commission") was created by the City pursuant to ordinance, said TIF Commission conducted a public hearing on August 17, 1994, and by motion, recommended approval of the Redevelopment Plan for the Chesterfield Valley Tax Increment Financing District, City of Chesterfield, dated August 17, 1994, as amended (the "Redevelopment Plan") and redevelopment project therein (the "Redevelopment Project"); and

WHEREAS, on October 17, 1994, the City adopted Ordinance No. 953 (the "Approving Ordinance") approving the Redevelopment Plan and Redevelopment Project pursuant to the Real Property Tax Increment Allocation Redevelopment Act, Sections 99.800 to 99.865, inclusive, of the Revised Statutes of Missouri, as amended (the "Act"); and

WHEREAS, pursuant to the Approving Ordinance, the City designated that area legally described in Exhibit A of the Redevelopment Plan as a redevelopment project area (the "Redevelopment Project Area"); and

WHEREAS, pursuant to Ordinance No. 954, the City adopted tax increment allocation financing under the Act; and

WHEREAS, Monarch-Chesterfield Levee District (the "Levee District") is a public corporation duly organized and existing under the laws of the State of Missouri, including Sections 245.010 to 245.280 and Sections 246.005 to 246.305 of the Revised Statutes of Missouri, as amended; and

WHEREAS, the Missouri River flood plain includes an area along a five-mile length of I-64/U.S.40 between Bonhomme Creek on the east and south, the Missouri River on the north and west, Eatherton Road and the Missouri River on the west and St. Louis Southwestern Railroad tracks on the south (as described, the "Chesterfield Valley Area") and the Chesterfield Valley Area includes the Redevelopment Project Area; and

WHEREAS, the Levee District has jurisdiction over the construction, maintenance, oversight and improvement of the levee and drainage system which protects the Chesterfield Valley Area; and

WHEREAS, the City has responsibility to provide for the general health, safety and welfare of that portion of Chesterfield Valley Area within the City. Further, the City has been designated by the Federal Emergency Management Agency ("FEMA") as flood plain manager and, to that end, has certain responsibilities to the entire flood plain within the Chesterfield Valley Area. Recognizing that a breach of a portion of the Monarch-Chesterfield Levee (as occurred in 1993) imperils the property and persons of the City, the City desires to protect existing property and persons and enhance the economic viability of the Chesterfield Valley Area and the Redevelopment Project Area for the overall betterment of the City by undertaking certain obligations with the Levee District consistent with its obligations as defined under state and federal law; and

WHEREAS, the City and the Levee District desire to cooperate and to take the reasonable steps necessary to facilitate the prompt design, commencement and completion of certain Chesterfield Valley improvements including the installation of internal pumps and structural improvements for the Monarch-Chesterfield Levee; and

WHEREAS, the City and the Levee District desire to share certain of the costs and other obligations in connection with the Chesterfield Valley Area improvements according to the terms and conditions in an Intergovernmental Cooperation Agreement, dated September 12, 1996, as amended by the First Amendment to Intergovernmental Cooperation Agreement (collectively, the "Agreement"), in accordance with and pursuant to the provisions of Article VI, § 16 of the Missouri Constitution and Sections 70.210 through 70.325 of the Revised Statutes of Missouri, as amended; and

WHEREAS, on October 21, 1996, the City Council adopted Ordinance No. 2046 authorizing the issuance of the City of Chesterfield, Missouri Tax Increment Financing Note (Chesterfield Valley Redevelopment Project), Series 1996 (the "Phase I TIF Note"), pursuant to the Act and the Agreement, in the original aggregate principal amount of $2,600,000 to finance certain costs associated with said Chesterfield Valley Area improvements, specifically acquisition, construction and installation of Phase I Drainage Improvements, as that term is defined in the Agreement; and

WHEREAS, the City intends to issue its Tax Increment Financing Notes (Chesterfield Valley Redevelopment Project), Series 1998 (collectively, the "TIF Notes"), pursuant to the Act and the Agreement, in an original aggregate principal amount not to exceed $4,400,000 to finance certain costs associated with the Project (as that term is hereinafter defined); and

WHEREAS, it is hereby found and determined that it is necessary and advisable and in the best interest of the City and of its inhabitants that the TIF Notes be issued and secured in the form and manner as hereinafter provided to provide funds for such purpose;

NOW, THEREFORE BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CHESTERFIELD, MISSOURI, AS FOLLOWS:

ARTICLE I

DEFINITIONS

Section 101. Definitions of Words and Terms. Capitalized terms not otherwise defined herein shall have the meanings ascribed to them in the Agreement. In addition to the foregoing and other words and terms defined elsewhere in this Ordinance, the following capitalized words and terms, as used in this Ordinance, shall have the following meanings:

"Act" means Sections 99.800 to 99.865, inclusive, of the Revised Statutes of Missouri, as amended.

"Additional TIF Notes" means any additional parity TIF Notes issued pursuant to Section 207 of this Ordinance.

"Agreement" means the Intergovernmental Cooperation Agreement between the City and Levee District, dated September 12, 1996, as amended by the First Amendment to Intergovernmental Cooperation Agreement.

"Approving Ordinance" means Ordinance numbered 953 of the City dated October 17, 1994, pertaining to the approval of the Redevelopment Plan and creation of the Redevelopment Project Area for Chesterfield Valley Tax Increment Financing District.

"Bond Resolution" means a Resolution of the Levee District dated August 19, 1997, pertaining to issuance by the Levee District of $6,000,000 Principal Amount of Levee District Improvement Bonds, Series 1997.

"Business Day" means a day on which (i) the New York Stock Exchange is not closed and (ii) none of the following are required or authorized to close: banks or savings and loan associations located in the City.

"Certificate of Mitigation" means a certificate of the same name in substantially the form of **Exhibit D**, attached hereto and incorporated herein, executed by an officer of the Levee District delivered, from time to time, to the Finance Director.

"City" means the City of Chesterfield, Missouri, and its successors or assigns.

"City Engineer" means the City Engineer of the City of Chesterfield, Missouri, or any other officer as may be assigned, from time to time, to the duties of that office.

"Deficiency" means the difference between the interest and principal payment scheduled to be paid on a Payment Date and the amount then available in the Special Allocation Fund to satisfy the amount owed by the City.

"Finance Director" means the City's Director of Finance and Administration or such other officer of the City authorized, from time to time, to act as the chief financial officer and treasurer by the City.

"First Phase II Note" means a TIF Note to the Levee District in a principal amount equal to the sum of properly documented Reimbursable Project Costs for the Phase II Levee Improvements incurred by the Levee District up to the date of the Notice of Commencement of Construction.

"First Wetlands Note" means a TIF Note to the Levee District in a principal amount, not to exceed $250,000, equal to properly documented Reimbursable Project Costs for the Wetlands Improvements incurred by the Levee District before the delivery of the first Certificate of Mitigation.

"Fund Ordinance" means Ordinance numbered 954 of the City dated October 17, 1994, adopting tax increment financing.

"Government Obligations" means direct obligations of, or obligations the principal of and interest on which are unconditionally guaranteed by, the United States of America.

"Levee District" means the Monarch-Chesterfield Levee District, a public corporation duly authorized and existing under the laws of the State of Missouri.

"Maturity Date" means December 31, 2017.

"Mitigation Site 1 Account" means an account of the same name created within the Wetlands Fund under Section 401 of this Ordinance.

"Mitigation Site 2 Account" means an account of the same name created within the Wetlands Fund under Section 401 of this Ordinance.

"Net Proceeds" on deposit in the Special Allocation Fund are those payments in lieu of taxes (as that term is defined in section 99.805(10) of Missouri Revised Statutes) attributable to the increase in the current equalized assessed valuation of each taxable lot, block, tract, or parcel of real property in the area of the Project and any applicable penalty and interest over and above the certified total initial equalized assessed value (as that term is used and described in sections 99.845.1 and 99.855 of Missouri Revised Statutes) of each such unit of property in the area of the Project and as paid to the City's Finance Director by the St. Louis County Collector of Revenue during the term of the Plan and the Project; and, subject to annual appropriation, fifty percent (50%) of the total additional revenues from taxes, penalties and interest which are imposed by the City or other taxing districts (as that term is defined in section 99.805(16) of Missouri Revised Statutes) and which are generated by economic activities within the area of the Project over the amount of such taxes generated by economic activities within the area of the Project in the calendar year 1993 and paid into the Special Allocation Fund, but excluding personal property taxes, taxes imposed on sales or charges for sleeping rooms paid by transient guests of hotels and motels, taxes levied pursuant to section 70.500 Missouri Revised Statutes, or for the purpose of public transportation taxes levied pursuant to section 94.660, Missouri Revised Statutes, licenses, fees or special assessments, other than payments in lieu of taxes and penalties and interest thereon, and less the costs of collection; and fifty percent (50%) of the net new revenues from the utility tax imposed by the City and generated by utility use within the area of the Project over the amount of such revenues generated within the area of the Project in the calendar year 1993; and to the extent available under the Act, up to fifty percent (50%) of the new state revenues (as that term is defined in section 99.845.8 Missouri Revised Statutes), estimated for the businesses within the area of the Project and identified by the City in the application required by section 99.845.10 Missouri Revised Statutes, if any, over and above the amount of such taxes reported by businesses within the area of the Project in the calendar year 1993. Net Proceeds do not include any such amount paid under protest until the protest is withdrawn or resolved against the taxpayer, nor do Net Proceeds include any sum received by the City which is the subject of a suit or other claim communicated to the City, which suit or claim challenges the collection of such sums or their payment to the Levee District or its successors in interest.

"Notes" or "TIF Notes" means the Tax Increment Financing Notes (Chesterfield Valley Redevelopment Project), Series 1998 of the City, in an original aggregate principal amount not to exceed $4,400,000 authorized and issued pursuant to this Ordinance, including the Phase II Notes and the Wetlands Mitigation Notes.

"Original Purchaser" means the Levee District.

"Owner", when used with respect to the TIF Notes, means the holder of such TIF Notes.

"Phase I Note" means the City's Tax Increment Financing Note (Chesterfield Valley Redevelopment Project) Series 1996, issued in an aggregate principal amount of $2,600,000.

"Phase II Notes" means those notes authorized pursuant to this Ordinance to fund the Phase II Levee Improvements, including without limitation the First Phase II Note, the Second Phase II Note and the Third Phase II Note.

"Payment Dates" means each February 15 and August 15, commencing on February 15, 1998.

"Project" means the acquisition, construction and installation of the Phase II Levee Improvements, as that term is defined in the Agreement and described in Exhibit A of the Agreement; along with the improvements contemplated by the Wetland Mitigation Plan, as that term is defined in the Agreement.

"Redevelopment Plan" means the Redevelopment Plan for Chesterfield Valley Tax Increment Financing District, City of Chesterfield, Missouri, dated August 17, 1994, as amended.

"Redevelopment Project Area" means that area legally described as a redevelopment project area in the Redevelopment Plan approved pursuant to the Approving Ordinance.

"Redevelopment Project Costs" means those redevelopment project costs, as defined in the Act, that may be paid financed through tax increment financing and which the City has provided for under the Redevelopment Plan.

"Second Phase II Note" means a TIF Note to the Levee District in a principal amount equal to Reimbursable Project Costs incurred by the Levee District after the date of the Notice of Commencement of Construction.

"Second Wetlands Note" means a TIF Note to the Levee District in a principal amount, not to exceed $500,000, equal to properly documented Reimbursable Project Costs for the Wetlands Improvements incurred by the Levee District before the delivery of the second Certificate of Mitigation.

"Site 1 Reimbursements" means the first Ten Thousand Dollars ($10,000.00) of wetlands bank credits allocable to Mitigation Site 1.

"Site 2 Reimbursements" the first Six Thousand Dollars ($6,000.00) of wetlands bank credits allocable to Mitigation Site 2.

"Special Allocation Fund" means the fund by that name created by Section 4 of the Fund Ordinance.

"State" means the State of Missouri.

"Third Phase II Note" means a TIF Note in a principal amount equaling the sum of all properly documented Reimbursable Project Costs incurred by the Levee District and not already reimbursed by the First Phase II Note or the Second Phase II Note.

"Third Wetlands Note" means a TIF Note to the Levee District in a principal amount, which when added to the principal amounts of the First Wetlands Note and Second Wetlands Note does not

exceed $1,000,000, equal to properly documented Reimbursable Project Costs for the Wetlands Improvements incurred by the Levee District before the delivery of the third Certificate of Mitigation.

"Wetlands Mitigation Credit Proceeds" means the money received by the City for the sale of wetland mitigation bank credits as contemplated by the Agreement, including without limitation, the Site 1 Reimbursements and the Site 2 Reimbursements.

"Wetlands Fund" means the Wetlands Bank Credit Fund created under Section 401 of this Ordinance.

"Wetlands Improvements" means those improvements contemplated by the Wetlands Mitigation Plan.

"Wetlands Mitigation Notes" means those TIF Notes authorized by this Ordinance that are issued to fund the Wetlands Improvements, including without limitation, the First Wetlands Note, the Second Wetlands Note and the Third Wetlands Note.

ARTICLE II

AUTHORIZATION OF TIF NOTES

Section 201. Authorization of TIF Notes. There are hereby authorized and directed to be issued Tax Increment Financing Notes (Chesterfield Valley Redevelopment Project), Series 1998 of the City (the "TIF Notes") in an aggregate original principal amount not to exceed Four Million Four Hundred Thousand and No/100 Dollars ($4,400,000.00) for the purpose of paying a portion of those Project costs determined to be Redevelopment Project Costs in connection with the Redevelopment Plan, as provided in this Ordinance.

Section 202. Security for TIF Notes. The TIF Notes shall be a special obligation of the City payable solely from, and secured as to the payment of principal and interest by a pledge of, the Net Proceeds deposited in the City's Special Allocation Fund, and the taxing power of the City is not pledged to the payment of the TIF Notes either as to principal or interest; provided, however, that the principal and interest of the Wetlands Mitigation Notes may be paid with the use of Wetlands Mitigation Credit Proceeds, as is more particularly provided in Sections 508 and 509. The TIF Notes shall not be or constitute a general obligation of the City, nor shall they constitute an indebtedness of the City within the meaning of any constitutional, statutory or charter provision, limitation or restriction. EXCEPTED AS PROVIDED IN SECTION 701 HEREOF, THE OBLIGATIONS OF THE CITY WITH RESPECT TO THE TIF NOTES SHALL TERMINATE ON DECEMBER 31, 2017, WHETHER OR NOT THE PRINCIPAL AMOUNT HAS BEEN PAID IN FULL.

Section 203. Description of TIF Notes. The TIF Notes shall be issued in an aggregate original principal sum not to exceed $4,400,000 and shall provide for simple interest accruing on the unpaid principal at the following rates: (i) on the Phase II Notes, a rate equal to the average annual interest rates on the obligations issued pursuant to the Bond Resolution or seven and one-half percent (7.5%) per annum, whichever is less; and (ii) on the Wetlands Mitigation Notes, a rate of six percent (6%). The TIF Notes shall be substantially in the form set forth in Section 301 hereof. The TIF Notes shall be dated the date of original delivery of the TIF Notes, and shall become due on December 31, 2017.

Section 205. Method and Place of Payment of TIF Notes. The principal of and interest on the TIF Notes shall be payable in any coin or currency which, on the respective dates of payment thereof, in legal tender for the payment of debts due the United States of America.

Payment shall be made by the Finance Director at the offices of the City on each Payment Date upon presentation of the TIF Notes by a duly authorized representative of Owner. Upon payment of interest and principal and the notation upon the payment ledger of the TIF Notes, the Finance Director shall enter the amount paid and outstanding balance on its books which shall be rebuttably presumptive evidence of the principal amount outstanding on the TIF Notes.

Section 206. Transfer and Assignment. The TIF Notes are being issued to the Original Purchaser pursuant to the Agreement. The TIF Notes are not transferable or assignable except upon the express written permission of the City and only upon such terms and conditions the City, in its is sole discretion, places upon any such transfer or assignment.

Section 207. Authorization of Additional TIF Notes. Subject to the limitations set forth in the Agreement, Additional TIF Notes may be authorized under the following circumstances:

(a) Before any Additional TIF Notes shall be issued under the provisions of this Section, the City shall adopt an ordinance authorizing the issuance of such Additional TIF Notes, fixing the amount and terms thereof pursuant to the Agreement; and

(b) Such Additional TIF Notes shall be executed substantially in the form and manner set forth in Article III hereof; and

(c) the City provides the Levee District with fifteen days' written notice of its election to issue the Additional TIF Notes; AND EITHER

(ii) at the time of issue of such Additional TIF Notes, the ratio of (x) all sums deposited to the Special Allocation Fund over the twelve month period ending on the date of issuance to (y) the aggregate amount of principal and interest to be paid on all TIF Notes issued in connection with or secured by the Special Allocation Fund over the twelve month period commencing on the date of issuance shall not be less than 1.2:1; OR

(iii) Additional TIF Notes are issued in connection with a redevelopment project consisting of the construction of at least one hundred thousand square feet of building improvements on a parcel or parcels under common ownership or control; provided that interest on said Additional TIF Notes shall not be payable from the Special Allocation Fund until such time that monies attributable to said redevelopment project are deposited in the Special Allocation Fund.

ARTICLE III

FORM OF TIF NOTE

Section 301. Form of TIF Notes. The First Phase II Note, as originally issued upon transfer, exchange or substitution, shall be in substantially in the form of **Exhibit A**, attached hereto and incorporated herein by this reference. The Second Phase II Note and Third Phase II Note shall be in substantially the same form. The Wetlands Mitigation Notes, as originally issued upon transfer, exchange or substitution, shall be in substantially in the form of **Exhibit B**, attached hereto and incorporated herein

by this reference. The Finance Director shall be, and hereby is, authorized to alter the form of the TIF Notes to reflect the terms thereof in accordance with the Agreement and the summary that follows:

Reference	Maximum Amount	Time of Issuance
First Phase II Note	$1,000,000	Upon the City's receipt of the Notice of Commencement of Construction
Second Phase II Note	Principal amount shall not, when added to the principal amount of the First Phase II Note, shall not exceed the aggregate amount of $2,500,000	Amount of Reimbursable Project costs plus amount of First Phase II Note equal or exceed $2,500,000, after the date of the Notice of Commencement
Third Phase II Note	Principal amount shall not, when added to the principal amounts of the Phase I Note, First Phase II Note, and the Second Phase II Note, exceed $6,000,000	Following the City's receipt of a notice of substantial completion
First Wetlands Note	$250,000	Following the Levee District's submittal of its first Certificate of Mitigation
Second Wetlands Note	$500,000	Following the Levee District's submittal of its second Certificate of Mitigation
Third Wetlands Note	Principal amount shall not, when added to the principal amounts of the First Wetlands Note and Second Wetlands Note, exceed $1,000,000	Following the Levee District's submittal of its third Certificate of Mitigation

ARTICLE IV

ESTABLISHMENT OF FUNDS

Section 401. Funds and Accounts.

(a) The creation and establishment in the treasury of the City of the following funds and accounts is hereby ratified: Chesterfield Valley Special Allocation Fund of the City of Chesterfield (the "Special Allocation Fund"), and within the Special Allocation Fund, a PILOTs Account and an Economic Activity Tax Account.

(b) There is hereby created and ordered to be established in the treasury of the City the Wetlands Bank Credit Fund (the "Wetlands Fund"). Within the Wetlands Fund there is hereby created a Mitigation Site 1 Account and a Mitigation Site 2 Account.

Section 402. Administration of Funds and Accounts. The funds and accounts established, or the establishment of which was ratified, pursuant to Section 4 of the Fund Ordinance and Section 401 hereof shall be maintained and administered by the City solely for the purposes and in the manner as provided in this Ordinance so long as any portion of the TIF Notes remains outstanding hereunder.

ARTICLE V

PAYMENT OF TIF NOTE

Section 501. Special Allocation Fund and Wetlands Fund. Pursuant to the Act and this Ordinance, the Finance Director shall deposit all Net Proceeds into the Special Allocation Fund. Pursuant

to the Agreement and this Ordinance the Finance Director shall deposit all Wetlands Mitigation Credit Proceeds into the Wetlands Fund; provided, however, that the Finance Director shall deposit all Wetlands Mitigation Credit Proceeds that relate to Mitigation Site 1 into the Site 1 Account and all Wetlands Mitigation Credit Proceeds that relate to Mitigation Site 2 into the Site 2 Account. The City Engineer shall deliver a certificate in the form of **Exhibit C**, attached hereto and incorporated herein, each time Wetlands Mitigation Credit Proceeds are delivered to the Finance Director in accordance with the terms of the Agreement.

Section 502. Application of Moneys in the Special Allocation Fund. So long as any of the TIF Notes remain outstanding, the Finance Director shall, on Payment Dates administer and allocate the moneys held in the PILOTs Account and, subject to annual appropriation by the City, the Economic Activity Tax Account as follows:

(a) Fees and Expenses. There shall first be paid to the City or its payees any fees and expenses incurred by the City incidental to the Redevelopment Plan or the TIF Notes; provided that such amount shall not exceed the sum of $100,000 during any calendar year.

(b) Payment of TIF Notes. There shall next be paid to the Owner an amount equal to the interest and principal then due pursuant to **Schedule 1** of each of the TIF Notes; provided, however, that although the Wetlands Mitigation Notes shall have a parity claim to the moneys in the Special Allocation Fund with the Phase II Notes, no payments from the Special Allocation Fund shall be made to the Owner of the Wetlands Mitigation Notes until the Wetlands Fund has been exhausted.

(c) Payment of Deficiency. There shall next be paid to the Owner of each of the TIF Notes amounts owed on all outstanding Deficiencies.

(d) Prepayment of TIF Notes. At the City's sole discretion, the City may prepay any portion of or the entire principal amount owed on the TIF Notes.

(e) Payment on Maturity Date. If not repaid in full sooner, the entire outstanding balance of the TIF Notes together with all interest thereon, shall be paid on December 31, 2017, but only to the extent that Net Proceeds are available in or then due to the Special Allocation Fund as of December 31, 2017. Except as provided in Section 701 hereof, the City shall have no further obligations under this Ordinance or the TIF Notes after December 31, 2017.

Except as provided in Section 701 hereof, all moneys remaining in the Special Allocation Fund after December 31, 2017, shall be treated as "Surplus" as defined in the Act, and distributed in the manner provided by law.

Section 503. Levy and Collection of Net Proceeds. The City hereby ratifies and confirms its obligation to levy and collect Net Proceeds pursuant to the Act for deposit in the Special Allocation Fund for the purpose of paying the TIF Notes.

The Net Proceeds shall be determined, collected and applied in the manner provided by law for the period through December 31, 2017. After December 31, 2017, or the date on which the TIF Notes has been paid in full, whichever shall first occur, all Net Proceeds for any period after December 31, 2017, shall cease and all property in the Redevelopment Project Area shall be subject to assessments and payment of all ad valorem taxes based on the full true value of the real property and the standard assessment ratio then in use for similar property by the St. Louis County Assessor.

The Net Proceeds shall be deposited in the Special Allocation Fund, shall be kept separate and apart from all other funds of the City, and shall be used solely as provided in the Act and this Ordinance.

Section 504. Acceleration of Maturity Upon Default. The City covenants and agrees that if it defaults in the payment of the principal of or interest on the TIF Notes as the same become due on any Payment Date, or if the City or its governing body or any of the officers, agents or employees thereof fail or refuse to comply with any of the provisions of this Ordinance or of the Constitution or statutes of the State of Missouri, and such default continues for a period of 60 days after written notice specifying such default has been given to the City by the Owner at any time thereafter and while such default continues, the Owners may, by written notice of the City filed in the office of the City Clerk or delivered in person to said City Clerk, declare the principal of the TIF Notes due and payable immediately. Upon any such declaration given as aforesaid, shall become and be immediately due and payable, anything in this TIF Notes Ordinance or in the TIF Notes contained to the contrary notwithstanding. This provision, however, is subject to the condition that if at any time after the principal of the TIF Notes has been so declared to be due and payable, all arrears of interest upon all of the TIF Notes, except interest accrued, but not yet due, on such TIF Notes, and all arrears of principal upon the TIF Notes has been paid in full and all other defaults, if any, but the City under the provisions of this Ordinance and under the provisions of the statutes of the State of Missouri have been cured, then and in every such case the Owner by written notice to the City given as hereinbefore specified, may rescind and annul such declaration and its consequences, but no such rescission or annulment shall extend to or affect any subsequent default or impair any rights consequent thereon.

Section 505. Remedies. The provisions of this Ordinance, including the covenants and agreements herein contained, shall constitute a contract between the City and the Owner. The Owner shall have the right:

(a) by mandamus or other suit, action or proceedings at law or in equity to enforce the rights of the Owner against the City and its officers, agents and employees, and to require and compel duties and obligations required by the provisions of this Ordinance or by the constitution and laws of the State of Missouri;

(b) by suit, action or other proceedings in equity or at law to require the City, its officers, agents and employees to account as if they were the trustees of an express trust; and

(c) by suit, action or other proceedings in equity or at law to enjoin any acts or things which may be unlawful or in violation of the rights of the Owner.

Section 506. Limitation on Rights of Owner. The Owner secured hereby shall not have any right in any manner whatever by its action to affect, disturb or prejudice the security granted and provided for herein, or to enforce any right hereunder, except in the manner herein provided.

Section 507. Remedies Cumulative. No remedy conferred herein upon the Owner is intended to be exclusive of any other remedy, but each such remedy shall be cumulative and in addition to every other remedy and may be exercised without exhausting and without regard to any other remedy conferred herein. No waiver of any default or breach of duty or contract by the Owner shall extend to or affect any subsequent default or breach of duty or contract or shall impair any rights or remedies thereon. No delay or omission of the Owner to exercise any right or power accruing upon any default shall impair any such right or power or shall be construed to be a waiver of any such default or acquiescence therein. Every substantive right and every remedy conferred upon the Owner by this Ordinance may be enforced and exercised from time to time and as often as may be deemed expedient. If any suit, action or

proceedings taken by the Owner on account of any default or to enforce any right or exercise any remedy has been discontinued or abandoned for any reason, or has been determined adversely to the Owner, then, and in every such case, the City and the Owner shall be restored to their former positions and rights hereunder, respectively, and all rights, remedies, powers and duties of the Owner shall continue as if no such suit, action or other proceedings had been brought or taken.

Section 508. Application of Moneys in the Site 1 Account. The Finance Director shall, on Payment Dates, administer and allocate the moneys held in the Site 1 Account as follows:

(a) Reimbursements. There shall first be paid to the City or its payees the Site 1 Reimbursements.

(b) Payment of Wetlands Mitigation Notes. There shall next be paid to the Owner of each of the Wetlands Mitigation Notes an amount equal to the interest and principal then due pursuant to **Schedule 1** of the respective Wetlands Mitigation Notes.

(c) Payment to Special Allocation Fund. Before December 31, 2017, the balance of any moneys remaining in the Site 1 Account shall be payable into the Special Allocation Fund.

(d) Payment to City. After December 31, 2017, the balance of any moneys remaining in the Site 1 Account shall be deposited into the City's general fund.

Section 509. Application of Moneys in the Site 2 Account. The Finance Director shall, on Payment Dates, administer and allocate the moneys held in the Site 2 Account as follows:

(a) Reimbursements. There shall first be paid to the City or its payees the Site 2 Reimbursements.

(b) Payment of Wetlands Mitigation Notes. There shall next be paid to the Owner of each of the Wetlands Mitigation Notes an amount equal to the interest and principal then due pursuant to **Schedule 1** of the respective Wetlands Mitigation Notes.

(c) Payment to Special Allocation Fund. Before December 31, 2017, the balance of any moneys remaining in the Site 2 Account shall be payable into the Special Allocation Fund.

(d) Payment to Levee District. After December 31, 2017, the balance of any moneys remaining in the Site 2 Account shall be payable to the Levee District for Valley Improvements.

ARTICLE VI

DEPOSIT AND INVESTMENT OF MONEYS

Section 601. Deposits of Moneys. Cash moneys in each of the funds and accounts created by and referred to in this Ordinance shall be deposited in a bank or banks located in the State of Missouri having combined capital, surplus and undivided profits of at least $5,000,000, and which is a member of the Federal Deposit Insurance Corporation, and all such bank deposits shall be continuously and adequately secured by the banks holding such deposits as provided by the laws of the State of Missouri.

Section 602. Investment of Moneys. Moneys held in any fund or account referred to in this Ordinance shall be invested by the City pursuant to the direction of the City in Government Obligations

or in time or demand deposits or in certificates of deposit issued by any bank having combined capital, surplus and undivided profits of at least $5,000,000, but only to the extent such time or demand deposits or certificates of deposit are fully insured by the Federal Deposit Insurance Corporation; provided, however, that no such investment shall be made for a period extending longer than the date when the moneys invested may be needed for the purpose for which such fund was created. All earnings on any investments held in any fund shall accrue to and become a part of such fund or account.

ARTICLE VII

MISCELLANEOUS PROVISIONS

Section 701. Payments Due on Saturdays, Sundays and Holidays. In any case where the date of maturity of principal of or interest on the TIF Notes is a Saturday, a Sunday or a legal holiday or other day that is not a Business Day, then payment of principal or interest need not be made on such date but may be made on the next succeeding Business Day with the same force and effect as if made on the date of maturity or the date fixed for redemption, and no interest shall accrue for the period after such date.

Section 702. Notices, Consents and Other Instruments. Any notice, consent, request, direction, approval, objection or other instrument required by this Ordinance to be signed and executed by the Owner of the TIF Notes may be in any number of concurrent writings of similar tenor and may be signed or executed by such Owner in person or by agent appointed in writing. Proof of the execution of any such instrument or of the writing appointing any such agent and of the ownership of the TIF Notes, if made in the following manner, shall be sufficient for any of the purposes of this Ordinance, and shall be conclusive in favor of the City with regard to any action taken, suffered or omitted under any such instrument, namely:

(a) The fact and date of the execution by any person of any such instrument may be proved by a certificate of any officer in any jurisdiction who by law has power to take acknowledgments within such jurisdiction that the person signing such instrument acknowledged before such officer the execution thereof, or by affidavit of any witness to such execution.

(b) The fact of ownership of the TIF Notes, the amount or amounts and other identification of the TIF Notes, and the date of holding the same shall be proved by the registration books of the City.

Section 703. Execution of Documents. The City is hereby authorized to enter into and the Mayor is hereby authorized and directed to execute and deliver, for and on behalf of and as the act and deed of the City, the TIF Notes and such other documents, certificates and instruments as may be necessary or desirable to carry out and comply with the intent of this Ordinance.

Section 704. Further Authority. The officers of the City, including the Mayor, City Administrator, the City Clerk and the Finance Director, shall be, and they hereby are, authorized and directed to execute all documents and take such actions as they may deem necessary or advisable in order to carry out and perform the purposes of this Ordinance and to make ministerial alterations, changes or additions in the foregoing agreements, statements, instrument and other documents herein approved, authorized and confirmed which they may approve and the execution or taking of such action shall be conclusive evidence of such necessity or advisability.

Section 705. TIF Notes Taxable. The interest on the TIF Notes is includable in gross income for federal income tax purposes.

Section 706. **Severability.** If any section or other part of this Ordinance, whether large or small, shall for any reason be held invalid, the invalidity thereof shall not affect the validity of the other provisions of this Ordinance.

Section 707. **Governing Law.** This Ordinance shall be governed exclusively by and constructed in accordance with the applicable laws of the State of Missouri.

Section 708. **Effective Date.** This Ordinance shall take effect and be in full force from and after its passage by the City's City Council.

PASSED AND APPROVED THIS 30TH DAY OF April, 1998.

(Seal)

Nancy Greenwood, Mayor

ATTEST:

Martha L. DeMay, City Clerk

Exhibit A

THE RIGHT TO TRANSFER, ASSIGN OR NEGOTIATE THIS NOTE SHALL BE LIMITED TO TRANSFER, ASSIGNMENT OR NEGOTIATION TO ANY ACCREDITED INVESTOR OR QUALIFIED INSTITUTIONAL INVESTOR, AS SUCH TERMS ARE COMMONLY DEFINED FROM TIME TO TIME BY APPLICABLE STATE AND FEDERAL SECURITIES LAWS AND REGULATIONS AND ONLY UPON WRITTEN CONSENT OF THE CITY.

CITY OF CHESTERFIELD, MISSOURI,
TAX INCREMENT FINANCING NOTE
(CHESTERFIELD VALLEY REDEVELOPMENT PROJECT)
Series 1998

REFERENCE:_____

THE CITY OF CHESTERFIELD, MISSOURI ("City"), on this _____ day of _____, 1998, for value received promises to pay to the **Monarch-Chesterfield Levee District**, its successors and assigns (the "Levee District") the principal sum of _____ Dollars ($_____.00), together with simple interest at the rate of _____ percent (____%) per annum on the outstanding balance hereof, calculated on the basis of a 365-day year and actual days elapsed from the date hereof to the earlier of: (i) the date of repayment, or (ii) December 31, 2017 (the "Maturity Date"). This Note evidences sums advanced by the Levee District on behalf of the City pursuant to the Intergovernmental Cooperation Agreement between them dated September 12, 1996, as amended by the First Amendment to Intergovernmental Cooperation Agreement (collectively, the "Agreement").

Reference is made to the Agreement and Ordinance No. _____ passed and adopted by the City Council on ___, 1998 (the "Note Ordinance"), for a description of the covenants and agreements made by the City and Levee District with respect to payment of Net Proceeds to pay this Note, the nature and extent of the security for this Note, the rights, duties and obligations of the City and Levee District with respect hereto and, the rights of the holder hereof. Capitalized terms not otherwise defined herein shall have the meanings ascribed to them in the TIF Note Ordinance.

All payments of principal and interest by the City shall be from the Net Proceeds on deposit in the Special Allocation Fund created by Ordinance No. 954 passed and adopted by the City Council on October 17, 1994 (the "Fund Ordinance").

This Note shall be payable solely from the aforesaid moneys and from no other revenue or property of the City, it being understood that this instrument is a special limited obligation of the City and is payable solely from the aforementioned sources, including from incremental tax revenues which the City is entitled to receive under sections 99.800 through 99.865 of Missouri Revised Statutes deposited from time to time in the Special Allocation Fund of the City as set forth below, and is not a general obligation of the City, St. Louis County, the State of Missouri or any political subdivision thereof, nor of any officer or employee thereof, and it being further understood that this Note is issued in connection with a certain redevelopment plan entitled "Chesterfield Valley Tax Increment Financing Redevelopment Plan," dated June 28, 1994, as from time to time may be amended (the "Plan"), and redevelopment projects including those specified in the Agreement (the "Project"), as approved in Ordinance No. 953, passed and adopted by the City Council on October 17, 1994 (the "Approving Ordinance").

The "Net Proceeds" on deposit in the Special Allocation Fund are those payments in lieu of taxes (as that term is defined in section 99.805(10) of Missouri Revised Statutes) attributable to the increase in the current equalized assessed valuation of each taxable lot, block, tract, or parcel of real property in the area of the Project and any applicable penalty and interest over and above the certified total initial equalized assessed value (as that term is used and described in sections 99.845.1 and 99.855 of Missouri Revised Statutes) of each such unit of property in the area of the Project and as paid to the City's Finance Director by the St. Louis County Collector of Revenue during the term of the Plan and the Project; and, subject to annual appropriation, fifty percent (50%) of the total additional revenues from taxes, penalties and interest which are imposed by the City or other taxing districts (as that term is defined in section 99.805(16) of Missouri Revised Statutes) and which are generated by economic activities within the area of the Project over the amount of such taxes generated by economic activities within the area of the Project in the calendar year 1993 and paid into the Special Allocation Fund, but excluding personal property taxes, taxes imposed on sales or charges for sleeping rooms paid by transient guests of hotels and motels, taxes levied pursuant to section 70.500 Missouri Revised Statutes, or for the purpose of public transportation taxes levied pursuant to section 94.660, Missouri Revised Statutes, licenses, fees or special assessments, other than payments in lieu of taxes and penalties and interest thereon, and less the costs of collection; and fifty percent (50%) of the net new revenues from the utility tax imposed by the City and generated by utility use within the area of the Project over the amount of such revenues generated within the area of the Project in the calendar year 1993; and to the extent available under the Act, up to fifty percent (50%) of the new state revenues (as that term is defined in section 99.845.8 Missouri Revised Statutes), estimated for the businesses within the area of the Project and identified by the City in the application required by section 99.845.10 Missouri Revised Statutes, if any, over and above the amount of such taxes reported by businesses within the area of the Project in the calendar year 1993. Net Proceeds do not include any such amount paid under protest until the protest is withdrawn or resolved against the taxpayer, nor do Net Proceeds include any sum received by the City which is the subject of a suit or other claim communicated to the City, which suit or claim challenges the collection of such sums or their payment to the Levee District or its successors in interest.

Subject to the terms of the immediately following paragraph, the principal and interest hereof shall be payable in semi-annual installments as set forth in **Schedule 1**, attached hereto and incorporated herein by reference, or if such day is not a Business Day, the first Business Day thereafter (the "Payment Dates") to the earlier of repayment or the Maturity Date of this Note, followed by a final payment, to the extent there are funds then available in the Special Allocation Fund, on the Maturity Date in the amount of the then unpaid principal balance hereof and all accrued and unpaid interest hereon.

Payment of principal and interest hereunder shall be subject to the following further terms and conditions:

(i) Subject to annual appropriation, Net Proceeds of the Special Allocation Fund shall first be disbursed to pay administrative, planning, legal and other related operational costs of the City associated with implementation of the Plan and Agreement but not to exceed $100,000 in any calendar year;

(ii) If on any Payment Date the Net Proceeds in the Special Allocation Fund are insufficient to pay scheduled principal and accrued interest then due and owing, the amount of the deficiency (the "Deficiency") shall be carried forward as an amount due and owing hereunder. So long as the amount of any Deficiency is carried as a liability on the City's Special Allocation Fund's financial records, the existence of such Deficiency shall not be deemed an event of default hereunder and shall not be cause for acceleration of this Note;

(iii) If on any Payment Date the Net Proceeds in the Special Allocation Fund are in excess of the amount required to pay the scheduled annual installment of principal plus accrued interest then due and owing, all excess Net Proceeds shall be applied by the City to the satisfaction of all outstanding Deficiencies under this Note and all other Notes executed and delivered pursuant to the Agreement, allocated in accordance with the then outstanding principal balances thereof;

(iv) On the Maturity Date, the City shall pay to the Levee District out of Net Proceeds then on deposit in the Special Allocation Fund all sums due to the Levee District; provided, however, that whether or not paid in full, this Note shall expire on the Maturity Date and the City shall have no further responsibility, liability, or obligation hereunder.

Subject to the foregoing, payments shall be applied first to accrued interest on the Note, and then, if there are additional funds available in the Special Allocation Fund on any Payment Date or on the Maturity Date, to the unpaid principal of this Note. Any unpaid interest carried forward as part of any Deficiency shall not be added to principal.

The City shall pay all amounts due and owing hereunder to the Levee District upon receipt by the City from the Levee District of an appropriate receipt, at such place within the City as may be specified by the Levee District from time to time.

This Note may be prepaid at any time in whole or in part without penalty. This Note shall be assignable by the Levee District only upon expressed written consent of the City. The right to transfer, assign, or negotiate this Note shall be limited to transfer, assignment, or negotiation to any accredited investor or qualified institutional investor, as such terms are commonly defined from time to time by applicable state and federal securities laws and regulations.

The interest on this Note is includable in gross income for federal income tax purposes.

Outstanding principal owed on this Note may be canceled or reduced by the City pursuant to Sections 2(F), 2(G) and/or 2(H) of the Agreement in accordance with the terms thereof.

CITY OF CHESTERFIELD, MISSOURI

By:_____

Title:_____

ATTEST:

_____

City Clerk

****

SCHEDULE 1

City of Chesterfield, Missouri,
Tax Increment Financing Note
(Chesterfield Valley Redevelopment Project)
Series 1998
****
Debt Service Schedule
****

Exhibit B

THE RIGHT TO TRANSFER, ASSIGN OR NEGOTIATE THIS NOTE SHALL BE LIMITED TO TRANSFER, ASSIGNMENT OR NEGOTIATION TO ANY ACCREDITED INVESTOR OR QUALIFIED INSTITUTIONAL INVESTOR, AS SUCH TERMS ARE COMMONLY DEFINED FROM TIME TO TIME BY APPLICABLE STATE AND FEDERAL SECURITIES LAWS AND REGULATIONS AND ONLY UPON WRITTEN CONSENT OF THE CITY.

CITY OF CHESTERFIELD, MISSOURI,
TAX INCREMENT FINANCING NOTE
(CHESTERFIELD VALLEY REDEVELOPMENT PROJECT)
Series 1998

REFERENCE:_____

THE CITY OF CHESTERFIELD, MISSOURI ("City"), on this _____ day of _____, 1998, for value received promises to pay to the **Monarch-Chesterfield Levee District**, its successors and assigns (the "Levee District") the principal sum of _____ Dollars ($_____.00), together with simple interest at the rate of _____ percent (____%) per annum on the outstanding balance hereof, calculated on the basis of a 365-day year and actual days elapsed from the date hereof to the earlier of: (i) the date of repayment, or (ii) December 31, 2017 (the "Maturity Date"). This Note evidences sums advanced by the Levee District on behalf of the City pursuant to the Intergovernmental Cooperation Agreement between them dated September 12, 1996, as amended by the First Amendment to Intergovernmental Cooperation Agreement (collectively, the "Agreement").

Reference is made to the Agreement and Ordinance No. _____ passed and adopted by the City Council on ____, 1998 (the "Note Ordinance"), for a description of the covenants and agreements made by the City and Levee District with respect to payment of Net Proceeds to pay this Note, the nature and extent of the security for this Note, the rights, duties and obligations of the City and Levee District with respect hereto and, the rights of the holder hereof. Capitalized terms not otherwise defined herein shall have the meanings ascribed to them in the TIF Note Ordinance.

All payments of principal and interest by the City shall be from the Net Proceeds on deposit in the Special Allocation Fund created by Ordinance No. 954 passed and adopted by the City Council on October 17, 1994 (the "Fund Ordinance"); provided, however, that payments for this Wetlands Mitigation Note shall first be made from available moneys in the Wetlands Fund.

This Note shall be payable solely from the aforesaid moneys and from no other revenue or property of the City, it being understood that this instrument is a special limited obligation of the City and is payable solely from the aforementioned sources, including from incremental tax revenues which the City is entitled to receive under sections 99.800 through 99.865 of Missouri Revised Statutes deposited from time to time in the Special Allocation Fund of the City as set forth below, and is not a general obligation of the City, St. Louis County, the State of Missouri or any political subdivision thereof, nor of any officer or employee thereof, and it being further understood that this Note is issued in connection with a certain redevelopment plan entitled "Chesterfield Valley Tax Increment Financing Redevelopment Plan," dated June 28, 1994, as from time to time may be amended (the "Plan"), and redevelopment projects including those specified in the Agreement (the "Project"), as approved in Ordinance No. 953, passed and adopted by the City Council on October 17, 1994 (the "Approving Ordinance").

The "Net Proceeds" on deposit in the Special Allocation Fund are those payments in lieu of taxes (as that term is defined in section 99.805(10) of Missouri Revised Statutes) attributable to the increase in the current equalized assessed valuation of each taxable lot, block, tract, or parcel of real property in the area of the Project and any applicable penalty and interest over and above the certified total initial equalized assessed value (as that term is used and described in sections 99.845.1 and 99.855 of Missouri Revised Statutes) of each such unit of property in the area of the Project and as paid to the City's Finance Director by the St. Louis County Collector of Revenue during the term of the Plan and the Project; and, subject to annual appropriation, fifty percent (50%) of the total additional revenues from taxes, penalties and interest which are imposed by the City or other taxing districts (as that term is defined in section 99.805(16) of Missouri Revised Statutes) and which are generated by economic activities within the area of the Project over the amount of such taxes generated by economic activities within the area of the Project in the calendar year 1993 and paid into the Special Allocation Fund, but excluding personal property taxes, taxes imposed on sales or charges for sleeping rooms paid by transient guests of hotels and motels, taxes levied pursuant to section 70.500 Missouri Revised Statutes, or for the purpose of public transportation taxes levied pursuant to section 94.660, Missouri Revised Statutes, licenses, fees or special assessments, other than payments in lieu of taxes and penalties and interest thereon, and less the costs of collection; and fifty percent (50%) of the net new revenues from the utility tax imposed by the City and generated by utility use within the area of the Project over the amount of such revenues generated within the area of the Project in the calendar year 1993; and to the extent available under the Act, up to fifty percent (50%) of the new state revenues (as that term is defined in section 99.845.8 Missouri Revised Statutes), estimated for the businesses within the area of the Project and identified by the City in the application required by section 99.845.10 Missouri Revised Statutes, if any, over and above the amount of such taxes reported by businesses within the area of the Project in the calendar year 1993. Net Proceeds do not include any such amount paid under protest until the protest is withdrawn or resolved against the taxpayer, nor do Net Proceeds include any sum received by the City which is the subject of a suit or other claim communicated to the City, which suit or claim challenges the collection of such sums or their payment to the Levee District or its successors in interest.

