N60921.AR.000302
NSWC WHITE OAK
5090.3a
Section : 2.01
Site 20903-5640 (White Oak)
Doc. #: 0028
00056

DEPARTMENT OF THE NAVY
ENGINEERING FIELD ACTIVITY CHESAPEAKE
1314 HARWOOD STREET SE
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IN REPLY REFER TO:

5090
181/WL

16 August 2000

Mr. John P. Wolflin
Supervisor
Chesapeake Bay Field Office
Fish and Wildlife Service
U.S. Department of the Interior
177 Admiral Cochrane Drive
Annapolis, MD 21401

RE: STREAM RESTORATION CONCEPT FOR FORMER NAVAL SURFACE WARFARE CENTER WHITE OAK SITE 3 COMMENT LETTER OF 23 MARCH 2000.

Dear Mr. Wolflin,

The Navy provides the following response to Fish and Wildlife Service (FWS) comments.

The success of a stream restoration project relies heavily upon a thorough analysis of the existing stream condition and detailed reference reach channel dimensions.

It is important to note that the geometry and dimensions of the 250-foot reach of Westfarm Branch at Site 3 remain unchanged throughout the landfill excavation project. The western bank of the stream (opposite from the landfill) will remain intact, other than for tree felling. Its existing grade will not be changed, and all stumps and root systems will be left in place to stabilize soils. Many of the stumps have already resumed top growth.

The bottom substrate of the subject stream reach will likewise remain intact. The two HDPE pipes that have been placed in the streambed to temporarily carry the flow during the landfill excavation lay on top of the intact, original bottom substrate. After completion of the project, the pipes will be removed without disturbing the bottom substrate, and surface flow over that substrate will resume. The existing distribution of cobbles, pebbles, riffles, and pools in the bottom substrate have not been altered by placement of the pipes and will not be altered by removal of the pipes.

The eastern bank of the stream will have to be reconstructed because the original bank was part of the excavated

landfill. The eastern bank will be constructed in the exact same position as the original bank before the landfill was excavated, thereby exactly restoring the existing channel width.

The proposal of a stream restoration plan based primarily on field observations as prepared for review, regardless of project size, jeopardizes project success and could ultimately result in adverse impacts to the restoration site as well as to stream reaches upstream or downstream of the site. At this particular site, the upstream culvert could be undercut and the downstream culvert could be silted in at the upstream end and undercut on the downstream end from channel adjustments in the restored reach as proposed in the concept plan. The stream channel itself could severely degrade or aggrade depending upon the restored channel dimensions.

The reference site will be monitored by the Navy until herbaceous vegetation covers soils left exposed by the excavation and until the planted trees and shrubs have become established. It is possible, although unlikely, that a high stormflow during the first several months following the restoration could overwhelm the coir blanket and cause bank erosion. If that happens, the Navy will repair the eroded area, re-seed, and replace any planted trees or shrubs that become uprooted. Short of using ecologically undesirable rigid armoring techniques (such as riprap), it is impossible to completely eliminate the probability of bank failure in the months following a restoration.

Because the original bottom substrate will be left intact, the restoration *per se* will have little potential to adversely affect upstream and downstream reaches of the stream. It is true that some erosion of the banks and bottom substrate of Westfarm Branch is presently occurring on the gravel-mining site upstream from Site 3. This may reflect increased runoff quantities from developing areas in the upper part of the watershed or it may reflect other unknown factors. But because the 250-foot reach at Site 3 will be restored to its existing conditions, the restoration should be expected to neither ameliorate nor aggravate this upstream erosion. The Navy desires to mitigate for any adverse effects to Westfarm Branch resulting from the landfill excavation but does not have an obligation to correct every problem associated with the entirety of Westfarm Branch.

The likelihood of failure is high due to limited field data and the lack of an appropriate reference reach and design criteria.

The design criteria are to restore the subject reach to its baseline condition prior to the landfill excavation. The proposed restoration concept achieves those criteria. The analysis of a reference reach is therefore unnecessary.

