**NEW DREDGING PROJECTS**

Please make sure that answers to all of the questions in this appendix correspond to the information on the application drawings.

**CLASSIFICATION OF CREEK TO BE DREDGED** (for projects in the Inland Bays only)

1. How is the creek classified according to the State dredging program's classification system? Is it open to dredging, open to dredging but requiring further study, or restricted due to environmental sensitivity? See example "Classification System" on page 7 of this application. For further explanation, refer to Section 2.0 of the "Goals and Objectives - Creek Evaluation Dredging Criteria" dated April, 1986.
    a. **Step One:** If the creek to be dredged is "restricted", an application cannot be accepted.
    b. **Step Two:** If the creek is "open" to dredging, the applicable parts of this application must be completed.
    c. **Step Three:** If the creek is "open" to dredging but requiring further analysis, submit information request as part of procedure outlined on page 4 and further explained in Section 2.4 of the Dredging Study.
2. SITE LOCATION OF DREDGING PROJECT
    a. Locate the project site with respect to the county, creek, tributary (enclose 8 ½" x 11" map).

3. DESCRIPTION OF DREDGING PROJECT
    a. How many cubic yards of material will be dredged or excavated channelward of the:

    Tidal waters: mean high water line? _____ cu. yds.

    mean low water line? _____ cu. yds.

    Non-tidal waters: ordinary high water line?_____ cu. yds.

    b. What are the proposed dimensions of the dredged area relative to mean low water or ordinary high water?

    _____ length _____ depth _____ base width _____ top width

    c. What are average and range of existing depths in area of proposed dredging? _____ft. (mlw/ohw)

    Include a survey of proposed and existing depths on application drawings.

    d. What is the proposed dredging depth in relation to surrounding bathymetry? _____ft.(mlw/ohw)

    Indicate both proposed depths and surrounding depths on attached drawings.

    a. Describe the other details of the proposed project including the equipment to be used, place and method of disposal, etc. Detail is important.

4. PURPOSE OF PROPOSED DREDGING PROJECT

    a. Define the purpose and need of the proposed dredging project. Who will benefit?

    b. Submit color photos of site and bordering upland with explanation of the views shown (prints only).

5. How often will maintenance dredging be required? _____ What measures are being taken to reduce the frequency of dredging.

**ENVIRONMENTAL CONSIDERATIONS OF THE DREDGING PROJECT**

A sediment analysis must be performed in accordance with the attached sampling plan.

6. CHARACTERIZE THE SUBSTRATE TO BE DREDGED

    a. What is the chemical composition of the material to be dredged? Does the substrate contain more pollutants relative to known clean bay sediments of similar composition? Attach Lab Reports and Analyses

    b. What is the physical composition of the substrate? State percent of sand, gravel, mud, silt. Does it contain shell fragments?

7. CHARACTERIZE THE UNDERLYING SUBSTRATE TO BE EXPOSED BY THE PROJECT

    a. Is the underlying substrate (material at proposed dredging depth) of similar physical composition and chemical quality as material to be dredged? _____ Yes _____ No

    b. Project the expected turbidity levels and area of effect (extent of plume) based on the percent of silt, sand, and gravel in the dredged material.

8. CHARACTERIZE THE BIOLOGICAL COMMUNITY IN THE AREA TO BE DREDGED

    a. Characterize how the area is utilized by shellfish and finfish and potential temporary and/or permanent impacts to these species.

    b. Identify the practices proposed to reduce impacts to aquatic species and the potential for degradation of water quality (turbidity curtain, time of year restrictions, etc.). Dredging in Delaware waters may be subject to certain time of year restrictions in order to protect fish and wildlife.

    c. What are the major benthic (bottom dwelling) species found at the area to be dredged?

    d. Characterize the subaquatic vegetation and other vegetation at or near the project site.

9. CHARACTERIZE THE EXISTING WATER QUALITY

   a. Determine the classification of the stream according to state water quality criteria. Will the dredging project cause violations of the water quality criteria? Will designated water uses be affected?

   b. Determine levels of dissolved oxygen (D.O.) in and around the project area. Measure D.O. at the water/substrate interface during worst case conditions (i.e. summer morning).

10. IMPACT TO THE BOTTOM CONTOURS OF THE BAY OR CREEK

   a. What is proposed dredging depth in relation to surrounding bathymetry? Provide map showing surrounding depths.

   b. Will the project change flow or circulation patterns in the bay or creek? Will shoaling patterns be altered?

   c. Describe the impact to sediment transportation along the shoreline and the potential for depriving adjacent shorelines of sediment?

11. IMPACT TO SURROUNDING LANDS

   a. What is the proximity of the dredging project to the nearest creek bank or banks?

   b. What are the existing land uses along this bank(s)?

   c. What is the shoreline composition adjacent to the proposed dredging and the areas immediately up and downstream (wetland, vegetated bank, rip-rap, bulkhead eroding bank)?

12. What measures will be taken during the dredging operation to minimize environmental impact?

**CONSIDERATIONS FOR DISPOSAL OF DREDGED MATERIALS**

13. What are your plans for disposing of dredged material (i.e., upland disposal, wetland creation, island creation, etc.)? What alternatives have you considered?