Subject to the terms of the immediately following paragraph, the principal and interest hereof shall be payable in semi-annual installments as set forth in **Schedule 1**, attached hereto and incorporated herein by reference, or if such day is not a Business Day, the first Business Day thereafter (the "Payment Dates") to the earlier of repayment or the Maturity Date of this Note, followed by a final payment, to the extent there are funds then available in the Special Allocation Fund, on the Maturity Date in the amount of the then unpaid principal balance hereof and all accrued and unpaid interest hereon.

Payment of principal and interest hereunder shall be subject to the following further terms and conditions:

(i) Subject to annual appropriation, Net Proceeds of the Special Allocation Fund shall first be disbursed to pay administrative, planning, legal and other related operational costs of the City associated with implementation of the Plan and Agreement but not to exceed $100,000 in any calendar year;

(ii) If on any Payment Date the Wetlands Fund and Net Proceeds in the Special Allocation Fund are insufficient to pay scheduled principal and accrued interest then due and owing, the amount of the deficiency (the "Deficiency") shall be carried forward as an amount due and owing hereunder. So long as the amount of any Deficiency is carried as a liability on the City's Special Allocation Fund's financial records, the existence of such Deficiency shall not be deemed an event of default hereunder and shall not be cause for acceleration of this Note;

(iii) If on any Payment Date the Wetlands Fund and Net Proceeds in the Special Allocation Fund are in excess of the amount required to pay the scheduled annual installment of principal plus accrued interest then due and owing, all excess amounts in the Wetlands Fund and Net Proceeds shall be applied by the City to the satisfaction of all outstanding Deficiencies under this Note and, subject to the terms of the Note Ordinance, all other Notes executed and delivered pursuant to the Agreement, allocated in accordance with the then outstanding principal balances thereof;

(iv) On the Maturity Date, the City shall pay to the Levee District out of Net Proceeds then on deposit in the Special Allocation Fund all sums due to the Levee District; provided, however, that whether or not paid in full, this Note shall expire on the Maturity Date and the City shall have no further responsibility, liability, or obligation hereunder.

Subject to the foregoing, payments shall be applied first to accrued interest on the Note, and then, if there are additional funds available in the Special Allocation Fund on any Payment Date or on the Maturity Date, to the unpaid principal of this Note. Any unpaid interest carried forward as part of any Deficiency shall not be added to principal.

The City shall pay all amounts due and owing hereunder to the Levee District upon receipt by the City from the Levee District of an appropriate receipt, at such place within the City as may be specified by the Levee District from time to time.

This Note may be prepaid at any time in whole or in part without penalty. This Note shall be assignable by the Levee District only upon expressed written consent of the City. The right to transfer, assign, or negotiate this Note shall be limited to transfer, assignment, or negotiation to any accredited investor or qualified institutional investor, as such terms are commonly defined from time to time by applicable state and federal securities laws and regulations.

The interest on this Note is includable in gross income for federal income tax purposes.

Outstanding principal owed on this Note may be canceled or reduced by the City pursuant to Sections 2(F), 2(G) and/or 2(H) of the Agreement in accordance with the terms thereof.

CITY OF CHESTERFIELD, MISSOURI

By:_____

Title:_____

ATTEST:

_____

City Clerk

****

SCHEDULE 1

City of Chesterfield, Missouri,
Tax Increment Financing Note
(Chesterfield Valley Redevelopment Project)
Series 1998
****
Debt Service Schedule
****

Exhibit C

DEPOSIT CERTIFICATE

The undersigned hereby certifies, in connection with Ordinance No. ____ passed by the City of Chesterfield on _____, 1998 (the "Ordinance"), as follows:

1. Capitalized terms not otherwise defined herein shall have the meanings ascribed to them in the Ordinance.

2. I have delivered herewith the sum of $_____ for deposit by the Finance Director in the Wetlands Mitigation Fund, to be segregated into separate accounts therein in accordance with the terms of the Ordinance and the Agreement.

3. Under the terms of the Ordinance, the funds delivered herewith shall be segregated as follows:

Site 1 Account	$
Site 2 Account	_____
Total Deposit to Wetlands Fund	$_____

In Witness Whereof, the undersigned has executed this Deposit Certificate as of the __ day of _____.

By:_____
City Engineer

Exhibit D

CERTIFICATE OF MITIGATION - Number _____

The undersigned hereby represents in connection with Ordinance No. ____ passed by the City of Chesterfield on _____, 1998 (the "Ordinance"), as follows:

1. Capitalized terms not otherwise defined herein shall have the meanings ascribed to them in the Ordinance.

2. Each item listed on the attached list constitutes a Reimbursable Project Cost and was incurred in connection with the Wetlands Mitigation Plan. Also attached to this Certificate is supporting documentation of the nature and amount of each Reimbursable Project Cost submitted herein.

3. These Reimbursable Project Costs have been incurred by the Developer and are presently due and payable or have been paid by the Levee District and are payable or reimbursable under the Agreement.

4. Each item so listed has not previously been paid or reimbursed from moneys in the Special Allocation Fund or the Wetlands Fund and no part thereof has been included in any other certificate previously filed with the City.

5. There has not been filed with or served upon the Levee District any notice of any lien, right of lien or attachment upon or claim affecting the right of any person, firm or corporation to receive payment of the amounts stated in this request, except to the extent any such lien is being contested in good faith.

6. In the event that any cost item to be reimbursed under this certificate is deemed to not constitute a "Redevelopment Project Cost" within the meaning of the Act and the Agreement, the Levee District shall have the right to substitute other eligible Reimbursable Project Costs for payment hereunder.

7. The Levee District is not in default or breach of any term or condition of the Agreement.

Dated this _____ day of _____, 199__.

MONARCH-CHESTERFIELD LEVEE DISTRICT

By:_____
Title:_____

Approved for Payment this _____ day of _____, 19__.

CITY OF CHESTERFIELD, MISSOURI

By:_____
Title:_____

City of Chesterfield

690 Chesterfield Pkwy W • Chesterfield MO 63017-0760
Phone: 636-537-4000 • Fax 636-537-4798 • www.chesterfield.mo.us

April 27, 2012

U.S. Army Corps of Engineers
Regulatory Office
1222 Spruce Street
St. Louis, Missouri 63103-2833

Attention: Mr. Shawn Sullivan

RE: Section 404 CWA Permit P-2032

Dear Shawn:

It has come to our attention that "Area A" as delineated by Midwest Testing's February 3, 2009 Jurisdiction Determination Request and Application for Extension and Modification to Section 404 CWA Permit (P-2032) has not been mitigated or permitted under any existing COE permit.

As such, we respectfully request that this jurisdictional wetland be included and incorporated into the Permit P-2032. Inasmuch as this permit was intended to be inclusive of all wetlands within the permit area, this appears to be an unintentional oversight.

If you require additional information or supporting documentation, please advise.

Sincerely,

Mike Geisel, P.E.
Director of Planning, Public Works and Parks.

Cc Brian McGownd, Public Works Director – City Engineer

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

May 26, 2010

Regulatory Branch
File Number: 1996-12870 (P-2032)

Mr. Mike Geisel
City of Chesterfield
690 Chesterfield Parkway W
Chesterfield, Missouri 63017-0760

Dear Mr. Geisel:

We are in receipt of your May 14, 2010 letter provided on your behalf by Midwest Testing which documents the outcome of a subsurface study conducted on the existing City of Chesterfield Mitigation Site #2. We acknowledge and agree with the problems identified on this existing mitigation area and the limitations which prohibit moving forward with a remedial action plan. The remedial action plan was required by Department of the Army Permit Modification for P-2032 issued to the City of Chesterfield on January 28, 2010. Special condition 1 of the permit modification required that the remedial action plan be submitted to this office by June 15, 2010. It is evident from the findings of the study that the requirements of special condition 1 cannot be achieved by the specified timeframe.

Therefore, special condition 1 of the permit modification states "In the event of an unforeseen problem in designing the corrective action strategy or with establishing the proper wetland acreage on the existing mitigation site, an alternative mitigation area(s) shall be identified, with a compensatory mitigation plan submitted in accordance with the regulation cited below." **Upon identifying alternative mitigation area(s), coordinating the identified areas with the respective Federal agencies (U.S. Army Corps of Engineers and Federal Aviation Administration), and selecting suitable mitigation area(s), a compensatory mitigation plan shall be prepared and submitted to this office by November 1, 2010.** The compensatory mitigation plan shall address The U.S. Army Corps of Engineers and U.S. Environmental Protection Agency joint regulation for *Compensatory Mitigation for Losses of Aquatic Resources*, (33 CFR, Part 332 and 40 CFR 230).

All other terms and conditions of P-2032 and its modification, including conditions of the water quality certification, remain in full force and effect. If any further changes occur in the scope, location, or plans of the work are found necessary, revised plans shall be submitted to the St. Louis District Regulatory Branch for review and approval. Proposed modifications may not be placed under construction until Department of the Army "Approval of Revised Plans" has been granted.

Thank you for keeping us informed about the status of your project. If you have any questions, please contact Mr. Shawn Sullivan at (314) 331-8580. Please include the identification number 1996-12870 (P-2032) with any inquiries about this project.

Sincerely

Danny D. McClendon
Chief, Regulatory Branch

Enclosures

Copy Furnished:

Ms. Patricia Conger
Missouri Department of Natural Resources
Water Protection Program
Post Office Box 176
Jefferson City, Missouri 65102-0176

Mr. Andrew McCord
Midwest Testing
8606 Page Avenue
St. Louis, Missouri 63114

Midwest Testing
GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

8606 Page Avenue
St. Louis, Missouri 63114
www.mwtesting.com

314 739-2727 Office
314 739-5429 Fax
314 739-8589 Accounting Fax

May 14, 2010

U.S. Army Corps of Engineers
Regulatory Office
1222 Spruce Street
St. Louis, Missouri 63103-2833

Attention: Mr. Shawn Sullivan

REQUEST FOR FURTHER MODIFICATION
TO SECTION 404 CWA PERMIT (P-2032)
MT JOB NO. 12263
CHESTERFIELD VALLEY, CHESTERFIELD, MISSOURI

Gentlemen:

This letter requests from the U.S. Army Corps of Engineers (Corps) on behalf of the Permittee, the City of Chesterfield (City), an additional modification to Clean Water Act Section 404 Permit P-2032. This permit was recently modified on January 28, 2010 to address (i) changes in the location and extent of jurisdictional waters covered by the permit and (ii) proposed 'measures to correct the non-functioning wetland mitigation particularly on Mitigation Site #2'.

Condition 1 of the recent modification states that the permittee 'shall submit a remedial action plan (RAP) to this office by June 15, 2010 [to] include design details for the selected method(s) to increase the frequency that hydrology enters the site and the duration that the water inundates and saturates the existing mitigation area.' As explained below, it now appears that it will be impracticable to remediate Mitigation Site #2 to the degree necessary to significantly increase the acreage of functioning wetlands within the Site. Preparation of a RAP for that purpose will not now be possible, and an alternative approach needs to be found for achieving the necessary compensation for the impacts to jurisdictional waters authorized by the permit.

The preferred option to provide the necessary improvements to the hydrology for the proposed RAP was to modify an existing flood control structure so that it could be managed to allow water to enter and be retained in Mitigation Site #2 during high Missouri River flows. Of the several factors to be considered for the

success of this option, the permeability of the underlying soils of Site #2 was deemed to be critical for early evaluation. Midwest Testing, which had been commissioned by the City to investigate the practicability and efficacy of the preferred option, therefore, prioritized a study of the soils in March 2010.

It is evident that, while the soil profiles examined in this study do include some clay- and silt-containing layers with lower permeability, overall the site comprises moderately to highly permeable sandy soils. Without major, costly amendments, these soils appear unlikely to be able to provide the moisture-holding levels necessary for the development of functioning wetlands, even if it were possible to provide frequent and sustained inundation via the proposed modified water control structure.

Additionally, Matt Shively and Jerry Berning from the Corps visited the site on March 19, 2010 with Midwest Testing, in order to inspect the character and distribution of on-site soils via a hand-held probe. Their field observations concurred with the above conclusion.

In a telephone conversation with yourself on March 30, 2010, you informed us that, based on the collective soil observations by the Corps and Midwest Testing, together with the known hydrological history of the East Mitigation Site over the past decade or so, the opinion of the St. Louis District office was that the original proposal to improve the hydrology of the site by modifying the existing water control structure would not be acceptable to them. This opinion, which the City accepts, was restated by the Corps at a meeting on April 29, 2010, attended by representative for the City, Corps, and Monarch Chesterfield Levee District.

We understand from the meeting on April 29th, that the Corps is prepared to consider an alternative approach to satisfying the compensatory mitigation requirements of Permit P-2032. In recognition of the substantial efforts made to date to establish functioning wetlands at Mitigation Sites #1 and #2, we understand that the alternative approach will likely include the continued protection and management of Mitigation Sites #1 and #2 as a mix of wetland and bottomland forest, and a re-evaluation of the total compensatory acreage required, coupled with the identification of alternative mitigation opportunities in the Missouri River floodplain in the general area of the Chesterfield Valley.

The City will identify and assess for Corps' approval alternative mitigation opportunities, possibly at more than one location, where, largely via restoration and enhancement actions, a sufficient acreage of functioning wetlands can be managed and protected as compensation for those wetlands authorized for impact under the current permit. Mitigation plans, which will include provisions for monitoring and appropriate perpetual protection, will be provided on a timeframe to be agreed with the Corps.

Please, therefore, modify Permit P-2032 to address the substitution of the previous proposal to develop remedial actions for improving hydrology at Mitigation Site #2 with the development of appropriate mitigation at alternative locations.

Please let me know if there is any additional information which we may provide in order to assist you in reviewing this request for further modification of Permit P-2032 as discussed above. I can be contacted at the letterhead phone number or cell phone at (314) 306-2764 or at my email address, amccord@mwtesting.com.

Very truly yours,
MIDWEST TESTING

Andrew J. McCord, MSc
Environmental Manager

Electronic copies: (1) S. Sullivan (USACE)
(1) M. Geisel, P.E. (City of Chesterfield)
(1) B. McGownd, P.E. (City of Chesterfield)
(1) L. McKinney, Col. USA (Ret) (McKinney & Associates)

2009-PW-09

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

January 28, 2010

Regulatory Branch
File Number: 1996-12870 (P-2032)

Mr. Mike Geisel
City of Chesterfield
690 Chesterfield Parkway W
Chesterfield, Missouri 63017-0760

Dear Mr. Geisel:

We have reviewed your submittal of February 3, 2009, provided on your behalf by Midwest Testing, requesting an extension and modification to Department of the Army Permit Number P-2032. The permit authorizes the discharge of dredged or fill material into wetlands and waters of the United States in conjunction with the implementation of the proposed Chesterfield Valley improvements, in the City of Chesterfield, St. Louis County, Missouri. Total impacts to waters of the United States authorized by P-2032 include; 41.2 acres of farmed wetland, 10.6 acres of open water, 11.5 acres of emergent wetland, and 9.0 acres of forested wetland.

P-2032 was issued on October 10, 1997 and was subsequently extended in October 2002. Upon your request for another extension of P-2032, we informed you that the jurisdictional determination for this project cannot remain valid for an indefinite period of time. Therefore, this office required the reevaluation of the project area to determine the extent of aquatic resources that remain, have changed spatially or in plant cover type, or are now present due to natural or man-induced environmental conditions. You commissioned Midwest Testing to reevaluate the permit area and they identified the presence of 4.04 acres of newly developed or expanded aquatic resources. Therefore, the City of Chesterfield is requesting a permit modification to impact the newly identified 4.04 acres of jurisdictional waters of the United States, including wetlands to continue with the planned development of Chesterfield Valley. The type of aquatic resources to be effected by the planned development include 3.27 acres of farmed wetland, 0.15 acres of

open water, 0.52 acres of emergent wetland, and 0.10 acres of forested wetland.

The project was coordinated with the Missouri Department of Conservation and the U.S. Fish and Wildlife Service through their on-line Natural Heritage Review. Based on the results of the review, a preliminary determination in compliance with the Endangered Species Act as amended, has been made that the proposed project is not likely to adversely affect species designated as threatened or endangered, or adversely affect critical habitat.

It is hereby acknowledged that Permit Number P-2032 and modifications have been authorized and that the request for the time extension is granted by the U.S. Army Corps of Engineers, St. Louis District. **Any incomplete activities originally authorized by this permit (particularly 5.9 acres of aquatic resource impact) and accompanying modifications (4.04 acres of waters) are herby extended for completion by the City of Chesterfield on or before January 31, 2015.**

In addition to the above noted modifications, the terms and conditions of Department of the Army Permit P-2032 remain in full force and effect. The Special Conditions of P-2032 require compensatory mitigation to offset unavoidable impacts associated with the original permit. Mitigation construction and planting were completed in 1999, with annual mitigation site monitoring ceasing in 2005. The final monitoring report identifies that hydrology is lacking on Mitigation Site #2. The U.S. Army Corps of Engineers has since required a wetland delineation of the two mitigation areas (Sites #1 and #2) to determine the extent of functioning wetland. The report prepared by Midwest Testing and dated September 10, 2009, reveals there is a shortfall of approximately 96.99 acres of functioning wetlands. On December 16, 2009, we met with you and your consultants' as well as the attorney for Monarch-Chesterfield Levee and Drainage District to discuss the responsibility for and potential measures to correct the non-functioning wetland mitigation particularly on Mitigation Site #2. During the meeting, the City revealed they are committed to exploring, identifying, and implementing a solution to improve upon the hydrologic conditions on Site #2. Based on our January 27, 2010 meeting, the City is exploring the option of installing a water control structure that will allow

Missouri River floodwater (flood that has a 50 percent chance of occurrence during the growing season) to flow onto mitigation site #2. **Therefore, the District Engineer has further conditioned this permit modification to include:**

1. The permittee shall submit a remedial action plan (RAP) to this office by **June 15, 2010.** The RAP shall discuss and include design details for the selected method(s) to increase the frequency that hydrology enters the site and the duration that the water inundates and saturates the existing mitigation area. The RAP shall target the reestablishment of 96.99 acres of functioning wetland. In the event of an unforeseen problem in designing the corrective action strategy or with establishing the proper wetland acreage on the existing mitigation site, an alternative mitigation area(s) shall be identified, with a compensatory mitigation plan submitted in accordance with the regulation cited below.

2. The permittee shall also provide compensatory mitigation for the unavoidable impacts to 4.04 acres of aquatic resources authorized by this permit modification. The compensatory mitigation details shall be integrated into the RAP by discussing and including design details for the restoration of 6.05 acres of emergent wetland and 0.40 acres of forested wetland.

3. The permittee shall follow the format of the attached outline developed from regulation entitled *Compensatory Mitigation for Losses of Aquatic Resources* (33 CFR Part 332 and 40 CFR 230), when developing the RAP. The specific sections to be covered in the RAP include; objectives, site protection, baseline information, work plan, operation and maintenance plan, performance standards, monitoring, long-term management plan, and adaptive management plan.

A copy of this permit modification and extension has been sent to the Missouri Department of Natural Resources (MDNR)-Water Protection Program for their determination of whether a new 401 Water Quality Certification is required. If the MDNR fails to act within 60 days from the date of this letter, a waiver will be presumed. Upon receipt of a new water quality certification, or determination by MDNR that a new certification

by MDNR is not required, the proposed work is authorized. If the water quality certification is conditioned by the state, those conditions will become part of the Corps permit. Any questions you may have on MDNR's process or any responses to project inquiries made by the MDNR should be directed to: Ms. Carrie Schulte, Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri, 65102-0176, phone: 573-751-7023, fax: 573-522-9920.

This determination is applicable only to the permit program administered by the Corps of Engineers. It does not eliminate the need to obtain other federal, state or local approvals before beginning work.

It is to be understood that this instrument does not give any property rights either in real estate or material, or any exclusive privileges; and that it does not authorize any injury to private property or invasion of private rights, or any infringement of Federal, state, or local laws or regulations; nor does it obviate the necessity of obtaining state assent to the work authorized.

If any material changes in the scope, location or plans for the work are found necessary, due to unforeseen conditions or otherwise, revised plans detailing proposed modifications in the work must be submitted to the District Engineer for review and approval. Proposed modifications may not be placed under construction until Department of the Army "Approval of Revised Plans" has been granted.

This letter contains an **approved jurisdictional determination** for your project. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the Mississippi Valley Division Office at the following address:

James B. Wiseman, Jr.
Administrative Appeals Officer
CEMVD-PD-KM (Mississippi Valley Division)
P.O. Box 80 (1400 Walnut Street)
Vicksburg, MS 39181-0080
Phone: (601) 634-5820 Fax: (601) 634-5816

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **March 29, 2010.**

The **jurisdictional determination** is valid for a period of five years from the date of this letter unless new information warrants revision of this determination before the expiration date.

If you have any questions concerning this matter, please contact Shawn Sullivan at (314) 331-8580.

Sincerely

Danny D. McClendon

Danny D. McClendon
Chief, Regulatory Branch

Enclosures

Copy Furnished:

Mr. Rick Hansen
U.S. Fish and Wildlife Service
101 Park Deville Drive, Suite A
Columbia, Missouri 65203

Ms. Patricia Conger
Missouri Department of Natural Resources
Water Protection Program
Post Office Box 176
Jefferson City, Missouri 65102-0176

Ms. Vicky Johnson
U.S. Environmental Protection Agency
Wetland Protection Section
901 North 5th Street
Kansas City, Kansas 66101

Ms. Judith Deel
Missouri Department of Natural Resources
State Historic Preservation Office
Post Office Box 176
Jefferson City, Missouri 65102-0176

Mr. Andrew McCord
Midwest Testing
8606 Page Avenue
St. Louis, Missouri 63114

DEPARTMENT OF THE ARMY PERMIT

Permittee City of Chesterfield

Permit No. P-2032

Issuing Office U.S. Army Engineer District, St. Louis

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: To place fill material into waters of the United States in conjunction with implementation of the proposed Chesterfield Valley improvements, in Chesterfield Valley, Chesterfield, St. Louis County, Missouri.

Project Location: Chesterfield Valley, Chesterfield, St. Louis County, Missouri, between approximate river miles 41 and 49 and adjacent to Bonhomme Creek.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2002. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

See continuation sheets, pages 4 and 5, of this document.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorization required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a revaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Michael G Herring — 10/1/97

(PERMITTEE) City of Chesterfield (DATE)
922 Roosevelt Parkway
Chesterfield, Missouri 63006

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Thomas J. Hodgini — 13 Oct 97

(DISTRICT ENGINEER) THOMAS J. HODGINI (DATE)
Colonel, U.S. Army
District Engineer

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) (DATE)

Special Conditions

1. That the permit be revoked or a stop work order be issued if the State of Missouri notifies us, that the activities are not being performed in conformance with the Missouri Department of Natural Resource's April 15, 1997, Section 401 water quality certification conditions for this permit (Attachment A).

2. That the permittee develop for wetland mitigation purposes, approximately 34.4 acres of forested wetlands, 42.0 acres of wet meadow, 12.0 acres of open water habitat, and 31.2 acres of emergent and scrub/shrub wetlands within the two, 119.6 acre mitigation sites, adjacent to the Monarch-Chesterfield Levee. The development of these mitigation areas will be in accordance with the applicant's November 1996 mitigation plan and June 16, 1997 revisions (Attachment B), with the following exceptions:

a. That the permittee plant, and ensure no less than an 80% survival rate through five (5) growing seasons, four hundred and thirty-six (436) trees per acre, on a 10-foot by 10-foot spacing, of approximately 34.4 acres of predominantly mast producing trees (pin oak, nuttal oak, pecan, hackberry, swamp white oak, bitternut hickory) within the two mitigation sites. Equal numbers of the above species, consisting of one to three year old seedlings, shall be planted and may be obtained from several private nurseries. Non-surviving seedlings will be replaced in-kind, unless there is a definite lack of certain species survival, in which case the low survival species may be substituted with the more successful species. Seedling locations should be adequately marked for future monitoring of tree survival and growth. This monitoring will be done using a subsample of the total mitigation area. Weed, grass, and natural tree regeneration competition will need to be monitored for a period of not less than five (5) years in order to ensure survival of the planted seedlings. Non-native woody or herbaceous invaders will be removed by mechanical, herbicide application, or other appropriate methods from the planted sites as necessary. Animal damage to the planted seedlings must also be monitored for a period of not less than five (5) years and corrective measures implemented if necessary. Natural regeneration will be allowed after the initial five (5) year period. All tree plantings must be implemented concurrently with project construction, and completed as outlined in Special Condition 2d below.

b. That the permittee plant and establish approximately 42.0 acres of wet meadow, and 31.2 acres of emergent and scrub/shrub wetlands within the two wetland mitigation sites. This should be accomplished by 1) natural revegetation; 2) removing topsoil plugs from existing wetland areas prior to construction impacts and spread within the mitigation stands; 3) grading and/or construction of berms to ensure that the hydrology is adequate to support these habitats; and 4) supplemental plantings. Supplemental plantings for shrub-scrub could include buttonbush, deciduous holly, swamp privet, black willow, red-osier dogwood, and swamp rose. In the event these habitats are not established after the first five (5) years, then additional plantings and/or hydrology manipulation will be required. All plantings must be implemented concurrently with project construction, and completed as outlined in Special Condition 2d below.

c. That the permittee develop approximately 12.0 acres of open water habitat within the two mitigation areas. These may consist of permanent water or areas that periodically dry up and create mud flat habitat.

d. Mitigation shall be implemented in phases concurrent or ahead of wetland impacts. The City of Chesterfield shall submit to the Corps of Engineers a phasing plan for mitigation implementation, along with a proposed accounting system for tracking wetland impacts versus mitigation complete or under construction. Mitigation design and implementation shall be done concurrent with, or in advance of, actual impacts to wetlands. In no instance will wetland impacts be permitted prior to the start of mitigation design and implementation. Mitigation shall be of the same type and at ratios indicated for impacted wetlands. Phase 1 of the mitigation shall consist of the area designated as Mitigation Site 1, and shall be completed no later than December 31, 1998. All other mitigation phases shall be completed by December 31, 2002.

e. After the first year of establishment of the mitigation areas, if the necessary hydrology is not adequate then corrective measures must be designed and implemented to restore the required wetland hydrology. Hydrologic monitoring shall begin with the completion of the first phase of mitigation and continue for a minimum of five (5) years after completion of the final mitigation phase.

f. The permittee shall conduct project monitoring, maintenance, and management of the mitigation areas. Monitoring is to include baseline studies prior to project construction, monitoring during construction, and long-term monitoring. Long-term monitoring and reports on the mitigation areas will be required annually for a minimum of five (5) years after all vegetation and hydrology criteria are met. Monitoring shall continue for a minimum of five (5) years after completion of the final mitigation phase. If at the end of the annual monitoring period, the mitigation stands are providing adequate wetland functions and values, then additional monitoring will not be required. However, if the stands are not functioning in the manner intended after the annual monitoring period, then corrective measures will need to be implemented. Maintenance, monitoring, and any corrective measures of the mitigation areas will be the responsibility of the permittee.

3. That the permittee shall revise the November 1996 wetland mitigation plan and June 16, 1997 plan with the revisions outlined above. All final grading plans, elevations, planting plans, tables and acreages, and phasing plan shall be submitted to the St. Louis District, Regulatory Branch no later than 90 days after issuance of the permit. Revisions to all text, final grading and elevation plans, planting plans, and related documents for the remaining mitigation phases shall be submitted to the St. Louis District, Regulatory Branch no later than 180 days after issuance of the permit. The City of Chesterfield shall notify the St. Louis District, Regulatory Branch of pending wetland impacts, their type, and size prior to the occurrence of said impacts.

4. That the permittee agree to place a perpetual deed restriction and Conservation Easement on the 25.6 acre mitigation site and the 94.0 acre mitigation site, that make up the mitigation plan. This deed restriction and Conservation Easement must be signed and recorded with the St. Louis County Recorder of Deeds no later than 120 days after issuance of the permit. A Conservation Easement is attached to the permit (Attachment C). A copy of the signed and notarized Conservation Easement and recordation record from the St. Louis County Recorder of Deeds Office is to be provided to the St. Louis District, Regulatory Branch no later than 120 days after issuance of the permit.

5. That the permittee submit any plans that could potentially affect the Monarch-Chesterfield Levee to the St. Louis District, Regulatory Branch at least 60 days before any construction is to take place.

19961287
Danny

STATE OF MISSOURI

Mel Carnahan, Governor • David A. Shorr, Director

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY

P.O. Box 176 Jefferson City, MO 65102-0176

September 4, 1997

City of Chesterfield
Mr. Michael Herring, City Administrator
922 Roosevelt Parkway
Chesterfield, MO 63017-2080

St. Louis County
P-2032
Revision

Dear Mr. Herring:

The Missouri Department of Natural Resources, Water Pollution Control Program, has reviewed your request for revisions to the Water Quality Certification issued April 15, 1997, for proposed Chesterfield Valley Improvements.

The proposed projects are located inside the current 100-year Monarch-Chesterfield Levee system in Chesterfield, St. Louis County, Missouri. The projects extend from Missouri River miles 41 to 49 and adjacent to Bonhomme Creek.

Condition number 1 has been revised as follows. All other conditions remain as stated on the original certification.

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0 SEP 97 10: 27

1. All wetland impacts shall be mitigated. Mitigation design and implementation shall be completed concurrent with or prior to wetland impacts, in accordance with the mitigation phasing plan submitted to the St. Louis District, U.S. Army Corps of Engineers, Regulatory Branch. In no instance shall impacts to wetlands occur in advance of the start of mitigation design and implementation. Mitigation plans should be approved prior to construction. The actual area to be mitigated should be based on the delineated wetlands as identified by the U.S. Army Corps of Engineers in the Section 404 permit, should it be issued. The applicant should furnish a survey of the area to be used as mitigation for wetland losses. The survey should be used to describe and identify the area to be reserved as the mitigation/avoidance corridor by a permanent conservation restriction. The conservation restriction covering this tract shall reserve this area for wetland protection and wildlife purposes exclusively, with the exception that trails for hiking and wildlife observation may be permitted. Any plans for such trails must be submitted to the Department of Natural Resources for review and approval. The conservation restriction shall be filed and recorded as a deed restriction on the property in perpetuity, and a copy furnished to this Department.

Water Quality Standards must be met during the operation. If compliance with Water Quality Standards is not maintained, the Corps of Engineers will be notified and the certification may be withdrawn. If you have any questions, please contact Terri Ely of the Planning Section at (573) 751-7428.

Sincerely,

WATER POLLUTION CONTROL PROGRAM

Edwin D. Knight
Director

EDK:tep

c: Danny McClendon, Corps of Engineers, St. Louis District
Department of Natural Resources, St. Louis Regional Office

RECYCLED PAPER

Attachment 1.

19961870

STATE OF MISSOURI

Mel Carnahan, Governor • David A. Shorr, Director

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY

P.O. Box 176 Jefferson City, MO 65102-0176

April 15, 1997

City of Chesterfield
Mr. Michael Herring, City Administrator
922 Roosevelt Parkway
Chesterfield, MO 63017

St. Louis County
P-2032

Dear Mr. Herring:

The Department of Natural Resources, Water Pollution Control Program, has reviewed your request for Water Quality Certification for proposed Chesterfield Valley Improvements, which include development of the Master Drainage Plan, Roadway Improvements, Parks Improvements and implementation of the Master Development Plan. Please refer to the Public Notice dated December 18, 1996, for project details.

Approximately 71 acres of wetlands will be impacted by this project.

The proposed projects are located inside the current 100-year Monarch-Chesterfield Levee system in Chesterfield, St. Louis County, Missouri. The projects extend from Missouri River miles 41 to 49 and adjacent to Bonhomme Creek.

This office certifies that the ongoing activity apparently will not cause the general or numeric criteria to be exceeded nor impair beneficial uses established in Water Quality Standards, 10 CSR 20-7.031, provided the following conditions are met:

1. All wetland impacts shall be mitigated. Mitigation shall be completed before impacts to the wetlands occur. Mitigation plans should be approved prior to construction. The actual area to be mitigated should be based on the delineated wetlands as identified by the U.S. Army Corps of Engineers in the Section 404 permit, should it be issued. The applicant should furnish a survey of the area to be used as mitigation for wetland losses. The survey should be used to describe and identify the area to be reserved as the mitigation/avoidance corridor by a permanent conservation restriction. The conservation restriction covering this tract shall reserve this area for wetland protection and wildlife purposes exclusively, and shall be filed and recorded as a deed restriction on the property in perpetuity, and a copy furnished to this Department.

2. A land disturbance permit may be needed from the Water Pollution Control Program. If you are disturbing five acres or more of land, please contact the Water Pollution Control Program at (573) 751-6825.

3. Best management practices should be utilized during the construction phase to minimize the amount of erosion and sedimentation into the rivers.

NOTIFICATION OF APPEAL PROCESS AND FACT SHEET AND REQUEST FOR APPEAL (RFA) FORM

Applicant: City of Chesterfield Attn: Mr. Mike Geisel	File Number: 1996-12870 (P-2032)	Date: 28/Jan/2010
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION

If you have questions regarding this decision and/or the appeal process you may contact: Shawn F. Sullivan U.S. Army Corps of Engineers St. Louis District, Regulatory Branch 1222 Spruce Street St. Louis, Missouri 63103-2833	If you only have questions regarding the appeal process you may also contact: James B. Wiseman, Jr. Administrative Appeals Officer CEMVD-PD-KM (Mississippi Valley Division) P.O. Box 80 (1400 Walnut Street) Vicksburg, MS 39181-0080

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

Compensatory Mitigation Plan Requirements
For
Permittee Responsible Mitigation Projects
St. Louis District, Corps of Engineers
January, 2010

The U.S. Army Corps of Engineers (Corps) and U.S. Environmental Protection Agency joint regulation for *Compensatory Mitigation for Losses of Aquatic Resources*, (33 CFR, Part 332 and 40 CFR 230) herein referred to as the mitigation rule, improves planning, implementation, and management of mitigation banks, in-lieu fee mitigation programs, and permittee-responsible mitigation projects. The mitigation rule establishes a hierarchy of mitigation preference for the Corps of Engineers' regulatory program (33 CFR 332.3(b)(2) through (b)(6)). The compensatory mitigation preference hierarchy established in the mitigation rule is as follows: mitigation banks; in-lieu fee programs; permittee responsible mitigation under a watershed approach; permittee responsible mitigation through on-site and in-kind mitigation; and permittee responsible mitigation through off-site and/or out-of-kind mitigation.

The purpose of this document is to provide guidance to the permittee for the development of a compensatory mitigation plan if a mitigation bank or an in-lieu fee program has not been approved within the service area of the project/impact site requiring Department of the Army permit authorization or if the permittee can demonstrate that the permittee responsible mitigation plan is environmentally desirable in comparison to the purchase of aquatic resource credit at an approved mitigation bank or with an approved in-lieu fee program sponsor if one or both are available in the service area.

1. Watershed Approach to Compensatory Mitigation

A. The most preferred permittee responsible compensatory mitigation plan incorporates a watershed approach to ensure that the proposed compensatory mitigation site and aquatic resource restoration plan supports the sustainability and/or the improvement of aquatic resources within the identified watershed. A landscape perspective is used to identify the types of aquatic resources that most benefit the affected watershed and how the proposed mitigation site is suited to the restoration of these aquatic resources.

B. In order to meet the watershed approach criterion, the permittee must define the identified watershed boundary and address how the mitigation proposal will benefit wetland and/or stream habitats, water quality, hydrologic conditions, and aquatic and/or terrestrial species needs within the identified watershed boundary.

1. The permittee must identify and briefly discuss the historic losses and the current trends of losses of aquatic resources (ie. wetland and streams) and other wildlife habitats within the watershed based on current and historic land use.
2. Identify and briefly discuss water quality issues present within the watershed.
3. Describe the immediate and the long-term needs of the watershed to improve both the wildlife habitats and the water quality and describe the suitability (technical feasibility) of the site to meet the needs of the watershed.
4. Describe the historic and the current state of the mitigation site and the adjacent lands. In addition, describe the ecological suitability (physical, chemical and biological characteristics) of the site to achieve the objectives of the mitigation plan and to improve the conditions within the identified watershed.
5. Identify and discuss the short-term and the long-term off-site threats (including water rights) within the watershed that may affect the wetland and the water quality services constructed at the mitigation site. Discuss how these threats are addressed in order to assure longevity of services at the site.

2. Mitigation Plan Requirements for a Permittee Responsible Mitigation

A. Objectives
   1. Specific objectives of the plan must identify:
      a. The resources to be provided (wetlands and/or stream habitats) with species composition matching similar aquatic resources on similar landscape positions in the watershed. Classify the stream type (ephemeral, intermittent, perennial) or the stream order (1st order, 2nd order etc.), or describe the annual flow characteristics of the stream and the hydro-period for restored wetlands.
      b. The final goal to be provided by the resource for: amount (e.g., acres, linear feet); function (e.g., channel stability, shading of the stream channel, vegetative structure, reconnect stream to floodplain); and/or services (filtering nutrients from agricultural runoff, provide quality habitat for a specific species of concern, provide flood water capacity, improve aquatic species passage),
      c. The method of compensation (i.e., restoration, enhancement, establishment, preservation), and

d. The feasibility of establishing the desired resource and briefly describe how the resources provided will address the needs of the watershed.

B. Site Selection

1. Compensatory mitigation projects shall be appropriately sited and designed to ensure that natural hydrology and landscape position will support long-term sustainability and function as a self-sustaining system. Discuss how the mitigation site is ecologically suitable for providing the desired aquatic resource functions by describing:
   a. The hydrological conditions, soil properties, native seed source, and other physical and chemical characteristics.
   b. The watershed-scale features such as aquatic habitat diversity, habitat connectivity, the existence of threatened or endangered species related to prior habitat loss, and other landscape scale functions.
   c. The size and the location of the mitigation site relative to hydrologic sources (including the availability of water rights) and other ecological features.
   d. The compatibility with adjacent land uses and any existing watershed management plans.
   e. The reasonably foreseeable effects the compensatory mitigation project will have on ecologically important aquatic or terrestrial resources, cultural resources, or habitat for federally or state listed threatened and endangered species.
   f. Other information as available including potential chemical contamination, impacts from land use changes including residential and/or commercial development within the watershed, and the proximity to the location of other mitigation banks, in-lieu fee mitigation project sites, or protected conservation areas within the watershed.

C. Site Protection Instrument

1. Describe the ownership, legal arrangements that will be used to ensure the long-term protection of the proposed mitigation site. Include the draft real estate instrument as an appendix to the mitigation plan document.
   a. Long-term protection of private property may be provided through real estate covenants such as conservation easements, held by approved entities such as federal, tribal, state or local resource agencies, nonprofit conservation organizations, or private land managers. In addition, long-term protection could be achieved through transfer of title of the mitigation land to such entities listed above or other restrictive covenants that are determined to afford

sufficient protection by the Corps of Engineers. A conservation easement, deed restriction, or restrictive covenant must, where practicable, establish an appropriate third party (e.g., governmental or non-profit resource management agency) the right to enforce site protections and provide the third party the resources necessary to monitor and enforce the site protections.

b. The long-term protection mechanism must contain a provision requiring 60-day advance notification to the Corps of Engineers before any action is taken to void or modify the instrument, management plan, or long-term protection mechanism, including transfer of title to, or establishment of any other legal claims over, the compensatory mitigation site.

c. For government property, long-term protection may be provided through federal facility management plans or integrated natural resources management plans as long as those plans are compatible with restrictive covenants specified on non-government property. If, as a result of a change in statute, regulations, or agency needs or mission results in an introduction of an incompatible use of the compensatory mitigation land, the public agency authorizing the incompatible use must provide alternative compensatory mitigation acceptable to the Corps of Engineers for any loss in functions resulting from the incompatible use.

d. A real estate instrument, management plan, or other long-term protection mechanism used for site protection of permittee responsible mitigation must be approved by the Corps of Engineers in advance of, or concurrent with, the activity causing the authorized impacts at the permit site.

D. Baseline Information

1. Describe the ecological characteristics of the proposed mitigation site.
   a. Include historic and existing plant communities, historic and existing hydrology, and existing soil conditions.
   b. Include map(s) identifying the boundary of the proposed mitigation site with coordinates (Latitude and Longitude in decimal degrees).
2. Conduct a wetland delineation using the appropriate Regional Supplement or if a supplement is not implemented in a geographic area of the State use the routine delineation methods as described in the Corps of Engineers 1987 Wetland Delineation Manual.
3. Describe the existing hydro-system connectivity between any stream channel(s) and any adjacent wetland(s). Include a discussion on the connectivity of any wetland(s) and stream channel(s) to downstream perennial waters.

E. Determination of Credits

1. Describe the number of and the type of proposed credits to be provided at the mitigation site including a brief explanation of the rationale for this determination.

   a. Wetland credit types shall be identified to the Cowardin class (e.g., PFOs, PSS, PEM). In the absence of a condition or functional assessment method, wetland credits will be determined based on a combination of land area and the method of compensation (restoration, enhancement, establishment, and/or preservation), with a maximum credit value given not to exceed 1 credit for each 1 acre gain in wetland area. Upon implementation of a functional or condition assessment method in the State of Missouri the approved methodology will be used to assess wetland credits.

   b. Upland buffers next to wetlands that provide habitat connectivity and other ecological functions may also generate compensatory mitigation credits because of their contribution to the ecological functions of the overall mitigation site. The Corps will determine on a case-by-case basis when buffers are essential to maintaining the ecological viability of adjoining aquatic resources, and thus eligible to produce compensatory mitigation credits. Credits will be determined on a percentage of land area, habitat connectivity, and ecological functions to be included as buffer until a condition or functional assessment methodology is approved for the State.

   c. Stream type (ephemeral/intermittent/perennial) the number of stream mitigation credits created by site improvements are determined by stream type, location, condition, in-stream improvements and linear feet of channel at the mitigation site. These factors are determined using the State of Missouri Stream Mitigation Method or the Kansas Stream Mitigation Guidance which derives a value expressed in credit.

   d. Riparian areas are critical components of stream ecosystems that provide important ecological functions, and directly influence the functions of streams, especially in terms of habitat quality and water quality. Therefore, it is important for mitigation sites containing streams and other open waters to include riparian areas as part of the overall compensatory mitigation project. In such cases, compensatory mitigation credits should also be awarded to riparian areas in accordance with the State of Missouri or the State of Kansas Stream Mitigation Method.

F. Mitigation Work Plan
   1. Describe in detail the specifications and work descriptions of the compensatory mitigation project, including, but not limited to the geographic boundaries of the project; construction methods; timing; and sequence.
   2. Describe the sources of water, including connections to existing waters and uplands, and anticipated seasonal water depths in the wetland (water budget).
   3. Describe the methods for establishing the desired plant community and plans to control undesirable plant species, including species composition and type of plantings (i.e. seeding, propagules, seedlings, saplings, etc.) and height of saplings. If trees are being planted, include a plan for control of wildlife damage.
   4. Include any grading plan identifying the location and the elevation of the constructed features proposed.
   5. For stream projects include existing channel cross-sections, proposed alterations to the stream channel and/or stream banks, a description of in-stream structures including materials used for improvements, dimensions and elevations, and riparian plantings.

G. Operation and Maintenance Plan
   1. A description and a schedule of maintenance required to maintain the viability of the mitigation site once the initial construction is completed [e.g. mowing timing and frequency, herbicide (application method, timing, type, and frequency), irrigation plan, passive water control structures, supplemental irrigation source, in-stream structures]

H. Performance Standards
   1. Describe the ecological, administrative, and adaptive management standards that will be used to determine whether the compensatory mitigation project is achieving its objectives. The standards must be based on attributes that are objective and verifiable. They must be based on the best available science that can be measured or assessed in a practicable manner. The standards should take into account the expected stages of the aquatic resource development process in order to allow early detection of potential problems and appropriate adaptive management. The use of reference aquatic resources (least disturbed and exhibiting the highest levels of functions in the service area) is encouraged to establish performance standards. This approach can help ensure that the performance standards are reasonably achievable, by reflecting the range of variability exhibited by the regional class of aquatic resources as a result of natural processes and anthropogenic disturbances.