The Navy furthermore notes that selection of a suitable reference reach is nearly impossible. Both the upstream and downstream reaches of Westfarm Branch have been heavily disturbed by other development activities unrelated to the landfill. The upstream reach flows through an active surface mine. The downstream reach has several road crossings, and the stream valley has been altered by past construction of several old military explosives bunkers. Neither would provide a good model for restoring the reach on Site 3.

Additionally, streambank stabilization and flood plain restoration techniques directly influence and are influenced by channel processes. Restoration techniques not fully investigated for their appropriateness could fail and result in further degradation of the restoration site.

The restoration has been designed to restore baseline conditions to the maximum extent possible. The restoration has also been designed to minimize the use of structures or rigid armor in the stream channel, banks, or floodplain. Such structures or armor can substantially alter the patterns of flow in the stream and result in severe bank erosion or the undercutting of the downstream culvert. The plan calls for restoring the original stream geometry using soils stabilized with grasses, willow and other fast-growing trees and shrubs, and a biodegradable geotextile to provide temporary stabilization until the vegetation becomes effective. This approach is in no way experimental, but no vegetative approach to streambank stabilization can completely eliminate the probability of failure due to exceptional storm events.

For example, warm season grasses require a longer period to establish than do cool season grasses and could be washed away by erosive flood flows. Additionally, cool season grasses interfere less, than warm season grasses, with the establishment of woody shrubs and trees. Warm season grasses do, however, provide better songbird habitat than cool season grasses.

The seed mix called for in the plant is a mixture of rapidly establishing warm and cool season grasses developed to provide rapid, effective surface soil stabilization and good wildlife habitat for old field and edge species. These species should establish almost as rapidly as species used traditionally for stabilization seeding (e.g. tall fescue). They should have a minimal deterrence to the planted trees and shrubs.

One problem with many wetland and upland habitat restoration plans is that they address the final "target" plant community only and ignore intermediate successional stages through which the restored vegetation must pass before attaining the target community. For example, deciduous forest restoration sites planted with seedlings, whips, or even saplings will function as old fields for 20 years or more before functioning as forests. A function-oriented restoration plan needs to address the functional value of the restored site during this extended interim period before the final design results are achieved.

There are a variety of alternatives, not yet fully investigated in your floodplain restoration plan, that could be implemented and would both control erosion and provide habitat.

The plan did not include a formal written text discussion of alternative actions considered and dismissed. Of course, other approaches were considered mentally. The draft plan presents those approaches considered to be most appropriate for restoring the subject stream segment in an ecologically sensitive manner. The Navy is open to specific suggestions as to how the draft plan might be modified to better achieve these objectives.

We recommend that a full field investigation be conducted to determine the existing condition of the proposed stream restoration site. This field investigation should include, but not be limited to, bankfull calibration at a USGS gage, channel dimensions, profile, and geometry survey, substrate particle size assessment, bank and bed stability assessments, historic channel condition assessment, hydrologic and hydraulic assessment, and culvert size assessment. A similar assessment should be conducted at a reference stream reach and used as a general design criterion for the proposed stream restoration plan.

The value of a suite of baseline condition measurements such as those prescribed above is how they might be used to directly change the restoration design. The proposed design

calls for maintaining intact the existing bottom substrate and restoring the exact existing (baseline) stream profile and dimensions. The effort recommended above would only be useful if the stream were to be restored to a condition other than the baseline condition. It may perhaps be ecologically desirable to restore the subject stream segment to a totally pre-disturbance condition, prior to construction of the landfill. To effectively restore Westfarm Branch to its pre-development status (or at least a short segment on and near the landfill site) would require removing several other disturbance features that have cumulatively altered the stream profile, including Dahlgren Road, other road crossings, and the privately-owned mining operation to the north. That would of course be impractical. The draft design calls for restoring the stream to mitigate for the effects of the landfill excavation but not to mitigate for a cumulative history of localized disturbances attributable to earlier military and private-sector activities.

Please contact me with any questions or concerns.

Sincerely,

Walter A. Legg
Acting BRAC Environmental
Coordinator, White Oak

cc:
Yazmine Yap-Deffler, EPA
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