APPENDIX A

TOUNGUE POINT MONITORING PROGRAM

TONGUE POINT MONITORING PROGRAM *

Dredging and consequent ocean disposal of sediments from the Tongue Point, Oregon Navigation Improvement project will involve large quantities of material. Monitoring of the disposal site during and after construction of the project will be appropriate and is supported by regulatory guidance (40 CFR 228), recent USACE/USEPA MOU's on disposal site management (national MOU signed July 1987, NW regional MOU signed October 1988) and coordination on this project with USEPA Region X. Dredge site monitoring must be conducted to meet the requirements of the Tongue Point Supplemental Feeding Program for bald eagles and future maintenance dredging sediment evaluation requirements. The monitoring program should focus on determining bathymetric, sediment, contaminant and benthic community changes in and adjacent to the ODMDS and sediment and contaminant changes in and around the dredge site. (see ATTACHMENT #1 & 2)

Material dredged during initial construction and maintenance of the Tongue Point navigation channel and turning basin shall be deposited at Ocean Dredge Material Disposal Site (ODMDS) F, which is an USEPA designated disposal site. Site F received final site designation on August 21, 1986. Located approximately 5 nautical miles off the mouth of the Columbia River, the centroid coordinates for site F are 46 deg. -12' -00" N and 124 deg. -09' -00" W. Site F is square in shape with side lengths of 1800 feet and depths of 125 to 140 feet. The last use of this site was in 1976 in which approximately 53,000 cy of material was deposited.

ODMDS MONITORING

Disposal of 1.2 million cubic yards (mcy) of fine sediment over 3 years from upper Coos Bay at ODMDS H off Coos Bay (depth 165-200 feet) has resulted in substantial elevations of fines and organics over an area 5 times the size of the site. These changes have resulted in shifts in benthic communities that could impact local crab and bottom fisheries of commercial importance. A similar and more pronounced condition is anticipated at site F off the MCR, since material quantity will be much greater (2.0-2.8 mcy), disposal rate higher (total quantity will be deposited in 3-4 months) and water shallower (depth 125-140 feet), than in the Coos Bay case. Assuming even spread of material throughout the site, a sandy silt sediment layer 16-19 feet thick will be deposited over the ambient medium sands at the site. This will cause complete smothering of organisms throughout the site at the time of deposition. Much of this material will disperse off the site, particularly in winter storms, and is anticipated to alter benthic habitats in adjacent areas. Contaminants in the dredged sediments may bioaccumulate in organisms in settling areas.

* This is a copy of the original "Tongue Point Monitoring Program" and is presented as originally written in 1989.

The following are components of the anticipated ODMDS Monitoring Program:

1. Pre-construction ODMDS baseline survey (June 1989);

   bathymetry profiles (1 n.m. sq. area)

   physical sediment survey (29 stations)

   contaminant survey (13 stations)

   benthic infauna survey (13 stations, 5 replicates)

   demersal fish/invertebrates survey (3 trawls)

2. During construction disposal site survey (September 1989):

   bathymetry profiles (1 n.m. sq. area)

3. Post-construction disposal site survey (November 1989):

   bathymetry profiles (1 n.m. sq. area)

   physical sediment survey (29 stations)

   contaminant survey (13 stations)

4. Post-construction disposal site survey (July 1990):

   Similar to survey 1, Depending on monitoring results to date.

5. Maintenance disposal site survey (July 1991):

   Similar to survey 1, Depending on monitoring results to date.

6. Maintenance disposal site survey (July 1992):

   Similar to survey 1, Depending on monitoring results to date.

DREDGE SITE MONITORING

The Tongue Point dredge site sediments were the subject of three evaluations related to the present Tongue Point Navigation Improvement project (Enviro Sciences, 1987, Battelle Pacific NW Laboratory, 1988 and Ardl Laboratory, 1988). These constitute the dredge site baseline survey. This monitoring plan therefore covers post-construction as well as pre- and post-maintenance dredge site surveys.

