APPENDIX M

ESTIMATED CONSTRUCTION SCHEDULE AND ASSUMPTIONS

ESTIMATED CONSTRUCTION SCHEDULE ASSUMPTIONS

An estimated construction schedule has been developed for the Site based on quantities from the 100% Design Report and anticipated production rates for each construction stage. This schedule is considered an estimated schedule because it relies on:

- Construction sequence;
- Working days;
- Working hours per day;
- Construction production rates; and
- Estimates of excavated volume.

The estimated construction schedule should be used to provide a general estimate of construction sequence and duration. A detailed schedule will be developed by the Contractor. The schedule detailed herein establishes assumptions for the Contractor's schedule.

Assumptions associated with the estimated schedule include:

- Schedule assumes working days only. Work is assumed to be conducted 5 days per week, Monday through Friday, with no work on weekends. Work is also assumed to be 8 hours per day. No work is assumed on holidays, which are expected to include:
  - New Year's Day;
  - Memorial Day;
  - Independence Day;
  - Labor Day;
  - Thanksgiving Day;
  - "Black Friday"; and
  - Christmas Day.
- The estimated schedule does not account for weather delays.
- No downtime has been accounted for transitions between construction stages, such as between installation of drilled pipe piles and excavation, or between excavation and cap construction.
- No work would proceed until an access agreement for land-based access is fully executed. The Contractor's Notice to Proceed will not to be issued until the access agreement is finalized.
- The Contractor's pre-mobilization submittal submission and review process is assumed to be 60 working days. It is assumed that the United States Environmental Protection Agency (EPA) must review and approve select submittals.
- Mobilization is assumed to be 15 working days and will not proceed until approval is provided by the Engineer. Note: It is likely that the Contractor will begin mobilization prior to all submittals being approved.

- Construction will utilize a portion of the 450 Carroll Street parking lot for staging, lay-down areas, and access for workers.
- The installation of bulkhead support is estimated to take 225 working days and assumes 2 crews would be working simultaneously the majority of the time. An additional 25 working days is assumed for set-up, down-time, and inclement weather days, for a total estimated 250 working days (50 weeks).
- The duration for drilled pile construction is based on the following productivity rates:
  - 2 piles per day for the 20-inch diameter pipe piles (282 piles);
  - 1 ½ piles per day for the 24.5-inch diameter pipe piles (234 piles); and
  - 1 pile per day for the 34-inch diameter pipe piles (151 piles);
- The excavation volume is estimated to be 24,900 cubic yards (cy). Excavation production rates are assumed to average 300 cy per day. Duration of excavation is estimated to be 83 working days, and material handling and final load-out is assumed to add an additional 5 working days after excavation activities are completed. Total construction duration for excavation and material handling is estimated to be 88 working days (18 weeks).
- The total number of permanent horizontal bracing members to be installed below the sediment cap is 26, and it is assumed that these members will be pre-assembled in the shop. The estimated tremie concrete encasement volume is 1,425 cy. The total duration for these two activities is estimated to be 30 working days (6 weeks) and is based on the following productivity rates:
  - 4 permanent bracing assemblies per day; and
  - 100 cy per day for tremie concrete.
- Sand backfill following excavation installation of horizontal bracing beneath the sediment cap is estimated to be 265 cy. A backfill production rate of 210 cy per day is assumed based on capping production rates (described below).
- The total area to be capped in the basin is assumed to be 17,800 square feet (sf). Volume estimates assume 15% material loss during placement for granular material; however, no material loss was not applied to the armor layer. The total estimated volumes, including the 15% material loss correction, associated with the cap design in the 100% Design Report are:
  - Leveling layer: 380 cy
  - Sand and oleophilic clay layer: 510 cy
  - Sand and granular activated carbon layer: 1,650 cy
  - Isolation layer: 380 cy
  - Armor layer (articulated concrete blocks): 17,800 sf
  - Habitat layer (assumes approximately 30% void space between blocks): 110 cy
- Total granular capping materials are estimated to be 3,030 cy. Capping production rates are assumed to be 210 cy per day for granular materials. For the TB4 Pilot Test, hourly production during up-time of the full-scale placement averaged 35 cy per hour and operational up-time

averaged 4.1 hours per day, resulting in approximately 144 cy per day. This schedule assumes the same hourly production rate but an increase in operational uptime to 6 hours per day, resulting in a daily production rate of 210 cy per day. Duration of granular cap material placement is estimated to be 16 days, including the placement of 265 cy of sand backfill following excavation installation of horizontal bracing beneath the sediment cap. The production rate for the armor layer is assumed to be 1,600 sf per day based on the assumption of 10 mats placed per day with a mat size of 8 inches by 20 inches. Duration of armor layer placement is estimated to be 12 working days. Total construction duration for capping is estimated to be 28 working days (6 weeks). Estimates do not take into account material mixing, transport, and Quality Assurance/Quality Control (QA/QC) verification.

- Intertidal vegetative shelf capping and restoration (without planting) volumes are estimated based on the 100% Design Report. The total area is assumed to be 4,800 sf. Volume estimates assume no more than 5% material loss during placement for granular material; this estimated material loss was not applied to the low permeability mat layer. Total estimated volumes, including the 5% material loss correction, associated with the intertidal vegetative cap and restoration design included in the 100% Design Report are:
  - Low permeability mat layer: 8,300 sf
  - Gravel layer: 320 cy
  - Sand layer: 320 cy
  - Sand Planting Soil layer: 720 cy
- Total granular capping and restoration materials are estimated to be 1,360 cy. Production rates are assumed to be similar to those within the basin (i.e., 210 cy per day for granular materials). Duration of granular material placement is estimated to be 7 days. The production rate for the low permeability mat layer is assumed to be approximately 4,000 sf per day. Duration of mat placement is estimated to be 3 working days. Total construction duration for intertidal vegetative shelf capping and restoration (without planting) is estimated to be 10 working days (2 weeks). Estimates do not take into account material mixing, transport, and QA/QC verification.
- The length of bulkhead concrete cap to be installed on the permanent bulkhead for the 24.5-inch and 34-inch diameter piles is approximately 535 linear feet and 510 linear feet, respectively. The volume of concrete cap for the 24.5-inch and 34-inch diameter piles is approximately 90 cy and 110 cy, respectively. The duration for concrete cap construction is estimated to be 20 working days (4 weeks), and is based on the following productivity rate:
  - 50 linear feet per day.
- The intertidal vegetative planting area is assumed to be 7,000 sf with plugs spaced at 12-inches on-center, to equal a total of roughly 8,000 plants with triangular spacing. The planting work will need to be coordinated to happen during low tide hours and must be followed immediately, at the end of each day, with the installation of a waterfowl barrier. Planting must take place during the spring planting season (May 1 through July 15) to allow plants to take root before going into dormancy in the fall. Duration of planting (including waterfowl barrier) is estimated to be 16 working days (3 weeks), assuming 500 plugs planted per day, using upland access. Installation using canal access or planting outside of the spring planting season will increase the duration of work significantly.

- The total chain link fence is assumed to be 500 linear feet, based on the 100% Design Report. Posts are to be installed every 6 feet, 9 inches prior to planting, with an estimated duration of 8 working days, assuming that the concrete cap will need to be core drilled for the posts. Rails and chain link to be secured following planting, with an estimated duration of 2 days. The total duration for the fence installation is estimated to be 10 working days (2 weeks).
- Demobilization is assumed to be 15 working days (3 weeks).