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MAR 0 6 2000

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

DOE-0450-00

Mr. Bil Kurey
U.S. Fish and Wildlife Services - Suite H
6950 Parkway
Reynoldsburg, Ohio 43068

Mr. Mike Chezik
U.S. Department of Interior
Office of Environmental Policy and Compliance
U.S. Custom House, Room 217
200 Chestnut St.
Philadelphia, Pennsylvania 19106

Dear Mr. Schneider, Mr. Chezik, and Mr. Chezik:

TRANSMITTAL OF RESPONSES TO OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE AREA 8, PHASE I REVEGETATION TEST PLOTS 1999 ANNUAL REPORT

Reference: Letter, T. Schneider to J. Reising, "Comments: A8PI Revegetation Test Plots 1999 Annual Report," dated December 28, 1999

Enclosed for your review are responses to the Ohio Environmental Protection Agency (OEPA) comments on the Area 8, Phase I Revegetation Test Plots 1999 Annual Report.

If you have any questions regarding these comment responses or need further information, please contact Pete Yerace at (513) 648-3161.

Sincerely,

Johnny Reising

FEMP:R.J. Janke

Johnny W. Reising
Fernald Remedial Action
Project Manager

Enclosure

cc w/enclosure:
T. Schneider, OEPA
B. Kurey, USFWS
M. Chezik, DOI
AR Coordinator, Fluor Fernald/78

cc w/o enclosure:
R. J. Janke, OH/FEMP
J. Reising, OH/FEMP
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J. Chiou, Fluor Fernald/52-0
T. Hagen, Fluor Fernald/65-2
J. Homer, Fluor Fernald/65-2
M. Jewett, Fluor Fernald/52-2
E. Kroger, Fluor Fernald/65-2
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E. Woods, Fluor Fernald/65-2
ECDC, Fluor Fernald/52-7

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RESPONSES TO OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE AREA 8, PHASE I REVEGETATION TEST PLOTS 1999 ANNUAL REPORT (21000-RP-0001)

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: General Comment Pg. #: Line #: Code: C
Original Comment #: 1

Comment: Ohio EPA recommends that a number of the methods and scientific rigor utilized in the Invasive Species Control research project seedling assessment be employed in this research project over the coming year. The rigor and statistical analysis utilized in the Invasive Species Control project, would allow for more well-supported conclusions from the Revegetation research project.

Response: The Principal Investigator and Co-Principal Investigator recognize the need for in-depth data analysis in future years. The Co-Principal Investigator on this project is the Principal Investigator on the Invasive Species Control Project and is aware of what types of statistical methods are appropriate for this project. Data have been collected concerning the size and health status of all saplings and will be compared with the results from the 2000 growing season. The Principal Investigator would be glad to provide data tables from 1999 if requested.

Action: None required.

Commenting Organization: Ohio EPA Commentator: OFFO
Section #: Pg. #: 1 Line #: Code: C
Original Comment #: 2

Comment: No method reference is provided for the decision to measure at 1 meter Diameter at breast height is a well-established standard for assessing tree growth. Better justification including supporting literature should be provided for using this non-standard method. In order to provide useful data for future restoration work at Fernald the research should use standard measurements that will be employed for monitoring restoration progress. Additionally, the comparability of this measurement to literature values, which commonly use DBH, is in question.

Response: The typical method of determining annual tree growth is to measure the diameter of the tree trunk. Forestry agencies have adopted "DBH" as the typical method to accurately measure tree growth. Trees are defined as any woody plant having a DBH >2.5 cm. None of the saplings that were planted at Fernald fall into this category. The saplings have relatively short trunks at this time; many nursery-grown trees are encouraged to branch within a few feet from the ground. It is not beneficial to measure the trunk at breast height (approximately 4.5 feet above the ground) because multiple branches and stems of the tree's crown would be measured instead of the main trunk. The decision to measure the diameter of the tree at 1 meter above the ground was made in order to accurately measure tree growth over the next several growing seasons. The diameters were determined with a caliper, which measures to the closest millimeter and is more accurate than a tape measure. Comparing diameter changes from the same point on the tree stem will provide a very accurate assessment of tree growth. This alternative method should work very well for all nursery grown trees which will be planted at

Fernald. The Principal Investigator suggests that the diameter at 1 meter approach be adopted for future assessments of growth since the majority of the trees will have similar branching patterns to the saplings purchased for this project.

Action: None required.

Commenting Organization: Ohio EPA Commentator: OFFO
Section #: Pg. #: 2 Line #: Code: C
Original Comment #: 3
Comment: The fact that the research results do not reflect actual field conditions (e.g., "It is likely that more trees will later succumb to transplant, drought and herbivore damage they faced this year.") suggest a different method of assessing trees is necessary. The data lead to the conclusion that survival was much higher than in reality it will be. The researcher should assess other methods for determine the health of the tree rather than dead or alive. A tree that has all the bark stripped off will certainly not survive and is only artificially inflating survival numbers. The assessment needs to somehow account for this.

