Prepared for

Gowanus Canal Remedial Design Group

CONSTRUCTION IMPLEMENTATION PLAN

RTA1 100% REMEDIAL DESIGN

GOWANUS CANAL SUPERFUND SITE BROOKLYN, NEW YORK

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ACB	Articulated Concrete Block
AD	after dredge
B&B	B&B Engineers & Geologists of New York, P.C.
BD	before dredge
Canal	Gowanus Canal
CAMP	Community Air Monitoring Program
CIP	Construction Implementation Plan
CQC	Construction Quality Control
CQA	Construction Quality Assurance
DWTS	Dredge Water Treatment System
EPA	United States Environmental Protection Agency
EoR	Engineer of Record
HASP	Health and Safety Plan
ISS	In situ stabilization/solidification
NOI	Notice of Intent
NRHP	National Register of Historic Places
PA	Project Administrator
PDM	processed dredged material
PRP	Potentially Responsible Party
RD	Remedial Design
RD Group	Gowanus Canal Remedial Design Group
RPM	Remedial Project Manager
RTA	Remediation Target Area
S&EC	Sediment and Erosion Control
Site	Gowanus Canal Superfund Site
SPDES	State Pollutant Discharge Elimination System
S/S	stabilization/solidification
SWPP	Stormwater Pollution Prevention Plan
UAO or Order	Unilateral Administrative Order

1. INTRODUCTION

This Construction Implementation Plan (CIP or Plan) was prepared by B&B Engineers & Geologists of New York, P.C. (B&B) for the Gowanus Canal Remedial Design Group (RD Group[1]) as part of the Remedial Design of the Gowanus Canal (Canal) Superfund Site (Site). The Remedial Design is being performed under the Unilateral Administrative Order (UAO or Order) effective March 24, 2014.

The CIP provides information about construction sequencing and oversight for the Remediation Target Area (RTA) RTA1 Remedial Design construction activities to be conducted by the Contractor in accordance with the Contract Documents. The CIP comprises two parts:

- Narrative Scope of Work; and
- Construction Communication Plan.

The Narrative Scope of Work provides a detailed summary of the project and Contractor scope of work and identifies Construction Drawings and Technical Specifications where more detailed information is contained. It highlights the sequencing of the work and factors that need to be accounted for at various stages of construction.

The Construction Communication Plan identifies and defines the roles of the various entities involved in implementation of RTA1 remedial construction. Lines of communication are also defined.

[1] It is expected that a subsequent group (or groups) of potentially responsible parties will implement this 100% design, in accordance with other Unilateral Administrative Orders issued by EPA. The term "RD Group" is used throughout these documents, including when referring to implementation, for convenience only.

2. NARRATIVE SCOPE OF WORK

2.1 Introduction

The following are key construction elements of the Remedial Design of RTA1:

- Bulkhead support - Various bulkhead support and/or replacement structures will be installed within the work area to facilitate the dredging, in situ stabilization/solidification (ISS), and capping components of the work. Bulkhead support work will be performed in accordance with design documents provided by APTIM, Inc. (APTIM), Greenman-Pederson, Inc. (GPI), and others.
- Dredging - Sediment and debris removal will occur with the use of barge-mounted cranes and/or excavators using various types of attachments, potentially including environmental clamshell buckets, excavator buckets with closing mechanisms, grapples, conventional clamshell buckets, and/or rakes.
- Dredged Material Management - Dredged material will be dewatered, screened for debris, and processed via solidification/stabilization (S/S) at an off-Site sediment processing facility. Based on waste characterization testing and United States Environmental Protection Agency (EPA) directive for determination of thermal treatment suitability, stabilized dredged sediment will either be thermally treated followed by beneficial use end-placement or directly transported to the end-placement facility for beneficial use.
- Decant Water Treatment - Dredge decant water will be captured and transported to the Dredge Water Treatment System located at the Staging Site for treatment and compliance testing prior to discharge back into the Canal. Alternative water treatment approaches such as off-Site treatment at a licensed disposal facility are also permissible for Phase I Dredging if approved by the Owner's Representative (as defined in the Communication Plan) and EPA.
- Debris Management – Only debris that has been selected for further inspection for cultural significance must be washed. The need for washing of debris that has not been selected for further inspection for cultural significance will be determined based on debris disposal requirements set forth by the end-placement facility. Large debris that is separated during dredging and requires washing may be washed on the barge, on the asphalt pad at the Staging Site, or at the off-Site processing facility. Large debris will be staged for archeological review, and either stored or disposed. Dredged material will be screened for debris at the off-Site processing facility and debris will then be evaluated for cultural resources. Items that are selected as potentially culturally significant will be washed and temporarily stored for regulatory review. All other debris will be disposed as non-hazardous waste. Detailed instructions for handling potentially culturally significant debris will be provided in the most recent Cultural Resources Monitoring Plan prepared by AHRS.

