CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP)

DRAFT FINAL 100 PERCENT DESIGN SUBMITTAL
HOLLY STREET LANDFILL CLEANUP/
WHATCOM CREEK ESTUARY RESTORATION
PROJECT

Prepared for

City of Bellingham

Office of Neighborhoods and Community Development

In Cooperation with:

U.S. Environmental Protection Agency,

Brownfields Assessment Program

and

Washington State Department of Ecology,

Toxics Cleanup Program

Prepared by

Anchor Environmental, L.L.C.

1423 Third Avenue, Suite #300

Seattle, Washington 98101

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1 INTRODUCTION

This Construction Quality Assurance Plan (CQAP) for the Holly Street Landfill Cleanup and Habitat Restoration Project is one element of the Draft Final (100 percent) Design Submittal, prepared by Anchor Environmental, L.L.C. This CQAP was prepared to comply with requirements of the Model Toxics Control Act (MTCA) administered by the Washington State Department of Ecology (Ecology), and specifically to satisfy the requirements of the MTCA regulations contained in WAC 173-340-410, Compliance Monitoring Requirements. The remedial actions selected for the Site are to occur under the legal framework of a Consent Decree between Ecology, the City of Bellingham (City), and other defendants.

2 PURPOSE AND SCOPE OF CQAP

The purpose of this document is to describe and explain implementation of selected remedial action elements for the Site, short-term environmental monitoring activities, and the rationale used to develop these activities for the project. This document also identifies the quality assurance/quality control (QA/QC) steps to be used in construction management, including monitoring actions, reporting mechanisms, and documentation formats. It presents how environmental monitoring will be performed and how modifications to the construction procedures will be directed, as necessary, in response to results of monitoring actions. Further, it defines the quality assurance methods and protocols for project personnel to ensure they have a complete understanding of monitoring, feedback, and adjustment mechanisms.

The three types of compliance monitoring to be conducted include the following:

- **Protection Monitoring** to confirm that human health and the environment are adequately protected during the construction period of the cleanup action (presented in this document, the CQAP).
- **Performance Monitoring** to confirm that the cleanup action has attained cleanup standards and other performance standards (presented in this document, the CQAP, and in the Compliance Monitoring and Contingency Response Plan attached to the Consent Decree).
- **Confirmation Monitoring** to confirm the long-term effectiveness of the cleanup action once performance standards have been attained (also described in a separate document, the Compliance Monitoring and Contingency Response Plan attached to the Consent Decree).

The Contractor will use this CQAP together with the contract plans and specifications to develop a Construction Plan and Schedule, a Construction Quality Control (CQC) Plan, and a Contractor's Health and Safety Plan (CHASP).

This CQAP specifies the following items in the subsequent sections:

- Responsibilities and authorities of key project personnel, Contractors, and all organizations involved in the construction or oversight of the remedial action, including Ecology and other agencies

- Necessary personnel, Contractor, and subContractor qualifications, including qualifications of an independent QA official who possesses the training and experience necessary to fulfill his or her identified responsibilities
- Inspection activities, including a description of the type and frequency of tests and observations used to monitor the remedial action and verify compliance with environmental requirements, customary construction practices, Occupational Safety and Health Administration (OSHA), building and safety codes, etc.
- Construction monitoring requirements, objectives, and sampling requirements.
- All documentation requirements for reporting construction QA activities, including daily summary reports, inspection data sheets, and filing system organization
- Procedures for project modifications and change orders, including documentation and reporting requirements
- Project close-out procedures, including final inspections, payments, and approvals
- Project meetings and conferences

3 PROJECT ORGANIZATION AND RESPONSIBILITIES

The roles and responsibilities of the parties involved in the project will be delineated in a Consent Decree that is being negotiated with Ecology.

3.1 Washington State Department of Ecology (Ecology)

Ecology is the regulatory authority and responsible agency for overseeing and authorizing the remedial action. In this capacity, Ecology will review monitoring plans in the design phase and the CQC Plan to ensure that the monitoring is consistent with the remedial design. An environmental monitor will be designated to exercise project oversight for the agency and to coordinate with the respondents to the Consent Decree. Ecology will make final decisions with participation from the respondents to resolve unforeseen problems that may change project components or the manner in which the construction is executed.