2. The performance standards should relate to the objectives of the mitigation site, so that the project can be quantitatively and/or qualitatively evaluated to determine if it is developing into the desired resource type, providing the expected functions and/or services, and attaining any other applicable metrics. Examples include:
    a. Structural Measures:
        - Description-size, classification (HGM, Cowardin, Rosgen) of aquatic resource(s).
        - Hydrology-duration, periodicity,
        - Soils-hydric indicators, redoximorphic features,
        - Vegetation-dominants, species composition, density, coverage,
        - Stream–status of structures and structural integrity, sinuosity, cross-section, bank full width, particle size (e.g. no significant change in D50 size particle silt, sand, gravel, cobble), longitudinal profile.
    b. Indicators of attainment or condition: snag density, foliage height, diversity, basal area, degree of shading, channel profile,

I. Monitoring Requirements

1. Monitoring must be conducted by the permittee or their authorized agent in order to determine if the compensatory mitigation project is on track to meet performance standards and used as a measure to determine if adaptive management is needed.
2. The mitigation site must be monitored for a period not less than five years after final construction and planting. Extending the monitoring period beyond the five year minimum may be required depending on:
    a. Resource type (e.g., forested wetlands, riparian corridors, bottomland hardwood forests, wet prairie).
    b. Adaptive management measures occurring after initial site work (e.g., planting of additional trees, adjustments/re-building of in-stream structures to address stream stability).
3. The mitigation plan must include: the parameters to be monitored, monitoring methods and procedures, a schedule for monitoring; the party responsible for conducting the monitoring and, if separate, the party responsible for submitting the monitoring report; and permission for the Corps to participate in the monitoring process if requested.
4. Upon a determination by the Corps that performance standards have not been met or the compensatory mitigation project is not on track to meet them, the monitoring period may be extended. The Corps may also

revise monitoring requirements when remediation and/or adaptive management are required.

J. Long-term Management Plan

1. Describe how the mitigation site will be managed after performance standards have been achieved to ensure the long-term sustainability of the resources, including a description of long-term management needs, annual cost estimates for these needs, identify the funding mechanism that will be used to meet those needs and the party responsible for carrying out the long-term management activities.
2. The permittee is encouraged to transfer the long-term management responsibilities for the mitigation site to a land stewardship entity, such as a public agency, non-governmental organization, or private land manager, as long as the entity is approved by the Corps. If the entity is identified in the instrument they shall be signatory to the instrument.
3. In cases where the long-term management entity is a public authority or government agency, that entity shall provide a plan or give an indication how long-term financing will be established, and include a written stewardship commitment specifying commitment to long-term management and maintenance and a plan for financing.
4. Non-governmental organizations shall demonstrate that long-term financing mechanisms will be implemented. In cases where long-term financing for long-term management of compensatory mitigation projects is necessary, district commanders should consider the need to make inflationary adjustments and certain financial assumptions such as total return assumptions and capitalization rates (e.g. endowments, or Consumer Price Index adjustments in the case of annual payments).
5. The Corps prefers that the land stewardship entity be identified in the mitigation plan however the Mitigation Rule provides the permittee the flexibility to identify the entity at a later time. In this instance, the sponsor will be responsible for long-term management until the sponsor identifies a long-term stewardship entity and that entity is approved by the Corps.

K. Adaptive Management Plan

1. Describe strategy to address unforeseen changes in site conditions or other components that adversely affect the mitigation site's success, including the party or parties responsible for implementing the adaptive management measures.
2. Circumstances that may qualify for adaptive management include an inability to construct the mitigation site in accordance with the approved mitigation work plans, monitoring or other information reveals the site is

not progressing towards meeting its performance standards, possible remedial measures that result in site modifications, design changes, revisions to maintenance requirements, revised monitoring requirements.

L. Financial Assurances

1. Describe the financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the compensatory mitigation project will be successfully completed in accordance with the proposed performance standards.
2. The amount of financial assurances, approved by the district engineer, will be determined by the size (number of mitigation credits required) and the complexity of the mitigation site, the likelihood of project success, the past performance of the permittee to successfully construct aquatic resource restoration projects, and any other factors the Corps deems appropriate.
    a. The rationale for determining the amount of the required financial assurances must be documented in the mitigation plan and may include; costs for land acquisition, planning and engineering, legal fees, mobilization, construction, monitoring, and maintenance. An alternative to providing an itemized cost analysis, would be to provide the cost of replacement mitigation through the purchase of credits from an approved mitigation bank or in-lieu-fee program whose service area includes the Department of the Army permit site.
3. The financial assurances may be in the form of performance bonds, escrow accounts, casualty insurance, letters of credit, or other appropriate instruments approved by the district engineer. The financial assurances must be in the form that ensures the district engineer will receive notification at least 120 days in advance of any termination or revocation.
4. For performance bonds or letters of credit a standby trust account must be established. All amounts paid by the financial assurance provider must be paid directly to the standby account for distribution by the account trustee in accordance with the Corps' instructions.
5. Financial assurances may be phased out once the mitigation site has been determined by the Corps to be successful in accordance with its performance standards. Otherwise, the assurance shall remain in place until the Corps determines performance standards have been achieved.
6. The mitigation plan must clearly specify the conditions under which the financial assurances are to be released to the sponsor, and/or other financial assurance provider.

3. Approval of the proposed mitigation plan.

A. Application for a Department of the Army (DA) Permit

1. For activities involving discharges of dredged or fill material into waters of the United States, the permit application must include a statement describing how impacts to waters of the United States, at the project site, are to be avoided and minimized. The application must also include either a statement describing how impacts to waters of the United States are to be compensated for or a statement explaining why compensatory mitigation should not be required for the proposed impacts.

B. Standard "Individual" DA Permits.

1. The permittee-responsible mitigation plan must be approved by the Corps of Engineers prior to the issuance of the DA Permit.
    a. The special conditions of the DA Permit will include:
        - Identification of the party responsible for providing the compensatory mitigation and the party responsible for the long-term management of the mitigation area if different from the permittee.
        - Incorporation, by reference, the final mitigation plan approved by the Corps of Engineers that includes all items described in section 2(A-L) above.

C. Nationwide/General DA Permits

1. For a Nationwide/General Permit activity requiring mitigation, the permittee must demonstrate that permittee-responsible mitigation is ecologically/environmentally preferable to the use of a mitigation bank or an in-lieu fee program.
    a. The verification that the proposed activity is authorized by one of these types of permits must include a special condition that describes the compensatory mitigation proposal and a special condition that prohibits the commencement of work in waters of the United States until the final mitigation plan is approved by the Corps of Engineers.
    b. The degree to which the mitigation plan items, included in section 2(A-L), are addressed is commensurate upon the level of impact to waters of the United States that is associated with the proposed project.

III. C.

MEMORANDUM

Date: January 31, 2008

To: Mike Herring, City Administrator

From: Brian McGownd, Public Works Director/City Engineer

Re: Chesterfield Valley Wetland Permit – Modification

As you know, in 1997 the U.S. Army Corp of Engineers issued the City a 5-year permit to excavate and fill existing wetlands within Chesterfield Valley. Since all of the identified wetlands were not impacted within five years, the permit was extended in 2002 for another five years. As of December 31, 2007, the expiration date of the extended permit, there were several previously identified wetlands that have still not been impacted.

Rather than extend the permit for another five years, the Corps has required that we modify the existing permit by re-evaluating the remaining non-impacted wetlands from the original permit, as well as, conduct a cursory review of the permit area to identify any previously unidentified jurisdictional wetland areas. In order to perform the necessary work to submit the permit modification to the Corps technical assistance will be required.

Therefore, **I request that the Planning & Public Works Committee recommend approval to engage the firm of Midwest Testing for professional services related to preparing a permit modification to the existing Chesterfield Valley Wetland permit, on an hourly cost basis, in an amount not to exceed $19,000, to be funded from TIF proceeds, and forward to City Council for approval.** Personnel from Midwest Testing that will be working on the project have been intimately involved in wetland delineations and permitting in the Chesterfield Valley since the mid-1990's. They have worked closely with Colonel Lee McKinney and the U.S. Army Corp of Engineers in the past on various projects.

If you have any questions, or need additional information regarding this matter, please advise.

cc: Mike Geisel, Director of Planning & Public Works

ok'd
JJH
2/1/08

Midwest Testing

3377 Hollenberg Drive
Bridgeton, Missouri 63044
www.mwtesting.com

314 739-2727 Office
314 739-5429 Fax
314 739-8589 Accounting Fax

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

January 31, 2008

City of Chesterfield
690 Chesterfield Parkway West
Chesterfield, Missouri 63317-0760

Attn: Mr. Brian McGownd, P.E.

Re: Proposal (P2343) for Wetlands Consulting Services
Valley-Wide Permit Modification
City of Chesterfield, Missouri

Gentlemen:

In accordance with our meeting with yourself, Mike Geisel, and Lee McKinney on January 25, 2008, we are pleased to submit this proposal to provide wetlands consulting services for the referenced project. The purpose of the work will be to (i) provide the necessary wetlands review and delineation services for the planned request for modification (reauthorization) of Section 404 permit P2032 and the associated Section 401 water quality certification and (ii) seek agency approval of the reauthorization requests. Certain additional technical criteria for this proposal were obtained during a meeting with Danny McClendon of the St. Louis District office of the U.S. Army Corps of Engineers on January 30, 2008.

We believe that Midwest Testing is uniquely qualified to perform these services as our personnel have been intimately involved in wetland delineations and permitting (and in other environmental issues) in the Chesterfield Valley since the mid-1990s. We provided wetland consultation services to several of the major developers in the Chesterfield Valley during the first five-year permit period, including obtaining a modification to the 'Valley-wide' permit for 'straightening' a segment of the Monarch-Chesterfield Levee. Our experienced wetlands personnel have continued to provide wetland and other environmental services in the Chesterfield Valley and nearby areas of the Missouri floodplain.

BACKGROUND INFORMATION

We understand that the Valley-wide permit, P2032, has lapsed after its first 5-year extension ended in December 2007. We understand that, as the permit is now over 10 years old, the U.S. Army Corps of Engineers (Corps) has requested the following:

- A review of the current wetland character of the four remaining originally identified jurisdictional wetlands which have to date not been notified to the Corps as impacted.

- A review of the current wetland character of wetland Areas 3 and 5 of the original permit in order to confirm their inclusion in the list of impacted wetlands.

- A re-evaluation of the coverage area of the original permit for potential jurisdictionality of any wetland areas which may have developed since the original permit date (1997).

- Submittal of a request for a Jurisdictional Determination of the above as part of a request for permit modification.

SCOPE OF WORK

The following tasks, which are listed more or less sequentially, will be performed:

1. Initial document review and project planning, followed by a meeting with the Corps (completed January 30, 2008) to confirm the investigative and informational details needed for the permit reauthorization.

2. Review of recent aerials and maps (to be provided by the City of Chesterfield) in order to identify potential previously unidentified jurisdictional wetland areas. (Constructed stormwater features and temporary, incidental wetlands resulting from construction activities will not be included in this review.)

3. Field visit for a preliminary reassessment of the remaining four non-listed (likely non-impacted) wetlands and wetland Areas 3 and 5 of the original permit.

4. Field visit for a preliminary reassessment of potential 'new' wetlands identified in the aerial review.

5. Present preliminary findings to and hold a field visit with the Corps in order that they can assess any identified wetlands for potential jurisdictionality.

6. Perform detailed '3-parameter' delineations, including boundary determinations, of any wetland areas identified by the Corps as having potential jurisdictionality.

7. Preparation of a short report, summarizing the findings of items 2 through 6, and containing, as appropriate, comments on the likely jurisdictionality of identified waters. This report will be attached to the permit modification request.

8. Confirmation with the City of Chesterfield of the final strategy for submitting the permit modification request .

9. Preparation and submittal of Jurisdictional Determination and Section 404 permit modification requests to the Corps.

10. Preparation and submittal of Section 401 water quality re-certification request to the Missouri Department of Natural Resources (MDNR).

11. Provision of assistance as necessary to the Corps and MDNR in the processing the respective reauthorizations.

12. Upon receipt from the respective agencies, review the Jurisdictional Determination, permit and certification for completeness.

METHODOLOGY

Wetlands investigations will employ methodology established by the Corps for identifying jurisdictional Waters of the U.S., including the document *Corps of Engineers Wetlands Delineation Manual,* dated January 1987 (amended and clarified in 1991, 1992, and 1994), commonly referred to as the '1987 Manual'. The 1987 Manual describes wetlands delineation methodologies acceptable to the Corps.

The Corps also regulates streams under the definition of Waters of the U.S. (33 CFR 328.3). Stream jurisdiction is typically asserted when flowing water has established a continuous drainage bed with a discernible OHWM; such a jurisdictional stream often being referred to as having a 'defined bed and bank'.

Based on the most recent regulatory guidance (June 2007 *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* ('Rapanos' Guidance)), the Corps and U.S. Environmental Protection Agency will assert jurisdiction over the following waters:

- 'Traditional Navigable Waters' (TNWs) and wetlands adjacent to TNWs; and
- Non-navigable tributaries of TNWs that are relatively permanent (i.e. the tributaries typically flow year-round or have continuous flow at least seasonally) and wetlands that directly abut such tributaries.

The following waters will also be found jurisdictional based on a fact-specific analysis that they have a significant nexus with a TNW:

- Non-navigable tributaries that ate not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and
- Wetlands adjacent to, but that do not directly abut, a relatively permanent non-navigable tributary.

The significant nexus evaluation includes an assessment of the flow characteristics and functions of the tributary, itself, in combination with the functions performed by any wetlands adjacent to the tributary to determine if they have more than an insubstantial or speculative effect on the chemical, physical and/or biological integrity of the TNWs.

The aerial photograph review for potential new wetland areas will utilize typical wetland 'signatures', such as soil and vegetation color differences, coupled with a comparison with existing topography.

Boundaries of the individual wetlands areas to be delineated in detail will be mapped onto topographic maps (to be provided by the City of Chesterfield) using Global Positioning System equipment.

FEE ESTIMATE

We will perform the work outlined herein on a time–and–expense basis in accordance with the enclosed *Fee Schedule*, with the cost of services estimated at a not-to-exceed total of $19,000. The majority of the work will be performed by Andrew McCord, MSc, Environmental Manager, and Jonathan Baer, MS CPSSc, Environmental Scientist.

We have included estimated time for a preliminary meeting and a field meeting with the Corps and two project team meetings at the Chesterfield City Hall. The estimated cost assumes that the existing permitted, non-impacted wetlands and several potential new wetlands will be identified by the Corps for detailed delineation; however, depending on the Corps' field assessment, this significant component of the scope may not be required.

This is an estimate and invoices will reflect the actual services performed; however, the estimated amount will not be exceeded without further authorization from the City of Chesterfield.

PROJECT SCHEDULE

We can begin work immediately after receiving notice to proceed. Initial aerial photograph review and preliminary field review will be completed within

approximately three weeks from receipt of the aerials and topographic maps from the City. The subsequent schedule will be highly dependent on Corps response time; however, it is likely that draft copies of the summary report and permit reauthorization requests will be submitted for your review and comment, within four weeks after the Corps field verification visit. Final documents will be completed within approximately one week after receiving comments on the drafts.

AUTHORIZATION

Please provide authorization for this work by signing in the space provided and returning one copy of this proposal to our office.

If you have any questions, please call.

Very truly yours,
MIDWEST TESTING

Andrew J. McCord, MSc
Environmental Manager

We accept the terms and conditions presented herein and authorize the work to proceed. The attached *Fee Schedule* and *General Conditions* are hereby made part of this proposal.

Accepted by_____ Title_____

Organization_____ Date_____

314.480-1710 direct dial
david.human@husch.com

February 16, 2005

Mr. Michael O. Geisel, P.E.
Director of Public Works / City Engineer
City of Chesterfield
690 Chesterfield Parkway West
Chesterfield, MO 63017

Dear Mike:

Enclosed for your review is the 2004 Monitoring Report for Monarch-Chesterfield Levee District wetland mitigation project, along with the self-explanatory letter from Rick DeAngelo. If you have any questions, please do not hesitate to give me a call.

Sincerely,

HUSCH & EPPENBERGER, LLC

By:_____
David R. Human

DRH/mmb
Enc.

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Chesterfield Valley Wetland Mitigation Project St. Louis County, Missouri

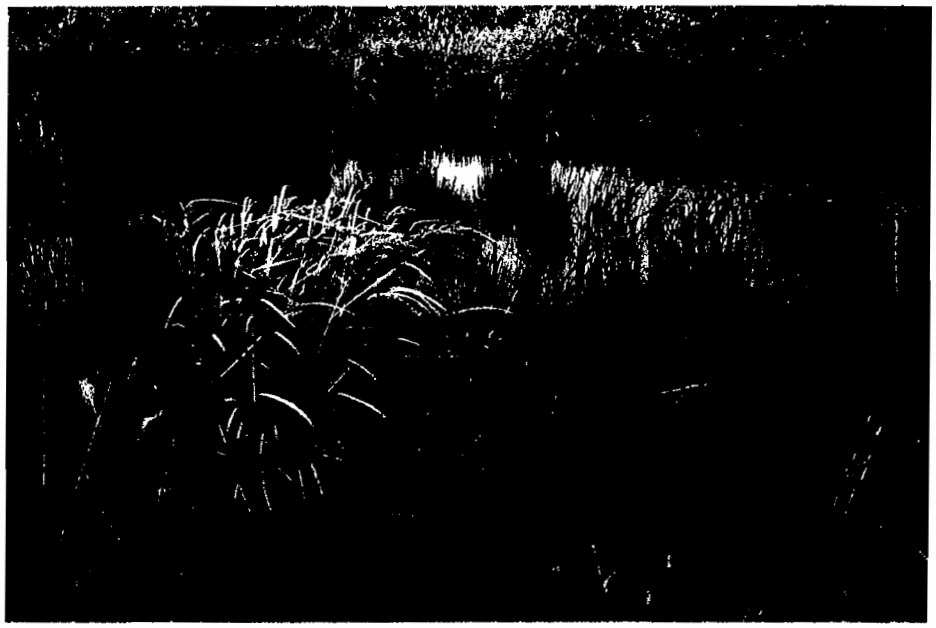
(USACE PERMIT NO. P-2302 / CITY OF CHESTERFIELD)

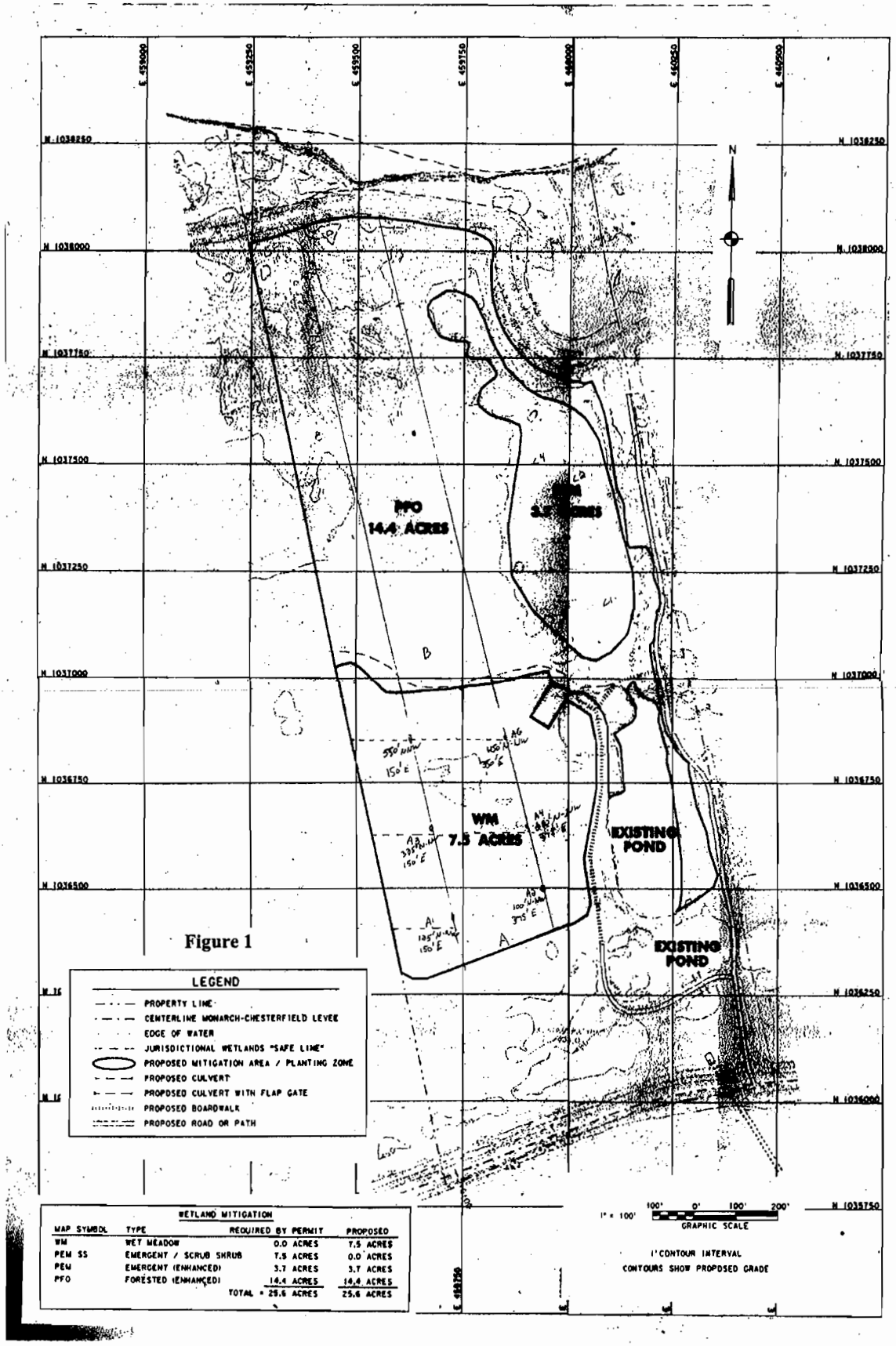
Annual Monitoring Report
2004

Prepared for Monarch-Chesterfield Levee District

By

The Zahniser Institute for Environmental Studies

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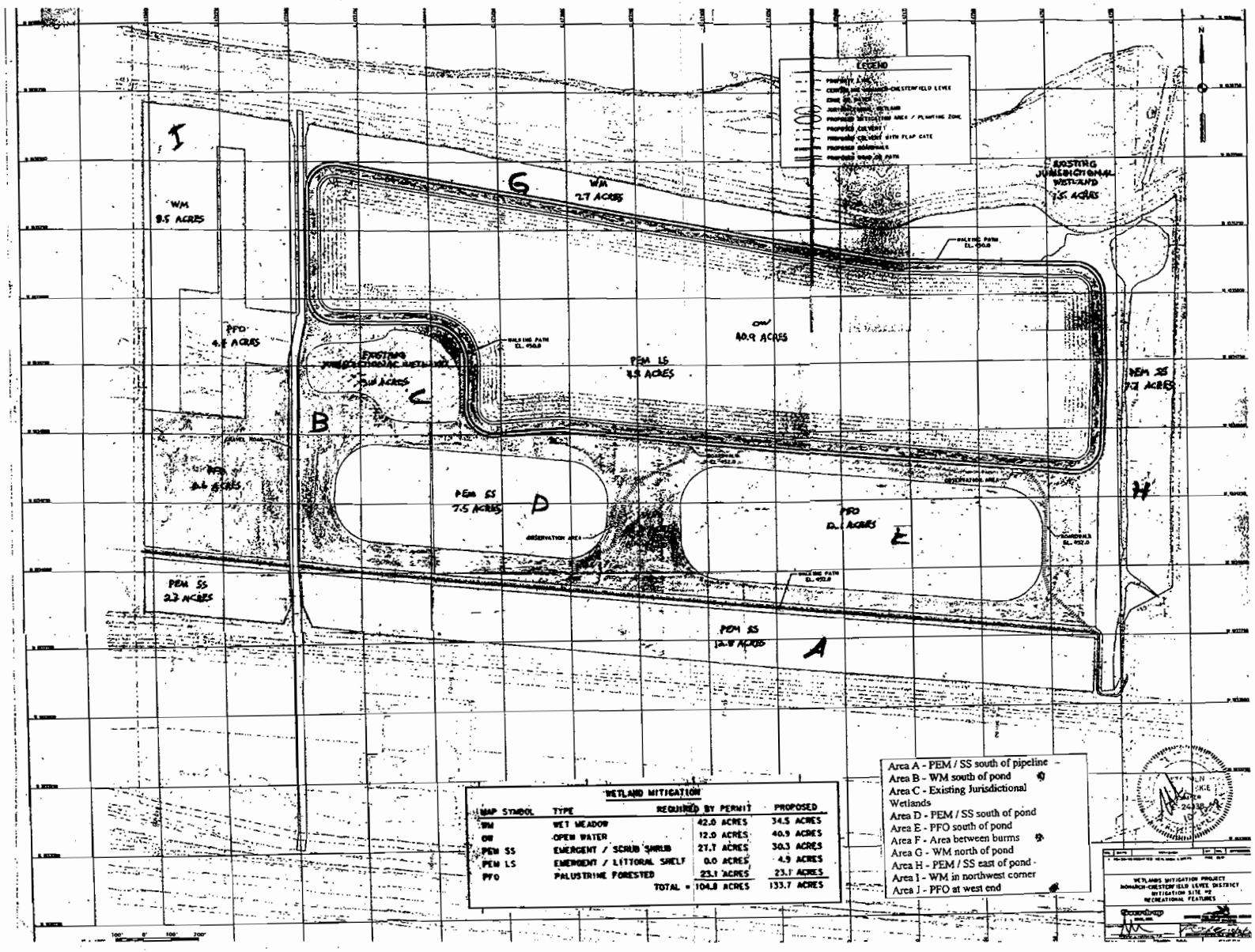
N
PFO
14.4 ACRES
WM
7.5 ACRES
EXISTING
POND
EXISTING
POND
LEGEND
PROPERTY LINE
CENTERLINE MONARCH-CHESTERFIELD LEVEE
EDGE OF WATER
JURISDICTIONAL WETLANDS "SAFE LINE"
PROPOSED MITIGATION AREA / PLANTING ZONE
PROPOSED CULVERT
PROPOSED CULVERT WITH FLAP GATE
PROPOSED BOARDWALK
PROPOSED ROAD OR PATH
WETLAND MITIGATION
MAP SYMBOL | TYPE | REQUIRED BY PERMIT | PROPOSED
WM | WET MEADOW | 0.0 ACRES | 7.5 ACRES
PEM SS | EMERGENT / SCRUB SHRUB | 7.5 ACRES | 0.0 ACRES
PEM | EMERGENT (ENHANCED) | 3.7 ACRES | 3.7 ACRES
PFO | FORESTED (ENHANCED) | 14.4 ACRES | 14.4 ACRES
TOTAL = 25.6 ACRES | 25.6 ACRES
1" = 100'
100' 0' 100' 200'
GRAPHIC SCALE
1' CONTOUR INTERVAL
CONTOURS SHOW PROPOSED GRADE

Figure 1


LEGEND
N
I
WM
9.5 ACRES
G
WM
2.7 ACRES
EXISTING JURISDICTIONAL WETLAND
7.5 ACRES
PFO
4.4 ACRES
EXISTING JURISDICTIONAL WETLAND
5.0 ACRES
C
B
OW
40.9 ACRES
PEM LS
4.9 ACRES
PEM SS
7.3 ACRES
PFO
2.6 ACRES
PEM SS
7.5 ACRES
D
PFO
2.1 ACRES
E
H
PEM SS
2.3 ACRES
PEM SS
12.8 ACRES
A
WETLAND MITIGATION
MAP SYMBOL | TYPE | REQUIRED BY PERMIT | PROPOSED
WM | WET MEADOW | 42.0 ACRES | 34.5 ACRES
OW | OPEN WATER | 12.0 ACRES | 40.9 ACRES
PEM SS | EMERGENT / SCRUB SHRUB | 27.1 ACRES | 30.3 ACRES
PEM LS | EMERGENT / LITTORAL SHELF | 0.0 ACRES | 4.9 ACRES
PFO | PALUSTRINE FORESTED | 23.1 ACRES | 23.1 ACRES
TOTAL = 104.8 ACRES 133.7 ACRES
Area A - PEM / SS south of pipeline
Area B - WM south of pond
Area C - Existing Jurisdictional Wetlands
Area D - PEM / SS south of pond
Area E - PFO south of pond
Area F - Area between burms
Area G - WM north of pond
Area H - PEM / SS east of pond
Area I - WM in northwest corner
Area J - PFO at west end
WETLANDS MITIGATION PROJECT
MONARCH-CHESTERFIELD LEVEE DISTRICT
MITIGATION SITE #2
RECREATIONAL FEATURES

I. Introduction

In February of 1999, the Monarch-Chesterfield Levee District entered into a contract with Greenville College for the construction and improvement of wetland areas mitigated under U.S. Army Corps of Engineers (USACE) Permit No. P-2302. This year (2004), monitoring and maintenance were carried out in accordance with guidelines set forth in the USACE Permit No. P-2032 / City of Chesterfield Wetland Mitigation Plan. This report details the procedures used during monitoring events and the results obtained by them.

The Chesterfield Valley Wetland Mitigation Project is divided into two areas. Site #1 is a 43-acre tract located at approximately Missouri River Mile 43, and Site #2 is a 246-acre tract at approximately Missouri River Mile 40. This report details the results of the final year of monitoring for Site #1, and the fourth year of monitoring for Site #2. Results are presented respectively.

II. Site #1 Physical Description

Three distinct management areas are defined in Site #1. The first is a 7.5-acre wet meadow area, referred to as Area A. Area A is a constructed depression, created to enhance the hydrology of the area with respect to wet meadow species planted there. In 1999, plugs of wetland species were hand-planted around the perimeter on one to three foot centers. Seeds from wet meadow species were planted the same year using a combination of drilling and harrowing, broadcasting and rolling. Native species were planted with a temporary matrix of red top (*Agrostis alba*), Canada rye (*Elymus canadensis*), oats (*Avena sativa*), timothy (*Phleum pratense*) and other grasses. A complete listing of species planted in Area A can be found in Table 1, Wet Meadow Seed Species.

Area B is a 14.4-acre tract of enhanced forest. The existing vegetation type consists of a varying canopy of young cottonwoods and willows to mature forest, with a rapidly changing understory dominated by *Acer negundo*, *Aster*, *Bidens*, *Desmodium*, and *Urtica* species throughout. Anthropogenic and flood debris have been removed from the site to enhance its natural qualities. During the fall / winter of 2001, RPM tree planting was commenced within Area B, and was completed in the spring of 2002. A complete listing of species planted in Area B can be found in Table 2, Tree & Shrub Species / RPM or Container.

Area C is an enhanced emergent wetland area totaling 3.7 acres. Planting here was similar to that done in Area A, and was completed in 1999. Plugs of wetland species were planted around the perimeter on approximately one foot centers. A wetland emergent seed mixture was broadcast and rolled as well as drilled through the interior of the site. The same temporary matrix as that used in Area A was also used in Area C. A complete listing of species to be used can be found in Table 3, Emergent Wetland Seed Species.

III. Site #1 Monitoring Activities / Results

Three scheduled monitoring events took place in 2004. Site visits occurred in the months of May and September, with wildlife observation only in December.

Vegetation

In Area A and Area C, permanent one-meter by one-meter monitoring quadrats were set up along two parallel lines through the long axis of each area. Each monitoring site was marked with a 2x2 inch stake driven into the northwest corner of the quadrat. These sites were labeled A-1 through A-6 in Area A, and C-1 through C-4 in Area C. A percent cover inventory was taken in each of the quadrats. The inventory method was such that the total amount of area a particular species covered in any strata inside the quadrat was approximated. Because various species can occur in different strata, percentage totals for all the species can be greater than 100.

A visual species inventory of Areas A and C was performed in the following manner. Each line along which the permanent monitoring quadrats were set out was walked from one end of the site to the other. All species visible from that line, which had not been previously encountered in the quadrats, were recorded. The perimeters of the areas were then walked, and any additional species recorded. The visual species inventory results for all areas are displayed in Table 7.

Survivorship of plugs in Areas A and C were not monitored this season. Individual plugs were randomly selected in 2000 and marked with a pin flag. Throughout the last five years the original plug markers and the replacement markers have been destroyed. This makes it impossible to effectively report on the survivorship of certain plugs. The plugs were however noted in the general species list and the overall survivorship of plants in general is good. The individual rows of plugs are easy to locate and additional plants of these species are spreading throughout the areas along with the surviving plugs increasing in size.

Monitoring of Area B was conducted in the following manner. A sample size representative of the overall health of the plantings was randomly chosen along a transect through the site. Individual specimens were then examined and assigned a health value of 0 through 2. Zero represented complete mortality, 1 indicated fair health, and 2 indicated good survivorship. Monitoring also consisted of a visual species inventory transect run diagonally from the southeast corner to the northwest corner of the area, as well as the perimeter.

May Results

Percent cover inventories of permanent monitoring sites in Area A yielded the following results:

A-1: 30% *Panicum virgatum*, 20% *Aster sp.*, ≤5% *Krigia biflora*, ≤5% *Melilotus alba*, ≤5% *Plantago virginica*, ≤5% *Veronica arvensis*

A-2: 20% *Panicum virgatum*, 10% *Aster sp.*, ≤5% *Bergia texana*

A-3: 10% *Panicum virgatum*, ≤5% *Conyza canadensis*, ≤5% *Erigeron annuus*, ≤5% *Krigia biflora*, ≤5% *Melilotus alba*, ≤5% *Plantago virginica*, ≤5% *Populus deltoides*, ≤5% *Salix interior*, ≤5% *Silene antirrhina*

A-4: 25% *Panicum virgatum*, ≤5% *Acer negundo*, ≤5% *Aster sp.*, ≤5% *Plantago virginica*, ≤5% *Populus deltoides*, ≤5% *Salix interior*, ≤5% *Strophostyles helvola*

A-5: 25% *Panicum virgatum*, 10% *Aster sp.*, 10% *Populus deltoides*, ≤5% *Equisetum arvense*, ≤5% *Erigeron annuus*, ≤5% *Medicago lupulina*

A-6: 10% *Panicum virgatum*, 10% *Aster sp.*, 5% *Medicago lupulina*, ≤5% *Conyza canadensis*, ≤5% *Silene antirrhina*, ≤5% *Veronica arvensis*

Percent cover inventories of permanent monitoring sites in Area C yielded the following results:

C-1: 30% *Lactuca sp.*, 30% *Senecio glabellus*, 10% *Veronica arvensis*, 10% *Vicia villosa*, ≤5% *Conyza canadensis*, ≤5% *Daucus sp.*, ≤5% *Solidago canadensis*, ≤5% *Vitis vulpina*

C-2: 80% *Senecio glabellus*, 20% *Conyza canadensis*, 20% *Veronica arvensis*, 5% *Acer negundo*, 5% *Populus deltoides*, 5% *Solidago canadensis*, ≤5% *Galium sp.*

C-3: 60% *Senecio glabellus*, 25% *Conyza canadensis*, 10% *Acer negundo*, 10% *Daucus sp.*, 5% *Veronica arvensis*

C-4: 50% *Lippia lanceolata*, 20% *Senecio glabellus*, 10% *Salix interior*, ≤5% *Acer nugundo*, ≤5% *Conyza canadensis*

The following table gives the monitoring results for area B:

Area B Transect					
Species	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**
Quercus sp.	2	*Unidentified*	0	*Juglands nigra*	2
Juglands nigra	2	*Juglands nigra*	1	*Juglands nigra*	1
Juglands nigra	2	*Quercus sp.*	2	*Unidentified*	0
Unidentified	0	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	1	Quercus sp.	2	*Quercus sp.*	1
Quercus sp.	1	*Quercus sp.*	1	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	1	*Quercus sp.*	1
Juglands nigra	1	*Juglands nigra*	1	*Unidentified*	0
Unidentified	0	*Quercus sp.*	1	*Unidentified*	0
Unidentified	0	*Quercus sp.*	2	*Quercus sp.*	1
Quercus sp.	1	Juglands nigra	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	2
Juglands nigra	2	*Quercus sp.*	1		
Juglands nigra	1	*Unidentified*	0		
Quercus sp.	1	*Quercus sp.*	1		
Quercus sp.	2	*Quercus sp.*	1		
Quercus sp.	2	*Quercus sp.*	2		
		Average vigor:	1.244	Survivorship 82%	

***Quercus sp.*: Area B**

September Results

Percent cover inventories of permanent monitoring sites in Area A yielded the following results:

A-1: 50% *Panicum virgatum*, 10% *Aster sp.*, 10% *Bidens sp.*, 10% *Desmodium sp.*, ≤5% *Panicum dichotomiflorum*

A-2: 40% *Panicum virgatum*, 20% *Panicum dichotomiflorum*, 10% *Aster sp.*, 10% *Lippia lanceolata*

A-3: 30% *Panicum virgatum*, 10% *Panicum capillare*, ≤5% *Bergia texana*

A-4: 20% *Panicum virgatum*, ≤5% *Desmodium sp.*, ≤5% *Populus deltoides*, ≤5% *Salix interior*

A-5: 30% *Panicum virgatum*, 20% *Lippia lanceolata*, 10% *Aster sp.*, ≤5% *Melilotus alba*, ≤5% *Populus deltoides*

A-6: 40% *Panicum virgatum*, 20% *Desmodium sp.*, 10% *Bergia texana*, 10% *Populus deltoides*, ≤5% *Lippia lanceolata*, ≤5% *Salix interior*

Percent cover inventories of permanent monitoring sites in Area C yielded the following results:

C-1: 100% *Xanthium chinense*, 25% *Cyperus strigosus*, 20% *Desmodium sp.*, 10% *Aster pilosus*

C-2: 80% *Xanthium chinense*, 30% *Populus deltoides*, 20% *Conyza canadensis*, 20% *Cyperus strigosus*, 10% *Desmodium sp.*

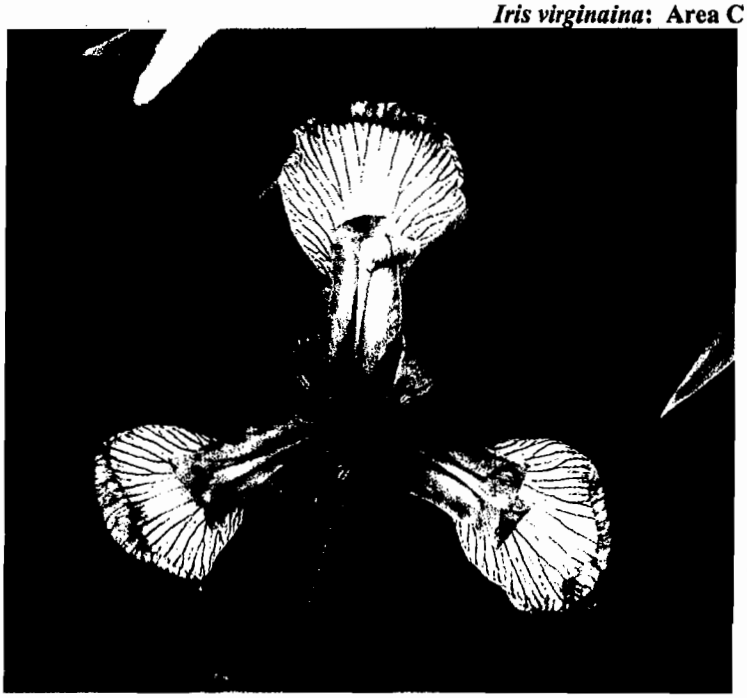
C-3: 100% *Desmodium sp.*, 20% *Salix interior*, ≤5% *Conyza canadensis*

C-4: 90% *Xanthium chinense*, 40% *Cyperus strigosus*, ≤5% *Acer negundo*, ≤5% *Aster pilosus*

The following table gives the monitoring results for area B:

Area B Transect					
Species	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**
Quercus sp.	2	*Quercus sp.*	0	*Juglands nigra*	2
Quercus sp.	2	*Quercus sp.*	0	*Juglands nigra*	0
Juglands nigra	1	*Juglands nigra*	1	*Quercus sp.*	2
Juglands nigra	1	*Juglands nigra*	2	*Quercus sp.*	2
Quercus sp.	1	Juglands nigra	1	*Quercus sp.*	1
Quercus sp.	0	*Quercus sp.*	1	*Quercus sp.*	1
Quercus sp.	2	*Juglands nigra*	2	*Juglands nigra*	2
Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	2
Juglands nigra	2	*Quercus sp.*	1	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	2	Quercus sp.	2	*Juglands nigra*	2
Quercus sp.	2	*Juglands nigra*	1	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	0	*Quercus sp.*	1
Juglands nigra	0	*Quercus sp.*	1	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	1	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	1		
Quercus sp.	1	*Juglands nigra*	2		
		Average vigor:	1.354	Survivorship 87.5%	

***Iris virginaina*: Area C**



IV. Photodocumentation Sites 1&2

A systematic photodocumentation system was designed as part of the monitoring protocol for the Chesterfield Valley Wetland Mitigation Project. In the past at each of the permanent monitoring stations in Area A and Area C, pictures were taken at compass bearings of north, south, east, and west. The purpose of this photodocumentation regime is to qualitatively track changes in the vegetative community, hydrology, and other functions of the site. However due to the increased vegetation height and thickness throughout the areas, compass bearing photos would reveal little about the sites. Many photos were taken of the general areas and specific spots within the sites. These photos track positive and negative trends within the vegetation and hydrology. All pictures are examined and catalogued in a database. This database currently holds approximately 1000 photographs.

V. Wildlife Survey - Site 1

December monitoring consisted solely of wildlife observation. In addition, notes were made of species observed during vegetative monitoring. Species of birds and mammals were noted either through direct observation or sign. The following lists include the wildlife using Site #1.

Birds:

American Crow
American Robin
American Tree Sparrow
Bank Swallow
Black-Capped Chickadee
Blue Jay
Brown Creeper
Chipping Sparrow
Common Grackle
Dickcissel
Downy Woodpecker
Eastern Turkey
Great Blue Heron
Hairy Woodpecker
Indigo Bunting
Killdeer
Northern Cardinal
Northern Flicker
Red Bellied Woodpecker
Red-Tailed Hawk
Red-Winged Blackbird
Swamp Sparrow
Tufted Titmouse
Turkey Vulture
Yellow-Billed Cuckoo
Wood Duck

Mammals:

Beaver
Coyote
Eastern Cottontail
Fox Squirrel
Meadow Vole
White-Tailed Deer

VI. Maintenance - Site #1

Maintenance at the Chesterfield Valley Wetland Mitigation Project Site #1 will consist of a complete dormant season mowing of Area A, Wet Meadow and Area C, Emergent Wetlands. Standing remnants of weedy broadleaf species, as well as dense grasses restrict resource availability for young plants. Mowing provides a successional stimulus without the risks associated with controlled burns.

VII. Future Efforts - Site #1

The 2004 season marked the final year of monitoring for Site #1. Areas A and C have been mowed for the last four seasons. The site should continue to receive mowing maintenance as needed to reduce the amount of woody competition.

VIII. Physical Description - Site #2

Ten distinct management areas are defined in Site #2. Area A is a 15.1 acre depression divided by the levee access road into two sections, 2.3 and 12.8 acres each. Area A was created as an emergent / scrub shrub area. In 1999, wetland species plugs were planted throughout on approximately six foot centers. A complete listing of plug species can be found in Table 4, Wetland Plug Species. Planting was completed in December and January of 2001 and 2002, respectively. Indian grass, switchgrass, rice cut-grass, cordgrass, and Canada wild rye were broadcast over the area. In addition, RPM containerized shrubs were installed in 57 groups of 16 (4x4 grid, 4 foot on center) through the site. Some units were broken up and planted on the margins of consistently wet areas to maximize moisture utilization. A complete listing of containerized shrub species can be found in Table 5, Shrub Species.

Area B is an 18.3 acre wet meadow area bordering existing jurisdictional wetland, emergent / scrub, and palustrine forested areas. Area B was hand planted on the east end with wetland species plugs in 1999 (Table 4). In 2000, two 600' observation boardwalks were constructed from the north and south berms. Drilling of wet meadow species was completed in 2001. A complete listing of wet meadow species can be found in Table 1, Wet Meadow Species.

Area C is a 3 acre section of existing jurisdictional wetland at the southwest corner of the borrow pit. No construction or augmentation was performed in this area in order to preserve the soil and vegetative communities found there. Monitoring in Area C was included in each monitoring event to document species occurring there.

Area D is a 7.5 acre emergent scrub / shrub area between the west boardwalk and the levee access road. In 1999, plugs of wetland species were hand planted on six foot centers in Area D. A complete listing of species can be found in Table 4, Wetland Plug Species. Seeds of wet meadow species were broadcast in 2001. In January of the following year, RPM containerized trees were installed in 28 groups of 16 (4x4 grid, 4 foot on center) through the site. Complete listings of wet meadow and containerized shrub species can be found in Tables 1 & 2, respectively.

Area E is a 12.1 acre palustrine forest area constructed between the boardwalks. Bare-root trees were planted on ten foot centers throughout the site in 2000. A complete listing of bare-root species can be found in Table 6, Bare-root Tree Species. In 2001, RPM containerized trees were planted on twenty foot centers throughout the site. A complete listing of containerized tree species can be found in Table 2.

Area F is a 4.9 acre littoral shelf area delineated by the area between the borrow pit berm and the wet meadow berm. Plugs of wetland species were hand planted in 1999 (Table 4). In 2001, seeds of wet meadow species were broadcast into the site (Table 1).