- In Situ Stabilization/Solidification (ISS) - ISS will be performed in targeted areas following Phase II Dredging.
- Capping – A multilayer cap will be constructed in targeted areas following dredging and ISS.

The Contractor is to execute the design described herein for dredging, ISS, capping, and associated other activities. In general, the Contractor shall implement the Work as described herein and as presented on the Construction Drawings and in the Technical Specifications. The Contractor is responsible for the development and implementation of a site-specific health and safety plan (HASP) specifying the Contractor's policies and procedures to adequately protect Site workers, visitors, and residents as indicated in Technical Specification 01 35 29.

Construction activities will occur within the upper reach of the Canal (i.e., RTA1), which extends from the top end of the Canal to the 3rd Street Bridge. A planned Staging Site is located at 459 Smith Street (Block 471, Lot 200), Brooklyn, New York 11231. The locations of RTA1 and the Staging Site are shown on the Construction Drawings (G-3). The Site refers to both the Canal and the Staging Site.

The sequencing of construction activities is indicated in Appendix G of the Design Report. The sequencing is subject to change depending upon the completion of key work activities by others.

2.1.1 Contractor Scope of Work

The scope of work for the Contractor includes provision of all labor, supervision, materials, and equipment necessary to complete the Work. All Work is performed in accordance with the requirements outlined in the Technical Specifications and Construction Drawings. Calculation packages and other supporting reports and documents referenced in the Technical Specifications are available to the Contractor upon request, unless specified otherwise. A description of the Work to be conducted by the Contractor is included in this section.

2.1.2 Project Work Activities

2.1.2.1 Task 1 – Construction Management

The Contractor will provide construction management services for Remedial Design construction. In this role, the Contractor will manage Site activities and execution of the Work.

2.1.2.1.1 Subcontractor Procurement

The Contractor will procure the subcontractors as necessary to implement the Work. If not already included in the proposal as part of the Contractor team, the proposed subcontractors will be subject

to approval by the RD Group and potentially by EPA, per the RD Order. It is expected the Contractor when procuring subcontractors will review proposed schedule(s) and critical path analyses and check for feasibility, completeness, contract compliance, and flexibility.

2.1.2.1.2 Review of Subcontractor Submittals

The Contractor will review technical submittals that are to be prepared by subcontractors for completeness and accuracy. The Contractor will provide a written narrative to indicate whether or not the submittals are in accordance with applicable codes, standards and contract documents. The Contractor will submit the narrative to the Project Administrator as defined in the Communication Plan.