3.2 City of Bellingham (City)

The City will be the signatories to the Consent Decree with Ecology. The construction project will be managed by the City and executed by Contractor(s) specializing in earthwork, excavation, backfilling, capping, and marine construction and demolition. On-site responsibility for construction management and contract administration will be assigned by the City. The City will have total authority and responsibility to deal with the Contractor on all contractual matters to ensure that the contract requirements are complied with and quality assurance information is provided. The City may also employ subordinate inspectors to monitor the contract work, but the interface on all contractual matters will be between the City and the Contractor(s). The City will be responsible for ensuring implementation of the CQAP, including required monitoring, sampling, testing, and reporting. Included within this responsibility will be the monitoring of the Contractor's quality control activities to ensure that project construction is conducted in accordance with the contract plans and specifications. These activities may be assigned to subordinate inspectors, or conducted by consultants with the requisite expertise and experience.

3.3 Construction Contractor(s)

The Contractor(s) will be selected through a competitive bidding process. The construction Contractor(s) will be required to perform the construction activities of excavation and disposal of soil, fill, and solid waste refuse; thin and thick layer capping; and marine structure work, in accordance with the Ecology-approved project plans and specifications. These documents contain specific, detailed requirements to achieve overall quality of the construction project.

The specifications require the Contractor(s) to develop and implement a CQC Plan, through which the Contractor(s) ensures compliance with the requirements of the contract. The CQC Plan will identify personnel, procedures, methods, instructions, inspections, records, and formats to be used in the CQC system. The CQC Plan must be reviewed and approved by the City and Ecology. The CQC Manager will have written CQC duties and responsibilities delegated by an officer of the firm. The Contractor(s) will also employ a Health and Safety Manager to implement its CHASP required by the contract specifications. The CHASP specifies the minimum health and safety requirements for job site activities, and the measures and procedures to be employed for protection of on-site personnel and tenants as well as visitors. Details on the documentation required are presented in the specifications.

3.4 Subcontractors

The Contractor(s) may employ subcontractors to perform selected phases of the work for which they have special expertise. The subcontractors are responsible to their prime Contractor for the quality of their work and health and safety of their project personnel in accordance with the Contractor's CQC Plan and CHASP. The subcontractors' principals will designate a job site superintendent or foreman with responsibility to see that the work is conducted in accordance with the contract requirements.

3.5 Consultants

During the course of construction, the owner will retain a Consultant (Anchor Environmental, L.L.C.) to act as Project Engineer, to ensure that the design objectives are realized and that the project is constructed in accordance with the specifications.

The Project Engineer will communicate with the City on a regular basis as a primary part of carrying out his or her responsibilities.

4 CONSTRUCTION CONTRACTOR/SUBCONTRACTOR QUALIFICATIONS

Prior to bidding on the project, the prospective Contractor(s) must demonstrate to the satisfaction of the City that they have the expertise, experience, and capability to satisfactorily execute the work. The Contractor(s) will keep, as part of their permanent organization, high caliber, knowledgeable, and experienced key personnel to perform their jobs. These individuals will have experience in the type of work being contracted. The journeyman operators, surveyors, and other Contractor personnel performing key jobs must have demonstrated the ability and skills to satisfactorily perform those assignments. For this project, the Project Manger/General Superintendent(s) will be required to have at least five years experience in the type of work being contracted.

Beyond this, the Contractor's Quality Control Manager and their organization must have documented qualifications and experience to perform the independent checks on the Contractor's operations necessary to determine compliance with the contract provisions. Additionally, any subContractors utilized in the work must have demonstrated to the satisfaction of the City that they are qualified and have satisfactorily performed the type of work for which they will be engaged. The Prime Contractor is responsible for the performance of its subContractors. All Contractors and subconsultants will be required to have all health and safety training required by the Washington State Department of Labor and Industries (Chapter 296-62 WAC, Subpart P, Hazardous Waste Operations and Emergency Response), including on-site training.

5 INSPECTION ACTIVITIES

Sufficient inspections, independent sampling and testing, and monitoring activities will be performed to ensure compliance with the terms and conditions of the contract. The results of these inspections, sampling and testing, and monitoring activities will be documented as specified in Section 6. Any work found not to be in accordance with the contract requirements will be immediately brought to the attention of the Contractor's General Superintendent for correction and annotated on the "Quality Assurance Report," with the corrective action taken. Any work found not to be in accordance with the approved remedial design plans, specifications, work plans, and/or contract documents shall be brought to the immediate attention of the Project Engineer and Ecology. Ecology will be notified of any changes to the approved contract documents before being implemented. The following inspection activities will be performed:

- Monitoring will be conducted during the remedial action to ensure that worker and public health and safety are protected during construction.
- Water quality monitoring will be performed during the construction work to ensure that water quality is protected in Whatcom Creek. Various construction controls will be implemented during the activity, and water quality monitoring will be used to identify the need for further controls as appropriate.
- Verification of the location control (stationing, offset, and elevation) during excavation, cap placement, and habitat construction activities. This may be done through independent means or verification of the Contractor's CQC checks. These checks are critical to ensure that refuse is removed, cap materials placed, and habitat elements installed to the limits and depths specified.
- Verification that imported materials (including but not limited to: backfilling, capping, and habitat substrate materials, steel, concrete, wood, installed habitat elements, and other construction materials) comply with all contract requirements prior to delivery to the job site.

6 DOCUMENTATION AND REPORTING

Prior to beginning work on the project, the Contractor will be required to submit various work plans for approval by the Project Engineer. Ecology will also review many of these documents pursuant to their approval authority as defined in the Consent Decree. This section summarizes submittals required of the Contractor prior to, during, and at the completion of different tasks. Details on the documentation requirements are presented in the specifications.

6.1 Construction Plan and Schedule

For construction activities, the Contractor(s) will be required to submit a Construction Plan and Schedule for approval by the City, the Project Engineer, and Ecology. No physical work is to be performed at the site until the plan is reviewed and specific authorization to start the work is obtained. The plan will cover potential environmental degradation as a result of the Contractor's operations. The plan will contain separate sections for contamination prevention, closure, cleanup, and erosion and turbidity control as they pertain to excavation and capping.

6.2 Construction Quality Control Plan

The Contractor's Quality Control (CQC)Plan will present the system that will ensure the Contractor(s) will meet the requirements of the contract. The CQC Plan will identify personnel, procedures, methods, instructions, inspections, potential remedies, records, and forms to be used in the CQC system.

The Plan will also include a description of procedures for maintaining and updating activity logs, laboratory records, procedures for reporting emergencies, potential remedies, records for personnel and maintenance, and monthly reports to agencies. The CQC Plan will include a description of how change orders will be reviewed for consistency with the specifications.

The Contractor shall prepare and maintain a Daily CQC Report which includes the results of all inspections, surveys, and monitoring activities and supporting documentation.

6.3 Contractor's Health and Safety Plan (CHASP)

The Contractor(s) will submit a CHASP that will present the minimum health and safety requirements for job site activities, and the measures and procedures to be employed for protection of on-site personnel. The plan will cover the controls, work practices, personal protective equipment, and other health and safety requirements that will be implemented by the Contractor(s) in connection with the remedial action activities. The specifications provide additional detail on the requirements for the CHASP.

6.4 Construction Documentation

The Contractor(s) is responsible for Quality Control, including daily checks and testing, as documented in the Daily CQC Report. The Project Engineer will provide Quality Assurance, which is oversight of the Contractor's Quality Control procedures.

The Project Engineer will document the results of the quality assurance inspections and testing and monitoring activities on a weekly basis in a Quality Assurance Report, which will include that week's worth of Daily CQC Reports (prepared by the Contractor). These reports will be transmitted weekly from the Project Engineer to Ecology and the City. An Executive Summary, which summarizes the significant construction activity for the period, will be submitted monthly to Ecology. Where QA inspections utilize the results of the Contractor's surveys and tests, these results will be summarized and included in the Quality Assurance Report. If the QA inspections' tests reveal out-of-spec conditions, the Project Engineer will immediately contact the Contractor's Superintendent to determine what action will be taken to modify the construction operation and correct the condition. A written memo will follow up this personal contact to the Contractor's General Superintendent confirming any oral instructions given. Instructions to the Contractor for any work that does not comply with the specifications will be confirmed with the Contractor in writing. The results of these discussions and follow-up corrective actions will be included in the weekly Quality Assurance report.

The Project Engineer will use discretion in keeping the Ecology representative informed of continuing events as the remediation work proceeds. Any work found not to be in accordance with the Ecology-approved remedial design plans, contract plans and specifications, work plan, and/or contract documents shall be brought to the immediate attention of the Project Engineer and Ecology. Ecology will be notified of any changes to approved documents before they are implemented. Documentation requirements for specific activities are contained in the contract plans and specifications. To enable monitoring of the progress of the work underway, the Contractor's Daily CQC Reports will be provided weekly to the Ecology monitor with the Quality Assurance Report.

