



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

JAMES B. HUNT, JR.
GOVERNOR

DIVISION OF HIGHWAYS
P.O. BOX 25201, RALEIGH, N.C. 27611-5201

R. SAMUEL HUNT III
SECRETARY

August 15, 1994

Triangle Wetland Consultants
P.O. Box 33604
Raleigh, NC 27636

ATTENTION: Doug Fredericks, Ph.D.

Dear Sir:

Subject: Wayne County, New Route from SR 1915 to NC 111.
State Project No. 6.804756, T.I.P. No. R-2422.

Enclosed is the revised Scope of Work for the R-2422 mitigation site near Seven Springs, North Carolina. This copy was rewritten in accordance with the recent conference we attended with the Corps of Engineers.

We ask that you prepare and submit tasking sheets based on the new Scope of Work. Upon arrival of the tasking sheets, we will work expeditiously to finalize contractual agreements.

Sincerely,

A handwritten signature in black ink, appearing to read "B.J. O'Quinn".

B.J. O'Quinn, PE
Assistant Manager
Planning and Environmental

DEP/BJO



SCOPE OF WORK

This scope of work is for TIP Number R-2422 located in Wayne County, North Carolina. It includes all work involved in locating a mitigation site, producing a Mitigation Plan for developing the site, reporting to NCDOT, securing approval by the US Army Corps of Engineers (USACOE), providing all services connected with physically accomplishing and monitoring the wetland mitigation, and securing agreement for mitigation credits with the USACOE for TIP R-2422. The proposed mitigation work will follow the Compensatory Hardwood Mitigation Guidelines for the Wilmington District (USAE, 1993).

With the exception of surveying and map making, all fieldwork, meetings, negotiation time, report writing will be done by Drs. Doug Frederick and Russ Lea of Triangle Wetland Consultants, Inc. (see attached description of the firm and credentials of principles). Surveying and map making will be done by Bass, Nixon, and Kennedy, Consulting Engineers, Raleigh, N.C. (Qualifications attached).

MITIGATION SITE

The potential mitigation site is located in the Neuse River watershed near Seven Springs, approximately 2 miles downstream from the TIP site (see map). The proposed mitigation will be an inkind replacement of impacted wetlands. The site was planted in March, 1993 (see attached Establishment Report), and will be supplementally planted in 1994 (see attached Supplemental Planting Report). The site has also been visited by NCDOT and USACOE.

1. Specific Tasks - (To be included in individual reports and Final Mitigation Plan)

EXISTING CONDITIONS

Task 1:

Contractor will obtain recent maps, botanical reports, hydrological documentation, and ground photography to document existing conditions. A report describing existing conditions will be submitted to NCDOT.

SOIL MAPPING AND REPORT

Task 2:

Contractor will document soils using profile descriptions at 5 well sites using standard soil mapping procedures. Sufficient soil investigation/coring will be done at each of the 5 well locations to document the soil profile. This information will be included as part of the mitigation plan.

HYDROLOGICAL ANALYSIS

Task 3:

Contractor will document the existing hydrological conditions by supplying existing data on groundwater well monitoring. The Contractor will also be responsible for developing a water budget model.

EXISTING VEGETATION

Task 4:

Contractor will document existing vegetation on the mitigation site. Field sampling will consist of a systematic sample using circular 1/100 ac. plots located at 100 ft. intervals on line transects spaced at 200 foot intervals. In each plot, species and coverage will be recorded. Species frequency will be calculated based on the total number of plots. Summary tables will be constructed along with plot documentation and included in a report to NCDOT. A botanical inventory of adjacent forests near the mitigation site will be provided as a reference.

MONITORING

Task 5:

Contractor will develop a monitoring plan specifying target wetland conditions and a means to evaluate the achievement of those conditions for a period of not less than 4 years or until regulatory release. The plan will specify methodology for assessing and documenting changes in hydrology, soils, and vegetation with reference to evaluation criteria described in the "Mandatory Technical Criteria for Wetland Identification" in the 1987 USACOE Field Manual. A yearly monitoring report will be prepared and submitted to NCDOT, USACOE and other regulatory agencies for review and approval. At the end of the monitoring period, the success of the mitigation project will be evaluated by the regulatory agencies to determine compliance with the plan, success of the project and whether changes, modifications, or extension of the monitoring time is required.

Matching the ecological setting of the project areas to natural wetlands is a fundamental aspect of the proposed mitigation approach. Monitoring, in the development of mitigation applications, provides an accounting of ecosystem processes to ensure that functioning forested wetlands are established. The performance of the restoration project will be assessed by comparing monitored data from the mitigation site to undisturbed, adjacent, reference forested wetland habitats. The monitoring regime will measure and evaluate both structural and functional indices. Data in the form of soils, and vegetation maps, tables and figures generated in the baseline data collection will be an important component of the monitoring plan. These data will be augmented by a written narrative of site description, including, site preparation, planting, and hydrological modifications. Once the as-built assessment is

complete, differences between what was proposed and what was developed will be evaluated by the agency providing oversight. If modifications to the project are necessary, the as-built assessment will need to be updated to reflect these changes. When the evaluation is final, the as-built assessment will become a permanent record to enable comparison with all future project assessments.