The goal of this plan is to evaluate and monitor the effect on surface sediments from material resuspended by dredging, prop-wash or sloughing at the project dredge site. Sampling sites will include, in addition to the eight sites located within the project area four sites corresponding to key eagle foraging areas. These four include the Mill Creek embayment, South Tongue Point across from John Day Point, Lois Island marsh and Twilight Creek swamp. Surface samples will be collected for physical and chemical analyses. The sample sites associated with eagle foraging areas are a required element of the formal consultation process for threatened and endangered species, under the auspices of the Endangered Species Act of 1973, as amended.

The following are components of the anticipated dredge site monitoring program:

1. Pre-construction dredge site baseline survey was conducted as part of the "Detailed Project Report and Environmental Assessment".

2. Post-construction dredge site survey (1 week after completion of dredging, 1989)

   physical sediment (12 stations, some samples may be composited)

   chemical sediment (12 stations, some samples may be composited)

3. Post-construction dredge site survey (July 1990):

   similar to survey 2

4. Pre-maintenance dredging site survey (July 1991):

   similar to survey 2

5. Pre-maintenance dredging site survey (July 1992):

   similar to survey 2

Additional ODMDS monitoring, dredge site monitoring or bioassays/bioaccumulation studies may be required depending upon results of the outlined program.

SAMPLING METHODS

Surveys will utilize the following methods:

Benthic infauna: Samples will be collected with a 0.096 m-sq. Gray-O"Hara box corer. Six box core samples will be collected at each station. Five of the samples will be for benthic macroinfauna and the sixth will be subsampled for physical and/or chemical analyses. Infauna samples will be passed through a 0.5 mm sieve with residue material, containing the infauna, preserved in a buffered solution of 5% formaldehyde in seawater. The protein stain Rose Bengal may be used on specimens if desired. Specimens will be sorted in the lab and identified to species if possible, otherwise to the lowest identifiable taxon. Results will be reported as number and abundance, per species and total, for each sample and each station. Community structure, diversity and evenness indices will be calculated. An evaluation will be made of the ecological significance of communities and their dominant species as trophic supports for fish and shellfish and any other significant ecologic functions.

Demersal fish/invertebrates: Demersal fauna will be collected with an 8-meter semi-balloon shrimp trawl, with 38 mm stretched mesh size and a finer cod-end mesh to retain smaller specimens. The trawl tow will be 10 minutes in duration and will be made on a track parallel to depth contours. Collected organisms will be identified to species, counted and lengths taken on a representative number. Diversity, evenness and richness indices will be calculated. Chemical analysis of tissue for bioaccumulation of contaminants will also be preformed on representative subsamples. These individuals will be frozen before transport to the laboratory.

Physical sediment analysis: Sediment samples will be analyzed for grain size using sieve/hydrometer soils analysis methods. Volatile solids (organic content) will be determined by sample ignition at 600 deg. C. or 1 hour. Oil and Grease analysis using gravimetric methods will be completed for the same samples. Work will be performed by the North Pacific Division Materials Laboratory in Troutdale, Oregon.

Chemical sediment analysis: The following constituents will be measured in samples submitted for chemical analysis. Some compositing of samples may occur depending on field observations. Also, more samples will be analyzed for TOC and heavy metals than for organic contaminants.

Total Organic Carbon (TOC)