7 REMEDIAL ACTION CONSTRUCTION ELEMENTS

The Contractor will be required to perform the following activities necessary to implement remedial actions identified in the Cleanup Action Plan:

- Demolition and clearing
- Excavation of existing soil, fill, and refuse
- Removal of excavated materials from the site and transport to appropriate offloading points
- Placement of backfill, capping materials, and habitat elements
- Installation of boardwalk structure and concrete elements
- Planting and landscaping

All related work will be conducted in strict accordance with the project plans and specifications, which contain specific detailed requirements to achieve the overall quality of the construction product. The following sections present a brief description of each construction element, including discussions of the following:

- ***Description*** – A description of the tasks for construction activities
- ***Potential Issues, Concerns, and Solutions*** – A description and evaluation of potential construction concerns, sources of information regarding potential problems, and common or anticipated remedies
- ***Monitoring, Contingency Plans, and Corrective Actions*** – A description of monitoring to be performed during remediation, required laboratory tests and their interpretation, a schedule of monitoring tasks and dates when they terminate, a description of threshold or triggering criteria, a contingency plan that describes construction alternatives in the event of a failure (to prevent undue hazard), and an evaluation of design vulnerability and environmental human health risks in the event of failure

7.1 Demolition and Clearing

7.1.1 Description

This element includes the removal of existing piles, debris, landscaping features, small structures, brush, and vegetation from specified areas along and within Whatcom Creek. Removed pilings and demolition debris will be disposed of off-site at a certified construction landfill.

The primary factors governing the selection of clearing and demolition techniques and equipment are the physical characteristics and size of those items requiring removal, existing slopes and topography, water depth and tidal variation, accessibility as dictated by existing structures, landscape features, and obstructions, equipment availability, and environmental factors such as minimizing contamination to Whatcom Creek.

Based on these factors, the majority of the demolition and clearing work will most likely be accomplished using a backhoe- or trackhoe-mounted bucket or handling tool with sufficient reach. In some cases, hand labor may be used to remove vegetation and the tops of piling.

7.1.2 Potential Issues, Concerns, and Solutions

The main concern in the demolition and clearing process is that the materials designated for removal (see specifications) are satisfactorily removed to the required depths and extents. A pre-construction condition survey will be performed by the City as the basis for contract or payment. The Contractor(s) will perform progress surveys every working day, to establish actual demolition/cleared extents and limits. Once the Contractor(s) has determined that demolition and clearing is complete in any given area, the City will perform a post-excavation survey in that area to confirm removal to the specified extents and limits.

The Contractor will be required to accurately locate the position of its excavation equipment at all times. This could include the use of differential global positioning system (DGPS) equipment, electronic positioning equipment (e.g., Mini Ranger) or stationing along the banks of Whatcom Creek. The method of positioning will be proposed by the Contractor in the Construction Plan, subject to review and approval by the City and Ecology.

The City will work with the Contractor's Quality Control Manager and survey crew to independently verify the extents and limits of demolition and clearing.

This may be done either by evaluation of the Contractor's daily progress surveys and/or positioning data, conducting independent surveys, or a combination of both methods. If the City determines that the Contractor is not removing materials to the proper extents, depths, or in the correct locations, they will immediately contact the Contractor's Superintendent to correct the situation. Any such direction and corrective action will be documented on the next Quality Assurance Report.

7.1.3 Water Quality Control and Monitoring

The Contractor will be responsible for monitoring water quality during demolition activities. Additional details on water quality protective measures and monitoring requirements are provided under Section 7.2.3.

7.2 Excavation of Existing Soil, Fill, and Refuse

7.2.1 Description

This element includes the removal of in-situ soil, fill materials, and solid waste refuse from selected bank areas of Whatcom Creek, to the extents and limits depicted in the contract plans and specifications. Excavated materials, including debris encountered, will be disposed of off-site at a certified solid waste landfill.

The primary factors governing the selection of excavation techniques and equipment are soil and refuse characteristics and gradation, existing slopes and topography, water depth and tidal variation, accessibility as dictated by existing structures, landscape features, and obstructions, equipment availability, and environmental factors such as the required cut depth and minimization of contamination to Whatcom Creek.

Based on these factors, the majority of the excavation work will most likely be accomplished using a backhoe- or trackhoe-mounted excavation bucket with sufficient reach. In some cases where longer reach is needed, such as situations where equipment access is on the opposite bank of the creek, a crane may be used to operate an excavation bucket (such as a small clamshell).