14. When do you plan to conduct your dredging/disposal operation (approximate dates of operation)?

15. Describe the characteristics and location of the proposed dredged material disposal site? What is the present use of the disposal site? Please identify both temporary dewatering/stockpiling areas as well as the permanent disposal area and pipeline route if applicable.

16. CHARACTERISTICS OF THE DREDGED MATERIAL

1. Based on sediment analysis required or other known factors, does the material contain any contaminants?

a. What is the bulking factor of the material (e.g., how much will material increase in volume during dredging and disposal operation based on material composition, material water holding capacity and dredging method)?

b. What is the settling rate of the dredged material?

c. What is the mounding ability of the material being disposed of?

17. CONSIDERATIONS FOR HABITAT DEVELOPMENT

a. Does similar habitat already exist in the area proposed for development?

b. What is the depth of water at mean low water (for water disposal for marsh or island creation)?

c. What is the salinity of water at the proposed site of development?

d. What is the salinity of water from which material is being dredged?

e. Is the composition of the dredged material similar to the substrate at the site of habitat development?

f. What are the biological characteristics of the site proposed for development? Are there oyster bars, spawning grounds, submerged aquatic vegetation, or other fragile ecosystems which require temporary or permanent protection? These sites should be avoided for habitat development.

g. What are the wind and current conditions at the site? Do they change seasonally?

h. Will habitat development interfere with any existing commercial or recreational activities?

i. Is there enough material to achieve desired elevations? Is the potential site of development large enough to accommodate the dredged material?

j. Who is the owner of the site proposed for development? Who will maintain the new habitat?

k. What types of wildlife are to be attracted to the site? Will the food and habitat needs be met?

l. What measures will be taken to reduce potential environmental impact?

18. CONSIDERATIONS FOR UPLAND DISPOSAL

a. What is the distance from the dredging operation to the proposed site of disposal?

b. What method of disposal is to be utilized (i.e., pipeline discharge, barge, hopper, etc.)?

c. Describe the proposed method of containment for the dredged material.

d. How much acreage is required for the quantity of material being disposed of?

e. Provide an engineering drawing of the proposed disposal facility. Include dimensions of the sediment to be contained in this dredging event. (Length, width, depth)

f. What measures will be taken to reduce potential environmental impact?

g. What is estimated life of the dredge spoil disposal site?

h. Are there any wells within 300 feet of the disposal site? If yes, show location of adjacent wells on disposal area plan.

19. If required, has an Erosion and Sediment Control Plan been approved by the designated plan approval agency for the project? An Erosion and Sediment Control Plan is required for any project disturbing more than 5,000 square feet of uplands. Final approved plans must be received by this office prior to permit issuance.

____ Yes _____ No ____ Not required

20. SAMPLING PLAN FOR NEW DREDGING PROJECTS

1. Physical and Chemical Analysis of Sediment

a. Particle size distribution and percent solids analysis on core samples taken to depth of proposed dredging. Percentage sand, silt and clay should be given based on:

sand: Greater than or equal to 0.0625mm

silt: Less than 0.0635mm but greater then 0.0039mm

clay: Less than 0.0039mm

b. Bulk sediment analysis (mg/lg) core samples taken to depth of proposed dredging for parameters as determined by the Department.

c. Elutriate analysis (mg/l) on core samples taken to depth of proposal dredging for parameters as determined by the Department. Dredge site water should be used for the dilution water.

d. Surface water analysis (mg/l) on one composite sample from the dredging area for parameters as determined by the Department.

2. Biological Sampling

e. Benthic Invertebrate survey based on minimum of three surface grab samples or benthic dredge. Organisms should be identified to genus-level species where possible.

f. Description of emergent and submerged vegetation in or adjacent to the proposed dredging area.

Important Notes:

The number of samples is dependent on size of area to be dredged and suspected pollution level. As a general rule, a minimum of three sampling stations should be established.

If sediment contaminants are shown to exist at levels of concern by the above analyses, a bioassay may be required. Suspected contaminated sediment proposed for upland disposal should be subjected to an EP Toxicity analysis.

Please be advised that all dredging in the Inland Bays must be undertaken between September 1 and December 31 in order to protect summer and winter flounder and other aquatic species. Dredging in other Delaware waters may also be subject to certain time of year restrictions in order to protect fish and wildlife. Contact DNREC for more specific information regarding the restrictions that may apply within your project area.

