DREDGING TECHNIQUES TO MEET QUALITY GOALS

The following comments come from more than 15 years of completed environmental dredging projects with Cable Arm Clamshell buckets.

1. Precision dredging requires a crane in top mechanical condition; precision instrumentation can be wasted on a poorly functioning crane.

2. Provide an accurate pre-dredge survey on a grid dense enough (1 to 2m) to provide at least one sounding within every bucket footprint.

3. Use a differential global positioning system, bucket and crane instrumentation, tide gauge, and dredging software (ClamVision). This will enable tracking of the bucket location in 3 dimensions (X, Y, & Z) to control excavation. Be sure that your dredging software provides the operator with current and target depths for each bucket location.

4. Provide independent quality assurance/control of the hydrographic surveys. Identify GPS reference marks to confirm the accuracy of surveying and positioning of GPS equipment. Triple check the coordinate transformations, datum conversions, and tide settings within the dredging software; these are the most frequent sources of errors.

5. Monitor turbidity in accordance with the approved work plan. Identify and control sources of turbidity other than dredging (i.e. prop wash, spudding, dragging cables or silt curtains, storm events, outfalls within work area, etc.). Link turbidity measurements to dredging activities/practices and show the cause-effect relationship to the crew.

6. When digging “to grade”, remove soft sediment with a Cable Arm Environmental Clamshell bucket. Compare samples and test sediments using the same methods, before and after dredging. Also, precisely determine the sampling locations and depths, before and after dredging.

7. Locate sediment receiving containers or scows close to the work area to minimize cycle times. The receiving container must be large enough for easy bucket entry. A drip pan should be at the discharge point to receive the closed, filled bucket. Install a chute sloped into the material barge. This will collect any leakage while the bucket is in transit from the drip pan to the material barge. Rinse the emptied bucket in a wash tank prior to re-entering the water column.

8. Expect debris such as logs, tires, and rocks. Have a plan to deal with materials that won’t allow the bucket to seal. Expect excess water when dredging to bucket refusal. Develop a plan to deal with debris and excess water, both on the water and ashore.

9. Lower the bucket through the water column at a controlled speed. Use the depth instrumentation and target depths from the dredging software to avoid overfilling the bucket. Use the horizontal bucket position to provide adequate overlap for each bite.

10. Communicate project goals to the entire dredging team. Explain the differences between environmental and production dredging.

11. Allocate time in the project schedule to train crane operators in the new instrumentation and procedures for precision dredging. Allow the operator to make test runs in clean sediment before dredging contaminated materials.

12. Involve the crew. Track project status on a real-time basis and provide daily updates. Provide feedback that includes both successes and areas for improvement. Establish realistic performance expectations.