7.2.2 Potential Issues, Concerns, and Solutions

The main concern in the excavation process is that the materials designated for removal (see specifications) are satisfactorily removed to the required depths and extents. A Pre-Construction Survey will be performed by the City as the basis for contract or payment. The Contractor(s) will perform Post-Excavation Surveys as construction proceeds to establish actual excavated depths and limits and to confirm removal to the specified depths and limits.

Soil, fill, and refuse will be removed to the limits detailed in the contract plans and specifications. The Contractor will be required to accurately locate the position of its excavation equipment at all times. This could include the use of DGPS equipment, electronic positioning equipment (e.g., Mini Ranger) or stationing along the banks of Whatcom Creek. The method of positioning will be proposed by the Contractor in their Construction Plan and Schedule, a submittal which is subject to review and approval by the City and Ecology.

The City will work with the Contractor's Quality Control Supervisor and survey crew to independently verify the extents, limits, and depths of excavation. This may be done either by evaluation of the Contractor's daily progress surveys and/or positioning data, conducting independent surveys, or a combination of both methods. If the City determines that the Contractor is not excavating to the proper depth or in the correct location, they will immediately contact the Contractor's Superintendent to correct the situation. Any such direction and corrective action will be documented on the next CQC Report.

The Contractor's procedures for offloading excavated materials onto trucks or other containers for eventual disposal will be continuously observed to ensure appropriate methods are used. If any activities are determined unacceptable by the City, the Contractor will be instructed to stop work immediately and modify methods of transfer.

7.2.3 Water Quality Control and Monitoring

The Contractor will be responsible for monitoring water quality during excavation and construction activities. The Contractor will obtain and analyze water quality samples to monitor and control short-term water quality impacts from excavation and construction activities, and to invoke corrective actions or modify construction operations, if necessary, to bring construction activities into compliance with water quality performance criteria.

The purpose of the specified water quality monitoring is to provide ongoing assessment of the water quality during the work. The objectives of the monitoring program are as follows:

- Ensure water quality conditions are within prescribed limits
- Allow for appropriate adjustment of construction activities in a manner that ensures protection of the environment
- Document the results of the water quality performance monitoring

The Contractor shall ensure that water quality criteria are met at all stages during implementation of remedial action. The Contractor will be responsible for monitoring water quality in the Whatcom Creek Estuary during construction periods at all tide conditions. Monitoring stations will be established at locations approximately 200 feet upstream and downstream of the active construction area (final mixing zone boundaries and sampling plans will be determined by Ecology as part of substantive Water Quality Certification review of the draft final design submittal). At each sampling location, water quality parameters including temperature, salinity, pH, turbidity and dissolved oxygen (DO) will be monitored at a midpoint depth within the water column.

Based on the results the dredge elutriate test (DRET) performed on representative samples of solid waste collected from the site (see Appendix B of the Design Analysis Report), potential contact and mixture of freshly excavated solid waste with creek waters does not have the potential to result in exceedances of State Surface Water Quality Standards (WAC 173-301A) for metal (dissolved basis) or organic (total recoverable basis) chemical contaminants. The DRET

testing confirmed that if turbidity releases from the construction site are maintained below State Water Quality Standards, that overall water quality protection of the Whatcom Creek Estuary will be achieved. Thus, turbidity is the primary water quality indicator parameter for this remedial action.

The Contractor will be required to control potential turbidity releases from the construction area by restricting excavation work to times when water levels are at least one foot below the elevation of the working surface. Furthermore, freshly excavated surfaces will be rolled to a smooth condition prior to the next tidal inundation to reduce the potential for erosion.

For excavation below elevation +3 feet (required in localized areas along the South Bank), the Contractor may perform excavation below the water surface only if they demonstrate to the satisfaction of the Engineer that doing such excavation in the dry is infeasible. In this case, excavation +3 feet MLLW shall be accompanied by water quality monitoring, and the possible use of water quality conservation measures and Best Management Practices (BMPs), such as installation of silt fencing, subject to the discretion of the Project Engineer and Ecology.

As discussed above, the Contractor will be required to confirm that these measures provide adequate environmental protection by monitoring water quality within the Whatcom Creek Estuary at the boundary of the approved mixing zone during construction actions. In the unlikely event that the initial monitoring data reveal a turbidity (or other parameter) release that exceeds applicable water quality standards, the Contractor will be required to modify operations as appropriate to further reduce such releases (e.g., by placing temporary silt fences at the boundary of the excavation area during low tide conditions). Given the implementation of conservation measures and BMP outlined above to minimize the potential for water quality impacts, and the expected short duration of in-water work, negligible water quality impacts are anticipated as a result of implementation of the remedial action.