Response: Trees have been individually tagged and health observations have been recorded for each tree. Survival figures accurately reflect the percentage of trees that were alive at the end of the first field season. Making judgements about whether trees are likely to die would be very subjective. Young trees have the ability to recover from an amazing array of problems due to their very active meristematic tissues. Trees that have had 90 percent of their bark stripped can often survive under favorable growing conditions. Because we recorded damage observations on a tree-by-tree basis (number of dead tips, percent of bark damaged, etc.), mortality in subsequent years will be accounted for. It should be noted that that all of the trees that were planted this year were subjected to one of the most intense drought periods ever recorded for our area. After observations in August 1999, all of the trees and bareroot saplings would have been placed in the "likely to die category." However, the trees recovered enough after the fall rains to produce many healthy terminal buds. In fact, many of the young buckeye trees even produced flower buds. The survival of young saplings and seedlings is always tenuous; data from subsequent years will provide more definitive results.

Action: None required.

Commenting Organization: Ohio EPA Commentator: OFFO
Section #: Pg. #: 3 Line #: Code: C
Original Comment #: 4
Comment: The document fails to provide sufficient justification for deviation from the original work plan procedure of applying repellants to the seedlings/saplings. Though browse appears to be light now, it is expected that the most substantial browse will occur during the winter and early spring. Additionally, the seedlings may become more visible under snow conditions that mat the grass down and leave seedlings standing.

Response: Deer repellants were not to be sprayed on saplings under the original work plan since the majority of the sapling branches are above the "browse line." Although it is possible the seedlings may become more visible as the winter progresses, foot trampling by workers would be more detrimental to the surviving seedlings than the possibility of deer browsing. All of the surviving seedlings will be reflagged in early March 2000, prior to planting the Quercus seedlings. At this point, workers will more easily locate and spray

the seedlings. Repellent treatments should be applied in future years since the seedlings will become more visible as they grow.

Action: Reflag all seedlings in March 2000 and apply repellants accordingly.

Commenting Organization: Ohio EPA Commentator: OFFO
Section #: Pg. #: 4 Line #: Code: C
Original Comment #: 5
Comment: Though trampling damage is used as a basis for not planting Celtis seedlings, it is not discussed in the decision to plant Quercus seedlings in the spring. Ohio EPA agrees with the decisions to plant Quercus seedlings and not plant Celtis seedlings as it is consistent with the original design. However, a method to assess damage to surrounding seedlings caused by planting Quercus seedlings should be developed. One suggestion would be do seedling assessment prior to and immediately following planting, thus attributing any damage to planting activities.

Response: See response to Comment 4. The seedlings will be re-flagged early this Spring prior to planting the Quercus seedlings. This should reduce any damage caused by trampling if the workers are carefully instructed before entering the plots.

Action: Reflag all seedlings and plant Quercus seedlings accordingly.

Commenting Organization: Ohio EPA Commentator: OFFO
Section #: Pg. #: 4 Line #: Code: C
Original Comment #: 6
Comment: Though "changes in the herbaceous undergrowth" is mentioned, it is not expounded upon. If this is possibly useful information resulting from the research project it should be included in the report. Particularly if the "change" is being attributed to the treatments rather than the absence of grazing and local soil conditions.

Response: In an effort to better explain the changes in the herbaceous growth, 160 $2m^2$ circular plots were added to the plots in late October 1999. The plots are permanently marked with rebar and aluminum tags. This should provide a valuable reference for long-term monitoring studies at Fernald. A recent survey of the Tri-state area, by Dr. David Gorchov at Miami University, did not locate any permanent vegetation plots. We intend to monitor the composition of the vegetation, as well as light and edaphic conditions in an attempt to quantify and explain our observations concerning the herbaceous flora. Although this additional work is not included in the original scope of the revegetation test plot task order, all findings and data will be made available to DOE, Ohio EPA, and U.S. Environmental Protection Agency. There will be no costs for this additional work.

DOE would also like to have the same student who will be conducting the monitoring work to conduct two additional projects, which should provide valuable restoration information. One of these projects involves looking at the soil seed bank to determine which plant species are represented by viable seed in the seed bank. This would require collecting small amounts of soil from the plots, placing it in thin layers on growing media at the Oxford greenhouse, and identifying plants as they germinate. DOE would also like the student to "disturb" small areas adjacent to the restoration plots to determine if particular planting practices (digging, herbiciding, tilling) would result in a release (growth) of herbaceous species which are currently being suppressed by the

non-native pasture grass. The results from these additional inquiries should provide an explanation for the changes in herbaceous growth, and may provide helpful information for future restoration activities.

It is possible that succession from man-made pastures to "old-field vegetation" could be expedited if native seeds are already present in the seedbank. The current grass (Festuca), which occupies the restoration study site, is likely inhibiting natural succession because of the dense mat of fibrous roots which prevent seeds from emerging. The dense Festuca canopy also prevents wind and animal borne seeds from reaching the surface of the soil. DOE would like to discuss the possibility of conducting these additional studies as soon as possible.

Action: Provide additional scope proposals for discussion, approval, and implementation.