Area G is a wet meadow planting area totaling 7.7 acres. It runs the length of the borrow pit, along the north edge of the site. Plugs of wetland species were hand planted on six foot centers throughout the site in 1999 (Table 4). In 2001, seeds of wet meadow species were drilled into the site (Table 1).

Area H, also 7.7 acres, is constructed as an emergent scrub / shrub vegetation area at the east end of the site, adjacent to the east property line. Planting consisted of hand-planted plugs in 1999 (Table 4) and broadcast seed in 2001 (Table 3).

Area I, in the northwest corner of the site, is an 8.5 acre wet meadow area. In 1999, plugs of wetland species were hand-planted throughout the site (Table 4). Drilling of wet meadow seeds took place in 2001 (Table 1).

Area J is a 6.6 acre palustrine forested area located in the southwest corner of the site. In 2000, bare-root tree species were planted on ten foot centers throughout the site (Table 6). Containerized tree species on twenty foot centers followed in 2002 (Table 2).

IX. Site #2 Monitoring Activities / Results

Three scheduled monitoring events took place in 2004. Site visits occurred in the months of May and September, with wildlife observation only in December. Complete monitoring events were carried out in May and September.

Monitoring at Site #2 utilized a variety of vegetation sampling methods. Permanent monitoring stakes were established throughout the sites. At each stake, a quadrat one

meter on each side was laid out, and a species composition survey was done according to the methods described in Section III Site #1 Monitoring Activities / Results. In addition, a visual species inventory was done on 100 meter transects extending along the long axis of each site, on two sides of the monitoring stakes. Any additional species that were noted between monitoring stakes were also described. The visual species inventory results for all areas are displayed in Table 7.

In areas where bare-root trees or containerized trees or shrubs were planted, the following protocol was used. A sample size representative of the overall health of the plantings was randomly chosen along a transect through the area. Individual specimens were examined and assigned a health value of 0 through 2. Zero represented complete mortality, 1 indicated fair health, and 2 indicated good survivorship.

May Results

Percent cover inventories of permanent monitoring sites in Area A yielded the following results:

A-1: 30% *Medicago sativa*, 20% *Ambrosia artimisiifolia*,
20% *Veronica arvensis*, 10% *Ilex decidua*, ≤5% *Ambrosia trifida*,
≤5% *Conyza canadensis*, ≤5% *Erigeron annuus*,
≤5% *Geranium carolinianum*, ≤5% *Rumex verticillatus*,
≤5% *Sorghum halepense*

A-2: 20% *Sorghastrum nutans*, 20% *Salix interior*, 10% *Populus deltoides*,
≤5% *Desmanthus illinoensis*, ≤5% *Erigeron annuus*,
≤5% *Medicago sativa*, ≤5% *Plantago virginica*, ≤5% *Silene antirrhina*

A-3: 20% *Salix interior*, 15% *Populus deltoides*, 10% *Sorghastrum nutans*,
10% *Strophostyles helvola*, ≤5% *Desmanthus illinoensis*,
≤5% *Erigeron annuus*, ≤5% *Erigeron philadelphicus*,
≤5% *Solidago canadensis*

A-4: 30% *Melilotus officinales*, 10% *Medicago sativa*, 10% *Sorghastrum nutans*,
≤5% *Conyza canadensis*, ≤5% *Desmanthus illinoensis*,
≤5% *Solidago canadensis*

A-5: 10% *Populus deltoides*, 10% *Solanum americanum*,
10% *Strophostyles helvola*, 5% *Cephalanthus occidentalis*,
5% *Festuca sp.*, 5% *Lycopus americanus*, 5% *Plantago virginica*,
≤5% *Acer negundo*, ≤5% *Solidago canadensis*

A-6: 20% *Aster sp.*, 20% *Festuca sp.*, 10% *Desmanthus illinoensis*,
5% *Ambrosia artemisiifolia*, ≤5% *Ambrosia trifida*

Percent cover inventories of permanent monitoring sites in Area B yielded the following results:

B-1: 20% *Populus deltoides*, 10% *Salix interior*, 10% *Sorghastrum nutans*, 5% *Erigeron annuus*

B-2: 30% *Sorghastrum nutans*, ≤5% *Erigeron annuus*, ≤5% *Medicago sativa*, ≤5% *Strophostyles helvola*

B-3: 40% *Sorghastrum nutans*, 15% *Populus deltoides*, 10% *Salix interior*, ≤5% *Conyza canadensis*, ≤5% *Erigeron annuus*, ≤5% *Medicago sativa*, ≤5% *Panicum virgatum*, ≤5% *Strophostyles helvola*

B-4: 30% *Sorghastrum nutans*, 20% *Salix interior*, 10% *Populus deltoides*, ≤5% *Conyza canadensis*, ≤5% *Erigeron annuus*, ≤5% *Solidago canadensis*

B-5: 50% *Sorghastrum nutans*, 20% *Medicago sativa*, ≤5% *Ambrosia trifida*, ≤5% *Cyperus acuminatus*, ≤5% *Erigeron annuus*, ≤5% *Strophostylese helvola*

B-6: 40% *Sorghastrum nutans*, 30% *Panicum virgatum*, 10% *Strophostylese helvola*, ≤5% *Lolium perenne*

Percent cover inventories of permanent monitoring sites in Area C yielded the following results:

C-1: 40% *Sorghum halepense*, 20% *Torrilis japonica*, 10% *Medicago sativa*, ≤5% *Ambrosia trifida*, ≤5% *Bromus japonica*

C-2: 40% *Aster pilosus*, 10% *Erigeron annuus*, ≤5% *Ambrosia trifida*, ≤5% *Bromus japonica*

Percent cover inventories of permanent monitoring sites in Area D yielded the following results:

D-1: 30% *Aster pilosus*, 30% *Strophostyles helvola*, 10% *Conyza canadensis*, ≤5% *Carex annectens*

D-2: 50% *Sorghastrum nutans*, 50% *Strophostyles helvola*, 10% *Populus deltoides*, 10% *Salix interior*, ≤5% *Desmanthus illinoensis*

The following tables give the monitoring results for Area E:

Transect 1				Transect 2			
Species	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**
Bare Root		Containerized		Bare Root		Containerized	
Quercus sp.	2	*Quercus sp.*	1	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	1	*Juglans nigra*	2	*Unidentified*	0	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	*Unidentified*	0	*Quercus sp.*	2
Quercus sp.	0	*Quercus sp.*	2	*Quercus sp.*	1	*Juglans nigra*	2
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Carya illinoensis*	2	*Quercus sp.*	1
Unidentified	0	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	2
Quercus sp.	2	*Juglans nigra*	0	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	0	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	0	*Quercus sp.*	1
Unidentified	0	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	0	*Quercus sp.*	2	*Quercus sp.*	1	*Juglans nigra*	1
Quercus sp.	2	*Juglans nigra*	2	*Quercus sp.*	1	*Quercus sp.*	0
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Carya illinoensis	1	*Juglans nigra*	2	*Carya illinoensis*	1	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	Quercus sp.	2	*Quercus sp.*	1
Quercus sp.	1	*Quercus sp.*	2	Quercus sp.	1	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Unidentified	0			*Quercus sp.*	2		
Unidentified	0			*Carya illinoensis*	1		
Quercus sp.	2			*Quercus sp.*	2		
Quercus sp.	1			*Quercus sp.*	2		
Quercus sp.	1			*Quercus sp.*	1		
Unidentified	0			*Quercus sp.*	2		
Carya illinoensis	2			*Platanus occidentalis*	1		
Carya illinoensis	1			*Quercus sp.*	1		
Platanus occidentalis	2			*Quercus sp.*	2		
Quercus sp.	2			*Quercus sp.*	2		
Quercus sp.	1			*Carya illinoensis*	1		
Quercus sp.	2			*Carya Illinoensis*	1		
Quercus sp.	2			*Quercus sp.*	2		
Quercus sp.	2			*Quercus sp.*	1		
Platanus occidentalis	2			*Quercus sp.*	1		
Platanus occidentalis	2			*Quercus sp.*	2		
Platanus occidentalis	2			Platanus occidentalis	2		
		Average Vigor:	1.518			Average Vigor:	1.536

Species	Vigor	Species	Vigor
Bare Root		Containerized	
Platanus occidentalis	2	Quercus sp.	1
Quercus sp.	1	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	1
Quercus sp.	1	*Quercus sp.*	2
Platanus occidentalis	1	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2
Quercus sp.	2	Quercus sp.	2
Platanus occidentalis	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2
Carya illinoensis	2	*Juglans nigra*	2
Carya illinoensis	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2
Unidentified	0	*Juglans nigra*	2
Platanus occidentalis	2	*Juglans nigra*	2
Unidentified	0	*Quercus sp.*	0
Carya illinoensis	1	*Quercus sp.*	1
Quercus sp.	0	*Quercus sp.*	0
Platanus occidentalis	2	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2
Platanus occidentalis	2		
Platanus occidentalis	2		
Platanus occidentalis	2		
Platanus occidentalis	2		
Platanus occidentalis	2		
Platanus occidentalis	2		
Quercus sp.	2		
Quercus sp.	1		
Carya illinoensis	1		
Carya illinoensis	2		
Quercus sp.	2		
Platanus occidentalis	2		
Platanus occidentalis	2		
Carya illinoensis	2		
Platanus occidentalis	2		
Platanus occidentalis	2		
Platanus occidentalis	2		
Overall Survivorship: 89%		Average Vigor:	1.625

Percent cover inventories of permanent monitoring sites in Area F yielded the following results:

F-1: 40% *Populus deltoides*, 30% *Iva ciliata*, 10% *Bidens sp.*, ≤5% *Desmanthus illinoensis*, ≤5% *Salix amygdaloides*

F-2: 80% *Spartina pectinata*, 20% *Desmanthus illinoensis*, ≤5% *Medicago sativa*, ≤5% *Poa pratensis*

F-3: 80% *Trifolium pratense*, 20% *Festuca sp.*, 20% *Populus deltoides*, ≤5% *Sorghum halepense*

F-4: 30% *Spartina pectinata*, 10% *Aster pilosus*, 10% *Sorghastrum nutans*, 5% *Medicago sativa*, ≤5% *Strophostyles helvola*

F-5: 30% *Festuca sp.*, 20% *Sorghastrum nutans*, 5% *Populus deltoides*, ≤5% *Desmanthus illinoensis*, ≤5% *Medicago sativa*

F-6: 70% *Sorghastrum nutans*, 15% *Melilotus officinales*, 10% *Festuca sp.*, 5% *Hibiscus militaris*

F-7: 50% *Conyza canadensis*, 20% *Trifolium campestre*, 10% *Sorghum halepense*, ≤5% *Aster pilosus*, ≤5% *Bromus squarrosa*, ≤5% *Carex molesta*, ≤5% *Chenopodium album*, ≤5% *Erigeron annuus*, ≤5% *Geranuium carolinianum*

Percent cover inventories of permanent monitoring sites in Area G yielded the following results:

G-1: 30% *Sorghastrum nutans*, 20% *Populus deltoides*, 5% *Medicago sativa*, ≤5% *Ampelamus albidus*, ≤5% *Strophostyles helvola*

G-2: 40% *Populus deltoides*, 30% *Medicago sativa*, 30% *Sorghastrum nutans*, 10% *Solidago canadensis*

G-3: 80% *Sorghastrum nutans*, 10% *Strophostyles helvola*, ≤5% *Solidago canadensis*

G-4: (Random) 90% *Sorghastrum nutans*, 20% *Strophostyles helvola*, 10% *Bromus japonica*

G-5: 80% *Spartina pectinata*, 10% *Sorghastrum nutans*, ≤5% *Festuca sp.*

Percent cover inventories of permanent monitoring sites in Area H yielded the following results:

H-1: 40% *Elymus canadensis*, 30% *Solidago canadensis*, ≤5% *Bromus japonicus*, ≤5% *Veronica arvensis*

H-2: 40% *Solidago canadinsis*, 25% *Bromus japonicus*, ≤5% *Ambrosia trifida*, ≤5% *Apocynum cannabinum*, ≤5% *Geranium carolinianum*, ≤5% *Lippia lanceolata*

H-3: 25% *Carex frankii*, 10% *Ambrosia trifida*, 10% *Torrelis japonica*, 5% *Apocynum cannabinum*, ≤5% *Trifolium campestre*

Percent cover inventories of permanent monitoring sites in Area I yielded the following results:

I-1: 70% *Sorghastrum nutans*, 10% *Populus deltoides*, ≤5% *Aster pilosus*, ≤5% *Erigeron annuus*, ≤5% *Medicago sativa*

I-2: 40% *Sorghastrum nutans*, 20% *Cassia fasciculatis*, 10% *Bidens sp.*, ≤5% *Acer saccharinum*, ≤5% *Aster pilosus*, ≤5% *Carex molesta*, ≤5% *Cyperus acuminatus*, ≤5% *Lolium perenne*

I-3: 25% *Carex crus-corvi*, 20% *Aster pilosus*, ≤5% *Erigeron annuus*, ≤5% *Lactuca canadensis*

I-4: 50% *Aster pilosus*, 10% *Acer negundo*, 10% *Sorghastrum nutans*

The following table gives the monitoring results for Area J:

Transect 1				Transect 2			
Species	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**
Bare Root		Containerized		Bare Root		Containerized	
Plantanus occidentalis	2	*Quercus sp.*	0	*Plantanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Plantanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	0	*Juglans nigra*	2	*Quercus sp.*	2	*Quercus sp.*	2
Plantanus occidentalis	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Plantanus occidentalis	2	*Quercus sp.*	2	*Plantanus occidentalis*	1	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	2	*Plantanus occidentalis*	1	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Juglans nigra*	2
Plantanus occidentalis	2	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2

Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Plantanus occidentalis	1	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Carya illinoensis*	2	*Juglans nigra*	2
Quercus sp.	2	*Juglans nigra*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Plantanus occidentalis	2	*Quercus sp.*	1	*Platanus occidentalis*	2	*Quercus sp.*	0
Quercus sp.	2	*Quercus sp.*	1	*Quercus sp.*	2	*Quercus sp.*	0
Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	2
Plantanus occidentalis	1	*Quercus sp.*	1	*Plantanus occidentalis*	1	*Quercus sp.*	2
Plantanus occidentalis	1	*Quercus sp.*	1	*Carya illinoensis*	1	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	1	*Quercus sp.*	1	*Juglans nigra*	2
Unidentified	0	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	0
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	*Carya illinoensis*	1	*Juglans nigra*	2
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	1	*Juglans nigra*	2
Carya illinoinsis	2			*Quercus sp.*	1	*Quercus sp.*	2
Quercus sp.	2			*Platanus occidentalis*	2	*Quercus sp.*	1
Quercus sp.	0			Unidentified	0		
Quercus sp.	2			Unidentified	0		
Quercus sp.	2			*Quercus sp.*	2		
Carya illinoensis	1			*Quercus sp.*	2		
Platanus occidentalis	2			*Platanus occidentalis*	1		
Platanus occidentalis	2			*Quercus*	1		
Quercus sp.	2			*Platanus occidentalis*	1		
Quercus sp.	1			*Quercus sp.*	2		
Platanus occidentalis	2			*Quercus sp.*	2		
Quercus sp.	2			*Quercus sp.*	2		
Quercus sp.	1			*Carya illinoensis*	1		
Quercus sp.	2			*Platanus occidentalis*	2		
Quercus sp.	1			*Platanus occidentalis*	2		
Carya illinoensis	2			*Quercus sp.*	2		
Quercus sp.	1			*Quercus sp.*	2		
Plantanus occidentalis	2			*Quercus sp.*	2		
Plantanus occidentalis	2			*Platanus occidentalis*	2		
Quercus sp.	1			*Quercus sp.*	1		
Quercus sp.	1			Unidentified	0		
Quercus sp.	0			Unidentified	0		
Quercus sp.	1			*Quercus sp.*	2		
Quercus sp.	2			*Quercus sp.*	1		
		Average vigor:	1.56	Overall Survivorship:	89%	Average vigor:	1.44

September Results

Percent cover inventories of permanent monitoring sites in Area A yielded the following results:

A-1: 40% *Strophostyles helvola*, 10% *Aster sp.*, 10% *Sorghum halepense*, ≤5% *Ambrosia artemisiifolia*, ≤5% *Desmanthus illinoensis*, ≤5% *Populus deltoides*

A-2: 25% *Sorghastrum nutans*, 20% *Salix interior*, 10% *Desmanthus illinoensis*, ≤5% *Ambrosia artemisiifolia*, ≤5% *Populus deltoides*

A-3: 30% *Panicum virgatum*, 10% *Populus deltoides*, 10% *Strophostyles helvola*, ≤5% *Aster pilosus*, ≤5% *Solidago canadensis*

A-4: 40% *Sorghastrum nutans*, 20% *Aster pilosus*, 10% *Erigeron annuus*, ≤5% *Salix interior*, ≤5% *Solidago canadensis*

A-5: 30% *Panicum virgatum*, 20% *Iva ciliata*, 20% *Populus deltoides*, 20% *Salix interior*, 20% *Sorghastrum nutans*, ≤5% *Digitaria sanguinalis*

A-6: 50% *Festuca sp.*, 10% *Ambrosia trifida*, ≤5% *Eupatorium rugosum*, ≤5% *Sorghsatrum nutans*

Percent cover inventories of permanent monitoring sites in Area B yielded the following results:

B-1: 40% *Sorghastrum nutans*, 30% *Populus deltoides*, 10% *Dalea alopecuroides*, 10% *Salix interior*, 5% *Lippia lanceolata*, ≤5% *Desmanthus illinoensis*, ≤5% *Verbena hastata*

B-2: 40% *Sorghastrum nutans*, ≤5% *Desmanthus illinoensis*, ≤5% *Medicago lupulina*, ≤5% *Populus deltoides*

B-3: 30% *Sorghastrum nutans*, 30% *Strophostyles helvola*, 10% *Panicum virgatum*, 10% *Populus deltoides*, ≤5% *Aster pilosus*

B-4: 30% *Sorghastrum nutans*, ≤5% *Populus deltoides*, ≤5% *Salix interior*, ≤5% *Strophostyles helvola*

B-5: 60% *Sorghastrum nutans*, 10% *Panicum virgatum*, ≤5% *Erigeron annuus*, ≤5% *Strophostyles helvola*

B-6: 100% *Sorghastrum nutans*, 10% *Strophostyles helvola*

Percent cover inventories of permanent monitoring sites in Area C yielded the following results:

C-1: 100% *Aster Pilosus*, ≤5% *Ambrosia trifida*, ≤5% *Solidago canadensis*

C-2: 100% *Sorghum halepense*, 20% *Solidago canadensis*, 10% *Torilis japonica*

Percent cover inventories of permanent monitoring sites in Area D yielded the following results:

D-1: 80% *Aster pilosus*, 20% *Panicum virgatum*, 20% *Strophostyles helvola*, 10% *Populus deltoides*, ≤5% *Sorghum halepense*

D-2: 90% *Sorghastrum nutans*, 20% *Desmanthus illinoensis*, 20% *Strophostyles helvola*, 10% *Populus deltoides*, 10% *Salix interior*, ≤5% *Aster pilosus*

Multiple species in flower: Area G

The following tables give the monitoring results for Area E:

Transect 1				Transect 2			
Species	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**
Bare Root		Containerized		Bare Root		Containerized	
Carya illinoensis	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Carya illinoensis*	2	*Quercus sp.*	1
Carya illinoensis	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Carya illinoensis*	1	*Juglans nigra*	2
Unidentified	0	*Quercus sp.*	2	Quercus sp.	2	*Juglans nigra*	1
Platanus occidentalis	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	0
Carya illinoensis	2	*Quercus sp.*	1	*Platanus occidentalis*	2	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	2	*Quercus sp.*	1	*Juglans nigra*	2
Unidentified	0	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	1
Platanus occidentalis	2	*Quercus sp.*	1	*Quercus sp.*	2	*Quercus sp.*	1
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	0
Platanus occidentalis	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	1
Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	0
Unidentified	0	*Quercus sp.*	1	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	2	*Juglans nigra*	2	*Quercus sp.*	2	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	2	*Carya illinoensis*	1	*Quercus sp.*	1
Platanus occidentalis	2	*Quercus sp.*	0	Unidentified	0	*Quercus sp.*	2
Quercus sp.	2			Unidentified	0		
Quercus sp.	1			*Platanus occidentalis*	2		
Quercus sp.	1			Unidentified	0		
Quercus sp.	1			*Platanus occidentalis*	1		
Quercus sp.	2			*Platanus occidentalis*	1		
Quercus sp.	2			*Quercus sp.*	1		
Quercus sp.	2			*Quercus sp.*	1		
Platanus occidentalis	2			*Quercus sp.*	2		
Platanus occidentalis	2			Unidentified	0		
Quercus sp.	1			Unidentified	0		
Unidentified	0			Unidentified	0		
Quercus sp.	2			Unidentified	0		
Unidentified	0			*Quercus sp.*	2		
Platanus occidentalis	2			*Platanus occidentalis*	2		
Carya illinoensis	2			*Platanus occidentalis*	1		
Platanus occidentalis	1			*Carya illinoensis*	2		
Platanus occidentalis	2			*Platanus occidentalis*	2		
		Average Vigor:	1.6364			Average Vigor:	1.3214

Transect 3			
Species	**Vigor**	**Species**	**Vigor**
Bare Root		Containerized	
Quercus sp.	2	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	2
Platanus occidentalis	2	*Juglans nigra*	2
Quercus sp.	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	1
Unidentified	0	*Quercus sp.*	1
Platanus occidentalis	2	*Quercus sp.*	2
Platanus occidentalis	2	*Juglans nigra*	2
Quercus sp.	1	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2
Platanus occidentalis	2		
Platanus occidentalis	2		
Quercus sp.	2		
Quercus sp.	2		
Quercus sp.	1		
Quercus sp.	2		
Carya illinoensis	2		
Platanus occidentalis	2		
Platanus occidentalis	2		
Quercus sp.	2		
Quercus sp.	2		
Quercus sp.	1		
Quercus sp.	1		
Quercus sp.	2		
Quercus sp.	2		
Quercus sp.	2		
Quercus sp.	1		
Overall Survivorship: 88.3%		Average vigor:	1.596

Percent cover inventories of permanent monitoring sites in Area F yielded the following results:

F-1: *40% Iva ciliata*, 20% *Cyperus sp.*, 20% *Populus deltoides*, 10% *Salix amygdaloides*, ≤5% *Aster pilosus*

F-2: 40% *Spartina pectinata*, 30% *Desmanthus illinoensis*, 20% *Cassia marilandica*, 10% *Elymus canadensis*, ≤5% *Bidens comosa*

F-3: 40% *Populus deltoides*, 20% *Festuca sp.*, 20% *Sorghum halepense*, ≤5% *Strophostyles helvola*

F-4: 30% *Sorghastrum nutans*, 20% *Spartina pectinata*, 15% *Strophostyles helvola*, 10% *Aster pilosus*, ≤5% *Erigeron annuus*

F-5: 60% *Sorghastrum nutans*, 10% *Populus deltoides*, ≤5% *Eupatorium rugosum*, ≤5% *Strophostyles helvola*, ≤5% *Xanthium chinense*

F-6: 90% *Sorghastrum nutans*, 20% *Strophostyles helvola*, ≤5% *Melilotus alba*

F-7: 50% *Conyza canadensis*, 25% *Cassia fascicularis*, 20% *Sorghum halepense*, 10% *Aster pilosus*, ≤5% *Ambrosia trifida*, ≤5% *Melilotus alba*

Percent cover inventories of permanent monitoring sites in Area G yielded the following results:

G-1: 80% *Sorghastrum nutans*, 30% *Populus deltoides*, 10% *Elymus canadensis*, 10% *Strophostyles helvola*

G-2: 40% *Populus deltoides*, 20% *Panicum virgatum*, 20% *Sorghastrum nutans*, ≤5% *Iva cilaita*, ≤5% *Solidago canadensis*, ≤5% *Strophostyles helvola*

G-3: 100% *Sorghastrum nutans*, 10% *Panicum virgatum*, ≤5% *Strophostylese helvola*

G-4: 90% *Sorghastrum nutans*, 20% *Strophostyles helvola*, 10% *Panicum virgatum*, 10% *Populus deltoides*

G-5: 70% *Spartina pectinata*, 30% *Sorghastrum nutans*, ≤5% *Elymus canadensis*, ≤5% *Krigia biflora*

Percent cover inventories of permanent monitoring sites in Area H yielded the following results:

H-1: 60% *Sorghastrum nutans*, 30% *Solidago canadensis*, 20% *Desmanthus illinoensis*

H-2: 40% *Solidago canadensis*, 30% *Aster novae-angliae*, 20% *Cornus sp.*, 10% *Acer negundo*, ≤5% *Lippia lanceolata*, ≤5% *Populus deltoides*

H-3: 40% *Lippia lanceoalata*, 20% *Carex frankii*, 20% *Populus deltoides*, ≤5% *Conyza canadensis*

Percent cover inventories of permanent monitoring sites in Area I yielded the following results:

I-1: 80% *Sorghastrum nutans*, ≤5% *Aster sp.*, ≤5% *Populus deltoides*

I-2: 90% *Cassia fascicularis*, 20% *Panicum virgatum*, ≤5% *Elymus canadensis*, ≤5% *Sorghastrum nutans*

I-3: 20% *Carex crus-corvi*, 10% *Aster pilosus*, ≤5% *Erigeron sp.*, ≤5% *Iva ciliata*

I-4: 40% *Aster pilosus*, 20% *Sorghastrum nutans*, ≤5% *Panicum virgatum*

***Typha latifolia* and *Sagitaria latifolia* : Area H**

The following table gives the monitoring results for Area J:

Transect 1				Transect 2			
Species	Vigor	Species	Vigor	Species	Vigor	Species	Vigor
Bare Root		Containerized		Bare Root		Containerized	
Quercus sp.	0	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	2	*Juglans nigra*	1	*Platanus occidentalis*	1	*Quercus sp.*	2
Quercus sp.	1	*Juglans nigra*	2	*Quercus sp.*	2	*Quercus sp.*	1
Carya illinoensis	2	*Quercus sp.*	1	*Quercus sp.*	1	*Quercus sp.*	0
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2
Quercus sp.	0	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	0
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	0	*Quercus sp.*	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	1	*Quercus sp.*	1	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Carya illinoensis*	2	*Quercus sp.*	0
Quercus sp.	0	*Quercus sp.*	1	*Carya illinoensis*	1	*Quercus sp.*	1
Unidentified	0	*Quercus sp.*	2	*Carya illinoensis*	2	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	1	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	0	*Platanus occidentalis*	1	*Quercus sp.*	2
Quercus sp.	2			Unidentified	0		
Unidentified	0			*Quercus sp.*	2		
Quercus sp.	0			*Quercus sp.*	2		
Carya illinoensis	2			*Quercus sp.*	1		
Carya illinoensis	2			*Quercus sp.*	1		
Carya illinoensis	1			*Platanus occidentalis*	2		
Quercus sp.	1			*Quercus sp.*	2		
Quercus sp.	1			*Platanus occidentalis*	1		
Unidentified	0			*Platanus occidentalis*	2		
Quercus sp.	1			*Platanus occidentalis*	2		
Platanus occidentalis	2			*Carya illinoensis*	2		
Platanus occidentalis	2			*Carya illinoensis*	2		
Quercus sp.	1			*Carya illinoensis*	1		
Quercus sp.	1			*Quercus sp.*	1		
Quercus sp.	2			*Carya illinoensis*	1		
Platanus occidentalis	2			*Carya illinoensis*	2		
Platanus occidentalis	1			*Quercus sp.*	1		
Quercus sp.	1			Unidentified	0		
Platanus occidentalis	2			Unidentified	0		
Platanus occidentalis	2			*Quercus sp.*	1		
Quercus sp.	2			Unidentified	0		
Platanus occidentalis	2			*Quercus sp.*	1		
Platanus occidentalis	2			*Platanus occidentalis*	1		
Platanus occidentalis	2			*Quercus sp.*	1		
Platanus occidentalis	2			*Quercus sp.*	0		
Quercus sp.	2			Unidentified	0		
		Average vigor: 1.46		Overall Survivorship 85%		Average vigor: 1.286	

X. Wildlife Survey - Site 2

December monitoring consisted solely of wildlife observation. In addition, notes were made of species observed during vegetative monitoring. Birds and mammals were recorded either through direct observation or sign.

Birds:

American Crow
American Gold Finch
American Kestrel
American Robin
American Woodcock
Bald Eagle
Bank Swallow
Black-Capped Chickadee
Blue-Winged Teal
Brown Thrasher
Chipping Sparrow
Common Grackle
Common Snipe
Coopers Hawk
Double Crested Cormerant
Eastern Bluebird
Eastern Meadowlark
Eastern Phoebe
Eastern Wood Pewee
Great Blue Heron
Horned Lark
Killdeer
Mallard
Mourning Dove
Northern Bobwhite
Northern Cardinal
Northern Flicker
Northern Harrier
Northern Mockingbird
Northern Oriole
Redhead
Red-Tailed Hawk
Red-Winged Blackbird
Ruby-Throated Hummingbird
Song Sparrow
Sharp-Shinned Hawk
Tufted Titmouse
Turkey Vulture
White-Breasted Nuthatch
Winter Wren
Yellow-Billed Cuckoo
Yellow Warbler

Mammals:

Beaver
Coyote
Eastern Cottontail
Eastern Mole
Meadow Vole
Raccoon
White Tailed Deer

XI. Maintenance - Site #2

All sites except the jurisdictional wetlands (Area C) and mature woods will be mowed during the dormant season. This will help prevent cottonwood / willow takeover until establishment of native planted materials is complete. The agricultural levee toe will also be mowed to prevent excessive growth of woody and invasive species.

XII. Future Efforts - Site #2

Three monitoring events will take place during the 2005 monitoring season. These should occur in May, September, and December. The first two will be full-scale efforts consisting of vegetative and wildlife evaluation, and the last will be wildlife only.

Site maintenance such as mowing and herbicide application will be considered as needed.

XIII. Wetland Indicator Species

Table 7: Species Inventory List, includes the wetland indicator status for the plants found on the National List of Plant Species that Occur in Wetlands: Region 3. This data was gathered from the National Plants Database online at http://plants.usda.gov/wetinfo.html.

Indicator Categories

OBL	Occurs almost always (estimated probability 99%) under natural conditions in wetlands.
FACW	Usually occurs in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.
FAC	Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
FACU	Usually occurs in non-wetlands (estimated probability 67%-99%), but occasionally found in wetlands (estimated probability 1%-33%).
UPL	Occurs in wetlands in another region, but occurs almost always (estimated probability 99%) under natural conditions in non-wetlands in the regions specified. If a species does not occur in wetlands in any region, it is not on the National List.

A positive (+) or negative (-) sign is used with the Facultative Indicator categories to more specifically define the regional frequency of occurrence in wetlands. The positive sign indicates a frequency toward the higher end of the category and the negative sign toward the lower end of the category.

The percentages of plants that occur in each indicator category for Sites 1 and 2 are as follows:

OBL:	47 species or 21.2%
FACW(+/-):	48 species or 21.6%
FAC(+/-):	46 species or 20.7%
FACU(+/-):	38 species or 17.1%
UPL:	5 species or 2.25%

There were 37 species or 16.7% of the total plants that are not listed and 10 specimens that were not keyed to the species and could not be designated.

XIV. Hydrology and Hydric Soils

The hydrology at Site 1 is mainly influenced by the Missouri River water level. When the water level in the river rises above the bottom elevation excavated, the wet meadow fills. If the river level surpasses flood stage for a prolonged amount of time the entire site becomes inundated. Large rain events also greatly influence the hydrologic input of the site. Surface runoff from the ball fields south of the Monarch-Chesterfield Levee is collected and pumped into the site at the southeast corner.

Areas A and C showed signs of inundation during the May monitoring event. Organic material build up was prevalent around the edges of both areas along with standing water still remaining throughout about half of Area A. This inundation was the result of a large amount of rain in May. The river level did not bring the water table up high enough to flood the entire site but there was enough rain and water from the ball fields to cover Areas A and C with several inches of water.

Hydrology at Site 2 depends mainly on the water elevation in the Missouri River. The site is connected to the river through the constructed 49.1 acre open water area. When the river level exceeds an elevation of 449' MSL for a substantial amount of time water fills the borrow pit and spills over and through a series of berms and floods the entire site.

Water depth is controlled by a stand pipe with stop logs located at the northeast corner of the site. The water control structure is set to allow approximately one foot of water to stand on the majority of the site. The length and depth of inundation can be controlled by removing or adding stop logs to the stand pipe. Rainfall also accounts for the inundation of many small areas within the site. These small pockets and low spots where rainwater collects often hold water through most of the summer often into August.

During May of 2004 large amounts of rain inundated several low spots in the site with at least a few inches of water. An adequate amount of rain over the summer allowed these spots to retain standing water for the entire growing season. This is the first time since the monitoring started that this has occurred. However the water level in the open water area did not reach an elevation high enough to overtake the berm surrounding it and flood the site.

Discussions this year about the lack of inundation at Site 2 introduced a couple of options for consideration. One option was to mechanically pump water out of the pond and the other is to create a water control structure to allow flood water from the river through the agricultural levee into the site. In order to assess the feasibility of pumping water from the pond a short term experiment was conducted in October. Theoretically without absorption or evaporation it would require a 1500 gpm. pump 8 days to cover the site with six inches of water.

It was planned that a pump would be placed in the pond on the east side of Area C the jurisdictional wetland. However due to unknown conditions the pump was placed in the south-west corner of the pond along the west side of the jurisdictional wetland. On October 11 the pump was started and ran continuously for eight days. The progress of inundation was monitored. After approximately two days of pumping there were a couple acres of Area B flooded. Four days into pumping Areas B and D were inundated half way from the access road to the west board walk. The results of eight days of pumping inundated about fifteen acres; all of Area C and Areas B and D almost up to the boardwalk.

The placement of the pump might have had some influence on the number of acres that were inundated. The water moved almost directly into one of the lowest spots on the site. The water in a few acres of Area B was over fifteen inches deep. If the pump would have been placed where planned it would have potentially flooded more of the site. However eight days of pumping was not even close to inundating the entire site. This experiment showed the difficulty of mechanically flooding a site of this size with the soil types present. The pump was rated at 1500 gpm. but due to the rise the water was pumped over it probably was actually moving about 1300 gpm. At this rate it moved about 15 million gallons during the eight days of pumping and covered approximately fifteen acres. After attempting to inundate the site by pumping it appears that the water control structure would be a more effective way to potentially flood the entire site.

Soil samples were taken from both sites. At Site 1 samples were collected in Area A and Area C. At Site 2 samples were taken from all areas except the jurisdictional wetland

(Area C). Several small samples were taken from each area and combined to create a general representation of the soil in that area. Samples were analyzed using two methods; the Munsell Soil Color Charts and a LaMotte Chemical Soil Texture Demonstration. The table below shows the results for both of the soil tests. The Munsell values are noted in order of hue then value/chroma and the texture results show the percent of sand, silt, and clay in each sample.

MCLD Soil Sample Results				
Area	**Munsell Notation**	**% SAND**	**% SILT**	**% CLAY**
		Site # 1		
A	2.5Y 3/2	40%	47%	13%
C	10YR 3/1	20%	27%	53%
		Site # 2		
A	2.5Y 4/2	40%	40%	20%
B	10YR 4/2	40%	53%	7%
D	2.5Y 5/3	27%	43%	30%
E	2.5Y 4/3	67%	27%	6%
F	10YR 4/1	26%	44%	30%
G	2.5Y 3/1	20%	17%	63%
H	2.5Y 3/2	47%	47%	6%
I	10YR 3/1	20%	13%	67%
J	2.5Y 3/2	40%	27%	33%

Throughout both sites there are areas that contain high percentages of sand in the soil profile. At Site 1, in Area A the planted vegetation is creating biomass which is adding to the organic content of the soil. This in turn will improve the ability of the sandy soil to sustain plant life and in time along with the annual inundation will create hydric conditions in Area A. At Site 2 the soil conditions are improving in areas where the planted grasses have established solid stands and where water stands for long periods of time. Areas D and E, which are centered in the middle of the site, have a low percentage of clay in the soil. They are also higher in elevation than the surrounding areas and have never been inundated during the growing season. The rest of the areas within the site have large portions that become inundated just from rainfall. The lack of flooding in these two areas is slowing the breakdown of organic material and hindering the soil building process.

XV. General Overview of Sites

Site #1

This was the final year of monitoring for Site 1. Areas A and C continue to improve with the natural recruitment of natural populations of wetland species and the spread of planted species. These two areas have also been inundated each season proving that the hydrology is in place to sustain a viable wetland. The soil in Area A has large amounts of sand, especially in the northern half, however it tends to hold water well when inundated and with time the soils will improve allowing the wetland vegetation to establish a solid stand.

Since Area C was not excavated it contains a good amount of clay in the soil and has a tremendous seed bank. This has made it difficult to create a solid stand with the seeded plants due to the competition of the naturally occurring species. The plugs however in Area C are doing extremely well. The overall make up of Area C depends mainly on the amount of rainfall received though out the season. In years where the pond holds water for a long period the vegetation trend of mainly obligate species. When it is inundated for shorter periods the species profile may be completely different but still wetland species dominated.

Area B is changing fast in succession terms from a willow dominated thicket to an area that will be dominated with cottonwood, box-elder, and hardwoods. There has even been some natural recruitment of oaks observed on the north end of the area. The planted trees are doing well and overall canopy is thinning itself allowing for the general species inventory to grow. The one problem in this area is the amount of standing and fallen snags from the dying willows that make much the area impassible not only to humans but also some wildlife. These snags will eventually break down and improve the soil conditions.

Site #2

Overall the plant communities at Site 2 are improving. The planted and plug species are increasing in size and spreading throughout the site. Area D is the biggest problem area within the site. The wetland species are having difficulty surviving because of the overall sandy soil type and dry conditions. Cottonwoods and willows are also creating a problem throughout the site. In areas where the native grasses have created a thick stand and the spots that hold water the trees are not a major problem. Annual mowing has kept the trees elsewhere from getting to large to control and allowed the introduced species to compete.

While there are many spots in the site that hold water well into the growing season the major problem for the site continues to be the hydrology. The size of the site creates a situation where rain alone does not have the capacity to inundate the entire site. This makes the hydrology totally dependant on the river forcing water out of the pond. This

has yet to happen creating a lack of hydrology. Several options to introduce water into the site have been discussed. Pumping was experimented with this fall just to see whether or not the site would even hold water. Several acres were successfully flooded especially Area D which held water better than expected. It took many more gallons to flood those acres than hoped but it can be flooded. Steps taken to improve the hydrology on the site will also help improve all other criteria for this project.