7.2.4 Description of Equipment, Monitoring, and Maintenance

Monitoring equipment will include DO, turbidity, temperature, salinity, and pH probe(s). Equipment will be maintained in good working order and in safe-working conditions at all times. Survey equipment will be maintained and calibrated for the life of the contract. Any calibration techniques necessary to ensure accuracy of performance will be prescribed in either the CQC Plan (dredging equipment and survey equipment) or the SAP and QAPP Addenda.

In addition to documentation requirements described in Section 5, the Contractor(s) will keep records of excavated and disposed volumes, and provide these records to the City. Pre- and post-construction surveys, however, will be the basis for payment to the Contractor.

The City will maintain water quality results, which will be submitted to Ecology on a weekly basis as part of the Daily CQC Reports.

7.3 Placement of Backfill and Capping Materials

7.3.1 Description

After excavation has been completed in any given area, capping and/or backfilling is required as documented in the project plans and specifications. In areas along the south bank of Whatcom Creek, placement of backfill materials will generally occur following little to no excavation. In all cases, placement of the material will likely be performed by mechanical methods, such as a bucket arm from a backhoe or trackhoe positioned on the bank being capped or backfilled, or from a crane.

7.3.2 Potential Issues, Concerns, and Solutions

The main concern in the placement of capping or backfilling materials is ensuring that the material is satisfactorily placed over the required areas and to the required thickness, as depicted on the contract plans. Furthermore, the Contractor will be required to minimize and monitor for possible release of suspended solids into Whatcom Creek, and in so doing to comply with water quality criteria (as discussed in Section 6.2.3).

7.3.2.1 Satisfactory Placement of Backfill and Capping Materials

To ensure that proper backfilling and capping is achieved, Contractor Quality Control grade surveys will be performed before and after backfill and capping materials are placed, to quantify actual cap/backfill thickness and extent. Other additional methods may be proposed by the Contractor (e.g., stakes). Wherever the material thickness is less than the specified amount, the Contractor will be required to add a sufficient amount of additional material to achieve the specified thickness in accordance with the terms of the contract. Final cap thickness determinations will be made after five complete tidal cycles.

The Contractor(s) will be required to employ an electronic positioning system for accurately locating and tracking the movement of its cap placement equipment. If the City determines the Contractor(s) is not placing cap materials in the correct location, the Contractor's General Superintendent will be immediately contacted to correct the situation. Any such direction and corrective action will be documented on the next Quality Assurance Report.

7.3.2.2 Release of Turbidity

In general, the Contractor will only be permitted to perform backfilling and cap material placement when the water level is at least one foot below the working surface. Cap placement work will therefore need to be timed so as to occur during sufficiently low tides. Potential limited exceptions to this may be granted for areas in which the initial lifts of rock material are placed below elevation +3 feet MLLW (i.e., in localized areas along the South Bank, and for the Gravel Berm along the North Bank). The Contractor may elect in these cases to place the necessary rock materials through water. In these areas, the Contractor(s) will be required to place materials in a manner that will minimize the release of turbidity (e.g., limiting the fall distance of aggregate materials through the water column). Water quality monitoring will be required as described in Section 6.2.3, and the Contractor may be

required to institute additional water quality conservation measures and BMPs, at the determination of the Project Engineer and Ecology.

7.3.3 Monitoring, Contingency Plans, and Corrective Actions

Potential import material used for capping and backfilling include:

- Fill materials and aggregates from quarries or pits
- Recycled dredge material from clean sources

Prior to the use of any imported material, its specified physical properties and gradation will be verified by laboratory testing. Furthermore, its chemical quality will be determined for a minimum of three composite (i.e., representative of all material being placed) samples.

7.3.4 Description of Equipment, Monitoring, and Maintenance

Backfilling and capping equipment will likely consist of either a front-end loader, backhoe, trackhoe, or bucket suspended from a crane. In accordance with the contract terms, the equipment will be maintained in good working order and in safe working condition at all times. Survey equipment will be maintained and calibrated for the life of the contract. Calibration techniques are prescribed to ensure that the equipment performs to the accuracy required by the specified order of survey.

7.3.5 Documentation

These requirements are described in Section 5. In addition, the Contractor(s) will keep records of capping material volumes or weights and provide these records to the City. These records will allow for a rough comparison of actual to theoretical cap volumes.