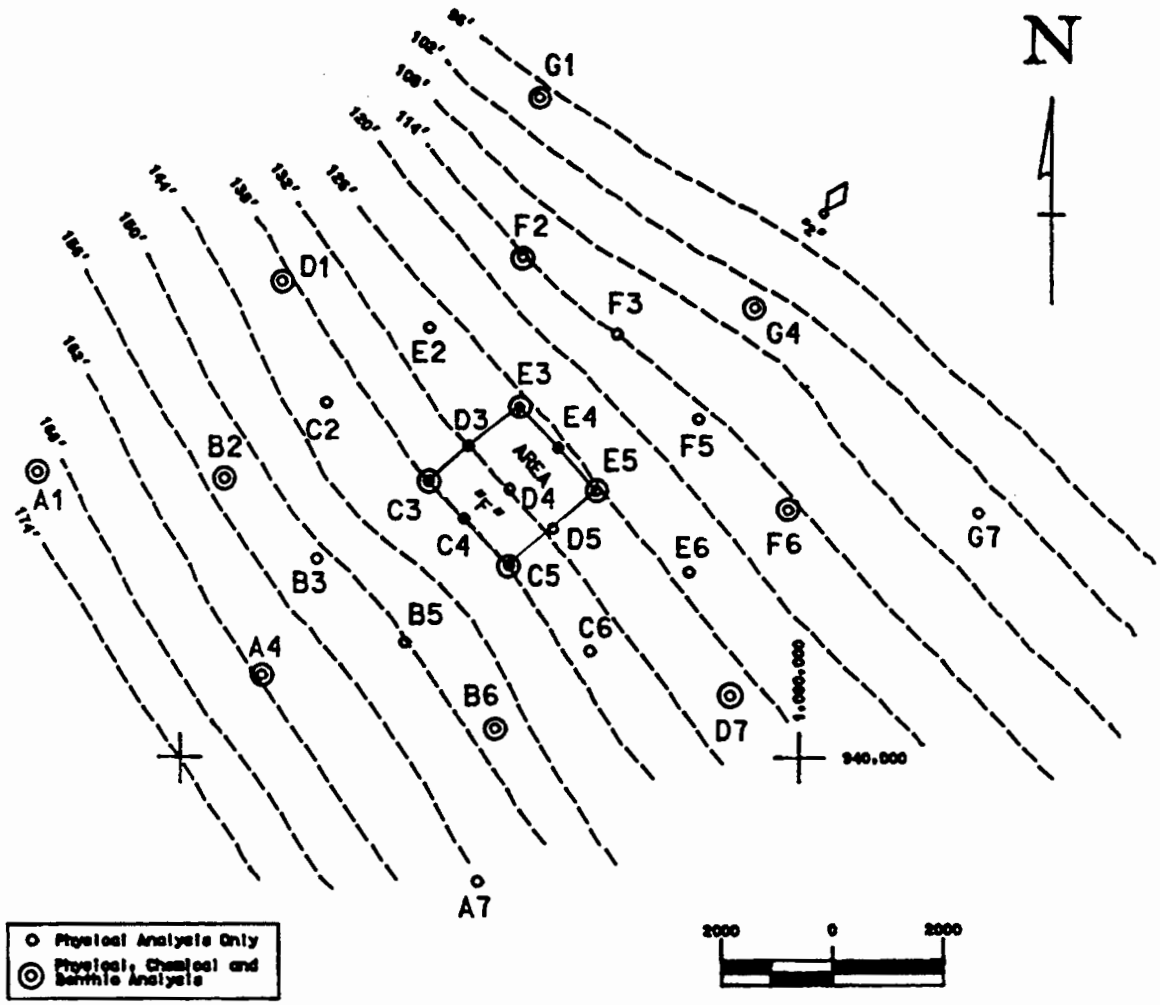
Heavy metals: As, Cd, Cr, Cu, Hg, Pb and Zn