XVI. Tables and Figures

Table 1 - Wet Meadow Seed Species

TABLE 1 - WET MEADOW SEED SPECIES LIST	
COMMON NAME	***SPECIES***
Big Blue Stem	*Andropogon gerardii*
Blue Joint Grass	*Calamagrostis canadensis*
Bottlebrush Sedge	*Carex hystricina*
Fringed Sedge	*Carex crinita*
Brown Fox Sedge	*Carex vulpinoides*
Various Sedges	*Carex spp.*
Fowl Manna Grass	*Glyceria striata*
Prairie Switch Grass	*Panicum virgatum*
Dark Green Rush	*Scirpus atrovirens*
Indian Grass	*Sorghastrum nutans*
Prairie Cordgrass	*Spartina pectinata*

Table 2 - RPM Tree Species

TABLE 5 - CONTAINERIZED TREE SPECIES LIST	
COMMON NAME	***SPECIES***
Bitternut	*Carya cordiformis*
Pecan	*Carya illinoensis*
Butternut / White Walnut	*Juglans cinerea*
Black Walnut	*Juglans nigra*
Swamp White Oak	*Quercus bicolor*
Overcup Oak	*Quercus lyrata*
Bur Oak	*Quercus macrocarpa*
Swamp Chestnut Oak	*Quercus michauxii*
Pin Oak	*Quercus palustris*
Shumard Oak	*Quercus shumardii*

Table 3 - Emergent Seed Species

TABLE 3 - EMERGENT SEED SPECIES LIST	
COMMON NAME	***SPECIES***
Sweet Flag	*Acorus calamus*
Water Plantain	*Alisma subcordata*
Millet	*Echinochloa crusgalli frumentacea*
Spike Rush	*Eleocharis palustris*
Arrow Arum	*Peltandra virginica*
Pinkweed	*Polygonum pensylvanicum*
Pickerel Weed	*Pontederia cordata*
Common Arrowhead	*Sagittaria latifolia*
Soft-stem Bulrush	*Scirpus validus*

Table 4 - Wetland Plug Species

TABLE 4 – PLUG SPECIES LIST	
SPECIES NAME	***SPECIES NAME***
Acorus calamus	*Alisma subcordatum*
Carex annectens	*Alisma plantago-aquatica*
Carex vulpinoidea	*Lycopus virginicus*
Carex squarrosa	*Amorpha fruticosa*
Carex lupulina	*Rorippa spp.*
Carex muskingumensis	*Lindernia dubia*
Carex crus-corvi	*Bacopa rotundifolia*
Carex lanuginose	*Bidens connata*
Carex frankii	*Bidens aristosa*
Carex ovalis	*Bidens cernua*
Carex grayii	*Boltonia asteroids*
Carex cristatella	*Mimulus ringens*
Eleocharis obtuse	*Leersia oryzoides*
Equisetum arvense	*Polygonum coccineum*
Hibiscus militaris	*Ammania coccinea*
Iris virginica	*Lobelia siphilitica*
Juncus torreyi	*Aster puniceus*
Ludwigia alternifolia	*Asclepias incarnata*
Peltandra virginica	*Scutellaria lateriflora*
Rumex verticillatus	*Cyperus spp.*
Sagittaria latifolia	*Lippia lanceolata*
Scirpus atrovirens	*Chelone glabra*
Scirpus americanus	*Eupatorium coelestinum*
Tripsacum dactyloides	*Lysimachia hybrida*

Table 5 - RPM Shrub Species

TABLE 5 - CONTAINERIZED SHRUB LIST	
COMMON NAME	***SPECIES***
Buttonbush	*Cephalanthus occidentalis*
Silky Dogwood	*Cornus amomum*
Rough-leaved Dogwood	*Cornus drummondi*
Gray Dogwood	*Cornus racemosa*
Deciduous Holly	*Ilex decidua*

Table 6 - Bare-root Tree Species

TABLE 4 - BARE-ROOT SPECIES LIST	
COMMON NAME	***SPECIES***
Bitternut	*Carya cordiformis*
Shellbark Hickory	*Carya laciniosa*
Pecan	*Cayra illinoiensis*
Butternut	*Juglans cinerea*
Black Walnut	*Juglans nigra*
Swamp White Oak	*Quercus bicolor*
Shingle Oak	*Quercus imbricaria*
Overcup Oak	*Quercus lyrata*
Bur Oak	*Quercus macrocarpa*
Pin Oak	*Quercus palustris*
Willow Oak	*Quercus phellos*
Shumard Oak	*Quercus shumardii*

Table 7 – Species Inventory List

Species		Site # 1				Site # 2							
Area		A	B	C		A	B	C	D	F	G	H	I
Abutilon theophrasti	FACU		X										
Acer negundo	FACW	X	X	X		X	X	X		X	X	X	X
Acer saccharinum	FACW												X
Achillea millefolium	FACU									X			
Acorus calamus	OBL			X									
Agalinis tenuifolia	FACW	X								X			X
Alisma gramineum	OBL											X	
Alisma subcordatum	OBL											X	
Amaranthus sp.	FAC	X									X	X	
Ambrosia artemisiifolia	FACU	X		X		X	X	X	X	X	X	X	X
Ambrosia trifida	FAC+	X	X	X		X	X	X	X	X	X	X	X
Ammannia coccinea	OBL	X		X		X	X			X	X	X	
Amorpha fruticosa	FACW+	X	X	X		X	X			X	X		
Ampelamus albidus	FAC		X	X		X	X		X	X	X		
Andropogon garardii	FAC-	X					X			X			X
Andropogon scorparius	FACU-						X			X	X	X	
Andropogon virginicus	FAC-											X	
Apocynum cannabinum	FAC	X	X	X		X	X	X	X	X		X	X
Asclepias incarnata	OBL	X		X		X	X			X	X	X	
Asclepias syriaca		X										X	
Aster novae-angliae	FACW					X	X				X	X	X
Aster pilosus	FACU+	X	X			X	X	X	X	X	X	X	X
Aster sp.		X	X	X		X	X						X
Astragalus canadensis	FAC+					X	X		X	X			
Bergia texana	OBL	X					X						
Bidens aristosa	FACW			X		X	X			X	X		X
Bidens comosa	FACW			X		X	X			X	X		X
Bidens discoidea	FACW			X		X	X			X	X		X
Bidens frondosa	FACW			X		X	X			X	X		X
Bidens sp.			X	X		X	X	X		X	X		X
Boehmeria cylindrica	OBL		X										X
Boltonia asteroides	FACW	X										X	X
Brickellia eupatoriodes						X							
Bromus elongatus		X											
Bromus inermis		X				X				X		X	
Bromus japonicus	FACU			X			X	X			X	X	X
Bromus squarrosus				X									X
Campsis radicans	FAC	X				X				X		X	
Cardiospermum halicababum	FAC					X		X					
Carduus nutans				X		X	X	X	X	X	X	X	X
Carex annectans	FACW	X		X		X	X		X	X	X		

Carex crawfordii	FAC+					X					X		
Carex cristatella	FACW+			X		X	X			X			
Carex crus-corvi	OBL			X		X	X		X	X	X	X	X
Carex frankii	OBL			X								X	X
Carex grayii	FACW+										X		
Carex hystericina	OBL					X						X	X
Carex lacustris	OBL											X	X
Carex lupulina	OBL			X									X
Carex lurida	OBL			X									
Carex molesta	FAC+			X		X	X			X	X	X	
Carex muskingumensis	OBL			X		X	X		X		X		X
Carex shortiana	FACW+			X		X				X			X
Carex sp.						X							
Carex squarrosa	OBL			X									X
Carya sp.	FACW									X			
Cassia fasciculata	FACU-					X	X	X		X	X		X
Cassia marilandica	FACW					X	X			X	X	X	X
Cephalanthus occidentalis	OBL	X		X		X			X	X			X
Chasmanthium latifolium	FACW					X				X		X	
Chenopodium album	FAC-						X			X			
Cirsium discolor		X		X		X	X					X	
Cirsium vulgare	FACU-	X		X									
Conium maculatum	FACW			X			X						
Conobea multifida	FACW+	X				X	X			X			
Conyza canadensis	FAC-	X	X	X		X	X	X	X	X		X	
Coreopsis tripteris	FAC					X	X		X	X	X	X	X
Cornus drummondi	FAC	X				X			X				X
Cornus sp.												X	
Coronilla varia						X							
Croton glandulosus			X										
Cyperus acuminatus	OBL	X		X		X	X			X	X	X	X
Cyperus sp.										X			
Cyperus squarrosus	OBL	X		X		X	X			X	X	X	
Cyperus strigosus	FACW	X	X	X		X	X			X	X	X	
Dactylis glomerata	FACU									X			
Dalea alopecuroides		X				X	X		X	X	X		X
Dalea candida							X		X	X			
Dalea purpurea							X		X	X			X
Daucus carota		X		X		X				X			
Desmanthus illinoensis	FAC-	X		X		X	X	X	X	X	X	X	X
Desmodium sp.		X	X	X		X	X	X		X	X	X	X
Dianthus armeria						X							
Digitaria ischaemum	FACU							X					
Digitaria sanguinalis	FACU					X							
Echinochloa crusgalli	FACW	X		X		X	X			X	X	X	X
Eclipta alba	FACW						X				X		
Elaeagnus umbellata								X				X	
Eleocharis compressa	FACW	X				X	X			X	X	X	

Eleocharis lanceolata	FACW					X	X			X		X	
Eleocharis obtusa	OBL	X				X	X			X	X	X	
Elymus canadensis	FAC-	X				X	X			X	X	X	X
Elymus virginicus	FACW-							X					X
Equisetum arvense	FAC	X											
Eragrostis spectabilis	UPL	X					X						
Erigeron annuus	FAC-	X				X	X	X	X	X	X	X	X
Erigeron philadelphicus	FACW	X	X			X	X					X	X
Eupatorium coelestinum	FAC+	X								X	X	X	
Eupatorium perfoliatum	FACW+	X	X										
Eupatorium rugosum	FACU	X	X	X		X	X	X	X	X	X	X	X
Euphorbia maculata	FACU-						X				X	X	X
Euphorbia supina							X						X
Festuca sp.						X	X			X	X	X	X
Fraxinus pennsylvanica	FACW		X										
Galium sp.		X											
Gaura parviflora	FACU		X			X	X		X		X	X	
Geranium carolinianum		X		X		X				X		X	
Glyceria striata	OBL			X							X		
Helenium autumnale	FACW+									X	X		
Helianthus annuus	FAC-					X	X			X			X
Heliopsis helianthoides						X	X			X		X	
Heterotheca latifolia						X					X		X
Hibiscis lasiocarpos	OBL			X		X				X		X	X
Hibiscus militaris	OBL			X		X				X	X		
Hordeum jubatum	FAC+					X					X		
Ilex decidua	FACW	X				X			X			X	
Impatiens sp.	FACW		X										
Ipomoea hederacea	FAC			X									
Ipomoea lacunosa	FACW			X		X							
Iris virginiana	OBL	X		X									
Iva ciliata	FAC					X	X			X	X		X
Juncus effusus	OBL					X				X	X		
Juncus gerardii	OBL										X		
Juncus interior	FAC+					X				X	X		
Juncus nodatus	OBL					X	X			X	X		
Juncus torreyi	FACW					X	X			X	X		
Krigia biflora	FACU	X		X		X	X		X	X	X	X	X
Krigia dandelion	FACU	X									X		X
Kuhnia eupatorioides						X						X	
Lactuca canadensis	FACU+					X	X	X					X
Lactuca saligna	FACU					X					X	X	
Lactuca scariola	FAC			X		X	X	X	X		X	X	X
Leersia oryzoides	OBL	X		X		X						X	
Lespedeza capitata	FACU						X						
Leucanthemum vulgare						X	X						
Lindernia anagallidea	OBL											X	
Lippia lanceolata	OBL	X	X	X		X	X			X	X	X	

Lolium perenne	FACU					X	X			X	X	X	
Lycopus americanus	OBL		X	X		X			X	X		X	X
Lythrum alatum	OBL					X				X	X	X	
Medicago lupulina	FAC-					X							
Medicago sativa		X		X		X	X	X	X	X	X	X	X
Melilotus alba	FACU	X		X		X	X		X	X	X		X
Melilotus officinales	FACU	X		X		X	X		X	X	X		X
Mimulus alatus	OBL					X							
Mimulus ringens	OBL					X							
Miscanthus sp.	UPL										X		
Monarda bradburiana	UPL											X	
Monarda fistulosa	FACU					X	X				X	X	X
Monarda punctata	UPL					X						X	
Morus alba	FAC		X			X		X					X
Oenethera biennis		X				X	X					X	
Panicum capillare	FAC	X					X						
Panicum dichotomiflorum	FACW-	X		X		X	X		X	X	X	X	X
Panicum virgatum	FAC+	X		X		X	X		X	X	X	X	X
Paspalum laeve	FACW-	X		X		X	X				X	X	
Penstemon digitalis	FAC-					X	X		X	X	X		X
Phalaris arundinacea	FACW+			X									
Phleum pretense	FACU									X			X
Plantago lanceolata	FAC											X	X
Plantago rugelii	FAC	X				X						X	X
Plantago virginica	FACU-	X				X			X				X
Platanus occidentalis	FACW		X							X			X
Poa pratensis	FACU	X								X			
Polygonum coccineum	OBL		X			X						X	
Polygonum hydropiper	OBL										X		
Polygonum hydropiperoides	OBL										X		
Polygonum lapathifolium	FACW+	X		X		X				X	X		X
Polygonum pensylvanicum	FACW+	X		X		X	X	X		X	X	X	X
Polygonum persicaria	FACW			X		X	X		X	X	X	X	X
Polygonum scandens	FAC					X	X				X	X	
Populus deltoides	FAC+	X	X	X		X	X	X	X	X	X	X	X
Prenanthes aspera	UPL											X	
Pycnanthemum pilosum	FAC					X	X					X	X
Pycnanthemum tenuifolium	FAC					X	X					X	X
Ratibida pinnata		X											
Rhus glabra						X			X	X			
Rhus radicans			X									X	X
Robina hispida									X				
Rudbeckia hirta	FACU					X				X	X		
Rudbeckia laciniata	FACW+			X									
Rudbeckia triloba	FAC-			X									
Rumex crispus	FAC+	X	X	X		X	X	X		X	X	X	X
Rumex stenophyllus	FACW	X	X	X			X			X	X		X
Rumex verticillatus	OBL	X	X	X		X	X			X	X	X	X

Sagitaria latifolia	OBL											X	
Salix amygdaloides	FACW					X	X	X	X	X	X	X	X
Salix caroliniana	OBL		X	X		X	X	X			X		X
Salix interior	OBL	X	X	X		X	X	X	X	X	X	X	X
Scirpus atrovirens	OBL					X				X	X	X	
Schoenoplectus heterochaetus	OBL					X				X		X	
Schoenoplectus tabernaemontani	OBL					X				X	X		
Scutellaria laterifolia	OBL			X		X							
Senecio glabellus	OBL	X	X	X		X							
Setaria faberii	FACU+					X		X				X	
Silene antirrhina		X				X			X	X		X	X
Silphium integrifolium						X	X						
Silphium perfoliatum	FACW-					X			X	X		X	X
Sium suave	OBL	X		X									
Solanum americanum	FACU-					X							
Solanum carolinense	FACU-			X									
Solidago canadensis	FACU	X	X	X		X	X	X	X	X	X	X	X
Solidago graminifolia						X							
Solidago rigida	FACU					X	X						
Sorghastrum nutans	FACU+	X				X	X		X	X	X	X	X
Sorghum halepense	FACU		X	X		X	X	X	X	X	X	X	X
Spartina pectinata	FACW+	X		X		X	X			X	X	X	
Sporobolus heterolepis						X							
Stellaria media	FACU						X						
Strophostyles helvola	FAC+	X	X	X		X	X	X	X	X	X		X
Strophostyles leiosperma		X	X	X		X	X		X	X	X		X
Taraxacum officinale	FACU			X		X							
Thlaspi arvense		X				X	X		X	X	X		X
Torilis japonica			X	X		X	X		X			X	X
Tradiscantia sp.		X				X							
Trifolium campestre								X			X	X	
Trifolium pratense	FACU	X		X		X					X		
Triodanis perfoliata	FAC	X				X	X	X	X	X	X		
Typha latifolia	OBL						X					X	X
Ulmus americana	FACW-							X					
Urtica dioica	FAC+		X	X									
Valerianella radiata	FAC+	X									X		
Verbascum blattaria	FACU-					X				X			X
Verbascum thapsus				X									
Verbena hastata	FACW+							X			X	X	X
Verbena urticifolia	FAC+		X	X		X	X	X		X	X	X	X
Veronica arvensis		X		X		X	X				X	X	
Vicia villosa				X		X	X			X	X	X	X
Viola sp.			X										
Vitis vulpina	FACW-		X	X				X		X		X	X
Xanthium chinense	FAC	X		X		X	X			X	X	X	
Zizia aurea	FAC+								X				

Chesterfield Valley Wetland Mitigation Project St. Louis County, Missouri

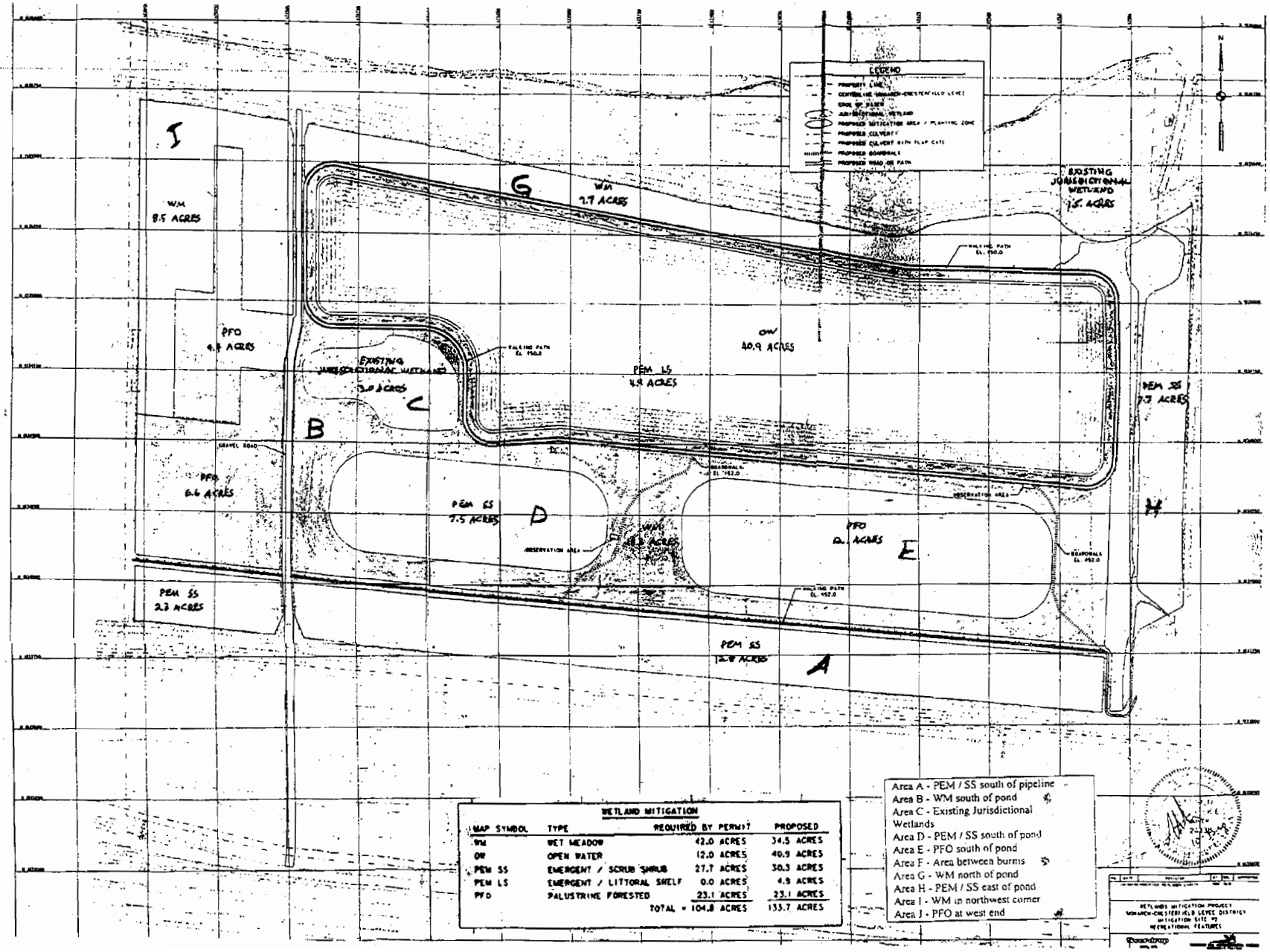
(USACE PERMIT NO. P-2302 / CITY OF CHESTERFIELD)

Annual Monitoring Report
2005

Prepared for Monarch-Chesterfield Levee District

By

The Zahniser Institute for Environmental Studies



WETLAND MITIGATION

MAP SYMBOL	TYPE	REQUIRED BY PERMIT	PROPOSED
WM	WET MEADOW	42.0 ACRES	34.5 ACRES
OW	OPEN WATER	12.0 ACRES	40.9 ACRES
PEM SS	EMERGENT / SCRUB SHRUB	27.7 ACRES	30.3 ACRES
PEM LS	EMERGENT / LITTORAL SHELF	0.0 ACRES	4.9 ACRES
PFO	PALUSTRINE FORESTED	23.1 ACRES	23.1 ACRES
	TOTAL =	104.8 ACRES	133.7 ACRES

I. Introduction

In February of 1999, the Monarch-Chesterfield Levee District entered into a contract with Greenville College for the construction and improvement of wetland areas mitigated under U.S. Army Corps of Engineers (USACE) Permit No. P-2302. This year (2005), monitoring and maintenance were carried out in accordance with guidelines set forth in the City of Chesterfield Wetland Mitigation Plan. This report details the procedures used during monitoring events and the results obtained by them.

The Chesterfield Valley Wetland Mitigation Project is divided into two areas. Site #1 is a 43-acre tract located at approximately Missouri River Mile 43, and Site #2 is a 246-acre tract at approximately Missouri River Mile 40. This report details the results for the final year of monitoring at Site #2. Results are presented respectively.

II. Physical Description - Site #2

Ten distinct management areas are defined in Site #2. Area A is a 15.1 acre depression divided by the levee access road into two sections, 2.3 and 12.8 acres each. Area A was created as an emergent / scrub shrub area. In 1999, wetland species plugs were planted throughout on approximately six foot centers. A complete listing of plug species can be found in Table 4, Wetland Plug Species. Planting was completed in December and January of 2001 and 2002, respectively. Indian grass, switchgrass, rice cut-grass, cordgrass, and Canada wild rye were broadcast over the area. In addition, RPM containerized shrubs were installed in 57 groups of 16 (4x4 grid, 4 foot on center) through the site. Some units were broken up and planted on the margins of consistently wet areas to maximize moisture utilization. A complete listing of containerized shrub species can be found in Table 5, Shrub Species.

Area B is an 18.3 acre wet meadow area bordering existing jurisdictional wetland, emergent / scrub, and palustrine forested areas. Area B was hand planted on the east end with wetland species plugs in 1999 (Table 4). In 2000, two 600' observation boardwalks were constructed from the north and south berms. Drilling of wet meadow species was completed in 2001. A complete listing of wet meadow species can be found in Table 1, Wet Meadow Species.

Area C is a 3 acre section of existing jurisdictional wetland at the southwest corner of the borrow pit. No construction or augmentation was performed in this area in order to preserve the soil and vegetative communities found there. Monitoring in Area C was included in each monitoring event to document species occurring there.

Area D is a 7.5 acre emergent scrub / shrub area between the west boardwalk and the levee access road. In 1999, plugs of wetland species were hand planted on six foot centers in Area D. A complete listing of species can be found in Table 4, Wetland Plug

Species. Seeds of wet meadow species were broadcast in 2001. In January of the following year, RPM containerized trees were installed in 28 groups of 16 (4x4 grid, 4 foot on center) through the site. Complete listings of wet meadow and containerized shrub species can be found in Tables 1 & 2, respectively.

Area E is a 12.1 acre palustrine forest area constructed between the boardwalks. Bare-root trees were planted on ten foot centers throughout the site in 2000. A complete listing of bare-root species can be found in Table 6, Bare-root Tree Species. In 2001, RPM containerized trees were planted on twenty foot centers throughout the site. A complete listing of containerized tree species can be found in Table 2.

Area F is a 4.9 acre littoral shelf area delineated by the area between the borrow pit berm and the wet meadow berm. Plugs of wetland species were hand planted in 1999 (Table 4). In 2001, seeds of wet meadow species were broadcast into the site (Table 1).

Area G is a wet meadow planting area totaling 7.7 acres. It runs the length of the borrow pit, along the north edge of the site. Plugs of wetland species were hand planted on six foot centers throughout the site in 1999 (Table 4). In 2001, seeds of wet meadow species were drilled into the site (Table 1).

Area H, also 7.7 acres, is constructed as an emergent scrub / shrub vegetation area at the east end of the site, adjacent to the east property line. Planting consisted of hand-planted plugs in 1999 (Table 4) and broadcast seed in 2001 (Table 3).

Area I, in the northwest corner of the site, is an 8.5 acre wet meadow area. In 1999, plugs of wetland species were hand-planted throughout the site (Table 4). Drilling of wet meadow seeds took place in 2001 (Table 1).

Area J is a 6.6 acre palustrine forested area located in the southwest corner of the site. In 2000, bare-root tree species were planted on ten foot centers throughout the site (Table 6). Containerized tree species on twenty foot centers followed in 2002 (Table 2).

III. Site #2 Monitoring Activities / Results

Three scheduled monitoring events took place in 2005. Site visits occurred in the months of May and September, with wildlife observation only in December. Complete monitoring events were carried out in May and September.

Monitoring at Site #2 utilized a variety of vegetation sampling methods. Permanent monitoring stakes were established throughout the sites. At each stake, a quadrat one meter on each side was laid out, and a percent cover inventory was taken in each of the quadrats. The inventory method was such that the total amount of area a particular species covered in any strata inside the quadrat was approximated. Because various species can occur in different strata, percentage totals for all the species can be greater

than 100. In addition, a visual species inventory was done on 100 meter transects extending along the long axis of each site, on two sides of the monitoring stakes. Any additional species that were noted between monitoring stakes were also described. The visual species inventory results for all areas are displayed in Table 7.

In areas where bare-root trees and containerized trees were planted, the following protocol was used. A sample size representative of the overall health of the plantings was randomly chosen along a transect through the area. Individual specimens were examined and assigned a health value of 0 through 2. Zero represented complete mortality, 1 indicated fair health, and 2 indicated good survivorship.

May Results

Percent cover inventories of permanent monitoring sites in Area A yielded the following results:

A-1: 60% *Medicago sativa*, 20% *Ambrosia trifida*, 10%, *Oenethera biennis*, 10% *Solidago canadensis*, ≤5% *Ilex dedidua*, ≤5% *Panicum virgatum*, ≤5% *Sorghum halepense*

A-2: 30% *Medicago sativa*, 20% *Populus deltiodes*, 20% *Salix interior*, 10% *Desmanthus illinoensis*, 10% *Sorghastrum nutans*, ≤5% *Melilotus alba*

A-3: 20% *Desmanthus illinoensis*, 20% *Populus deltiodes*, 20% *Salix interior*, 10% *Sorghastrum nutans*, 10% *Strophostyles helvola*, ≤5% *Erigeron annuus*, ≤5% *Medicago lupulina*, ≤5% *Panicum virgatum*, ≤5% *Solidago canadensis*

A-4: 25% *Sorghastrum nutans*, 20% *Medicago sativa*, 10% *Desmanthus illinoensis*, ≤5% *Salix interior*, ≤5% *Solidago canadensis*

A-5: Not Located

A-6: 25% *Festuca sp.*, 20% *Desmanthus illinoensis*, 20% *Solidago canadensis*, ≤5% *Ambrosia artemisiifolia*, ≤5% *Ambrosia trifida*

Percent cover inventories of permanent monitoring sites in Area B yielded the following results:

B-1: 40% *Populus deltoides*, 40% *Sorghastrum Nutans*, ≤5% *Desmanthus illinoensis*, ≤5% *Salix interior*

B-2: 40% *Sorghastrum nutans*, ≤5% *Desmanthus illinoensis*, ≤5% *Erigeron annuus*, ≤5% *Populus deltoides*, ≤5% *Strophostyles helvola*, ≤5% *Trifolium campestre*

B-3: 50% *Sorghastrum nutans*, 20% *Populus deltoides*, 10% *Panicum virgatum*, ≤5% *Solidago canadensis*, ≤5% *Strophostyles helvola*

B-4: 30% *Sorghastrum nutans*, 10% *Populus deltoides*, ≤5% *Erigeron annuus*, ≤5% *Medicago sativa*

B-5: 30% *Sorghastrum nutans*, 10% *Panicum virgatum*, ≤5% *Erigeron annuus*, ≤5% *Solidago canadensis*, ≤5% *Strophostyles helvola*

B-6: 60% *Sorghastrum nutans*, 10% *Medicago lupulina*, 10% *Solidago canadensis*, ≤5% *Erigeron annuus*

Percent cover inventories of permanent monitoring sites in Area C yielded the following results:

C-1: 80% *Sorghum halepense*, 20% *Torrilis japonica*, 10% *Erigeron annuus*, ≤5% *Krigia biflora*

C-2: 30% *Solidago canadensis*, 20% *Cassia fasciculata*, ≤5%*Ambrosia trifida*, ≤5% *Bromus japonica*

Percent cover inventories of permanent monitoring sites in Area D yielded the following results:

D-1: 30% *Solidago canadensis*, 20% *Strophostyles helvola*, ≤5% *Aster sp.*, ≤5% *Conyza canadensis*, ≤5% *Erigeron annuus*, ≤5% *Medicago sativa*

D-2: 50% *Sorghastrum nutans*, 20% *Strophostyles helvola*, 10% *Desmanthus illinoensis*, ≤5% *Populus deltoides*

The following tables give the monitoring results for Area E:

Transect 1				Transect 2			
Species	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**
Bare Root		Containerized		Bare Root		Containerized	
Unidentified	0	*Quercus sp.*	2	*Unidentified*	0	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2	*Platanus occidentalis*	2	*Juglans nigra*	2
Carya illinoensis	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	1	*Quercus sp.*	2	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	2	*Carya illinoensis*	1	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	0	*Unidentified*	0	*Quercus sp.*	2
Carya illinoensis	2	*Juglans nigra*	2	*Unidentified*	0	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	2	*Unidentified*	0
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2	*Unidentified*	0	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	1	*Juglans nigra*	2
Unidentified	0	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2	*Unidentified*	0	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2	*Unidentified*	0	*Unidentified*	0
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	2	*Juglans nigra*	2	*Quercus sp.*	2	*Unidentified*	0
Unidentified	0			*Unidentified*	0		
Unidentified	0			*Quercus sp.*	2		
Quercus sp.	2			*Quercus sp.*	2		
Quercus sp.	1			*Unidentified*	0		
Unidentified	0			*Platanus occidentalis*	2		
Platanus occidentalis	1			*Quercus sp.*	2		
Platanus occidentalis	2			*Platanus occidentalis*	2		
Quercus sp.	1			*Carya illinoensis*	2		
Unidentified	0			*Carya illinoensis*	2		
Quercus sp.	1			*Carya illinoensis*	2		
Unidentified	0			*Quercus sp.*	2		
Unidentified	0			*Platanus occidentalis*	2		
Unidentified	0			*Platanus occidentalis*	2		
Carya illinoensis	2			*Quercus sp.*	2		
Unidentified	0			*Platanus occidentalis*	2		
Quercus sp.	2			*Quercus sp.*	2		
Quercus sp.	2			*Quercus sp.*	2		
Platanus occidentalis	1			*Quercus sp.*	2		
Unidentified	0			*Quercus sp.*	2		
Average Vigor:			1.281	Average Vigor:			1.561

Transect 3			
Species	**Vigor**	**Species**	**Vigor**
Bare Root		Containerized	
Quercus sp.	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2
Carya illinoensis	2	*Juglans nigra*	1
Carya illinoensis	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	0
Unidentified	0	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2
Quercus sp.	1	*Juglans nigra*	2
Unidentified	0	*Quercus sp.*	2
Quercus sp.	1		
Quercus sp.	1		
Quercus sp.	2		
Unidentified	0		
Unidentified	0		
Platanus occidentalis	2		
Quercus sp.	2		
Quercus sp.	2		
Unidentified	0		
Quercus sp.	2		
Quercus sp.	2		
Quercus sp.	1		
Carya illinoensis	1		
Quercus sp.	1		
Unidentified	0		
Platanus occidentalis	2		
Platanus occidentalis	2		
Platanus occidentalis	2		
Unidentified	0		
Overall Survivorship: 75%		Average Vigor:	1.386

Percent cover inventories of permanent monitoring sites in Area F yielded the following results:

F-1: 60% *Populus deltoides*, 20% *Solidago canadensis*, 10% *Salix amygdaloides*, 10% *Vicia villosa*, ≤5% *Carex molesta*, ≤5% *Erigeron annuus*

F-2: 90% *Spartina pectinata*, 80% *Desmanthus illinoensis*, 10% *Festuca sp.*

F-3: 40% *Festuca sp.*, 25% *Populus deltoides*, 25% *Solidago canadensis*, 10% *Sorghum halepense*, ≤5% *Trifolium pratense*, ≤5% *Vicia villosa*

F-4: 50% *Spartina pectinata*, 10% *Populus deltoides*, 10% *Vicia villosa*, ≤5% *Bidens sp.*, ≤5% *Festuca sp.*, ≤5% *Medicago lupulina*

F-5: 40% *Sorghastrum nutans*, 10% *Desmanthus illinoensis*, 10% *Medicago lupulina*, 10% *Populus deltoides*, ≤5% *Festuca sp.*, ≤5% *Strophostyles helvola*, ≤5% *Trifolium pratense*

F-6: 80% *Sorghastrum nutans*, ≤5% *Hibiscus militaris*, ≤5% *Medicago lupulina*, ≤5% *Strophostyles helvola*

F-7: 30% *Medicago lupulina*, 25% *Erigeron annuus*, 10% *Aster pilosus*, 10% *Sorghum halepense*

Percent cover inventories of permanent monitoring sites in Area G yielded the following results:

G-1: 30% *Sorghastrum nutans*, 20% *Populus deltoides*, 10% *Melilotus alba*, ≤5% *Solidago canadensis*, ≤5% *Strophostyles helvola*

G-2: 30% *Populus deltoides*, 15% *Sorghastrum nutans*, 10% *Medicago lupulina*, ≤5% *Solidago canadensis*

G-3: 60% *Sorghastrum nutans*, ≤5% *Erigeron annuus*, ≤5% *Medicago lupulina*, ≤5% *Solidago canadensis*, ≤5% *Strophostyles helvola*

G-4: Destroyed

G-5: 80% *Spartina pectinata*, ≤5% *Medicago lupulina*

Percent cover inventories of permanent monitoring sites in Area H yielded the following results:

H-1: 40% *Sorghastrum nutans*, 20% *Solidago canadensis*, 10% *Bromus japonicus*, 10% *Bromus racemosus*, 10% *Geranium carolinianum*, ≤5% *Ulmus americana*, ≤5% *Veronica arvensis*

H-2: 50% *Solidago canadensis*, 10% *Bromus japonicus*, 10% *Populus deltoides*, 5% *Acer negundo*, 5% *Cornus sp.*

H-3: 30% *Carex frankii*, 10% *Aster sp.*, 10% *Daucus carota*, 10% *Medicago lupulina*, 10% *Salix interior*, ≤5% *Ambrosia trifida*, ≤5% *Apocynum cannabinum*, ≤5% *Populus deltoides*

Percent cover inventories of permanent monitoring sites in Area I yielded the following results:

I-1: 40% *Sorghastrum nutans*, 10% *Populus deltoides*, ≤5% *Medicago lupulina*, ≤5% *Solidago canadensis*, ≤5% *Strophostyles helvola*

I-2: 30% *Sorghastrum nutans*, 20% *Aster sp.*, ≤5% *Carex molesta*

I-3: 20% *Carex crus-corvi*, 10% *Aster sp.*

I-4: 20% *Aster sp.*, 10% *Acer negundo*, 5% *Panicum virgatum*, 5% *Sorghastrum nutans*, 5% *Sorghum halepense*, ≤5% *Bromus japonicus*, ≤5% *Galium sp.*

Area J: Bare root oak tree that has sent up new growth after top had been eaten off by a rabbit.

The following table gives the monitoring results for Area J:

Transect 1				Transect 2			
Species	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**
Bare Root		Containerized		Bare Root		Containerized	
Platanus occidentalis	2	*Juglans nigra*	1	Unidentified	0	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Carya illinoensis*	2	*Juglans nigra*	2
Unidentified	0	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Carya illinoensis*	1	*Quercus sp.*	0
Quercus sp.	2	*Juglans nigra*	2	Unidentified	0	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	1
Unidentified	0	*Quercus sp.*	2	*Carya illinoensis*	1	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	1	*Quercus sp.*	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	1
Unidentified	0	*Quercus sp.*	2	*Carya illinoensis*	2	Unidentified	0
Unidentified	0	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Juglans nigra*	2
Unidentified	0	Unidentified	0	*Carya illinoensis*	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	2	Unidentified	0
Carya Illinoensis	2	*Quercus sp.*	2	*Carya illinoensis*	2	*Quercus sp.*	2
Unidentified	0	Unidentified	0	*Quercus sp.*	2	Unidentified	0
Unidentified	0	*Quercus sp.*	2	*Quercus sp.*	1	Unidentified	0
Quercus sp.	2	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2
Carya illinoensis	2			*Quercus sp.*	2		
Quercus sp.	2			Unidentified	0		
Carya illinoensis	2			Unidentified	0		
Unidentified	0			*Carya illinoensis*	1		
Quercus sp.	2			*Quercus sp.*	2		
Unidentified	0			*Platanus occidentalis*	2		
Quercus sp.	2			*Quercus sp.*	2		
Unidentified	0			Unidentified	0		
Quercus sp.	2			Unidentified	0		
Carya illinoensis	2			*Platanus occidentalis*	2		
Carya illinoensis	2			*Quercus sp.*	2		
Unidentified	0			Unidentified	0		
Quercus sp.	2			*Quercus sp.*	2		
Carya illinoensis	1			*Carya Illinoensis*	2		
Carya illinoensis	2			*Quercus sp.*	2		
Platanus occidentalis	2			*Platanus occidentalis*	2		
Unidentified	0			*Platanus occidentals*	2		
Unidentified	0			*Platanus occidentalis*	2		
Quercus sp.	1			*Platanus occidentalis*	2		
Unidentified	0			*Quercus sp.*	1		
Unidentified	0			*Quercus sp.*	2		
Unidentified	0			*Platanus occidentalis*	2		
Platanus occidentalis	1			*Platanus occidentalis*	2		
		Average vigor:	1.35	Overall Survivorship:	74%	Average vigor:	1.38

September Results

Percent cover inventories of permanent monitoring sites in Area A yielded the following results:

A-1: 30% *Sorghastrum nutans*, 15% *Ilex decidua*, 10 % *Ambrosia artemisiifolia*, 10% *Populus deltoides*, 10% *Sorghum halepense*, ≤5% *Aster pilosus*

A-2: 40% *Sorghastrum nutans*, 10% *Desmanthus illinoensis*, 10% *Populus deltoides*, 10% *Salix interior*, ≤5% *Aster pilosus*, ≤5% *Melilotus alba*, ≤5% *Strophostyles helvola*

A-3: 60% *Strophostyles helvola*, 40% *Panicum virgatum*, 20% *Populus deltoides*, 10% *Desmanthus illinoensis*, 10% *Salix interior*

A-4: 80% *Trifolium campestre*, 20% *Sorghastrum nutans*, 10% *Desmanthus illinoensis*, 10% *Solidago canadensis*, ≤5% *Aster pilosus*, ≤5% *Salix interior*

A-5: 30% *Populus deltoides*, 30% *Sorghastrum nutans*, 25% *Desmanthus illinoensis*, 10% *Strophostyles helvola*

A-6: 80% *Aster pilosus*, 60% *Desmanthus illinoensis*, 20% *Festuca sp.* ≤5% *Ambrosia artemisiifolia*, ≤5% *Ambrosia trifida*

Percent cover inventories of permanent monitoring sites in Area B yielded the following results:

B-1: 40% *Sorghastrum nutans*, 30% *Populus deltoides*, 25% *Dalea alopecuroides*, 10% *Panicum virgatum*

B-2: 40% *Sorghastrum nutans*, ≤5% *Aster pilosus*, ≤5% *Desmanthus illinoensis*, ≤5% *Melilotus alba*, ≤5% *Populus deltoides*, ≤5% *Strophostyles helvola*

B-3: 50% *Strophostyles helvola*, 30% *Sorghastrum nutans*, 10% *Dalea alopecuroides*, 10% *Populus deltoides*, ≤5% *Aster pilosus*

B-4: 50% *Sorghastrum nutans*, ≤5% *Melilotus alba*, ≤5% *Populus deltoides*

B-5: 40% *Sorghastrum nutans*, 25% *Strophostyles helvola*, 10% *Panicum virgatum*, ≤5% *Aster pilosus*

B-6: 100% *Sorghastrum nutans*, 10% *Panicum virgatum*, 10% *Strophostyles helvola*

Percent cover inventories of permanent monitoring sites in Area C yielded the following results:

C-1: 100% *Sorghum halepense*, 20% *Aster pilosus*, ≤5% *Cassia fasciculata*

C-2: 80% *Aster pilosus*, 40% *Ambrosia trifida*, 25% *Solidago canadensis*

Percent cover inventories of permanent monitoring sites in Area D yielded the following results:

D-1: 50% *Aster pilosus*, 40% *Strophostyles helvola*, 20% *Populus deltoides*, 10% *Panicum virgatum*, 10% *Salix interior*, 10% *Sorghastrum nutans*, 10% *Sorghum halepense*

D-2: 70% *Sorghastrum nutans*, 40% *Strophostyles helvola*, 25% *Desmanthus illinoensis*, 10% *Panicum virgatum*, 10% *Salix interior*, ≤5% *Aster pilosus*, ≤5% *Erigeron annuus*

Area A: *Carex shortiana*

The following tables give the monitoring results for Area E:

Transect 1				Transect 2			
Species	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**
Bare Root		Containerized		Bare Root		Containerized	
Unidentified	0	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	1	*Platanus occidentalis*	2	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	1	*Platanus occidentalis*	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	1	*Quercus sp.*	1	*Juglans nigra*	2
Platanus occidentalis	2	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	0	*Quercus sp.*	2	Unidentified	0
Quercus sp.	1	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	1
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	1
Carya illinoensis	1	*Quercus sp.*	1	*Carya illinoensis*	1	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Platanus occidentalis	2	*Juglans nigra*	2	*Quercus sp.*	2	*Quercus sp.*	2
Quercus sp.	1	Unidentified	0	Unidentified	0	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	1	*Platanus occidentalis*	2	*Quercus sp.*	1
Quercus sp.	1	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	1
Carya illinoensis	1	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	1
Quercus sp.	2			*Quercus sp.*	2		
Unidentified	0			*Quercus sp.*	1		
Quercus sp.	1			*Quercus sp.*	2		
Unidentified	0			*Carya illinoensis*	1		
Quercus sp.	2			*Carya illinoensis*	1		
Platanus occidentalis	2			*Quercus sp.*	1		
Platanus occidentalis	2			Unidentified	0		
Quercus sp.	1			*Platanus occidentalis*	1		
Carya illinoensis	1			*Carya illinoensis*	1		
Unidentified	0			Unidentified	0		
Quercus sp.	2			*Carya illinoensis*	1		
Quercus sp.	1			*Quercus sp.*	1		
Carya illinoensis	2			*Quercus sp.*	1		
Platanus occidentalis	2			*Carya illinoensis*	1		
Platanus occidentalis	2			*Carya illinoensis*	2		
Platanus occidentalis	2			*Quercus sp.*	1		
Platanus occidentalis	2			Unidentified	0		
Platanus occidentalis	2			*Quercus sp.*	1		
Platanus occidentalis	2			*Carya illinoensis*	1		
Average Vigor:	1.4107					Average Vigor:	1.2857

Transect 3			
Species	**Vigor**	**Species**	**Vigor**
Bare Root		Containerized	
Unidentified	0	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	1
Quercus sp.	1	*Quercus sp.*	1
Unidentified	0	*Quercus sp.*	2
Unidentified	0	*Quercus sp.*	2
Quercus sp.	1	*Juglans nigra*	1
Quercus sp.	2	*Quercus sp.*	1
Carya illinoensis	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2
Quercus sp.	1	Unidentified	0
Quercus sp.	2	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	1
Quercus sp.	2	*Juglans nigra*	2
Carya illinoensis	1	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	1
Unidentified	0	*Quercus sp.*	2
Quercus sp.	1		
Quercus sp.	2		
Quercus sp.	1		
Carya illinoensis	2		
Quercus sp.	1		
Platanus occidentalis	2		
Platanus occidentalis	2		
Quercus sp.	1		
Quercus sp.	1		
Carya illinoensis	2		
Quercus sp.	1		
Unidentified	0		
Quercus sp.	1		
Unidentified	0		
Platanus occidentalis	2		
Platanus occidentalis	2		
Platanus occidentalis	2		
Platanus occidentalis	2		
Unidentified	0		
Overall Survivorship: 85.4%		Average vigor:	1.375

Percent cover inventories of permanent monitoring sites in Area F yielded the following results:

F-1: 50% *Aster pilosus*, 30% *Populus deltoides*, 10% *Salix amygdaloides*, ≤5% *Iva ciliata*, ≤5% *Strophostyles helvola*

F-2: 80% *Spartina pectinata*, 30% *Desmanthus illinoensis*, 10% *Elymus canadensis*

F-3: 50% *Sorghum halepense*, 20% *Populus deltoides*, 15% *Festuca sp.*, ≤5% *Elymus canadensis*, ≤5% *Solidago canadensis*, ≤5% *Strophostyles helvola*

F-4: 25% *Sorghastrum nutans*, 25% *Spartina pectinata*, 15% *Strophostyles helvola*, 10% *Populus deltoides*, ≤5% *Aster pilosus*

F-5: 50% *Sorghum halepense*, 20% *Populus deltoides*, ≤5% *Desmanthus illinoensis*, ≤5% *Melilotus alba*, ≤5% *Trifolium campestre*

F-6: 50% *Medicago lupulina*, 50% *Sorghastrum nutans*, 15% *Strophostyles helvola*

F-7: 40% *Aster pilosus*, 20% *Sorghastrum nutans*, ≤5% *Cassia marilandica*, ≤5% *Sorghum halepense*, ≤5% *Trifolium campestre*

Percent cover inventories of permanent monitoring sites in Area G yielded the following results:

G-1: 100% *Sorghastrum nutans*, 30% *Strophostyles helvola*, 25% *Populus deltoides*

G-2: 40% *Populus deltoides*, 20% *Sorghastrum nutans*, 10% *Strophostyles helvola*, ≤5% *Aster pilosus*, ≤5% *Desmodium sp.*, ≤5% *Solidago canadensis*

G-3: 90% *Sorghastrum nutans*, 15% *Panicum virgatum*, 10% *Strophostyles helvola*, ≤5% *Elymus canadensis*, ≤5% *Populus deltoides*

G-4: Destroyed

G-5: 100% *Spartina pectinata*, 10% *Populus deltoides*, ≤5% *Strophostyles helvola*

Percent cover inventories of permanent monitoring sites in Area H yielded the following results:

H-1: 60% *Sorghastrum nutans*, 25% *Solidago canadensis*, 10% *Ambrosia trifida*
≤5% *Desmanthus illinoensis*

H-2: 60% *Solidago canadensis*, 30% *Sorghastrum nutans*,
10% *Aster novae-angliae*, ≤5% *Acer negundo*, ≤5% *Lonicera morrowi*,
≤5% *Populus deltoides*

H-3: 30% *Populus deltoides*, 20% *Aster pilosus*, 20% *Carex frankii*,
10% *Salix interior*, ≤5% *Ambrosia trifida*, ≤5% *Solidago canadensis*

Percent cover inventories of permanent monitoring sites in Area I yielded the following results:

I-1: 70% *Sorghastrum nutans*, 25% *Populus deltoides*, ≤5% *Aster pilosus*,
≤5% *Medicago lupulina*, ≤5% *Solidago canadensis*,
≤5% *Strophostyles helvola*

I-2: 40% *Cassia fasciculata*, 25% *Aster pilosus*, 20% *Panicum virgatum*,
10% *Elymus virginicus*, ≤5% *Acer rubrum*

I-3: 20% *Carex crus-corvi*, 10% *Aster pilosus*, 10% *Dalea alopecuroides*,
10% *Populus deltoides*

I-4: 25% *Aster pilosus*, 25% *Sorghastrum nutans*, 15% *Populus deltoides*,
10% *Acer negundo*, ≤5% *Iva ciliata*

Area H: *Chasmanthium latifolium*

The following table gives the monitoring results for Area J:

Transect 1				Transect 2			
Species	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**	**Species**	**Vigor**
Bare Root		Containerized		Bare Root		Containerized	
Platanus occidentalis	1	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	1
Quercus sp.	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Carya illinoensis	1	*Quercus sp.*	2	*Carya illinoensis*	1	*Quercus sp.*	1
Unidentified	0	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	1	Unidentified	0	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	1
Carya illinoensis	2	Unidentified	0	*Quercus sp.*	1	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Carya illinoensis	1	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2	*Platanus occidentalis*	2	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	*Carya illinoensis*	2	*Quercus sp.*	1
Quercus sp.	1	*Quercus sp.*	2	*Carya illinoensis*	1	*Quercus sp.*	1
Unidentified	0	*Quercus sp.*	2	*Carya illinoensis*	1	*Quercus sp.*	1
Quercus sp.	1	*Juglans nigra*	2	*Quercus sp.*	1	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2
Platanus occidentalis	2	*Quercus sp.*	2	*Quercus sp.*	2	Unidentified	0
Quercus sp.	2	*Quercus sp.*	2	*Quercus sp.*	2	*Quercus sp.*	1
Quercus sp.	1	*Quercus sp.*	2	*Carya illinoensis*	2	*Quercus sp.*	1
Quercus sp.	1	Unidentified	0	*Carya illinoensis*	2	*Quercus sp.*	2
Carya illinoensis	1	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	2
Carya illinoensis	2	*Quercus sp.*	2	*Quercus sp.*	1	*Quercus sp.*	2
Quercus sp.	1	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2
Quercus sp.	2	*Quercus sp.*	2	Unidentified	0	*Quercus sp.*	2
Quercus sp.	1			*Quercus sp.*	1		
Carya illinoensis	1			Unidentified	0		
Unidentified	0			*Carya illinoensis*	2		
Unidentified	0			*Quercus sp.*	1		
Unidentified	0			*Carya illinoensis*	2		
Quercus sp.	1			*Carya illinoensis*	1		
Quercus sp.	2			Unidentified	0		
Quercus sp.	2			*Quercus sp.*	1		
Quercus sp.	2			*Quercus sp.*	1		
Quercus sp.	1			*Carya illinoensis*	1		
Carya illinoensis	1			*Platanus occidentalis*	1		
Quercus sp.	1			*Platanus occidentalis*	2		
Unidentified	0			*Quercus sp.*	2		
Quercus sp.	2			*Quercus sp.*	1		
Platanus occidentalis	2			*Quercus sp.*	2		
Platanus occidentalis	2			*Quercus sp.*	1		
Quercus sp.	2			*Quercus sp.*	1		
Platanus occidentalis	2			*Platanus occidentalis*	2		
Quercus sp.	1			*Platanus occidentalis*	2		
Carya illinoensis	1			*Quercus sp.*	1		
Platanus occidentalis	1			*Platanus occidentalis*	2		
Platanus occidentalis	2			Unidentified	0		
Platanus occidentalis	2			Unidentified	0		
		Average vigor: 1.48		Overall Survivorship 88%		Average vigor: 1.348	

IV. Photo Documentation

A systematic photo documentation system was designed as part of the monitoring protocol for the Chesterfield Valley Wetland Mitigation Project. In the past at each of the permanent monitoring stations in Area A and Area C, pictures were taken at compass bearings of north, south, east, and west. The purpose of this photo documentation regime is to qualitatively track changes in the vegetative community, hydrology, and other functions of the site. However due to the increased vegetation height and thickness throughout the areas, compass bearing photos would reveal little about the sites. Many photos were taken of the general areas and specific spots within the sites. These photos track positive and negative trends within the vegetation and hydrology. All pictures are examined and catalogued in a database. This database currently holds approximately 1200 photographs.