Routine monitoring for assessing project goals will record wetland development. This information will: 1) identify problems that require correction; 2) provide a record of progress; and 3) determine when project performance warrants releasing the Contractor from further responsibility. Data collected during routine monitoring will reflect project objectives and will include the following:

Ground Water

Water depth will be measured as a function of inundation above ground (staff gauge), and depth below ground using shallow monitoring wells consisting of slotted PVC pipe 2.5 inches in diameter to a 30 inch depth. Indirect indicators will also be recorded according to the Federal Interagency Committee for Wetland Delineation, 1987 Federal Manual for Identifying and Delineating Jurisdictional Wetlands. During the first year, measurements will occur monthly (dormant season), weekly (early growing season), and monthly thereafter for the first year. The only difference for the following monitoring periods will be bimonthly measurements following the weekly measurements through April. This monitoring schedule will be followed until regulatory release.

Ground water levels will be measured at 5 wells at 2 week intervals during the dormant season and at weekly intervals during the growing season. Groundwater levels will be measured to the nearest 0.1 inch at each sampling, graphed for each year, for 4 years, and compared to hydrological criteria in the 1987 Corps Manual. Hydrological conditions must be in accordance with the Corps Manual. A written report describing existing hydrological conditions and proposed modifications (if necessary) will be submitted to NCDOT.

Soils

Soil depth will be determined using a soil auger or by excavation of a pit at the 5 well sites to the depth of compacted soil or rock. Munsell color will be determined for chroma and hue for both matrix and mottles for each soil horizon to a depth of 40 inches. Soil texture will be determined for each soil horizon using textural triangle and based upon feel. All soil amendments such as fertilizer or lime will be documented and activity monitored by soil analysis for the first two years. Soil analysis will also include measuring organic matter.

The degree of anaerobiosis of surface soils will be measured using iron rebar inserted to a 30 inch depth established at each well location and recorded on the ground water well measurement schedule. The iron rod technique is based upon the principle that an iron rod placed in poorly drained soils will rust rapidly in the aerated zone of the soil, but not

in the saturated zone where biological oxygen demand (BOD) creates reducing conditions. This method has been shown to be a reliable indicator of the average soil water table levels on poorly drained, heavier soils, and is one of several methods used to determine the presence of reducing soil conditions in jurisdictional wetland determination (McKee, 1978; Hook et. al., 1987; Triangle Wetland Consultants, 1994). Correlation with the iron rod technique will be obtained by measuring oxidation reduction (redox) potential using platinum electrodes (Faulkner et. al., 1986).

Vegetation

Planting locations will be mapped and planting methods will be filed in the first year status report. Survival, number of plants per acre, and tree height and diameter (when appropriate) will be measured at the end of each growing season just prior to leaf fall. A survival rate for all planted woody species of 320 stems/acre is a minimum after 5 years. At least one, 1/20 acre sample plot will be established for every two acres of uniform terrain to ensure adequate representation of site conditions. Permanent vegetation row plots will be monumented in the field and on maps to facilitate repeated measurements.

Species composition, wetland indicator status, and dominance will be measured within each plot. The species and number of natural tree and shrub species will also be recorded within the same plot.

Contractor will be responsible for selecting seedling stock from appropriate regional sources that are adapted to conditions on site. Contractor will certify place of origin and source of seedlings utilized.

Observation

The project areas will be photographed from permanent photo stations and changes in any of the above variables will be recorded and included in each annual report. Groundwater sampling will be done using shallow, slotted PVC wells.

REGULATORY RELEASE

A report will be compiled annually to summarize the current year's assessments and will be submitted to the appropriate agencies in December. The report will indicate if corrections are required or if more comprehensive monitoring is needed to document wetland conditions since the last assessment was performed. The annual assessment will be filed with the NCDOT permanent project records so that it is available for future reference. Following review of the Annual Reports or interim review and recommendations by the regulatory agencies, modifications may be implemented.

The success of the wetland restoration will be determined at the end of the five-year monitoring (one year completed) based on review of the monitoring results. Evaluative criteria will follow the "Mandatory Technical Criteria for Wetland Identification" described in the 1987 USACOE field manual. Monitoring efforts will necessarily continue if the following standards are not attained:

1. A mean density of 320 trees per acre are growing on wetland sites consisting of preferred canopy tree and subcanopy shrubs based on an initial planning density of 726 plants/acre.
2. Species will average 6 feet tall based on the permanent sampling plots established for every 5 acres.
3. Soils will be considered acceptable for restoration when the physical and chemical properties for successful re-establishment of the wetland forest vegetation are present. At a minimum the soil will be saturated within 12 inches of the surface for seven consecutive days during the growing season (April through October, inclusive).
4. Hydrological conditions, as determined by visual observation and monitoring wells, will meet 80% overlap with Corps 1987 Mandatory Technical Criteria.