Pesticides/PCBs

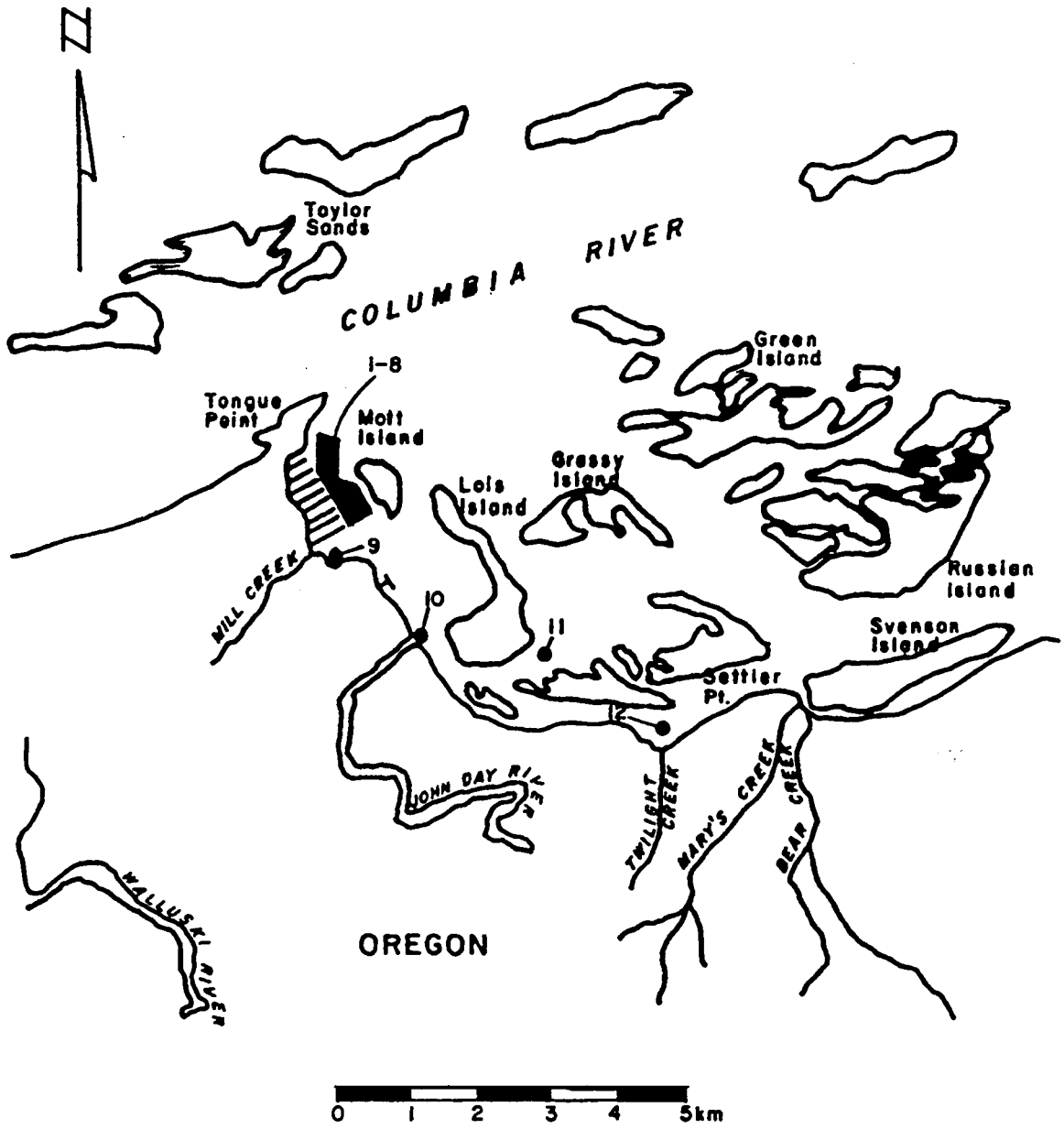
Base/Neutral extractible PAHs

Petroleum hydrocarbons

Dissolved sulfides and Ammonia



Attachment I: Ocean Dredge Material Disposal Site "F" Sample Locations



SAMPLE NO.

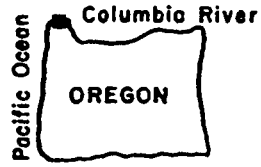
I-8 Tongue Point Dredge Site

9 Mill Creek Emboyment

10 South Tongue Point

11 Lois Island East Marsh

12 Twilight Swamp



Attachment 2: Dredging site sample locations.