V. Wildlife Survey - Site 2

December monitoring consisted solely of wildlife observation. In addition, notes were made of species observed during vegetative monitoring. Birds and mammals were recorded either through direct observation or sign.

Birds:

American Crow
American Kestrel
American Robin
American Woodcock
Belted Kingfisher
Black-Capped Chickadee
Brown Thrasher
Canada Goose
Coopers Hawk
Dickcissel
Downy Woodpecker
Double Crested Cormorant
Eastern Bluebird
Eastern Kingbird
Eastern Meadowlark
Eastern Wild Turkey
European Starling
Gray Catbird
Great Blue Heron
Horned Lark
Indigo Bunting
Killdeer
Mallard
Mourning Dove
Northern Bobwhite
Northern Cardinal
Northern Flicker
Northern Mockingbird
Pied-Billed Grebe
Red-Bellied Woodpecker
Red-Shouldered Hawk
Red-Tailed Hawk
Red-Winged Blackbird
Ring-Billed Gull
Song Sparrow
Swamp Sparrow
Tree Sparrow
Tree Swallow
Tufted Titmouse
Turkey Vulture
Wood Duck

Mammals:

Beaver
Coyote
Eastern Cottontail
Eastern Mole
Opossum
Raccoon
White Tailed Deer

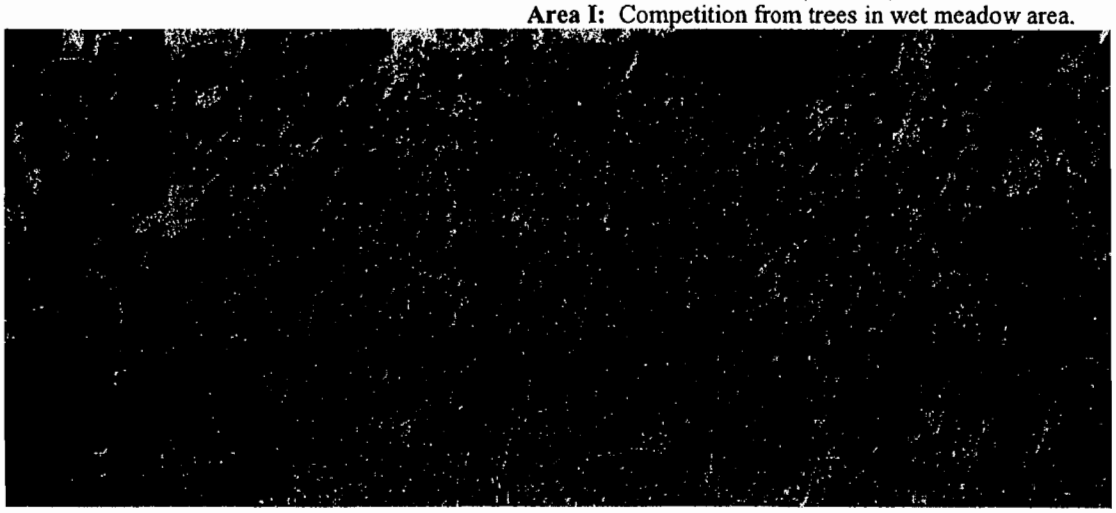
VI. Maintenance - Site #2

All areas except the jurisdictional wetlands (Area C) and mature woods will be mowed during the dormant season. This will help prevent cottonwood / willow takeover until establishment of native planted materials is complete. The agricultural levee toe will also be mowed to prevent excessive growth of woody and invasive species.

VII. Future Efforts - Site #2

2005 was the final year of monitoring and maintenance for Site 2. Future maintenance for the site should include an annual mowing or controlled burn of the wet meadow and emergent areas in order to control competition from woody species. The palustrine forested areas may require thinning in order to release desired species if the canopy becomes too dense.

Area I: Competition from trees in wet meadow area.



VIII. Wetland Indicator Species

Table 7: Species Inventory List, includes the wetland indicator status for the plants found on the National List of Plant Species that Occur in Wetlands: Region 3. This data was gathered from the National Plants Database online at http://plants.usda.gov/wetinfo.html

Indicator Categories

OBL Occurs almost always (estimated probability 99%) under natural conditions in wetlands.

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

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

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

UPL Occurs in wetlands in another region, but occurs almost always (estimated probability 99%) under natural conditions in non-wetlands in the regions specified. If a species does not occur in wetlands in any region, it is not on the National List.

A positive (+) or negative (-) sign is used with the Facultative Indicator categories to more specifically define the regional frequency of occurrence in wetlands. The positive sign indicates a frequency toward the higher end of the category and the negative sign toward the lower end of the category.

The percentages of plants that occur in each indicator category for Site 2 are as follows:

OBL:	35 species or 17.5%
FACW(+/-):	41 species or 20.5%
FAC(+/-):	42 species or 21.0%
FACU(+/-):	37 species or 18.5%
UPL:	4 species or 2.00%

There were 41 species or 20.5% of the total plants that are not listed and 5 specimens that were not keyed to the species and could not be designated.

IX. Hydrology and Soils

Hydrology at Site 2 depends mainly on the water elevation in the Missouri River. The site is connected to the river through the constructed 49.1 acre open water area. When the river level exceeds an elevation of 449' MSL for a substantial amount of time water fills the borrow pit and spills over and through a series of berms and floods the entire site. Water depth is controlled by a stand pipe with stop logs located at the northeast corner of the site. The water control structure is set to allow approximately one foot of water to stand on the majority of the site. The length and depth of inundation can be controlled by removing or adding stop logs to the stand pipe. Rainfall also accounts for the inundation of many small areas within the site. These small pockets and low spots where rainwater collects often hold water through most of the summer.

Soil Samples were taken from all areas within Site 2. Several small samples were taken from each area and combined to create a general representation of the soil in that area. Samples were analyzed using two methods; the Munsell Soil Color Charts and a LaMotte Chemical Soil Texture Demonstration. The table below shows the results for both of the soil tests. The Munsell values are noted in order of hue then value/chroma and the texture results show the percent of sand, silt, and clay in each sample.

MCLD Soil Sample Results

Area	Munsell Notation	% SAND	% SILT	% CLAY
Site # 2				
A	10YR 4/2	20%	43%	37%
B	2.5Y 4/2	40%	40%	20%
C	2.5Y 2.5/1	27%	53%	20%
D	2.5Y 5/3	40%	40%	20%
E	2.5Y 4/2	67%	27%	6%
F	2.5Y 3/1	27%	43%	30%
G	2.5Y 4/2	20%	27%	53%
H	2.5Y 3/1	30%	53%	17%
I	10YR 3/1	20%	27%	53%
J	2.5Y 4/2	40%	40%	20%

Throughout Site 2 there are areas that contain high percentages of sand in the soil profile. Areas B, E, D, and J contain the largest amounts of sand. However, within these areas there are pockets which contain more favorable soil conditions. These areas are easily identified because of the quality of vegetation compared to the more sandy areas. Over

all the areas that contain a majority of silt or clay in the soil have a thicker stand of vegetation. The planted species in these areas are healthier than the areas containing mostly sand.

X. General Overview of Site

Moderate drought was the major factor for the site this season. According to the National Weather Service this spring was the third driest on record. The month of May was also the third driest. During spring, the Chesterfield area received 11.55 inches of rain which is 6.21 inches below normal. The site received only 65% of normal rainfall from March through June. The summer brought only 72% of normal rainfall during July and August. There was also a streak of one hundred degree heat in the middle of July with heat indexes between 100 and 113 degrees.

The sedges, in which a majority of the species are cool season plants, performed well in the early season before drought impacted the site. The warm season grasses showed good drought tolerance as well. The main stress showed in these species was below normal height and delayed maturity. The major effect drought had on the site was the competition from undesirable species. There were many areas where the white and yellow sweet clover composed a large majority of the strata. Spots that normally hold water were dry throughout the season allowing drier species to grow where they usually do not occur. Most of the trees showed some stress and did not put on extensive growth but were able to survive. Some bare root oaks were grazed by rabbits the previous winter causing many trees to send up new shoots and discard the damaged portions. Overall the species composition within the site continues to improve. Native species are beginning to make up the majority of the biomass. The largest problem species continue to be the cotton wood and willow trees in the wet meadow and emergent areas and the bind weeds in the palustrine forested areas.

Hydrology is still the largest downfall of the site. The river levels this year had no chance of allowing water to flow out of the pond and into the site. The lack of rain also prevented areas which normally hold rain water to remain dry for the majority of the season. Improved hydrology would create more favorable conditions for desirable species and make it more difficult for the weedy species to survive. The soils would also benefit from inundation which would aid the creation of more hydric soils.

XI. Tables and Figures

Table 1 - Wet Meadow Seed Species

TABLE 1 - WET MEADOW SEED SPECIES LIST	
COMMON NAME	***SPECIES***
Big Blue Stem	*Andropogon gerardii*
Blue Joint Grass	*Calamagrostis canadensis*
Bottlebrush Sedge	*Carex hystricina*
Fringed Sedge	*Carex crinita*
Brown Fox Sedge	*Carex vulpinoides*
Various Sedges	*Carex spp.*
Fowl Manna Grass	*Glyceria striata*
Prairie Switch Grass	*Panicum virgatum*
Dark Green Rush	*Scirpus atrovirens*
Indian Grass	*Sorghastrum nutans*
Prairie Cordgrass	*Spartina pectinata*

Table 2 - RPM Tree Species

TABLE 5 - CONTAINERIZED TREE SPECIES LIST	
COMMON NAME	*SPECIES*
Bitternut	*Carya cordiformis*
Pecan	*Carya illinoensis*
Butternut / White Walnut	*Juglans cinerea*
Black Walnut	*Juglans nigra*
Swamp White Oak	*Quercus bicolor*
Overcup Oak	*Quercus lyrata*
Bur Oak	*Quercus macrocarpa*
Swamp Chestnut Oak	*Quercus michauxii*
Pin Oak	*Quercus palustris*
Shumard Oak	*Quercus shumardii*

Table 3 - Emergent Seed Species

TABLE 3 - EMERGENT SEED SPECIES LIST	
COMMON NAME	*SPECIES*
Sweet Flag	*Acorus calamus*
Water Plantain	*Alisma subcordata*
Millet	*Echinochloa crusgalli frumentacea*
Spike Rush	*Eleocharis palustris*
Arrow Arum	*Peltandra virginica*
Pinkweed	*Polygonum pensylvanicum*
Pickerel Weed	*Pontederia cordata*
Common Arrowhead	*Sagittaria latifolia*
Soft-stem Bulrush	*Scirpus validus*

Table 4 - Wetland Plug Species

TABLE 4 – PLUG SPECIES LIST	
SPECIES NAME	***SPECIES NAME***
Acorus calamus	*Alisma subcordatum*
Carex annectens	*Alisma plantago-aquatica*
Carex vulpinoidea	*Lycopus virginicus*
Carex squarrosa	*Amorpha fruticosa*
Carex lupulina	*Rorippa spp.*
Carex muskingumensis	*Lindernia dubia*
Carex crus-corvi	*Bacopa rotundifolia*
Carex lanuginose	*Bidens connata*
Carex frankii	*Bidens aristosa*
Carex ovalis	*Bidens cernua*
Carex grayii	*Boltonia asteroids*
Carex cristatella	*Mimulus ringens*
Eleocharis obtuse	*Leersia oryzoides*
Equisetum arvense	*Polygonum coccineum*
Hibiscus militaris	*Ammania coccinea*
Iris virginica	*Lobelia siphilitica*
Juncus torreyi	*Aster puniceus*
Ludwigia alternifolia	*Asclepias incarnata*
Peltandra virginica	*Scutellaria lateriflora*
Rumex verticillatus	*Cyperus spp.*
Sagittaria latifolia	*Lippia lanceolata*
Scirpus atrovirens	*Chelone glabra*
Scirpus americanus	*Eupatorium coelestinum*
Tripsacum dactyloides	*Lysimachia hybrida*

Table 5 - RPM Shrub Species

TABLE 5 - CONTAINERIZED SHRUB LIST	
COMMON NAME	*SPECIES*
Buttonbush	*Cephalanthus occidentalis*
Silky Dogwood	*Cornus amomum*
Rough-leaved Dogwood	*Cornus drummondi*
Gray Dogwood	*Cornus racemosa*
Deciduous Holly	*Ilex decidua*

Table 6 - Bare-root Tree Species

TABLE 4 - BARE-ROOT SPECIES LIST	
COMMON NAME	*SPECIES*
Bitternut	*Carya cordiformis*
Shellbark Hickory	*Carya laciniosa*
Pecan	*Cayra illinoiensis*
Butternut	*Juglans cinerea*
Black Walnut	*Juglans nigra*
Swamp White Oak	*Quercus bicolor*
Shingle Oak	*Quercus imbricaria*
Overcup Oak	*Quercus lyrata*
Bur Oak	*Quercus macrocarpa*
Pin Oak	*Quercus palustris*
Willow Oak	*Quercus phellos*
Shumard Oak	*Quercus shumardii*

Table 7 – Species Inventory List

Species		Site # 2							
Area		A	B	C	D	F	G	H	I
Abutilon theophrasti	FACU		X					X	
Acer negundo	FACW	X	X	X	X	X	X	X	X
Acer rubrum	FACW					X			X
Achillea millefolium	FACU		X						
Agalinis tenuifolia	FACW	X							
Alisma subcordatum	OBL							X	
Amaranthus sp.	FAC		X					X	
Ambrosia artemisiifolia	FACU	X	X	X	X		X	X	
Ambrosia trifida	FAC+	X	X	X	X	X	X	X	X
Ammannia coccinea	OBL							X	
Amorpha fruticosa	FACW+	X	X		X	X	X		
Ampelamus albidus	FAC	X						X	X
Andropogon gerardii	FAC-		X						X
Andropogon scorparius	FACU-	X	X			X	X	X	
Andropogon virginicus	FAC-							X	
Apocynum cannabinum	FAC	X	X	X			X	X	
Asclepias incarnata	OBL		X				X	X	
Asclepias syriaca								X	
Aster novae-angliae	FACW	X	X		X			X	X
Aster pilosus	FACU+	X	X	X	X	X	X	X	X
Aster sp.		X	X	X	X	X	X	X	X
Astragalus canadensis	FAC+				X				
Bidens aristosa	FACW					X	X		
Bidens comosa	FACW						X	X	
Bidens discoidea	FACW							X	
Bidens frondosa	FACW						X	X	
Bidens sp.		X	X		X	X	X	X	
Brickellia eupatoriodes			X					X	X
Bromus elongatus				X				X	
Bromus inermis		X	X			X	X		X
Bromus japonicus	FACU	X	X	X		X	X	X	X
Bromus racemosus								X	
Bromus squarrosus		X	X				X	X	
Campsis radicans	FAC	X							
Carduus nutans		X	X	X		X	X	X	
Carex annectens	FACW	X	X		X	X	X	X	X
Carex crawfordii	FAC+						X	X	
Carex cristatella	FACW+	X	X			X		X	
Carex crus-corvi	OBL	X	X			X	X		X
Carex davisii	FAC+					X			
Carex frankii	OBL	X	X					X	X

Carex gravida						X			
Carex hystericina	OBL			X				X	X
Carex lacustris	OBL							X	X
Carex lupulina	OBL		X			X	X		
Carex molesta	FAC+	X	X			X	X	X	X
Carex muskingumensis	OBL		X			X	X		X
Carex shortiana	FACW+	X	X			X	X	X	X
Carex squarrosa	OBL							X	X
Cassia fasciculata	FACU-		X	X		X	X		X
Cassia marilandica	FACW					X	X		
Cephalanthus occidentalis	OBL	X			X	X	X		
Chasmanthium latifolium	FACW					X		X	
Chenopodium album	FAC-	X					X	X	
Cirsium vulgare	FACU-	X	X					X	
Conobea multifida	FACW+							X	
Conyza canadensis	FAC-	X	X	X	X	X	X	X	
Coreopsis tripteris	FAC	X	X		X	X		X	X
Cornus drummondi	FAC	X			X			X	
Coronilla varia		X							
Cyperus acuminatus	OBL	X						X	
Cyperus sp.						X	X	X	
Cyperus squarrosus	OBL	X						X	
Cyperus strigosus	FACW	X			X			X	
Dactylis glomerata	FACU	X				X	X		
Dalea alopecuroides		X	X		X	X	X	X	X
Dalea candida					X	X			
Dalea purpurea		X			X	X			
Daucus carota		X		X		X	X	X	X
Desmanthus illinoensis	FAC-	X	X	X	X	X	X	X	X
Desmodium sp.		X	X	X	X	X	X	X	X
Dianthus armeria			X						
Digitaria sanguinalis	FACU	X							
Dipsacus sylvestris						X			
Echinochloa crusgalli	FACW	X						X	
Eclipta alba	FACW							X	
Elaeagnus umbelatta			X						
Eleocharis compressa	FACW	X	X			X		X	
Eleocharis lanceolata	FACW							X	
Eleocharis obtusa	OBL	X	X					X	
Elymus canadensis	FAC-	X	X		X	X	X	X	X
Elymus virginicus	FACW-							X	X
Equisetum arvense	FAC				X				
Erigeron annuus	FAC-	X	X	X	X	X	X	X	X
Erigeron philadelphicus	FACW	X	X		X				
Eupatorium coelestinum	FAC+	X			X	X	X		
Eupatorium perfoliatum	FACW+	X	X		X			X	X
Eupatorium rugosum	FACU	X	X	X	X	X	X	X	X
Euphorbia maculata	FACU-	X			X	X		X	X

Euphorbia supina		X						X	
Festuca sp.		X	X	X	X	X	X	X	X
Galium sp.				X			X		
Gaura parviflora	FACU	X	X					X	
Geranium carolinianum		X	X				X	X	X
Glyceria striata	OBL	X				X			
Helenium autumnale	FACW+		X			X	X		
Helianthus annuus	FAC-	X	X		X	X	X	X	X
Heliopsis helianthoides		X	X		X			X	
Heterotheca latifolia		X	X		X	X	X		
Hibiscus lasiocarpos	OBL					X			
Hibiscus militaris	OBL	X				X	X	X	
Hordeum jubatum	FAC+						X		
Ilex decidua	FACW	X			X			X	
Ipomoea hederacea	FAC	X	X					X	
Ipomoea lacunosa	FACW	X	X						X
Iva ciliata	FAC	X	X		X	X	X	X	X
Juncus effusus	OBL	X				X	X		
Juncus gerardii	OBL		X				X		
Juncus nodatus	OBL	X							
Juncus torreyi	FACW	X				X			
Krigia biflora	FACU	X					X		
Krigia dandelion	FACU						X		
Kuhnia eupatorioides		X	X		X				
Lactuca canadensis	FACU+	X					X		
Lactuca saligna	FACU	X		X				X	
Lactuca scariola	FAC	X						X	
Lamium maculatum							X		
Leersia oryzoides	OBL	X							
Lespedeza capitata	FACU		X			X			X
Lespedeza cuneata						X			
Leucanthemum vulgare		X							X
Liatrus pycnostachya						X			
Lippia lanceolata	OBL	X	X					X	
Lolium perenne	FACU	X	X				X	X	
Lonicera morrowi								X	X
Lycopus americanus	OBL					X		X	
Lythrum alatum	OBL	X							
Medicago lupulina	FAC-	X	X	X	X		X	X	X
Medicago sativa		X	X	X		X	X		
Melilotus alba	FACU	X	X	X	X	X	X	X	X
Melilotus officinales	FACU	X	X		X	X	X	X	X
Miscanthus sp.	UPL		X				X		
Monarda bradburiana	UPL	X							
Monarda fistulosa	FACU	X	X					X	X
Monarda punctata	UPL	X							
Morus alba	FAC	X	X	X		X	X	X	X
Oenethera biennis		X	X					X	

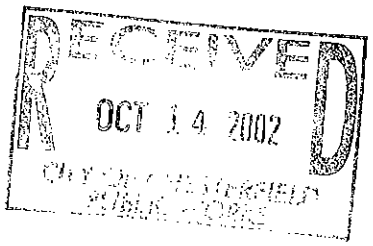
Panicum capillare	FAC			X	X			X	
Panicum dichotomiflorum	FACW-		X		X			X	
Panicum virgatum	FAC+	X	X		X	X	X	X	X
Penstemon digitalis	FAC-	X	X		X	X	X	X	X
Phleum pratense	FACU		X			X			
Plantago lanceolata	FAC					X		X	
Plantago rugelii	FAC					X			
Plantago virginica	FACU-					X	X		
Platanus occidentalis	FACW		X			X			X
Polygonum coccineum	OBL	X							
Polygonum hydropiperoides	OBL	X							
Polygonum lapathifolium	FACW+	X						X	X
Polygonum pensylvanicum	FACW+	X	X			X		X	
Polygonum persicaria	FACW							X	
Polygonum scandens	FAC	X							
Populus deltoides	FAC+	X	X	X	X	X	X	X	X
Pycnanthemum pilosum	FAC	X	X		X			X	X
Pycnanthemum tenuifolium	FAC	X	X		X	X		X	X
Quercus palustris	FACW	X							
Ranunculus sceleratus	OBL							X	
Rhus glabra		X			X	X			X
Rhus radicans								X	X
Robina hispida		X			X				
Rudbeckia hirta	FACU					X	X		
Rudbeckia laciniata	FACW+				X				
Rumex crispus	FAC+	X	X		X	X	X	X	X
Rumex stenophyllus	FACW		X						
Rumex verticillatus	OBL		X		X				
Salix amygdaloides	FACW	X	X	X	X	X	X	X	X
Salix caroliniana	OBL	X	X						
Salix interior	OBL	X	X	X	X	X	X	X	X
Scirpus atrovirens	OBL					X	X		
Schoenoplectus heterochaetus	OBL	X						X	
Schoenoplectus tabernaemontani	OBL							X	
Scutellaria lateriflora	OBL	X							
Scutellaria parvula	FACU	X							
Setaria faberii	FACU+	X	X					X	
Sida spinosa	FACU								X
Silene antirrhina		X	X		X				
Silphium integrifolium			X		X	X		X	
Silphium perfoliatum	FACW-	X	X		X	X		X	
Solanum americanum	FACU-							X	
Solanum carolinense	FACU-		X					X	
Solidago canadensis	FACU	X	X	X	X	X	X	X	X
Solidago graminifolia		X					X	X	
Solidago rigida	FACU	X	X		X	X		X	
Sorghastrum nutans	FACU+	X	X		X	X	X	X	X
Sorghum halepense	FACU	X	X	X	X	X	X	X	X

Spartina pectinata	FACW+	X	X			X	X	X	
Strophostyles helvola	FAC+	X	X	X	X	X	X	X	X
Strophostyles leiosperma		X	X	X	X	X	X	X	
Taraxacum officinale	FACU	X		X			X	X	
Torilis japonica		X	X	X	X	X		X	X
Tridens flavus	UPL	X							
Trifolium campestre		X	X			X	X		
Trifolium pratense	FACU	X	X			X	X		X
Triodanis perfoliata	FAC	X					X		
Typha latifolia	OBL		X					X	
Ulmus americana	FACW-							X	
Verbascum blattaria	FACU-		X			X			X
Verbascum thapsus				X		X			
Verbena hastata	FACW+	X	X		X				
Verbena urticifolia	FAC+	X	X	X	X	X		X	X
Veronica arvensis		X	X	X	X		X		X
Vicia villosa		X	X		X	X	X	X	X
Vitis vulpina	FACW-	X	X	X	X	X	X	X	X
Xanthium chinense	FAC							X	
Zizia aurea	FAC+				X				

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

October 10, 2002

REPLY TO
ATTENTION OF:



Regulatory Branch
File Number: **P-2032** (1996-12870)

Mr. Mike Geisel, P.E.
Director of Public Works / City Engineer
690 Chesterfield Parkway W
Chesterfield, Missouri 63017-0760

Dear Mr. Geisel:

We have reviewed your permit extension request letter, dated June 27, 2002. As you are aware, the original permit was issued by the St. Louis District Corps of Engineers on October 10, 2002. Department of the Army Individual Permits and modifications can be extended for an additional five years. Any additional time extension needs, may require a new permit review procedure.

With exception of General Condition 1, all terms and conditions of originally authorized **P-2032** and modifications are identical. It is hereby acknowledged that Permit Number **P-2032** and modifications have been authorized this time extension by the United States Army Corps of Engineers, St. Louis District. Incomplete activities originally authorized by this permit are hereby extended for completion by the City of Chesterfield on or before December 31, 2007.

If any material changes in the scope, location or plans of the work are found necessary, due to unforeseen conditions or otherwise, revised plans detailing proposed modifications in the work must first be submitted to the Regulatory Branch, St. Louis District for review and approval prior to initiation of any project activities. Proposed modifications may not be initiated until Department of the Army "Approval of Revised Plans" has been granted.

If you have any questions or comments related to this action you may contact me at (314) 331-8187.

Sincerely,

Robert S. Gramke
Project Manager
Missouri Evaluations Section

Copy Furnished:

Mr. Don Boos – Missouri Deparment Natural Resources
Water Pollution Control Program

City of Chesterfield

690 Chesterfield Pkwy W • Chesterfield MO 63017-0760
Phone: 636-537-4000 • Fax 636-537-4798 • www.chesterfield.mo.us

June 25, 2002

Danny McClendon
Army Corp of Engineers
1222 Spruce Street
St. Louis, MO. 63103-2833

RE: Chesterfield Valley Wetland Permit Extension Request – Army Permit Number P-2032

Dear Mr. McClendon:

This correspondence shall serve as the City's official request for a time extension for the referenced permit. The City's Wetland Permit No. P-2032, authorizing the excavation or placement of fill material into the wetlands and waters of the United States in conjunction with the implementation of the proposed Chesterfield Valley improvements, in Chesterfield Valley, Chesterfield, St. Louis County, Missouri, between approximate Missouri River miles 41 and 49 and adjacent to Bonhomme Creek is set to expire on December 31, 2002. As of this date the City is still mitigating wetlands in Chesterfield Valley as described in our permit. As such, we are requesting an extension of five years for our permit.

Your consideration and assistance in this matter is greatly appreciated. Should you have any questions or need additional information, please advise.

Sincerely,

Mike Geisel, P.E.
Director of Public Works/ City Engineer

Enclosures

cc: Brian McGownd, Deputy Director of Public Works/Assistant City Engineer
Bonnie Hubert, Superintendent of Engineering
Kimberly McMahan, Civil Engineer

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

December 2, 1998

Construction-Operations
Readiness Division
Regulatory Branch
File Number 199612877

12/4/98
original → GEISEC
cc → MGH

Mr. Michael G. Herring
City Administrator
City of Chesterfield
922 Roosevelt Parkway
Chesterfield, Missouri 63017-2080

Dear Mr. Herring:

I have reviewed your November 3, 1998 request for approval of modified plans for Permit Number P-2032 for Wetlands Mitigation Design-Chesterfield Valley. This request is a result of the permit modification dated June 24, 1998, which required the acquisition and development of 10.81 acres of additional wetland mitigation to the original wetland mitigation plan. The proposed modification would add approximately 10.81 acres of land to Wetland Mitigation Site No. 2. Approximately 7.69 acres of emergent wetlands (PEM SS) would be established on the recently acquired Haynes Property on the east end of Wetland Mitigation Site No. 2. An existing 1.5 acre linear ephemeral wetland (Area G), also exists on the newly acquired property, bringing the total acreage of the new property to approximately 9.5+ acres in size. Approximately 3.12 acres of existing forested area in the western portion of Wetland Mitigation Site No. 2 would have the hydrology modified to establish 3.12 acres of forested wetlands. An additional 2.6 acres of open water would be established adjacent to the large open water borrow pit in Wetland Mitigation Site No. 2.

Based upon my staff review, I hereby approve your request for modification to the Wetlands Mitigation Design-Chesterfield Valley for Permit Number P-2032. All terms and conditions of the October 10, 1997 authorization and June 24, 1998 modification remain in full force and effect. The following special conditions have been added to P-2032:

1. The permittee shall establish 7.69 acres of emergent and shrub-scrub wetland and 3.12 acres of forested wetland in accordance with your November 3, 1998 Addendum to Wetland Mitigation Plan. This Addendum will be added to Special Conditions 2a-2f of the October 10, 1997 permit, June 24, 1998 modification, and the June 25, 1998 final mitigation plan.

2. The 10.81 acres of additional wetland mitigation shall be added to the 119.6 acres of wetland mitigation under the perpetual deed restriction and conservation easement that was signed by the City of Chesterfield on October 3, 1997. A revised deed restriction and conservation easement, with a legal description, for the 130.41 acres of wetland mitigation shall be revised, notarized and filed with the St. Louis County Recorder of Deeds no later than 120 days from the date of this modification. A signed and notarized copy of the revised deed restriction and conservation easement, legal boundary survey, and final recordation for the mitigation sites shall be provided to the St. Louis District, Regulatory Branch no later than March 31, 1999.

During review of the November 3, 1998 Addendum to Wetland Mitigation Plan, it was noted that the acreage proposed for mitigation does not accurately represent the acreage required by the October 10, 1997 permit and June 24, 1998 modification. Permit No. P-2032 requires that you mitigate and deed restrict a minimum of 130.41 acres of wetlands in Mitigation Site No.1 and Mitigation Site No. 2 combined. Mitigation Site No. 1 consists of approximately 43 acres, of which 25.6 acres have been designated as mitigation lands. This 25.6 acres was deed restricted by you on October 3, 1997. However, we have never received a legal description and boundary survey of the 25.6 acres in Mitigation Site No. 1. Therefore, it is unclear if you intend to deed restrict the entire 43 acre parcel or just the 25.6 acres required for mitigation. The same holds true for Mitigation Site No. 2. Mitigation Site No. 2 consists of a 235 acre tract plus the newly acquired 9.5+ acre Haynes Property. However, only 94.0+ acres was deed restricted by you on October 3, 1997. Again, we have never received a legal description and boundary survey of the 94.0 acres in Mitigation Site No. 2. In the November 3, 1998 Addendum to Wetland Mitigation Plan you have proposed 120.3 acres at Site 2 and an additional 13.4 acres for Site 2 Modification for a total of 133.7 acres in Wetland Mitigation Site No. 2; this added to Wetland Mitigation Site No. 1 would now total 159.3 acres. As mentioned above, you are only required to mitigate and deed restrict 130.4 acres. However, if you choose to deed restrict the entire 159.3 acres that is your decision. In addition, it is unclear if you plan to include the 1.5 acre (Area G) on the Haynes Property, the 3.0 acre wetland from Permit No. 2SB0XR13449, all of the 40.9 acres in the open water borrow area or only 12.0 acres required by the permit, forested areas riverward of the agricultural levee along the Missouri River, and any buffers, roads, berms, and easements into the deed restriction. This issue needs to be clarified and a final, revised deed restriction with appropriate acreages and legal boundary descriptions provided to this office in accordance with Special Condition 2 listed above.

The modification to Permit Number P-2032 for Addendum to Wetland Mitigation Plan is approved with the inclusion of the above two additional special conditions to the October 10, 1997 permit and June 24, 1998 modification. If you have any questions, please contact Mr. Danny McClendon at (314) 331-8580.

Sincerely,

Michael A. Brazier
Chief, Regulatory Branch

Copy Furnished:

Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
608 East Cherry Street, Room 207
Columbia, Missouri 65201

Mr. John Madras
Missouri Department of Natural Resources
Water Pollution Control Program
Post Office Box 176
Jefferson City, Missouri 65102-0176

Mr. Dan Witter
Missouri Department of Conservation
Policy Coordination Section
Post Office Box 180
Jefferson City, Missouri 65102-0180

Ms. Kathy Mulder
U.S. Environmental Protection Agency
Region VII
726 Minnesota Avenue
Kansas City, Kansas 66101

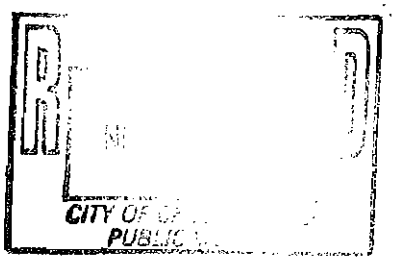
Mr. Steve McCaskie
Sverdrup Civil, Incorporated
13723 Riverport Drive
Maryland Heights, Missouri 63043

Mr. David Patrick
Institute for Environmental Studies
Greenville College
315 East College Avenue
Greenville, Illinois 62246

Mr. David Human
Ziercher Hocker, P.C.
The Bemiston Tower
231 South Bemiston, 8th Floor
St. Louis, Missouri 63105-1914

City of Chesterfield

November 3, 1998



Thomas J. Hodgini, Colonel U.S. Army
District Engineer
St. Louis District, Corps of Engineers
1222 Spruce Street
St. Louis, MO 63103-2833

Subject: Wetlands Mitigation Design – Chesterfield Valley, City of Chesterfield
St. Louis County, Missouri; Permit No. P-2032 issued October 10, 1997

Dear Col. Hodgini:

In response to your letter dated June 24, 1998 approving our request for modification for Permit Number P-2032 for Wetlands Mitigation Design – Chesterfield Valley, and as a follow up to our letter dated July 20, 1998 concerning the same, attached herewith we provide an addendum to the Wetland Mitigation Plan dated June 25, 1998. This addendum addresses the additional requirements as a result of the permit modification, including the requirement for 10.81 acres of additional wetlands mitigation. As a result of the permit requirements:

1) The Monarch-Chesterfield Levee District has entered into a contract to purchase additional lands to the east of Wetland Mitigation Site No. 2. These lands are a part of the Haynes Property (St. Louis County Locator No. 17T540037) and are contiguous and adjacent to Wetland Mitigation Site No. 2.

2) The Wetland Mitigation Design for Site No. 2 has been modified, incorporating lands purchased from the Haynes Property, to provide an additional 10.81 acres of wetlands mitigation, which includes 7.69 acres of emergent wetlands (PEM SS) and 3.12 acres of forested wetlands (PFO). The attached addendum to our Wetland Mitigation Plan addresses these additional wetlands along with modified drawings including: Site Plan; Wetland Planting Zones; Recreational Features; and Cross Sections and Details.

3) Land surveys are nearing completion and a Conservation Easement and Perpetual Deed Restriction for the additional lands is being developed. We expect that a draft copy will soon be made available for review, approval, signature, and recording by the City of Chesterfield and the Monarch-Chesterfield Levee District.

922 Roosevelt Parkway • Chesterfield, Missouri 63017-2080 • 314/537-4000 • Fax 314/537-4798 or 314/537-4799

We request your review and approval of the Wetland Mitigation Plan, as modified by this addendum so that plans may be finalized and implementation continue. Should you have any questions, please call Mr. Steve McCaskie (Sverdrup Project Manager, 314-770-4554) or Mr. David Patrick (Greenville College Project Manager, 618-664-2800 X4486). Thank you for your time.

Sincerely,

Michael G. Herring
City Administrator

MGH:ck

cc: Danny D. McClendon (USACE-STL)
Earl R. Hoffmann (Monarch-Chesterfield Levee District)
Michael O. Geisel, Director of Public Works/City Engineer
David R. Human (Ziercher & Hocker)

City of Chesterfield

97-PW-02

April 17, 1998

Mr. Danny McClendon
US Army Corps of Engineers
Project Manager
Regulatory Office
1222 Spruce Street
St. Louis, MO 63103-2833

Re: Modification to Section 404 Permit No.: P2032
Boones Crossing Interchange, Chesterfield, MO
DGPA Project No.: THCMRCO1

Dear Danny:

I appreciate you and Dennis Woodruff providing the opportunity for Don Purdy, Andy McCord, Lee McKinney, David Human and Frank Hackmann to review the findings of the March 3, 1998 NRCS wetland certification of properties in the vicinity of the proposed Boones (Chesterfield Commons) Crossing Interchange at the meeting on March 11, 1998 in Chesterfield, Missouri. Your annotated map, indicating wetlands A to E and G, offered a very useful summary of the then best available location and area determinations. I have conferred with Lee McKinney and D.G. Purdy & Associates, Inc. (DGPA) familiar with the details of the interchange proposals and NRCS wetlands certification issues.

In a letter dated January 16, 1997, to the St. Louis District Corps of Engineers, D.G. Purdy & Associates, Inc. requested, on behalf of THF Chesterfield Development, L.L.C., the inclusion in the valley-wide Section 404 permit application of portions of what are now generally referred to as wetlands A, B, C and D (see Figure 1.0 attached). The proposed impact to these wetlands is for the completion of the above Interchange project. This request, which was accepted by the District Engineer for incorporation in the valley-wide permit, sought approval for an impact area of an estimated 1.77 acres. The impact area, according to the January 16 letter, would be "further refined as engineering design and confirmation of wetlands delineation are completed".

Engineering and construction criteria, which have evolved since the January 16, 1997 letter, have led to an increased construction footprint which addresses (i) revised roadway embankment widths, (ii) acknowledgement that remnant portions of impacted wetlands outside of the strict interchange construction footprint will likely lose wetlands functionality as a result of construction and should therefore be considered entirely impacted, (iii) improved topographic area and (iv) all Interchange project related improvements.

NRCS/Corps confirmation of wetlands boundaries are complete for wetlands areas A, D, E and G which would be affected by the construction of the Interchange project. No wetlands were identified on the Haynes property in the project area. The certification process for the Novel tract (wetlands areas B and C) awaits authorization from tract owners, however there appears to be agreement as to the forested wetlands boundaries (which can be readily defined on topographic survey maps) on that tract, and we have for the moment taken a "worst case" view of potential farmed wetlands north of these wooded areas.

D.G. Purdy & Associates, Inc. has refined the likely impacted area for Interchange construction to address the more advanced construction proposals and recent wetlands certifications. The best available data to date has been utilized for the estimation of wetlands extent. An explanation of DGPA's rationale for each area is presented in Attachment A. The enclosed Plan 1.0 shows the interchange project construction footprint and wetlands boundaries overlaid onto the 1997 topographic plans. Figure 2.0 indicates the approximate location of the area covered by the detailed Plan 1.0.

Impacted wetlands area estimates are shown in Column II of Table 1.0 attached. The total impacted area is determined as 7.72 acres.

Of this total, 1.77 acres were provisionally identified in DGPA's letter of January 16, 1997, and this figure was included in the total of 71 acres of wetlands which we understand is the 'base' figured permitted to be impacted in the valley-wide Section 404 permit. Additional area requirements, which total 5.95 acres, are shown in Column IV of Table 1.0. This figure acknowledges that the NRCS has not yet certified one tract, and takes a worst case approach in this respect.

We therefore, request that Section 404 permit number P.2032 be modified to include the additional impacted area of 5.95 acres of wetlands A, B, C and D now determined to be necessary for the construction of the Boones Crossing Interchange project. We feel that the requested modification conforms to the description of work permitted under that permit as well as to the prescribed mitigation requirements. Mitigation provisions, which will satisfy the ratios and other requirements of the existing permit are presented in Table 1.0, with the additional mitigation areas listed in column IX totaling 7.72 acres.

You will note that wetlands E and G are not included in the totals in Table 1.0 nor are they included in our request for a modification to the existing permit. Should the Corps decide that inclusion of these wetlands would be appropriate at this time, then we would not object to the inclusion of areas E and G in the current modification request, provided that such inclusion would not delay the proposed construction start date of June 1, 1998. As you know, construction of the Interchange project is scheduled to begin on that date and will require the maximum possible window of dry weather and ground conditions over the summer and fall.

While we recognize that we are seeking an expedited review of this permit modification request, we believe that, given the already extensive understanding of project and site characteristics by the involved parties, we have provided sufficient information for construction to start by June 1, 1998.

Please let me know if you have any questions or require additional information.

Sincerely,

Michael Geisel, P.E.
City Engineer and Director of Public Works
City of Chesterfield

enc.

cc: Michael G. Herring, City Administrator, City of Chesterfield
M. Staenberg, THF Realty, Inc.
Don Purdy/Andy McCord
Frank Hackmann, Esq.
A. Bornstein, Esq.
S. McCaskie, Sverdrup
R. Brinkmann, Brinkmann Construction
D. Smith, Wolverton
L. McKinney

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

OCT 10 1997

REPLY TO
ATTENTION OF:

Construction-Operations
Readiness Division
Regulatory Branch
Project Number 199612870

10/15/97

originals → Mike Herring

cc: (letter only)
MAYOR
PUB. WKS/PARKS COMMIN
MGW, C.A.
(copy everything for me)

Mr. Michael Herring, City Administrator
City of Chesterfield
922 Roosevelt Parkway
Chesterfield, Missouri 63017

Dear Mr. Herring:

Transmitted herewith is Department of the Army Permit No. P-2032 authorizing the excavation or placement of fill material into wetlands and waters of the United States in conjunction with implementation of the proposed Chesterfield Valley improvements, in Chesterfield Valley, Chesterfield, St. Louis County, Missouri, between approximate Missouri River miles 41 and 49 and adjacent to Bonhomme Creek.

It is to be understood that this instrument does not give any property rights either in real estate or material, or any exclusive privileges; and that it does not authorize any injury to private property or invasion of private rights, or any infringement of Federal, state or local laws or regulations; nor does it obviate the necessity of obtaining state assent to the work authorized.

General Conditions 1 through 6 and parts 2 through 6 under "Further Information" are standard conditions for all permits. Special condition 1 points out three (3) Section 401 water quality certification conditions from the Missouri Department of Natural Resources which specify measures to protect water quality at the worksite (enclosure). The Missouri Department of Natural Resources modified their April 15, 1997, Section 401 Water Quality Certification Condition Number 1 for this permit on September 4, 1997 (enclosure). This modified condition is now a condition of this permit. Special conditions 2 through 5 specify measures to protect water quality at the worksite and to insure permit compliance. The changes to the special conditions that you requested on August 20, 1997 have been incorporated into the permit.

If any material changes in the scope, location and plans of the work are found necessary, due to unforeseen conditions or otherwise, revised plans detailing proposed modifications in the work must be submitted to the District Engineer for review and

approval. Proposed modifications may not be placed under construction until Department of the Army "Approval of Revised Plans" has been granted.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:

Thomas J. Hodgini
Colonel, U.S. Army
District Engineer

Enclosures

Copies Furnished: w/Special Conditions only

Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
608 East Cherry Street, Room 200
Columbia, Missouri 65201

Mr. John Madras
Missouri Department of Natural Resources
Water Pollution Control Program
Post Office Box 176
Jefferson City, Missouri 65102-0176

Ms. Kathy Mulder
U.S. Environmental Protection Agency
Region VII
Wetland Protection Section
726 Minnesota Avenue
Kansas City, Kansas 66101

Mr. Dan Witter
Missouri Department of Conservation
Post Office Box 180
Jefferson City, Missouri 65102-0180

Ms. Claire Blackwell
Missouri Department of Natural Resources
State Historic Preservation Program
Post Office Box 176
Jefferson City, Missouri 65102-0176

Mr. John Hicks
Booker Associates, Incorporated
1139 Olive Street
St. Louis, Missouri 63101

This notice of authorization must be conspicuously displayed at the site of work.