Contingency Plan

Contingency planning is an important and necessary component of this mitigation project. The proposed mitigation will be monitored for a period of 5 years (one year completed), at which time the success will be reviewed by the USACOE in consideration with other state and federal agencies. If the mitigation is determined partially successful additional monitoring may be recommended and a contingency plan will be developed and implemented.

Success will be determined at the end of the five year monitoring period (one year completed) based on a review of the monitoring results. Evaluate criteria will consist of the following:

If the plan is partially successful i.e.: wetlands have been restored but less than the number of acres projected, additional restored wetland area may be required but only in an amount necessary to make up the balance of shortfall from the projected area. Adjustments to the hydrology of the site through filling or modifications to the ditch and/or species planting may be necessary to bring the project into compliance with the mandatory wetland technical criteria. If adjustments or planting do not produce successful restoration, additional area may be sought. It is implicit that the mitigation plan and contingency actions proposed are complete and will require no further actions once standards are obtained. A draft Mitigation Plan will be submitted to NCDOT, USACOE and other regulatory agencies as appropriate.

6. Mitigation Plan Acceptance

Contractor will coordinate negotiations, meetings, presentations, field trips, etc. to facilitate concurrence of the Plan with USACOE and other representatives and liaisons of NCDOT. Contractor will provide all written reports and/or correspondence to NCDOT.

7. Information Transfer

Contractor will provide information and respond to state, federal or local agencies about the project: arrange field trips, meetings, workshops to explain, justify, or demonstrate the mitigation actions.

8. Final Mitigation Plan Approval

Contractor will produce a Final Mitigation Plan containing the results of all investigations, data, reports, and maps of the mitigation site and the specific planning criteria for accomplishing the mitigation activities and implementing the monitoring for a minimum of 5 years (one year completed). Contractor will obtain approval of the Plan by NCDOT, USACOE, DEM, and other regulatory agencies as appropriate.

9. Additional Features

Contractor will itemize and describe all proposed additional features for the mitigation site to enhance habitat values or other wetland functions. Features for the Seven Springs site will include but will not be limited to connection of the site to existing undisturbed, high value forested wetlands and wildlife corridors.

10. Wetland Mitigation Credits

Contractor and NCDOT will negotiate and secure mitigation credits with the USACOE for the (other) specific NCDOT construction period. Credits will be calculated based on the ratios in current EPA/COE guidance documents.

Other Items to be Performed:

1. Property Access and Easement Rights

Contractor will provide access rights to the site and an approach to purchasing easement rights which will provide NCDOT a specific permanent legal interest in the property. A written report will be provided to NCDOT.

2. Perpetuity

Contractor will legally secure wetland perpetuity for the mitigation site to assure that the site will remain protected from alterations or change of use in perpetuity. A written report to NCDOT will be submitted.

3. Hazards

- a. Contractor will provide a hazardous material/wastes report on the site to NCDOT.
- b. Contractor will provide a report to NCDOT on the effects of any hydrological modifications, earth moving, herbicide, or pest controlling measures on adjacent properties.

4. Liability

Contractor shall be responsible for professional liability as specified by NCDOT.

Literature Cited

- Brinson, M. M. 1993. Hydrogeomorphic Classification for Wetlands. USAE, WES Tech. Rpt. WRD-DE-4, 101 pp.
- Faulkner, S.T., W. H. Patrick, Jr., W. B. Parker, E. Maltby, and R. T. Trambell. 1986. Characteristics of soil processes in bottomland hardwoods and wetland-non wetland transition zones in the lower Mississippi Valley. submitted to Environmental Laboratory for Wetland soils Sediments, Center for Wetlands Research. L. A. State Univ., Baton Rouge, L. A. contract No. DACW39-81-6-0032.
- Hook, D. D., M. D. Murry, D. S. DeBell, and B. C. Wilson. 1987. Variation in Growth of Red Alder Families in Relation to Shallow Water Level. For Sci 33(1): 224-229.
- McKee, W. H. Jr. 1978. Rust on Iron Rods Indicate Depth of Soil Moisture. Site Productivity Symposium. U. S. Dep. Agric., Atlantic, GA., pp. 286-291.
- Triangle Wetland Consultants 1994. Tyrrell County Mitigation Project. Annual Report. 22 pp.
- USAE, 1993. Corps of Engineers Wilmington District Compensatory Hardwood Mitigation Guidelines, 4 pp.
- USAE, 1993. Installing Monitoring Wells/Piezometers in Wetlands. WRP Tech. Note HY-1A-3.1, 14 pp.
- USDA, 1987. Hydric Soils of the United States. U. S. Soil Conservation Service in Cooperation with the National Technical Committee for Hydric Soils. Washington, D. C.