**CLASSIFICATION OF CREEK TO BE DREDGED (for Inland Bays)**

| **Step One: Environmental Classification** | **Areas of Restricted Dredging** | |
|---|---|---|
| Objective: Classify as areas where dredging should be restricted creeks, creek segments, and open water areas with high environmental sensitivity.<br>Factor One: Bodies of water and associated shorelines which have been designated as state natural areas, or which are totally contained in or where more than 50% of the shoreline borders a wildlife refuge or state/federal/parkland.<br>Factor Two: Creek segments whose shorelines are dominated by wetland vegetation and which have open water channels equal to or less than 40 feet in width.<br>Factor Three: Creek segments where the presence of rare and endangered species has been identified either in-stream or along the shoreline.<br>Factor Four: Creek segments where at least 30% of the land area within ¼ mile of the water's edge is contained in designated wetlands and is less than 50% developed as moderate density residential development.<br>*Creeks less than 40 feet in width (headwaters and tributaries) and other areas not designated on the maps should not be considered for dredging by the state | **<u>Upstream reaches of:</u>**<br>Vines Creek<br>Pepper Creek<br>Herring Creek<br>• Hopkins Prong<br>• Burton Prong<br>• Guinea Creek<br>Wilson Creek<br>White Oak Creek<br>• Johnson Branch<br>Collins Creek<br>• Joshua Prong<br>Simon Glade<br>• Edgar Creek<br>White Creek<br>Arnell Creek<br>Dirickson Creek<br>Emily Gut<br>Love Creek<br>Lingo Creek<br>Drum Creek<br>Roy Creek<br>Lee Joseph Creek<br>Love Creek<br>Blackwater Creek<br>Miller Creek | **<u>Segments of:</u>**<br>Drum Creek<br>Dirickson Creek<br>Love Creek<br>Dorman Branch<br>Lingo Cove<br>Joshua Cove<br>Sloughs Gut<br>Collins Creek<br>Joshua Prong<br>Edgar Prong<br>Stump Creek<br>Swan Creek<br>Island Creek<br>Warwick Gut<br>Emily Gut<br>Lingo creek<br>Other small unnamed creeks/guts<br><br>*May list more creek segments as the presence of both state and federally designated rare and endangered species are identified. |
| **Step Two: Classification by Water Use and Dredging History** | **Areas Open to Dredging** | |
| Objective: To further segregate creeks into those which are characterized by intensive use and a recent dredging history and those which are less used and have not been previously dredged. Those areas which are both intensively used and have a recent dredging history will then be classified as being open to dredging.<br>Factor One: Is the waterbody, creek or creek segment consistently and intensively used as and access route to, or between the following types of boating activities:<br>• Recreational boating, including sailing and excursions<br>• Recreational or commercial fishing, including shellfishing<br>• Water skiing, jet skiing, etc.<br>• Commercial transportation (i.e. hauling of commodities)<br>• Access channel connecting major water use areas<br>Factor Two: Has the water area, creek or creek segment been dredged by the State of Federal government within the last 10-15 years? | Assawoman Canal and approach channels to be dredged for navigation purposes only. Future development projects requiring access to Assawoman Canal, structures that conflict with navigation and projects which degrade water quality will be prohibited.<br>Indian River Navigation Channel<br>Lewes & Rehoboth canal<br>Massey's Ditch<br>Rehoboth Bay Navigation Channel<br>As a general policy, the State should not dredge artificially constructed dead-end lagoons unless it is for environmental rehabilitation or ther are overriding concerns. If dredging is requested by incorporated communities, cost/benefit analysis should be conducted. | |
| **Step Three: Generators and Attractors of Boat Traffic** | **Areas Requiring Further Analysis** | |
| Objective: To further segregate the group remaining after Step II into those areas with or without navigational demand. The criteria used to determine navigational demand is the presence of generators and/or attractors of boat traffic as defined below.<br>Factor One: The presence of a marina with one of the following characteristics:<br>• Publicly accessible marina with more than 25 slips<br>• Significant proportion of vessels using marina have drafts exceeding 4'and lengths exceeding 25'.<br>• Publicly accessible boat launching ramp<br>• Private marina with more than 100 slips<br>Factor Two: The presence of a residential subdivision, campground or trailer park with more than 50 units and which has either and accompanying marina, or whose parcels front on boat channel<br>Factor Three: The presence of waterfront recreational, industrial or commercial activities that are regularly visited by vessels with drafts exceeding 2'.<br>Factor Four: At least 50 percent of the land area located within ½ mile of the creek or creek segment is developed at a minimum as moderate density residential. (i.e. at least one dwelling unit acre).<br>If at least one of the factors is present, classify as Level I; if none of the factors are present, classify as Level II. Level I creeks are higher priority projects as they satisfy the navigational demand criteria. Level II creeks exhibit little current demand or use. | **<u>Level I Creek Segments</u>**<br>Love Creek (up to first bridge)<br>Arnell Creek (mouth only)<br>Lingo Creek<br>Pepper Creek (up to Holland Pt.)<br>Vines Creek (up to Ballast Pt.)<br>Dirickson creek<br>Roy Creek<br>Herring Creek<br>Burton Prong<br>Hopkins Prong<br>Wilson Creek (mouth only)<br>Lee Joseph Creek (mouth only)<br>**<u>Level II Creek Segments</u>**<br>Bald Eagle Creek<br>White Oak Creek (mouth only)<br>Beach Cove<br>Vines Creek (from Ballast Pt. to first bridge)<br>*These are only portions of the creeks listed under each level as illustrated on the set of maps accompanying this report<br>*These requirements were developed for marinas near the creek mouths on the bays. The marina size and facility requirements increase the farther upstream it is located due to related dredging costs and environmental impacts. | |