United States Army Corps of Engineers

19 97

A permit to excavate or place fill material into wetlands and waters of the United States in conjunction with implementation of the proposed Chesterfield Valley improvements.

at in Chesterfield Valley, Chesterfield, St. Louis County, Missouri, between approximate Missouri River miles 41 and 49 and adjacent to Bonhomme Creek.

has been issued to City of Chesterfield on 10 Oct 19 97

Address of Permittee 922 Roosevelt Parkway
Chesterfield, Missouri 63017

Permit Number

P - 2 0 3 2

District Commander
Thomas J. Hodgini
Colonel, U.S. Army
District Engineer

ENG FORM 4336 , Jul 81 (33 CFR 320-330) EDITION OF JUL 70 MAY BE USED (Proponent CECW O

DEPARTMENT OF THE ARMY PERMIT

Permittee City of Chesterfield

Permit No. P-2032

Issuing Office U.S. Army Engineer District, St. Louis

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: To place fill material into waters of the United States in conjunction with implementation of the proposed Chesterfield Valley improvements, in Chesterfield Valley, Chesterfield, St. Louis County, Missouri.

Project Location: Chesterfield Valley, Chesterfield, St. Louis County, Missouri, between approximate river miles 41 and 49 and adjacent to Bonhomme Creek.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2002. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

See continuation sheets, pages 4 and 5, of this document.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorization required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a revaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive,this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Michael B Hanna 10/1/97

(PERMITTEE) City of Chesterfield (DATE)
922 Roosevelt Parkway
Chesterfield, Missouri 63006

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Thomas J. Hodgini 13 Oct 97

(DISTRICT ENGINEER) THOMAS J. HODGINI (DATE)
Colonel, U.S. Army
District Engineer

When the structures or work authorized by this permit are still in existence at the time the property is transferred,the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions,have the transferee sign and date below.

(TRANSFEREE) (DATE)

Special Conditions

1. That the permit be revoked or a stop work order be issued if the State of Missouri notifies us, that the activities are not being performed in conformance with the Missouri Department of Natural Resource's April 15, 1997, Section 401 water quality certification conditions for this permit (Attachment A).

2. That the permittee develop for wetland mitigation purposes, approximately 34.4 acres of forested wetlands, 42.0 acres of wet meadow, 12.0 acres of open water habitat, and 31.2 acres of emergent and scrub/shrub wetlands within the two, 119.6 acre mitigation sites, adjacent to the Monarch-Chesterfield Levee. The development of these mitigation areas will be in accordance with the applicant's November 1996 mitigation plan and June 16, 1997 revisions (Attachment B), with the following exceptions:

a. That the permittee plant, and ensure no less than an 80% survival rate through five (5) growing seasons, four hundred and thirty-six (436) trees per acre, on a 10-foot by 10-foot spacing, of approximately 34.4 acres of predominantly mast producing trees (pin oak, nuttal oak, pecan, hackberry, swamp white oak, bitternut hickory) within the two mitigation sites. Equal numbers of the above species, consisting of one to three year old seedlings, shall be planted and may be obtained from several private nurseries. Non-surviving seedlings will be replaced in-kind, unless there is a definite lack of certain species survival, in which case the low survival species may be substituted with the more successful species. Seedling locations should be adequately marked for future monitoring of tree survival and growth. This monitoring will be done using a subsample of the total mitigation area. Weed, grass, and natural tree regeneration competition will need to be monitored for a period of not less than five (5) years in order to ensure survival of the planted seedlings. Non-native woody or herbaceous invaders will be removed by mechanical, herbicide application, or other appropriate methods from the planted sites as necessary. Animal damage to the planted seedlings must also be monitored for a period of not less than five (5) years and corrective measures implemented if necessary. Natural regeneration will be allowed after the initial five (5) year period. All tree plantings must be implemented concurrently with project construction, and completed as outlined in Special Condition 2d below.

b. That the permittee plant and establish approximately 42.0 acres of wet meadow, and 31.2 acres of emergent and scrub/shrub wetlands within the two wetland mitigation sites. This should be accomplished by 1) natural revegetation; 2) removing topsoil plugs from existing wetland areas prior to construction impacts and spread within the mitigation stands; 3) grading and/or construction of berms to ensure that the hydrology is adequate to support these habitats; and 4) supplemental plantings. Supplemental plantings for shrub-scrub could include buttonbush, deciduous holly, swamp privet, black willow, red-osier dogwood, and swamp rose. In the event these habitats are not established after the first five (5) years, then additional plantings and/or hydrology manipulation will be required. All plantings must be implemented concurrently with project construction, and completed as outlined in Special Condition 2d below.

c. That the permittee develop approximately 12.0 acres of open water habitat within the two mitigation areas. These may consist of permanent water or areas that periodically dry up and create mud flat habitat.

d. Mitigation shall be implemented in phases concurrent or ahead of wetland impacts. The City of Chesterfield shall submit to the Corps of Engineers a phasing plan for mitigation implementation, along with a proposed accounting system for tracking wetland impacts versus mitigation complete or under construction. Mitigation design and implementation shall be done concurrent with, or in advance of, actual impacts to wetlands. In no instance will wetland impacts be permitted prior to the start of mitigation design and implementation. Mitigation shall be of the same type and at ratios indicated for impacted wetlands. Phase 1 of the mitigation shall consist of the area designated as Mitigation Site 1, and shall be completed no later than December 31, 1998. All other mitigation phases shall be completed by December 31, 2002.

e. After the first year of establishment of the mitigation areas, if the necessary hydrology is not adequate then corrective measures must be designed and implemented to restore the required wetland hydrology. Hydrologic monitoring shall begin with the completion of the first phase of mitigation and continue for a minimum of five (5) years after completion of the final mitigation phase.

f. The permittee shall conduct project monitoring, maintenance, and management of the mitigation areas. Monitoring is to include baseline studies prior to project construction, monitoring during construction, and long-term monitoring. Long-term monitoring and reports on the mitigation areas will be required annually for a minimum of five (5) years after all vegetation and hydrology criteria are met. Monitoring shall continue for a minimum of five (5) years after completion of the final mitigation phase. If at the end of the annual monitoring period, the mitigation stands are providing adequate wetland functions and values, then additional monitoring will not be required. However, if the stands are not functioning in the manner intended after the annual monitoring period, then corrective measures will need to be implemented. Maintenance, monitoring, and any corrective measures of the mitigation areas will be the responsibility of the permittee.

3. That the permittee shall revise the November 1996 wetland mitigation plan and June 16, 1997 plan with the revisions outlined above. All final grading plans, elevations, planting plans, tables and acreages, and phasing plan shall be submitted to the St. Louis District, Regulatory Branch no later than 90 days after issuance of the permit. Revisions to all text, final grading and elevation plans, planting plans, and related documents for the remaining mitigation phases shall be submitted to the St. Louis District, Regulatory Branch no later than 180 days after issuance of the permit. The City of Chesterfield shall notify the St. Louis District, Regulatory Branch of pending wetland impacts, their type, and size prior to the occurrence of said impacts.

4. That the permittee agree to place a perpetual deed restriction and Conservation Easement on the 25.6 acre mitigation site and the 94.0 acre mitigation site, that make up the mitigation plan. This deed restriction and Conservation Easement must be signed and recorded with the St. Louis County Recorder of Deeds no later than 120 days after issuance of the permit. A Conservation Easement is attached to the permit (Attachment C). A copy of the signed and notarized Conservation Easement and recordation record from the St. Louis County Recorder of Deeds Office is to be provided to the St. Louis District, Regulatory Branch no later than 120 days after issuance of the permit.

5. That the permittee submit any plans that could potentially affect the Monarch-Chesterfield Levee to the St. Louis District, Regulatory Branch at least 60 days before any construction is to take place.

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Danny

STATE OF MISSOURI

Mel Carnahan, Governor • David A. Shorr, Director

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY

P.O. Box 176 Jefferson City, MO 65102-0176

September 4, 1997

City of Chesterfield
Mr. Michael Herring, City Administrator
922 Roosevelt Parkway
Chesterfield, MO 63017-2080

St. Louis County
P-2032
Revision

Dear Mr. Herring:

The Missouri Department of Natural Resources, Water Pollution Control Program, has reviewed your request for revisions to the Water Quality Certification issued April 15, 1997, for proposed Chesterfield Valley Improvements.

The proposed projects are located inside the current 100-year Monarch-Chesterfield Levee system in Chesterfield, St. Louis County, Missouri. The projects extend from Missouri River miles 41 to 49 and adjacent to Bonhomme Creek.

Condition number 1 has been revised as follows. All other conditions remain as stated on the original certification.

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1. All wetland impacts shall be mitigated. Mitigation design and implementation shall be completed concurrent with or prior to wetland impacts, in accordance with the mitigation phasing plan submitted to the St. Louis District, U.S. Army Corps of Engineers, Regulatory Branch. In no instance shall impacts to wetlands occur in advance of the start of mitigation design and implementation. Mitigation plans should be approved prior to construction. The actual area to be mitigated should be based on the delineated wetlands as identified by the U.S. Army Corps of Engineers in the Section 404 permit, should it be issued. The applicant should furnish a survey of the area to be used as mitigation for wetland losses. The survey should be used to describe and identify the area to be reserved as the mitigation/avoidance corridor by a permanent conservation restriction. The conservation restriction covering this tract shall reserve this area for wetland protection and wildlife purposes exclusively, with the exception that trails for hiking and wildlife observation may be permitted. Any plans for such trails must be submitted to the Department of Natural Resources for review and approval. The conservation restriction shall be filed and recorded as a deed restriction on the property in perpetuity, and a copy furnished to this Department.

Water Quality Standards must be met during the operation. If compliance with Water Quality Standards is not maintained, the Corps of Engineers will be notified and the certification may be withdrawn. If you have any questions, please contact Terri Ely of the Planning Section at (573) 751-7428.

Sincerely,

WATER POLLUTION CONTROL PROGRAM

Edwin D. Knight
Director

EDK:tep

c: Danny McClendon, Corps of Engineers, St. Louis District
Department of Natural Resources, St. Louis Regional Office

19961287O

STATE OF MISSOURI

Mel Carnahan, Governor • David A. Shorr, Director

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY

P.O. Box 176 Jefferson City, MO 65102-0176

April 15, 1997

City of Chesterfield
Mr. Michael Herring, City Administrator
922 Roosevelt Parkway
Chesterfield, MO 63017

St. Louis County
P-2032

Dear Mr. Herring:

The Department of Natural Resources, Water Pollution Control Program, has reviewed your request for Water Quality Certification for proposed Chesterfield Valley Improvements, which include development of the Master Drainage Plan, Roadway Improvements, Parks Improvements and implementation of the Master Development Plan. Please refer to the Public Notice dated December 18, 1996, for project details.

Approximately 71 acres of wetlands will be impacted by this project.

The proposed projects are located inside the current 100-year Monarch-Chesterfield Levee system in Chesterfield, St. Louis County, Missouri. The projects extend from Missouri River miles 41 to 49 and adjacent to Bonhomme Creek.

This office certifies that the ongoing activity apparently will not cause the general or numeric criteria to be exceeded nor impair beneficial uses established in Water Quality Standards, 10 CSR 20-7.031, provided the following conditions are met:

1. All wetland impacts shall be mitigated. Mitigation shall be completed before impacts to the wetlands occur. Mitigation plans should be approved prior to construction. The actual area to be mitigated should be based on the delineated wetlands as identified by the U.S. Army Corps of Engineers in the Section 404 permit, should it be issued. The applicant should furnish a survey of the area to be used as mitigation for wetland losses. The survey should be used to describe and identify the area to be reserved as the mitigation/avoidance corridor by a permanent conservation restriction. The conservation restriction covering this tract shall reserve this area for wetland protection and wildlife purposes exclusively, and shall be filed and recorded as a deed restriction on the property in perpetuity, and a copy furnished to this Department.

2. A land disturbance permit may be needed from the Water Pollution Control Program. If you are disturbing five acres or more of land, please contact the Water Pollution Control Program at (573) 751-6825.

3. Best management practices should be utilized during the construction phase to minimize the amount of erosion and sedimentation into the rivers.

Preservation Act nor the Archeological and Historic Preservation Act of 1974 would apply.

WETLAND MITIGATION PLAN

The City of Chesterfield proposes to create a wetland mitigation bank on the identified site to offset losses to wetlands impacted within the Valley. With implementation a contiguous wetland ecosystem will be created from the adjacent agricultural areas to the Missouri River. Wildlife will have a variety of cover types and food sources.

When implemented, the plan will maintain natural water flow, help reduce flooding in some areas, enhance adjacent wetlands, provide diverse habitat, and create numerous recreational and educational opportunities. Consequently, these improvements will provide many of the functions associated with existing wetland types that will be impacted in Chesterfield Valley.

The City of Chesterfield will coordinate with the Corps of Engineers, U. S. Fish and Wildlife Service, Missouri Department of Natural Resources, and the Missouri Department of Conservation to help insure the success of this mitigation plan.

NO NET LOSS

The " No Net Loss " policy of Section 404 of the Clean Water Act of 1977 has provided the opportunity for long-term environmental planning regarding wetlands on the part of regulatory agencies as well as public and private entities. To compensate for wetland impacts, they must be mitigated using a minimum 1:1 ratio.

Wetlands lost will be mitigated at the following ratios, depending on wetland type:

	Creation
Farmed Wetland	1.0 to 1.0
Emergent	1.5 to 1.0
Scrub/Shrub	1.5 to 1.0
Wetland Woods	2.0 to 1.0

Previously issued 404 permits in the Valley usually limited mitigation to incorporating replaced wetlands on-site. However, it is now accepted that larger, more contiguous wetlands benefit the environment better than smaller isolated ones. It is the goal of the proposed mitigation to replace in-kind the wetlands lost due to the proposed actions. The proposed mitigation site has conditions which are favorable for replicating wetlands similar to those lost to development.

The City of Chesterfield will mitigate for all wetland impacts associated with the proposed drainage and development. Since development of the Valley will occur over an extended time period and to avoid piecemealing wetland impacts and mitigation, all mitigation will be developed in phases.

The mitigation plan will utilize soil composition, vegetative communities, and hydrologic systems to create a higher quality wetland ecosystem. All mitigation areas will be protected by a conservation easement.

EXCAVATION

The site will be graded to enlarge and deepen depressional areas and to trap additional water. Excavation will be phased to coordinate with the borrow needs of the Monarch Chesterfield Levee District. Grading will be done to create a variety of elevations and curvillinear edges on the site. Excavated material will be used to create peninsulas of land into the proposed wetland areas to create upland habitats. These peninsulas will increase habitat diversity. Some of the excavated material will also be used to create a buffer area along the perimeter of the site, separating the proposed wetland areas from agricultural areas. Areas near the property line will be graded to ensure little to no impact to the adjacent properties.

HYDROLOGY MANAGEMENT PLAN

Potential hydrologic input to the mitigation bank includes direct precipitation, overland flow (stormwater runoff), ground water, and periodic overflow from the Missouri River. Hydrologic outputs include evapotranspiration, fluctuation (lowering) of the water table, and overland flow off-site.

The site will be graded so that most of the surface flow onto the site remains on-site. The proposed mitigation plan will result in only slight changes to the hydrologic input and output at the mitigation site. Surface grades will be maintained to direct the maximum amount of runoff into the depressional areas. This will result in a slight reduction of runoff onto adjacent areas.

The Missouri River is a major influence on the water table at the proposed mitigation site. The water table on the site fluctuates as a result of precipitation and Missouri River levels. Deeper excavating on portions of the mitigation site will potentially intercept ground water from the Missouri River.

Hydrologic input will provide conditions which favor the development of wetlands in the excavated areas on site. During a normal climatic year, water potentially will be increased at or near the surface of the proposed wetland areas. Once complete, the newly created wetlands will function similar to existing wetlands, reacting to prolonged wet or dry periods in much the same manner as existing wetlands.

The flood elevation will not be impacted by the proposed mitigation plan. If monitoring of the mitigation site indicates that insufficient hydrologic conditions are present to support the development of wetlands, remedial measures will be recommended and implemented.

HABITATS AND VEGETATION

Providing different elevation changes and hydrologic conditions will result in an increase in the diversity of habitats and vegetation on the mitigation site. The habitats created include wet meadow areas, scrub-shrub areas emergent areas, bottomland hardwood forests, and others.

Topsoil will be excavated and stockpiled from on site and stockpiled from the upper 6" of topsoil and redistributed over the enlarged depressional areas once rough grades are established.

Additional seeding and planting operations will be used in establishing herbaceous and woody species in wet meadow.

The excavated areas of the proposed mitigation site will be planted with a variety of wetland type species. Plantings will consist of herbaceous plants and woody shrubs as well as selected tree species throughout. These trees will largely be nut-bearing trees. Where the excavated material is placed to form a berm barrier, upland tree and shrub plantings will be introduced to increase the buffer between wetland and the surrounding areas.

Hardwood forest habitats will be planted with variety of nut-bearing trees and other species. These will be planted as one to two year old nursery whips in a 12' X 12' grid formation to facilitate extraction of undesirable plant species and other maintenance. Using the nursery whips will revegetate a larger area more rapidly than planting established trees.

On the side slopes of the upland berms, revegetation will take several forms. A variety of tree species will be planted in the form of two-year old nursery whips. Scattered two-inch caliper trees will be used as well. The introduction of additional nut trees will eventually provide food for wildlife. A mix of shrubs/whips will be planted, as appropriate. The slopes of the upland barrier will be seeded with an appropriate wildflower seed mix for erosion protection until other species are established. A mix of wetland species will be used to overseed other areas.

The following chart lists plants representing possible species for mitigation habitats. This is a tentative list of species and may be altered as the progression of the design dictates. many of the plants indicated will grow in several of the defined habitats. Many plants indicated are also transitional from one habitat to another.

Plant List

Bottomland Hardwood Areas	Scrub / Shrub / Pond
White Oak	Arrowhead
Pin Oak	Bulrush
Pecan	Pickeral Plant
Red Maple	Water Plantain
Black Gum	Marsh Mallow
Sassafras	Buttonbush
Cutleaf Sumac	
Fragrant Sumac	
Cranberrybush Viburnum	

It is anticipated that due to the increase of moisture at or near the surface, wetland plants will become rapidly established. Maintaining a vegetated buffer will reduce sediment deposition into the newly created wetland sites.

PHASING

The Wetland mitigation site will be implemented in phases. The first phase will include mitigation for impacts to wetlands caused by the proposed Chesterfield Parks development. The second phase, which will occur almost concurrently with the first, will be for wetlands impacted

by the proposed Master Drainage Plan. Subsequent wetland mitigation will be for impacts due to roadway improvements, commercial development and the upgrade of the Monarch-Chesterfield Levee to a 500 year levee. This will be accomplished in a minimum of three phases.

MANAGEMENT

The wetland mitigation bank will be managed jointly by the City of Chesterfield and the Monarch-Chesterfield Levee District. The entire site will be placed under a conservation easement. The City of Chesterfield proposes to operate the mitigation bank site as a park site for low impact uses. These uses include bird watching, hiking and similar activities. A trail system will be developed concurrently with the mitigation.

MAINTENANCE AND MONITORING

Proper maintenance and monitoring of newly created wetlands is a critical factor contributing to the mitigation bank's success. Maintenance is especially important during the establishment period. The following are some of the key maintenance and monitoring items proposed for Chesterfield Valley's wetland mitigation site. If monitoring indicates the need, additional maintenance activities will be implemented.

Maintenance Items

Until vegetative cover becomes established, erosion, and sedimentation can occur. However, it is not anticipated that this will become a major problem. Slopes on the mitigation sites are flat or nearly so. Water on-site will not be concentrated, minimizing erosion potential. The wetland replacement site will be monitored to check for erosion and sediment damage. If erosion does

become a problem, affected areas will be regraded and stabilized. Specific stabilization measures will be determined based upon the extent of the damage.

The bottomland soil found throughout the sites generally have sufficient nutrient levels to support herbaceous and woody wetland vegetation. During the monitoring of the wetland replacement project, if signs of nutrient stress appear, appropriate action will be taken. If vegetation shows signs of being nutrient deficient, such as below normal growth or chlorosis, the affected areas will be top-dressed with a commercially available, slow-release fertilizer. If there appears to be an oversupply of nutrients on-site will be scheduled. An oversupply of nutrients will lead to excessive soft top growth which may lead to slumping and smothering of new growth.

A newly created wetland is a disturbed site and presents opportunities for noxious and invasive weeds which thrive on disturbed soil. Weeds such as purple loosetrife, certain reeds, and johnson grass can quickly become established in disturbed soils. Invasive plants have the capability of establishing vast monoculture colonies, to the detriment of desirable species. If monoculture colonies of undesirable species become established, diversity will decrease, resulting in a lower quality wetland.

In monitoring indicated the establishment of invasive plant species, various remedial measures will be taken. For minor problems, this may involve removal by hand or application of herbicides by wick or drag stick. If colonization is widespread, a larger-scale herbicide application may be warranted. Controlled burning is an option on some of the sites. Burning and large-scale herbicide application should be used sparingly due to the non-selective nature of these methods.

Organic and non-organic debris is a potential problem in wetlands. Debris can smother desirable vegetation and impede growth. Litter and trash will be removed as necessary to prevent excessive build-up. The sites will be posted for no dumping.

Mowing (brush-hogging) and other mechanical methods will be used to control faster growing, less desirable species. This will give slower growing, desirable species the opportunity to become established. Mowing will occur primarily in the areas where bottomland hardwoods are planted. Mowing will occur once in late spring, prior to seed heads developing on many herbaceous species, and again in later summer prior to seed head maturation. Organic matter from mowing will remain on-site. This will act as a mulching agent, and will also provide organic matter to the soils.

Monitoring Plan

Monitoring provides a measure of the relative success of a wetland replacement project. Replication of some of the functions of wetlands to be replaced may be one measure of success. The monitoring process identifies problems and any remedial actions that may be necessary. It also identifies any necessary changes to the maintenance which must be performed to maximize the success or avert failure of a project.

Monitoring of the wetland mitigation site will occur for a period of five years. During the first year, the site will be inspected on a monthly basis during the growing season, from April through September. The site will be inspected on a quarterly basis thereafter, until the end of the second year. For the remaining three years, inspections will be reduced to twice a year. The monitoring schedule will be adjusted, as necessary.

Among the items to be evaluated during the monitoring period will be the types and coverage of vegetation present, the condition of vegetation, and any items identified in the aforementioned maintenance plan. Hydrologic conditions will be checked to see if remedial action is necessary. Personnel performing the monitoring will be knowledgeable in the vegetation, hydrology, and soils of the area, as well as the Corps of Engineers Wetland Delineation Manual.

In conjunction with delineation data points, seven photographic data points will be established around the perimeter of the site. These will establish benchmarks for data collected in association with future monitoring reports. These points were placed in areas which can be easily accessed over the course of wetland development. Subsequently, these were positioned in the most representative locations for tracking the progress of the mitigated wetland.

A summary of conditions observed during each of the site visits will be assimilated into an annual monitoring report to be submitted to the U.S. Army Corps of Engineers, St. Louis District, Regulatory Branch. The monitoring report will include appropriate photographs showing the conditions found during each of the site visits for the previous 12 month period. Photographs will be taken at the previously identified points and at other locations, as necessary. The report will describe the status of the wetland replacement project and include a summary on maintenance activities for the previous year. Descriptions of actions taken or proposed to correct problems observed during the monitoring period will be provided. If problems are identified at other times of the year, the COE will be notified immediatley.

Booker
Engineers Architects Planners

Booker Associates, Inc.
1139 Olive Street
St. Louis, Missouri 63101

Phone: 314/421-1476
FAX: 314/421-1741

Transmittal Sheet

TO: Army Corps of Engineers
Regulatory Compliance
St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103

Date: June 16, 1997
Project No. D-3995
Project: Chesterfield Valley
Mitigation Site Locations

Attention: Danny McClendon

We are transmitting the following:

☐ Herewith ☐ Under Separate Cover ☐ Original Drawings

☐ Blue Line Prints ☐ Sepia Prints ☐ Shop Drawings

☐ Report ☐ Specifications ☐

Quantity	Drawing Number	Description
1		Chesterfield Valley Mitigation Sites

☐ For Your Information ☐ Preliminary ☐ Returned to You

☐ As Required by Contract ☐ Issued ☐ Disposition Noted

Comments

This is the mitigation site location information you requested for Chesterfield Valley.

Sincerely,

BOOKER ASSOCIATES, INC.

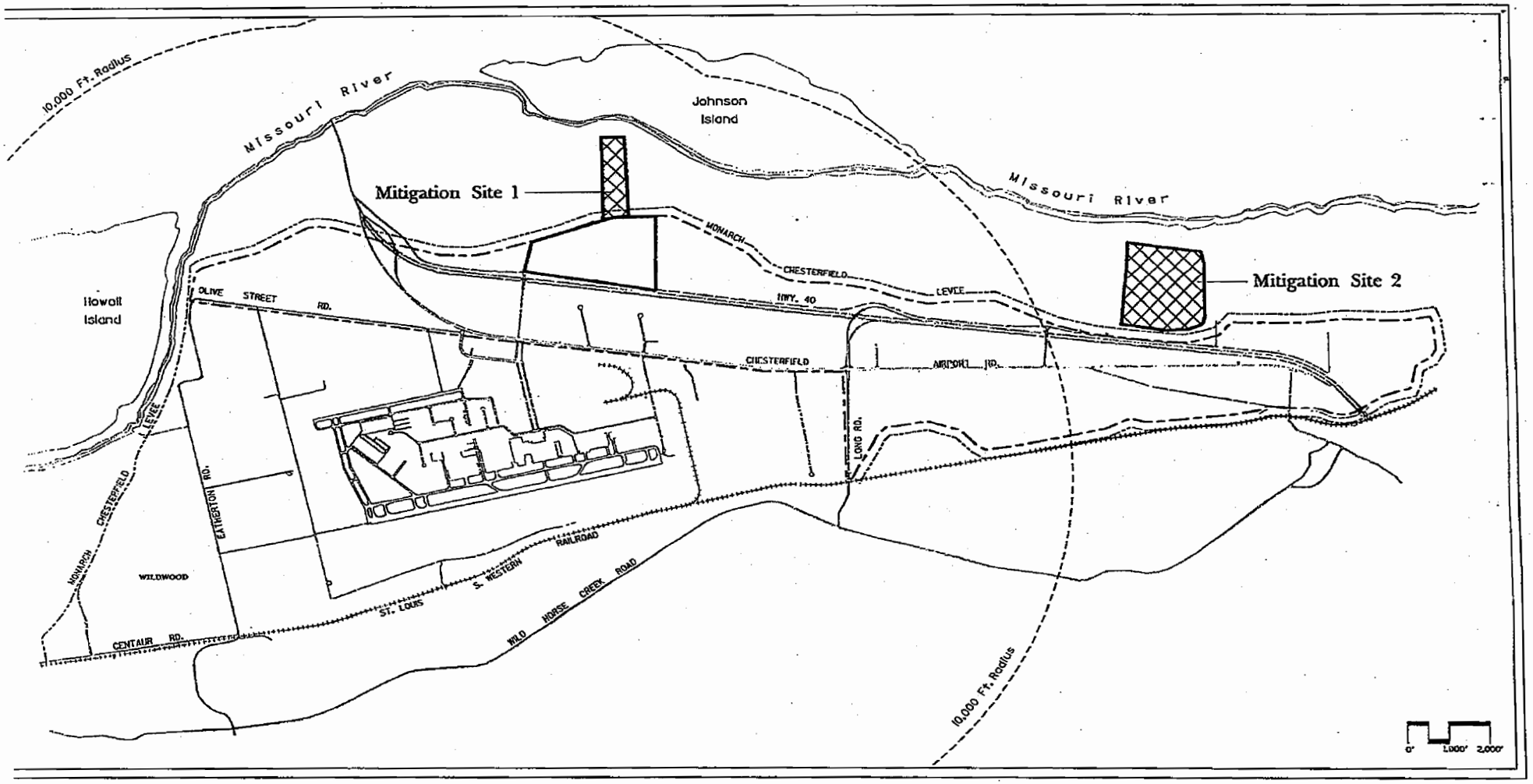
Howard S. Horwitz, R.E.P.
Environmental Planner

cc: File # D-3995
jjh

VALLEY MITIGATION

TYPE	ACRES IMPACTED	RATIO	REQUIRED MITIGATION	PROPOSED MITIGATION SITE 1	PROPOSED MITIGATION SITE 2	PROPOSED MITIGATION TYPE
Farmed Wetland	41.2	1:1	41.2		42	Wet Meadow
Open Water	10.6	1:1	10.6		12	Open Water
Palustrine Emergent (PEM)	11.5	1.5:1	17.3	7.5	20	Scrub/Shrub/PEM
				3.7		PEM (Enhanced)
High Quality Forested	7.9	2:1	15.8		20	Forested
Low Quality Forested	1.1	1.5:1	1.7	14.4		Forested (Enhanced)
TOTAL			**86.6**	**25.6**	**94**	

Total Impacts	86.6 acres+/-
Total Mitigation	119.6 acres +/-



LEGEND

LOCATOR NUMBERS,
MITIGATION SITE 1 – 16V140030

LOCATOR NUMBERS,
MITIGATION SITE 2 – 17T440014
17T530038
17T440036

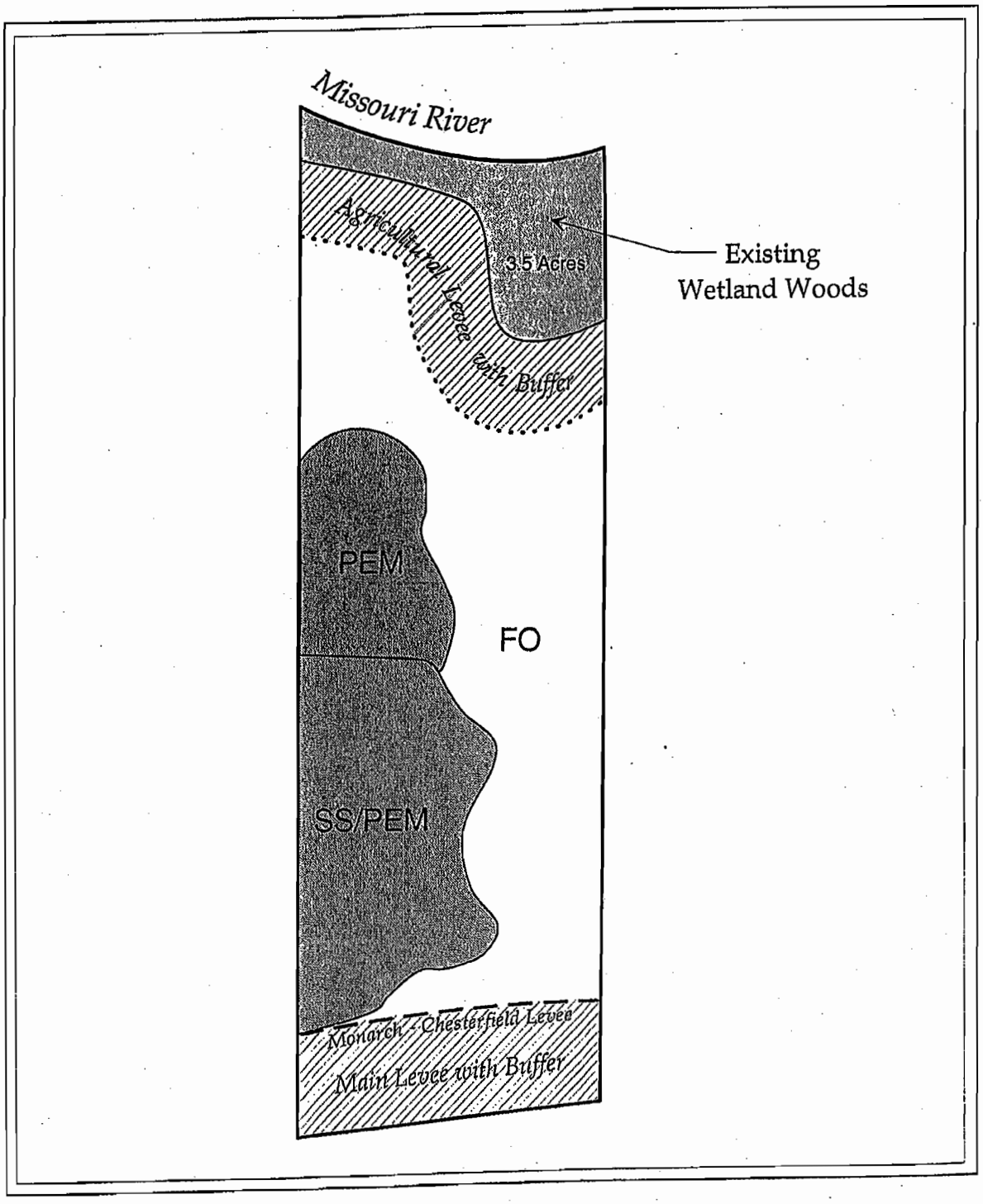
—— LEVEE
—·— STUDY AREA BOUNDARY

N

Booker
Engineers Architects Planners

Chesterfield Valley

Mitigation Sites



N

May 1997

Becker
Engineers Architects Planners

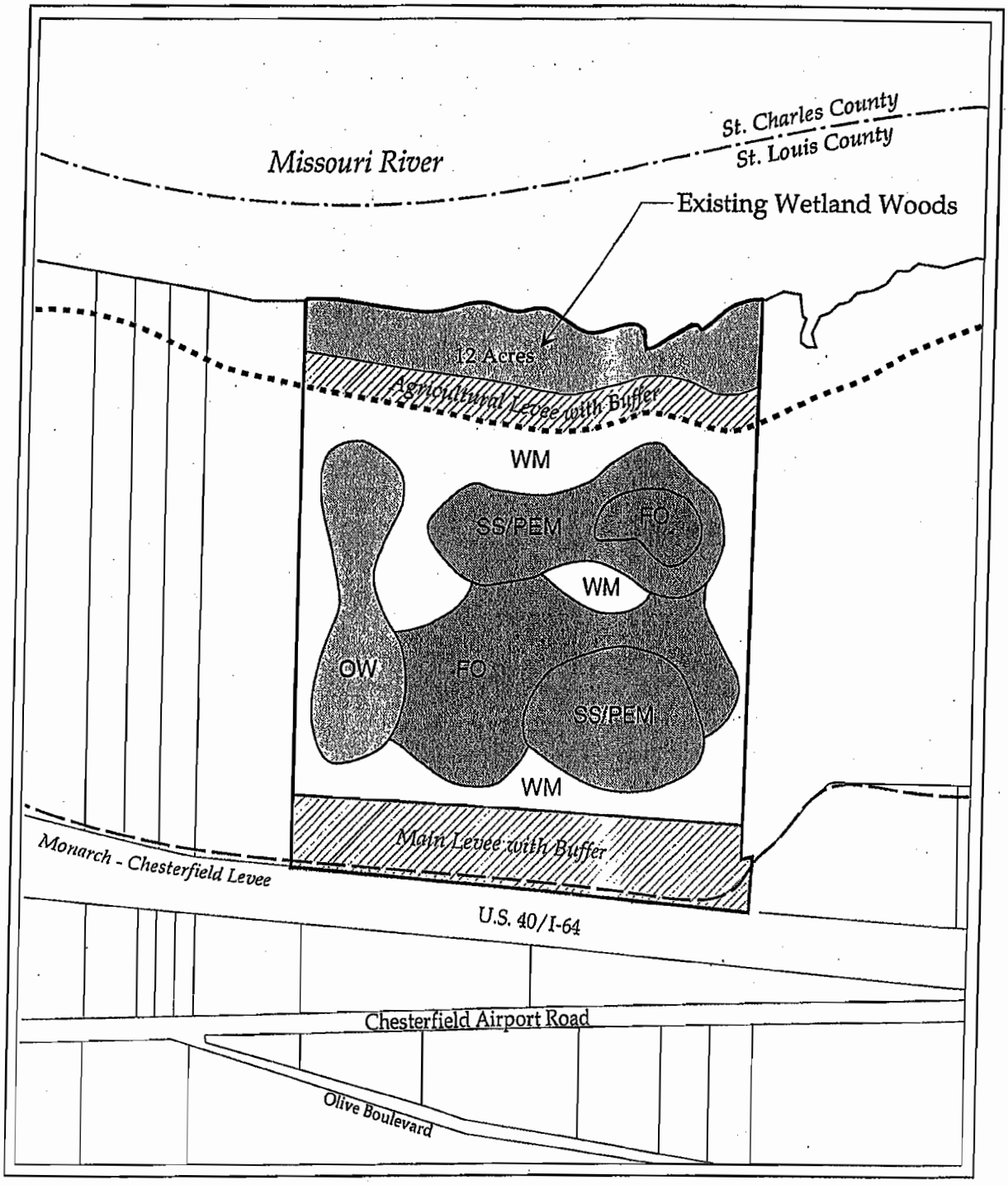
Legend

SS/PEM - Scrub-Shrub/Palustrine Emergent (7.5 Acres)
PEM - Palustrine Emergent - Enhanced (3.7 Acres)
FO - Forested Wetland - Enhanced (14.4 Acres)

Chesterfield Valley

Resource Management Plan

Mitigation Site 1 - Park Site



May 1997

Booker
Engineers Architects Planners

Legend

FO	- Forested Wetland (20 Acres)
WM	- Wet Meadow (42 Acres)
SS/PEM	- Scrub-Shrub/Palustrine Emergent (20 Acres)
OW	- Open Water (12 Acres)

Chesterfield Valley

Resource Management Plan

Mitigation Site 2 - Levee District Site

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

August 14, 1998

AUG 20 1998

Construction-Operations
Readiness Division
Regulatory Branch
File Number 199612873

Mr. Michael G. Herring
City Administrator
City of Chesterfield
922 Roosevelt Parkway
Chesterfield, Missouri 63017-2080

Dear Mr. Herring:

I have reviewed your July 20, 1998 request for an extension of time for Permit Number P-2032, to submit a modified/amended Wetland Mitigation Plan. Permit Number P-2032 was modified by the St. Louis District on June 24, 1998, with a requirement that you submit a modified/amended Wetland Mitigation Plan, deed restriction, and conservation easement for an additional 10.81 acres of mitigation by July 20, 1998. You have asked for a time extension until October 31, 1998 to submit these documents.

Based upon a review of the proposal, I hereby authorize an extension of time to submit the modified/amended Wetland Mitigation Plan, deed restriction, and conservation easement to October 31, 1998. All other terms and conditions of the original permit and subsequent modifications remain valid.

If you have any questions, please contact me at (314) 331-8574. Please include the identification number 199612873 with any inquiries about this project.

Sincerely,

Michael A. Brazier

Michael A. Brazier
Chief, Regulatory Branch

8/20/98

cc: Mike Geisel
Mayor Greenwood

STATE OF MISSOURI
Mel Carnahan, Governor • David A. Shorr, Director
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

September 4, 1997

City of Chesterfield
Mr. Michael Herring, City Administrator
922 Roosevelt Parkway
Chesterfield, MO 63017-2080

St. Louis County
P-2032
Revision

Dear Mr. Herring:

The Missouri Department of Natural Resources, Water Pollution Control Program, has reviewed your request for revisions to the Water Quality Certification issued April 15, 1997, for proposed Chesterfield Valley Improvements.

The proposed projects are located inside the current 100-year Monarch-Chesterfield Levee system in Chesterfield, St. Louis County, Missouri. The projects extend from Missouri River miles 41 to 49 and adjacent to Bonhomme Creek.

Condition number 1 has been revised as follows. All other conditions remain as stated on the original certification.

1. All wetland impacts shall be mitigated. Mitigation design and implementation shall be completed concurrent with or prior to wetland impacts, in accordance with the mitigation phasing plan submitted to the St. Louis District, U.S. Army Corps of Engineers, Regulatory Branch. In no instance shall impacts to wetlands occur in advance of the start of mitigation design and implementation. Mitigation plans should be approved prior to construction. The actual area to be mitigated should be based on the delineated wetlands as identified by the U.S. Army Corps of Engineers in the Section 404 permit, should it be issued. The applicant should furnish a survey of the area to be used as mitigation for wetland losses. The survey should be used to describe and identify the area to be reserved as the mitigation/avoidance corridor by a permanent conservation restriction. The conservation restriction covering this tract shall reserve this area for wetland protection and wildlife purposes exclusively, with the exception that trails for hiking and wildlife observation may be permitted. Any plans for such trails must be submitted to the Department of Natural Resources for review and approval. The conservation restriction shall be filed and recorded as a deed restriction on the property in perpetuity, and a copy furnished to this Department.

Water Quality Standards must be met during the operation. If compliance with Water Quality Standards is not maintained, the Corps of Engineers will be notified and the certification may be withdrawn. If you have any questions, please contact Terri Ely of the Planning Section at (573) 751-7428.

Sincerely,

WATER POLLUTION CONTROL PROGRAM

Edwin D. Knight
Director

EDK:tep

c: Danny McClendon, Corps of Engineers, St. Louis District
Department of Natural Resources, St. Louis Regional Office

9/11/97
cc: Mike Bensel
Doug Beach

Booker
Engineers Architects Planners

Booker Associates, Inc.
1139 Olive Street
St. Louis, Missouri 63101

(314) 421-1476
Telefax (314) 421-1741

December 2, 1996

Mr. Mike Giesel
Director of Public Works
City of Chesterfield
922 Roosevelt Parkway
Chesterfield, Missouri 63107

Re: 404 Valley Wide Permit
City of Chesterfield
Chesterfield Valley Improvements
Chesterfield Valley
Booker Project No. Y-3995

Dear Mr. Giesel:

We are transmitting herewith one original and four copies of the 404 permit application for Chesterfield Valley. Also included, as a part of the 404 permit application, is four copies of the Chesterfield Valley Resource Management Plan. Please call me should you have any questions.

Very truly yours,

BOOKER ASSOCIATES, INC.

John J. Hicks

John J. Hicks, ASLA
Group Leader, Environmental

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)

OMB APPROVAL NO. 0710-003
Expires October 1996

PRIVACY ACT STATEMENT

Authority: 33 USC 401, Section 10; 1413, Section 404. Principal Purpose: These laws require permits authorizing activities in, or affecting, navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Routine Uses: Information provided on this form will be used in evaluating the application for a permit. Disclosure: Disclosure of requested information is voluntary. If information is not provided, however, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME
Michael G. Herring, City Administrator
Mike Giesel, Director of Public Works

8. AUTHORIZED AGENT'S NAME AND TITLE *(an agent is not required)*
Booker Assoicates, Inc.

6. APPLICANT'S ADDRESS
City of Chesterfield
922 Roosevelt Parkway
Chesterfield, Missouri 63017

9. AGENT'S ADDRESS
1139 Olive Street
St. Louis, Missouri 63101

7. APPLICANT'S PHONE NOS. W/AREA CODE
a. Residence
b. Business (314) 537-4742

10. AGENT'S PHONE NOS. W/AREA CODE
a. Residence
b. Business (314) 421-1476

11. STATEMENT OF AUTHORIZATION

I hereby authorize, Booker Assoicates, Inc. to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

[signature] 11/27/96
[signature] 11/27/96

APPLICANT'S SIGNATURE — DATE

NAME, LOCATION AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE *(see instructions)*
Chesterfield Valley Improvements
including Master Drainage Plan, Roadway Improvements, Parks Improvements and Master Development Plan

13. NAME OF WATERBODY, IF KNOWN *(if applicable)*
Missouri River

14. PROJECT STREET ADDRESS *(if applicable)*
Not Applicable

15. LOCATION OF PROJECT
St. Louis County — COUNTY
Missouri — STATE

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN, *(see instructions)*

South of the Missouri River, between river mile 41 and 49.

17. DIRECTIONS TO THE SITE

From east, take U.S. 40 to Long Road south to Chesterfield Airport Road west.
From west, take U.S. 40 east to Chesterfield Airport Road (Olive Street), continue east.

18. Nature of Activity *(Description of project, include all features)*

See Attachment

19. Project Purpose *(Describe the reason or purpose of the project, see instructions)*

See Attachment

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

See Attachment

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

Common earth. All excavation and fill will be balanced on site. Volume of each has not been calculated.

22. Surface Area in Acres of Wetlands or Other Waters Filled *(see instructions)*

68.3 acres of wetlands will be impacted. All excavation to be done with standard earth-moving equipment.

23. Is Any Portion of the Work Already Complete? Yes ____ No X IF YES, DESCRIBE THE COMPLETED WORK

24. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

See Attachment

25. List of Other Certifications or Approvals/Denials Received from other Federal, State or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

*Would include but is not restricted to zoning, building and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described hersin or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
Michael B. Jones Mike D. Jones	11/27/96 11/27/96	John J. Phillips	11/27/96

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

*U.S.GPO:1994-520-478/82018

CHESTERFIELD VALLEY IMPROVEMENTS

1.0 INTRODUCTION

Since the opening of the Spirit of St. Louis Airport in the 1960's, Chesterfield Valley has been an attractive place for development. Located in the Missouri alluvial floodplain, this area has suffered however, from flooding of the Missouri River as well as from internal stormwater runoff. Although this limits the amount of development in the Valley, it is still an attractive place for businesses to locate. The flood of 1993 did not slow the pace of development. The recent proposal for a Wal-Mart to locate in the Valley is an evident sign that the business opportunities are greater than the risks.

The Chesterfield Valley area represents one of the largest remaining development opportunities in St. Louis County. The Valley includes approximately 1900 acres protected by the Monarch-Chesterfield Levee. Almost 3.4 million square feet of development already occurs in the Valley. Much of the development is office/warehouse or manufacturing distribution uses. Favorable conditions such as topography, access to all modes of transportation, and a shortage of developable locations elsewhere in St. Louis County, make Chesterfield Valley a prime location for development.

The expansion pressures on the Valley are also the result of the growth occurring in neighboring communities. Like Chesterfield Valley, these surrounding areas are considered prime locations for residential development. The City of Chesterfield currently has a population over 42,000. It also has the 3rd largest total number of housing units in St. Louis County, 16,061. With ample room to expand the City of Chesterfield will continue to have strong growth in the ensuing decades. Towards the south/south-west of the Valley, is the newly incorporated City of Wildwood. It has been estimated that Wildwood's current population is 23,340 residents. Between 1990 and 1995, the community has grown 42%. It is foreseen that in the year 2000, the City of Wildwood will have approximately 30,000 residents. Another area adjacent to the Valley that is rapidly growing is along Wild Horse Creek Road, formerly known as the Wild Horse Valley Community. The estimated growth rate of this area between 1980 and 1990 was

109%, with the population more than doubling from 1,794 to 3,756 persons. Since 1980, the number of housing units has nearly doubled from 609 to 1,188 in 1990. These areas are sparsely populated relative to the rest of St. Louis County, but their population is growing at a much faster rate.

The purpose of this 404 permit is to facilitate implementation of needed improvements to Chesterfield Valley to not only meet the demands of growing pressures from within the Valley itself, but from its surrounding communities. The proposed improvements to the Valley will provide a higher degree of safety from flooding of new and existing businesses as well as to provide better access and circulation of roadways. Sufficient infrastructure has to be provided for Chesterfield Valley that would not only increase further opportunities for growth but would support the growth that has occurred and will continue to occur.

2.0 ALTERNATIVE ANALYSIS

The proposed improvements to Chesterfield Valley are entirely location dependent. They are specifically designed to rectify existing and foreseen problems in the Valley. An environmental assessment prepared by the Army Corps of Engineers, has evaluated alternative drainage and other improvements relative to the Valley. For that reason, this section will only examine the need for the improvements and consequences of not implementing the improvements.

DRAINAGE SYSTEM IMPROVEMENTS

To prevent flooding of existing businesses the implementation of a drainage plan in Watersheds 3, 4, 5, and 6 is imperative. Due to the relatively flat terrain, poor soil drainage, and the lack of a complete drainage system, business properties and roadways continue to be subjected to frequent interior flooding. Large ponding areas develop which store water until is dissipates through evaporation and eventual soil absorption. The extent and depth of flooding is dependent upon rainfall amounts and water levels of the Missouri River.

A complete drainage system is needed to provide improved flood and drainage protection for portions of the Valley committed to urban development. Both St. Louis County and the City of Chesterfield have long recognized that there is a problem of interior flooding which renders approximately one-third of the levee protected area useless for development. Due to the lack of a defined drainage scheme, much of the stormwater runoff within the Valley simply ponds. In recognition of this problem, and with a view toward solving it, the County authorized a drainage study in the early 1980's, which was titled "Master Plan for Interior Drainage - Chesterfield Valley". This report considered various designs to reduce flooding. The recommended course of action was the construction of a network of ditches which would collect and store the runoff from a 100-year storm. Since 1985, portions of the Master Drainage Plan have been constructed. As businesses developed in the Valley, they were required to implement whatever portion of the Master Drainage Plan that fell within their property lines. As a result of scattered

development, implementation of this plan has been in piecemeal fashion. In its current state, the incomplete system is not capable of handling the drainage requirements of the Valley.

The City of Chesterfield with financial assistance from the Economic Development Administration, proposes to implement a complete drainage system in Watersheds 3, 4, 5, and 6 based on an update of the Master Drainage Plan. This project will include construction of a network of drainage ditches, pumping stations, and dry and wet detention basins. The plan proposes flat bottom ditches with 4 horizontal: 1 vertical side slopes which are capable of transmitting runoff from intense storm events to discharge points along the levee. If the Missouri River stage is high and discharge through the levee is impossible, then the ditches are capable of storing runoff from a lesser intensity storm until the Missouri River stage subsidies. Various alternatives to the original drainage plan have been evaluated. In 1995, a study, Hydrologic Modeling of Watersheds 2, 5, 6, and 7 of Chesterfield Valley, was prepared which resulted in recommendations for the modification of the Master Drainage Plan.

ROADWAY AND ACCESS IMPROVEMENTS

The Valley presently has rather limited access from I-64/US 40. The existing access includes a westbound off ramp and an eastbound on-ramp at Long Road, and a westbound on-ramp an eastbound off-ramp near the Missouri River. With development increasing in the surrounding area as well as in the Valley, better access will be needed to accommodate the increase in the number of vehicles wanting access to and from the Valley. There are also plans for the future development of a Wal-Mart east of Long Road. This in itself will spur additional development. The Highway I-64/ US 40 interchanges present serious traffic handling concerns and a more modern interchange system for the Valley is urgently needed before anticipated traffic volumes occur.

From the south, the Valley can be reached by the winding and steep Eatherton Road at the western end of the Valley and Long Road near the middle. These are the primary roads used by residents along Wild Horse Creek Road and in Wildwood to access the Valley.

Currently, these arterial roads have deficiencies, which include narrow rights-of-way and pavement surfaces, meandering alignments, steep grades, poor curvature, and inadequate sight distances. With development in the Valley and adjacent areas flourishing, these roads are becoming congested further compounding safety concerns.

Internal Valley roadways need to be modified or updated to accommodate proposed development. According to the East West Gateway Coordinating Council (EWGCC), the I-64/ US 40 corridor is one of the five transportation corridors in St. Louis County that is expected to have the most growth. Also, West St. Louis County ranks second in the St. Louis area in projected household gains. Currently, roads in the Valley are receiving increased traffic from surrounding residential development off Wild Horse Creek Road and from the City of Wildwood, increased development in the Valley, and through traffic from St. Charles residents. The City of Chesterfield has recently been submitted a plan for a Wal-Mart store in the Valley. When this development occurs it will lead to a domino effect of intense development of surrounding properties. As a result, traffic demands will exceed the Valley's roadway capacity that was designed to handle smaller traffic volumes. It is further predicted that the increase in volume would create a breakdown in traffic flow through the Valley unless improvements are made.

CHESTERFIELD VALLEY MASTER PLAN

Realizing the development opportunities as well as the development pressures in the Valley, the City of Chesterfield and St. Louis County created the "Chesterfield Valley Master Development Plan and Implementation Strategy". Created in 1993, the master plan evaluates the development potential of the Valley and proposes general guidelines as to the type of development which should occur. In sum, this document plans for the complete development of the Valley. However, the full development of the Valley will likely extend over a number of decades and will require significant improvements at the outset.

PARKS AND RECREATION

As part of the Chesterfield Parks Master Plan, there are several park improvements occurring in the Valley which will impact wetlands. One, located north of US 40 at the Spirit of St. Louis Boulevard calls for the development of an athletic complex of baseball, softball, and soccer fields. Included in this proposal are parking, concession and other support facilities. This action will result in the loss of several wetlands. This site was chosen because of available sites, it had the least amount of wetland impacts.

A second park facility is proposed at the location of Long Road and Bonhomme Creek. While this is not within the watersheds of the main study area, it is within the Valley. The facility is primarily a tennis complex. No wetlands have been identified at this site.

NO- BUILD

By not implementing the proposed improvements and plans, Chesterfield Valley will not only continue to be subjected to the same constraints that have limited development but will suffer from future problems. Issues to continue or result include: internal flooding from stormwater runoff will still occur; the I-64/US 40 interchanges will not meet the Missouri Department of Transportation interstate standards; the internal roadway system will be unable to meet anticipated traffic volumes; and the City of Chesterfield's development and recreational plans for the Valley will be hindered or become unachievable to the detriment of residents. It is important to note that development will continue to occur in the Valley regardless of whether or not improvements take place. However, it will do so in such a way that the social, economical, and environmental goals of the community and Valley are not fully accounted for, and 404 permitting issues will be piecemealed.

3.0 MITIGATION ANALYSIS

The City of Chesterfield's goals for Chesterfield Valley is to increase development potential, provide highway and roadway improvements, and provide recreational opportunities. After implementation of these improvements it is inevitable that development in the Valley will rapidly increase and thus result in secondary impacts to wetlands. Nonetheless, development will occur regardless of the primary action, but do so at a slower rate. If any type of improvement or development is being undertaken which may impact a potential wetland, an individual 404 permit needs to be applied for through the COE. Development in the Valley will have to go through this process on a site by site basis. This will involve longer time spans for the review process; increase in costs to the applicant as well as to federal, state, and local agencies; and a higher probability for the incomplete mitigation of impacts.

To avoid piecemealing of the Section 404 process, the Army Corps of Engineers determined that a single 404 permit should be issued for the entire Chesterfield Valley (Watersheds 3, 4, 5, and 6). This will facilitate the permit process and save an abundance of time and money for both the permit applicant and the regulatory agency. Furthermore, it makes the regulatory process quite predictable, eliminating the financial risks often associated with activities that require permits. Conforming with the COE recommendations, the City of Chesterfield prepared the "Chesterfield Valley Resource Management Plan".

The Chesterfield Valley Resource Management Plan establishes guidelines in which natural resource protection and urban land uses are adjusted and brought into the best possible relationship to each other. The goals, policies, and recommendations set forth in the plan provide a foundation for maximizing development potential and minimizing the unavoidable impacts to wetlands. Wetland impacts that are unavoidable will be compensated for through the implementation of a system of restored and created wetlands, or mitigation bank, as a component of the Resource Management Plan. The Chesterfield Valley Resource Management Plan provides for the comprehensive advance delineation, classification and evaluation of existing wetlands which will reduce the costs

and delays associated with the individual permit process. The mitigation bank will be implemented in phases. However, all mitigation of impacts will be completed in advance of the actual destruction of wetlands, resulting in a "No Net Loss of Wetlands".

4.0 CONCLUSION

All available information and analysis to date suggests that the proposed actions, improvements to Chesterfield Valley's drainage system and roadways, represents the only practicable course to meet the public and private needs. Nonetheless, these improvements are exclusively location dependent and can only occur in Chesterfield Valley. The City of Chesterfield is committed to ensuring that future development in the Valley occurs in a manner that sustains its resources while meeting a range of community objectives. Collectively, the proposed action will lead to no net loss of wetlands, better highway and roadway access to the valley, upgraded flood protection of existing and new development, and the ability to adhere to the growing pressures of the Valley and its surrounding communities.

18. Nature of Activity *(Description of Project, include all features)*

Perform all work associated with the proposed drainage system. This consists primarily of grading for flat-bottom ditches of variable widths, with side slopes of 4:1, along with associated pump stations. The proposed drainage improvements are designed to transmit runoff from intense storm events to discharge points along the levee. The ditches are capable of storing runoff from lesser intensity events when the Missouri River is high and discharge along the levee is impossible. The drainage system will provide Chesterfield Valley property and facilities protection from the 100 year interior storm event, as well as lesser events.

The work consists primarily of bulk excavation of common earth to construct the ditches, compaction and seeding of ditch bottoms and side slopes. Rip-rap and concrete will be used at the pump stations to construct the pump housing and protect the inflow. Excavation and filling will be balanced on-site. All fill areas will be compacted and seeded, and slopes stabilized. Filling will occur in area of facility improvements. Any excess excavated material will be disposed of off-site in a non-wetland area.

Roadway improvements include upgrading I-64/U.S. 40 with full interchanges. Other improvements include extending Baxter Road to intersect with I-64/U.S. 40 at the east end of the Valley, realigning portions of Eatherton Road, extending Edison Avenue within the Valley and realigning or constructing additional roads to improve access and circulation. Conceptual roadway improvements are as proposed by the Chesterfield Valley Master Development Plan.

The City of Chesterfield proposes to develop a sports complex within Chesterfield Valley. This consists of grading for ballfields, soccer fields, parking, associated facilities, roads and drainage. The sports complex is designed to support a variety of tournaments and league sports. It will consist of 780 parking spaces, 12 baseball/softball fields, 7 soccer fields, 4 volleyball courts, 3 concession and restroom facilities, and 3 maintenance and storage facilities. The entire 110 acre site is design to serve a crowd of 1,875 people. The sports complex will help the City provide for the recreation needs of residents, as well as portions of west St. Louis County. The complex will also allow the City to host tournament play, and is designed to meet the needs and requirements of the National Amateur Softball Association and the International Baseball Association.

The City proposes to move forward with Chesterfield Valley Master Development Plan and Implementation strategy. This identifies development options for the Valley, with potential for over 18,000,000 square feet of buildable area. It should be noted that development will proceed within the Valley, albeit at a slower pace, regardless of any action on the part of the City of Chesterfield.

The secondary and cumulative impacts of all actions proposed for the Valley will result in impacts to 68.3 acres of wetlands. The purpose and need, practicable alternatives analysis mitigation plan and additional supporting information is provided within the Chesterfield Valley Resource Management Plan, submitted as part of this permit application.

19. Project Purpose *(Describe the reason or purpose of the project, see instructions)*

The purpose of the drainage improvements are to provide improved flood and drainage protection for development in the Valley. The purpose of roadway improvements are to upgrade I-64/U.S. 40 and its interchanges to full interstate standards, and to modify and update internal Valley roadways to accommodate proposed development in the area. The parks improvements will provide recreation opportunities not found elsewhere in Chesterfield or St. Louis County.

20. Reason(s) for Discharge

Impacts are associated with excavation of drainage ditches and filling of Valley properties to provide greater flood and internal drainage protection for the portions of the Valley committed to Urban development and to allow for roadway improvements. There will be no discharge into waters of the U.S. other than wetlands impacts which are necessary and unavoidable, the proposed improvements are location dependent.

24. Adjoining addresses

Walter Graeler
16645 Swingly Ridge Rd.
Chesterfield, Missouri 63017

MDB Trucking Company
72 Becky Drive
St. Charles, Missouri 63303

Neil Sellenriek
16710 Chesterfield Airport Road
Chesterfield, Missouri 63005

Storage Masters
16824 Chesterfield Airport Road
Chesterfield, Missouri 63005

Petropolis Incorporated
16831 Olive Street Road
Chesterfield, Missouri 63005

Virginia M. Stone
16879 Olive Street Road
Chesterfield, Missouri 63005

Peter and Mathilda Willi
16880 Olive Street Road
Chesterfield, Missouri 63005

Florinad S. Abichandani
16965 Olive Street Road
Chesterfield, Missouri 63005

JPR Corporation
16955 Chesterfield Airport Road
Chesterfield, Missouri 63005

Peter Willi
17067 Olive Street Road
Chesterfield, Missouri 63005

Edward Novel
17211 Chesterfield Airport Road
Chesterfield, Missouri 63005

DeWit and Elizabeth Fisher
P.O. Box 501
Chesterfield, Missouri 63005

Douglas E. Maxwell
17233 Chesterfield Airport Road
Chesterfield, Missouri 63005

LPA Shands Farms
1 Mercantile Center
24th Floor
St. Louis, Missouri 63101

Richard J. Slais
3117 Big Bend Blvd.
Suite 100
St. Louis, Missouri 63143

Sheridan Properties Ltd. Partnership
11 McBride and Sons Corporate Drive
Chesterfield, Missouri 63005

McBride and Sons Investment Company
11 McBride and Sons Corporate Drive
Chesterfield, Missouri 63005

Chesterfield Industrial Investors
7755 Carondelet Ave.
St. Louis, Missouri 63105

Peter Piccone
P.O. Box 14633
St. Louis, Missouri 63178

Pierce Liberman
12140 Woodcrest Executive Drive
St. Louis, Missouri 63141

Eunice Koester
16638 Chesterfield Airport Road
Chesterfield, Missouri 63005

Save Gas Corporation
1 Mercantile Center
St. Louis, Missouri 63101

Barken Dubinsky Partnership
115 Valley Center Drive
St. Louis, Missouri 63005

Mary J. Harris
1749 Gilsinn Drive
Fenton, Missouri 63026

William S. Kurchoff
17627 Wild Horse Creek Road
Chesterfield, Missouri 63005

Gene V. Mainini
16624 Chesterfield Airport Road
Chesterfield, Missouri 63017

Long Investment Company
250 South Brentwood Blvd.
Suite 10
St. Louis, Missouri 63105

Junior J. Kool
17550 Chesterfield Airport Road
Chesterfield, Missouri 63005

Pearl Mure
128 Long Road
Chesterfield, Missouri 63005

Sandra B. Hunsaker
124 Long Road
Chesterfield, Missouri 63005

William F. Human Jr.
17588 Chesterfield Airport Road
Chesterfield, Missouri 63005

Mary E. Pohlmann
17514 Chesterfield Airport Road
Chesterfield, Missouri 63005

Donald F. Budde
17516 Chesterfield Airport Road
Chesterfield, Missouri 63005

Mooses Team Limited Partnership
17541 Chesterfield Airport Road
Chesterfield, Missouri 63005

Louis J. Fusz
17529 Chesterfield Airport Road
Chesterfield, Missouri 63005

Airport Tract Joint Venture
17617 Chesterfield Airport Road
Chesterfield, Missouri 63005

Lipton Realty Inc.
17655 Chesterfield Airport Road
Chesterfield, Missouri 63005

St. Louis Industrial Properties Limited 7
17679 Chesterfield Airport Road
Chesterfield, Missouri 63005

John H. Kramer
17825 Chesterfield Airport Road
Chesterfield, Missouri 63005

Mary Lucy Dunker
17831 Chesterfield Airport Road
Chesterfield, Missouri 63005

James Walker
17839 Chesterfield Airport Road
Chesterfield, Missouri 63005

Peter J. Danna Jr.
17887 Chesterfield Airport Road
Chesterfield, Missouri 63005

Muk Rotrakain
17947 Chesterfield Airport Road
Chesterfield, Missouri 63005

Chesterfield Valley General Partnership
703 Goddard
Chesterfield, Missouri 63005

The Corona Two Partnership
715 Goddard
Chesterfield, Missouri 63005

Kaliman Incorporated A. Missouri Corp.
722 Goddard
Chesterfield, Missouri 63005

Chesterfield Valley Center One
732 Goddard
Chesterfield, Missouri 63005

The Three Corona Partnership
727 Goddard
Chesterfield, Missouri 63005

Chesterfield Valley Investment Company
735 Goddard
Chesterfield, Missouri 63005

Andy Mark
18031 Chesterfield Airport Road
Chesterfield, Missouri 63005

Stefco of St. Louis Incorporated
750 Spirit 40 Park
Chesterfield, Missouri 63005

LSL Partnership
18331 Chesterfield Airport Road
Chesterfield, Missouri 63005

John G. Kile
18333 Chesterfield Airport Road
Chesterfield, Missouri 63005

Edward O. Beyers III
18301 Chesterfield Airport Road
Chesterfield, Missouri 63005

Green Arrow Enterprises
18357 Chesterfield Airport Road
Chesterfield, Missouri 63005

Fred W. Padberg
18385 Chesterfield Airport Road
Chesterfield, Missouri 63005

Vonder Harr Concrete Company
18395 Chesterfield Airport Road
Chesterfield, Missouri 63005

Enid J. Brasher
18575 Olive Street
Chesterfield, Missouri 63005

Vera A. Schmidt
18609 Olive Street
Chesterfield, Missouri 63005

Walter G. Rombach
18683 Olive Street
Chesterfield, Missouri 63005

Emil H. Rombach
18677 Olive Street
Chesterfield, Missouri 63005

Norman H. Rombach
18639 Olive Street
Chesterfield, Missouri 63005

Fred Padberg
17957 Outer 40
Chesterfield, Missouri 63005

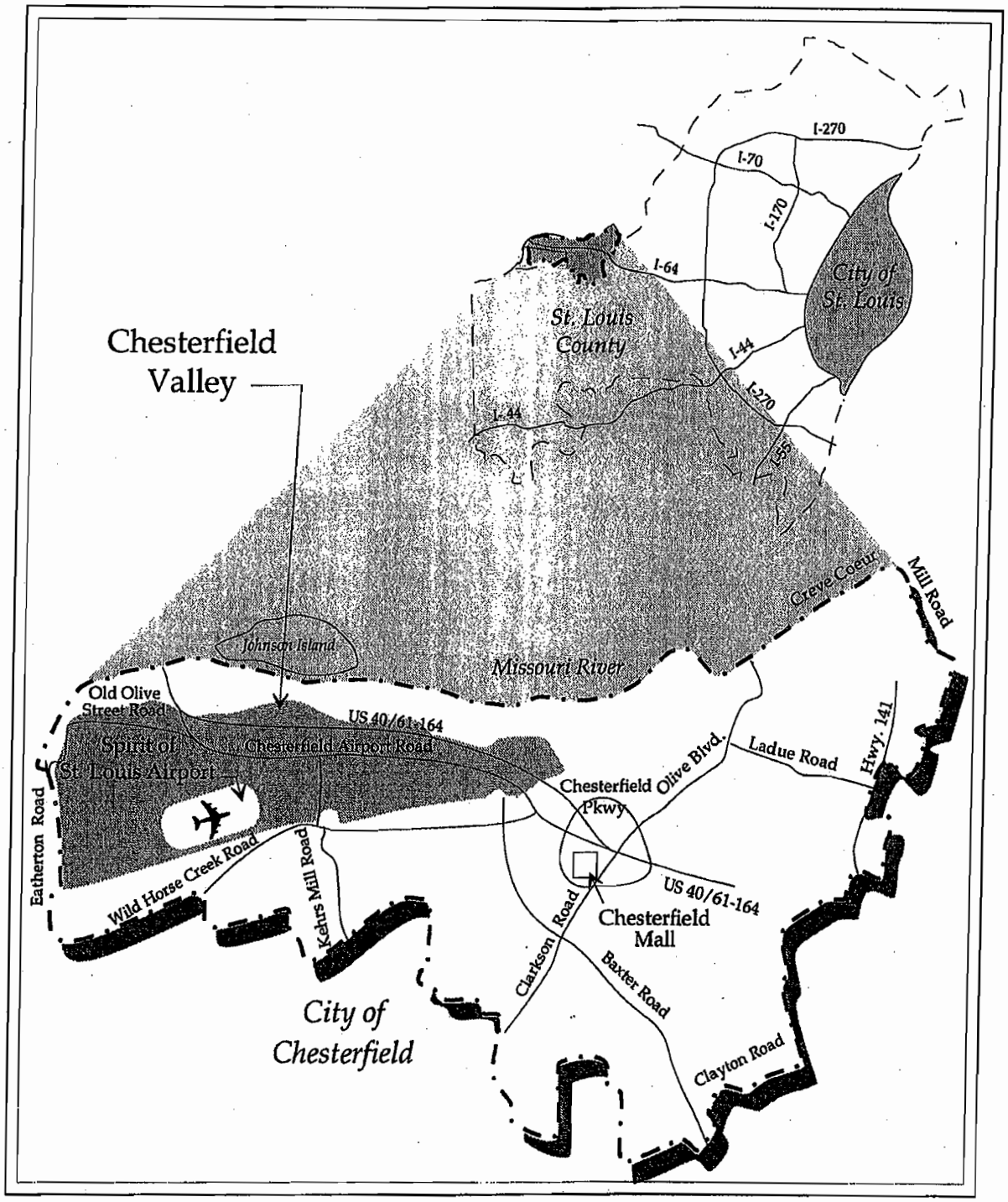
Ruth Mufford
17941 Outer 40
Chesterfield, Missouri 63005

Successful Investors
17909 Outer 40
Chesterfield, Missouri 63005

William G. Ash
17903 Outer 40
Chesterfield, Missouri 63005

Nanette M. Hotlzman
17867 Outer 40
Chesterfield, Missouri 63005

C.C.A
17827 Outer 40
Chesterfield, Missouri 63005



N

October 1996

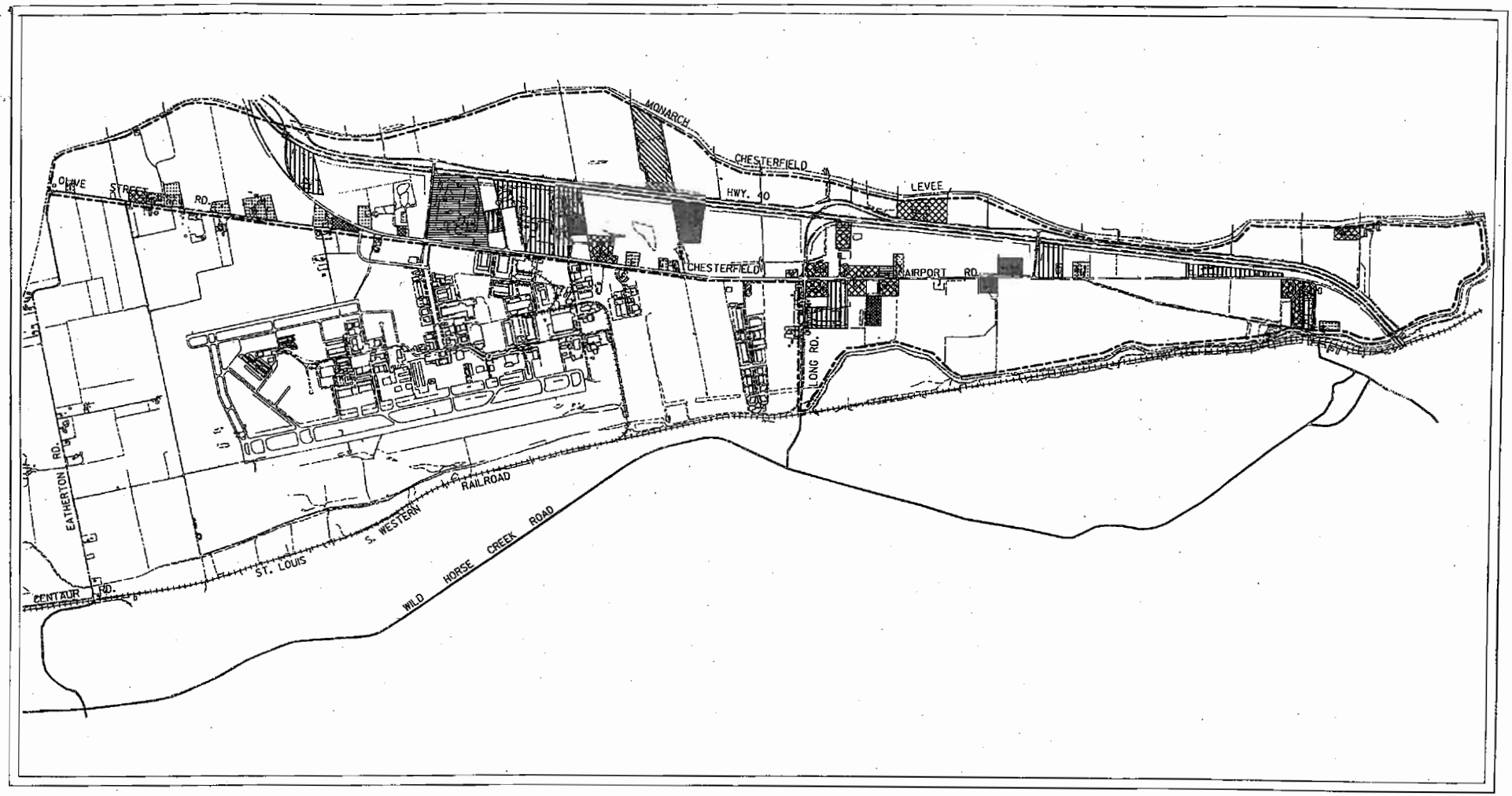
Booker Engineers Architects Planners

Chesterfield Valley

Resource Management Plan

Vicinity Map

Exhibit 1



LEGEND

- RESIDENTIAL
- RETAIL COMMERCIAL
- OFFICE /WAREHOUSE
- MANUFACTURING /DISTRIBUTION
- INSTITUTIONAL
- RECREATIONAL
- LEVEE
- STUDY AREA BOUNDARY

Source: Chesterfield Valley Master Development Plan & Implementation Strategy; Development Strategies, Inc.

Approximate Scale: 1" = 2000'

March 1996

Booker

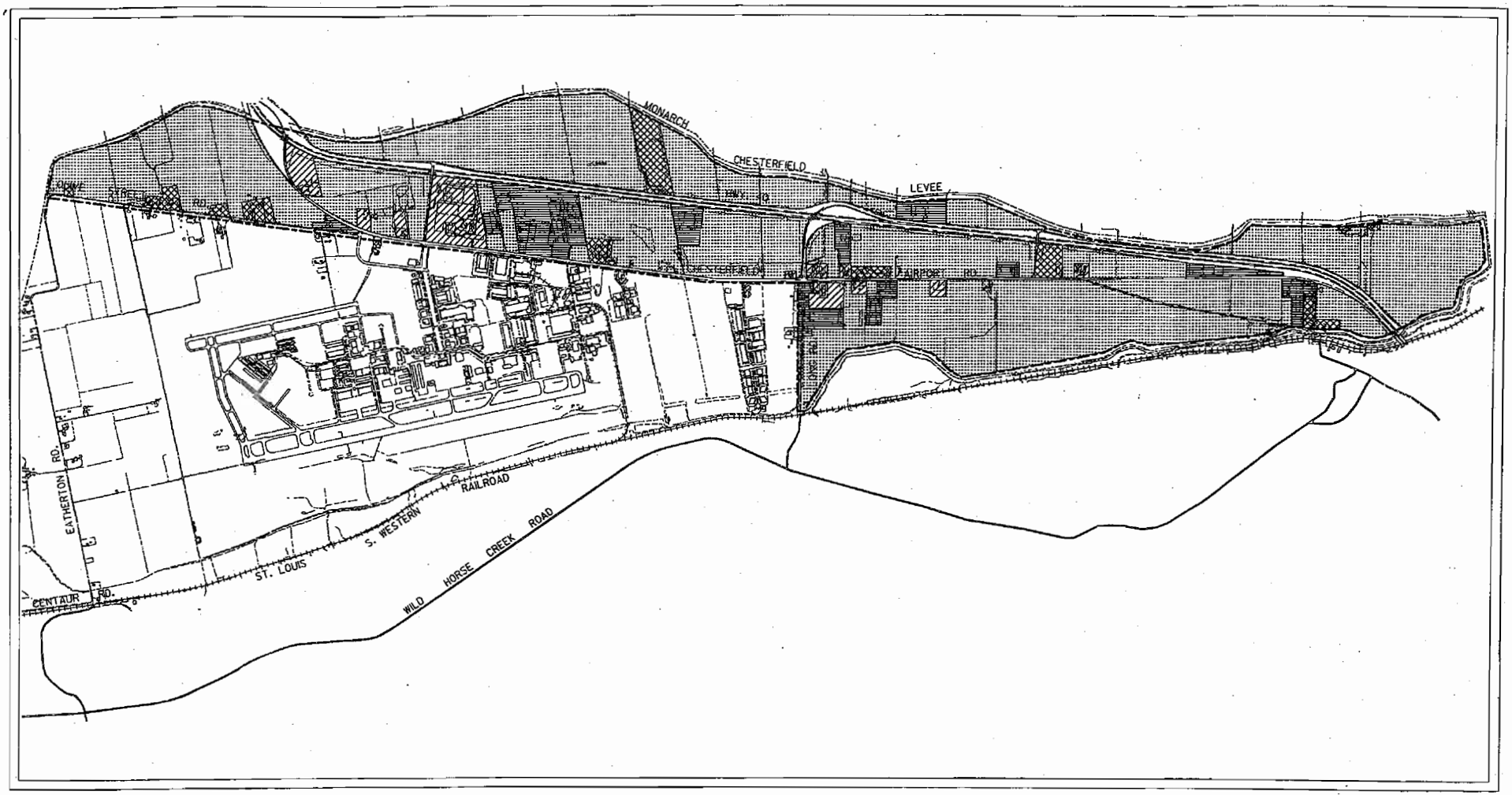
Engineers Architects Planners

Chesterfield Valley

Environmental Study

Existing Land Use

Exhibit 5



LEGEND

- EXISTING DEVELOPMENT TO BE RETAINED
- OPTIONAL CONSERVATION OR REDEVELOPMENT OF EXISTING DEVELOPMENT
- PROBABLE REDEVELOPMENT OF EXISTING DEVELOPMENT
- UNDEVELOPED LAND AVAILABLE FOR DEVELOPMENT
- ------ LEVEE
- — — — STUDY AREA BOUNDARY

Source: Chesterfield Valley Master Development Plan & Implementation Strategy; Development Strategies, Inc.

Approximate Scale 1" = 2000'

March 1996

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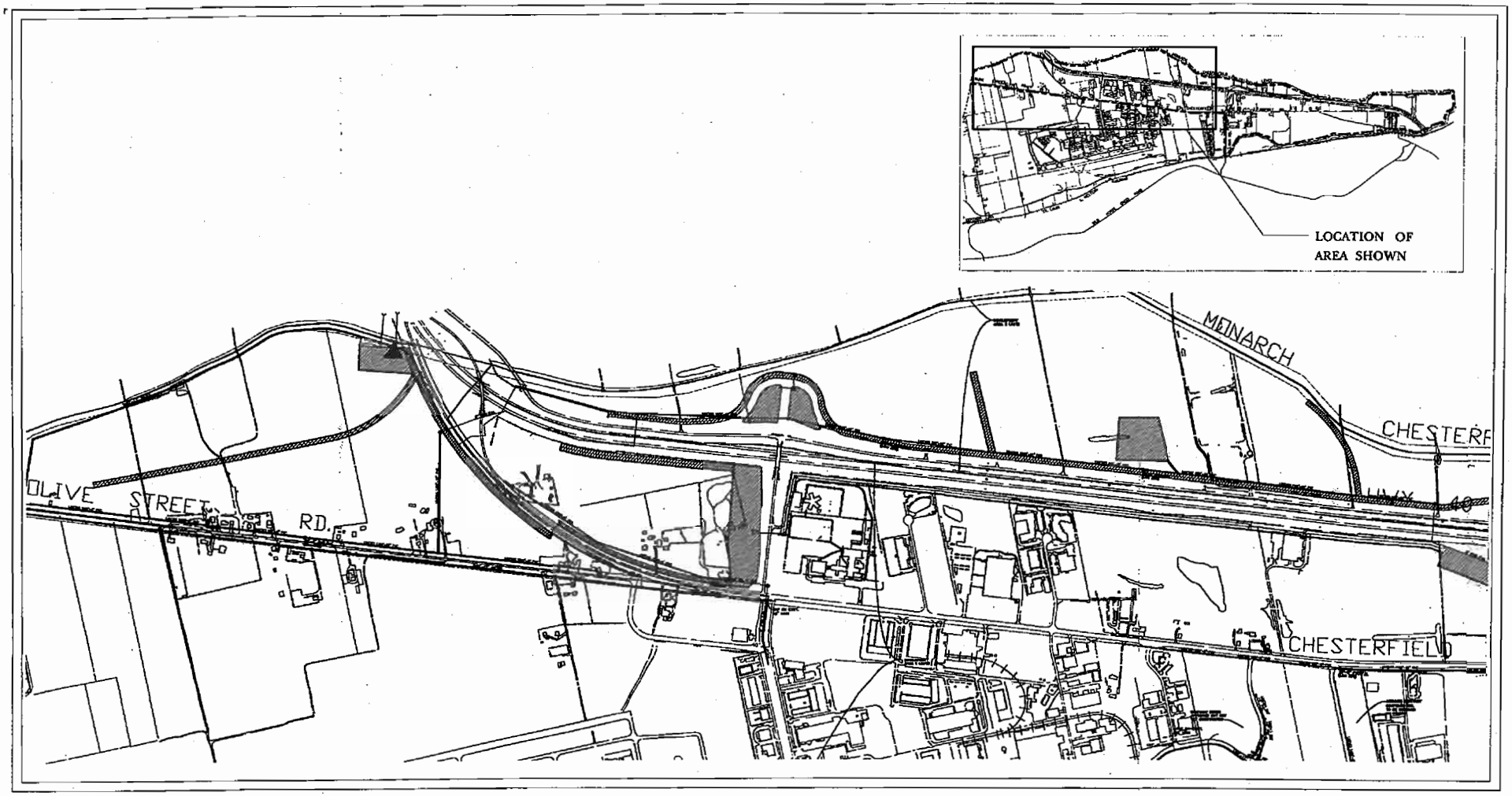
Engineers Architects Planners

Chesterfield Valley

Environmental Study

Development Potential

Exhibit 6



LEGEND

- DRY RESERVOIR
- DRAINAGE DITCH
- RETENTION POND
- PUMP STATION

Approximate Scale: 1" = 1000'

March 1996

Booker

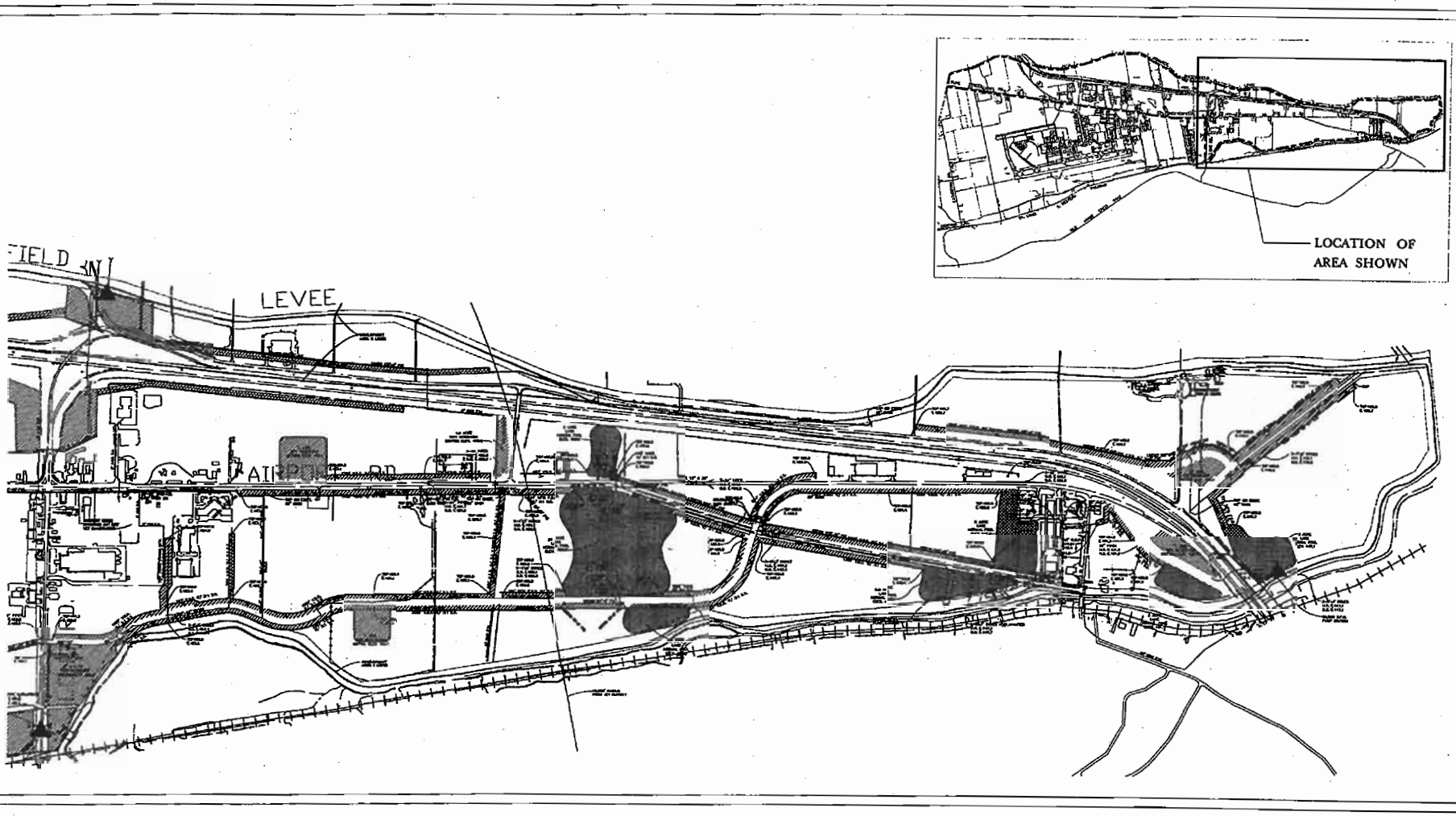
Engineers Architects Planners

Chesterfield Valley

Environmental Study

Proposed Drainage System

Exhibit 9 (1 of 2)



LEGEND

- DRY RESERVOIR
- DRAINAGE DITCH
- RETENTION POND
- PUMP STATION

Approximate Scale: 1" = 1000'

March 1996

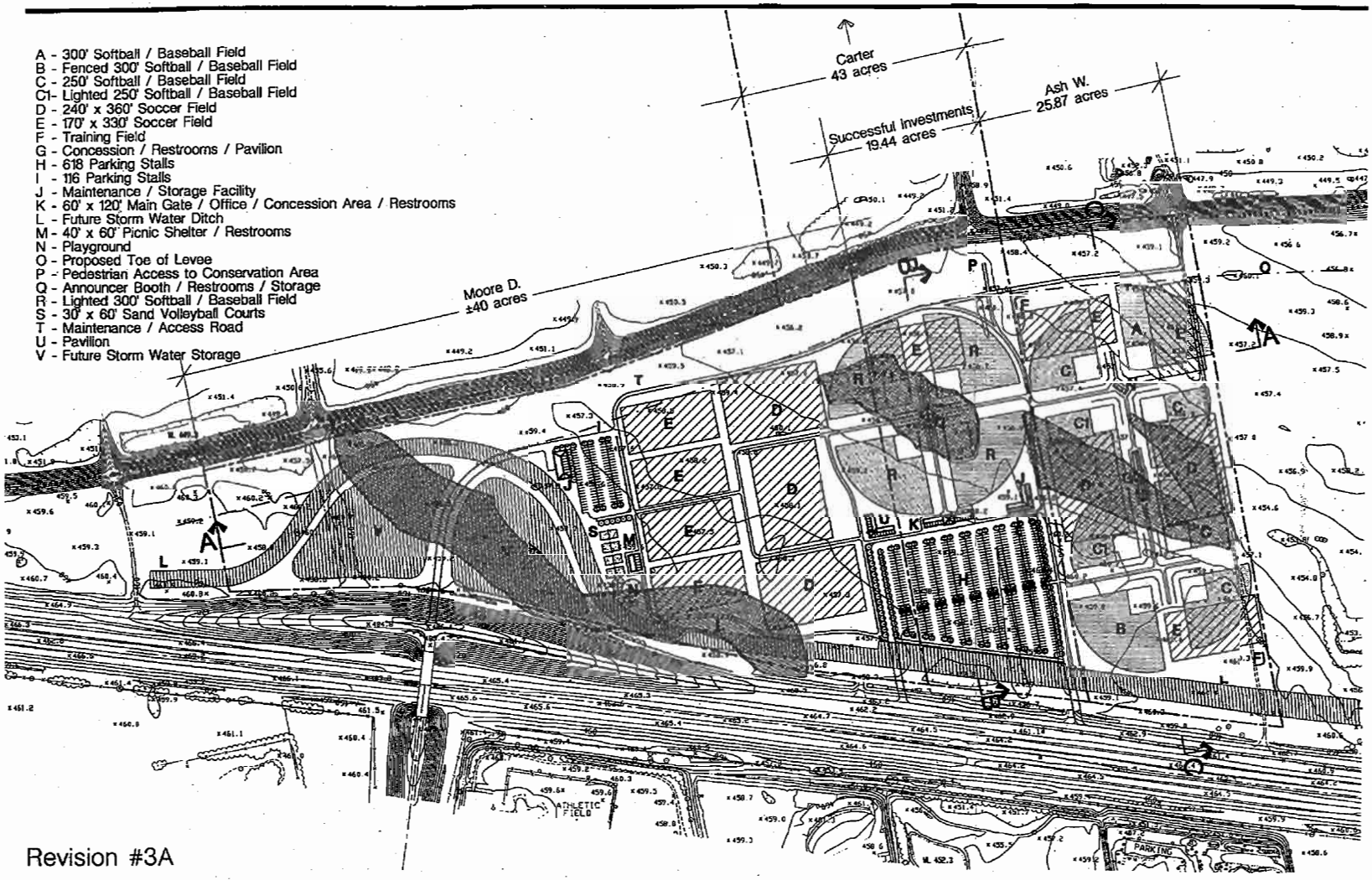
Booker
Engineers Architects Planners

Chesterfield Valley

Environmental Study

Proposed Drainage System

Exhibit 9 (2 of 2)



Revision #3A

City of Chesterfield

0 125 250 500 750

Booker Associates, Inc.

North

Parks System Master Plan

November 1996