2.1.2.1.3 Meetings and Project Management

Provide various project services including:

- Attend pre-mobilization meetings with RD Engineer of Record, RD Group, and other representatives as needed. The Contractor will provide agenda and minutes for meeting;
- Chair weekly progress meetings with the RD Engineer of Record, RD Group, and other representatives as needed. Prepare agenda and distribute minutes of all such meetings;
- Prepare and maintain schedule and update as required by Contract Documents, identifying both failing critical path tasks and the entity responsible for correction;
- Develop, with critical input from RD Engineer of Record, the Project Safety Manager, and other contractors as necessary, corrective action plans and implement as needed to maintain the project schedule, safety, and quality objectives;
- Perform timely review of the required contract submittals and shop drawings, coordinating with RD Engineer of Record, as necessary;
- Submit weekly Construction Progress Reports to the Project Administrator via e-mail by noon on the first workday following the reporting week;
- Prepare monthly Progress Reports for submittal by the Project Administrator to the applicable regulatory agencies;
- Coordinate field design changes with the Engineer of Record, Project Safety Manager, and the Project Administrator;
- Track construction activity and budget status with Project Administrator;
- Document and report Force Majeure events in accordance with the contract, and applicable regulatory provisions; and

- Support the RD Group's Community Relations Program, as requested by the RD Group, in order to respond to issues and inquiries from the community and local officials.

2.1.2.1.4 Construction Management

This task involves providing field management of construction activities in order to ensure technical compliance with the design documents (in conjunction with the RD Engineer of Record) and conformance with all relevant requirements.

- Monitor work for compliance with the contract, and promptly address and resolve issues of non-compliance and notify the Project Administrator;
- Ensure that environmental controls, training, and medical monitoring are in place and functional, follow the provisions of the Contract, and meet applicable regulations;
- On a full-time basis, provide field supervision during remedial construction, documentation of site activities, and attend site meetings.

Note – Community Air Monitoring will be provided by an independent third party. Contractor role is to communicate and coordinate to ensure compliance with air quality during operations.

2.1.2.1.5 Construction Quality Control (CQC)

The Contractor is responsible for the implementation of the various CQC responsibilities outlined in the specifications. The Contractor will perform any CQC testing and inspection necessary to demonstrate that the work meets the requirements of the contract documents

2.1.2.2 Task 2 – Mobilization and Staging Site Preparation

A portion of the property at 459 Smith Street is planned to be used as a Staging Site. Anticipated activities at the Staging Site include staging of trailers and administrative facilities, staging of equipment, material storage, dredge water treatment, and debris washing and sorting on the existing asphalt pad. The Contractor will prepare and submit plans for preparing the Staging Site in accordance with the Construction Drawings and Specifications including, but not limited to, performing the following actions:

1. Completion of pre-construction photographic surveys and assessments;
2. Installation of sediment and erosion controls and temporary construction fencing;
3. If necessary, flush-mounting existing stickup wells within the footprint of the available work area (note that wells in the footprint of the asphalt pad are already flush-mounted);
4. Relocation of storage containers as necessary;
5. Staging trailers for project personnel;

6. Installation of the dredge water treatment system;
7. Preparation of material and equipment storage and laydown areas; and
8. Installation of marine facilities for on-water work.

A portion of Huntington Street may be closed for use as a temporary staging area and controlling access to the waterfront of the Canal.

The Contractor is responsible for Staging Site Maintenance, which includes the following.

1. Rodent control;
2. Snow and ice removal from within the Staging Site and sidewalks along the perimeter of the Staging Site;
3. Trash/recycling removal from the Staging Site;
4. Weed whacking within the Staging Site and sidewalks along the perimeter of the Staging Site;
5. Providing and servicing portable toilets and hand washing stations;
6. Handling of ponding within the Staging Site during heavy rainfall;
7. Trailer internet connection and phone service;
8. Maintaining green fencing along perimeter of the Staging Site; including ensuring such fencing is free from graffiti; and
9. Pickup of trash/litter along perimeter sidewalks of the Staging Site.

2.1.2.3 Task 3 – Hydrographic Surveys

The Contractor will perform hydrographic surveys to document conditions before, during, and after construction. Hydrographic surveys are to be conducted in accordance with Technical Specifications 35 20 23.13, 35 43 00, 35 43 29, and 01 71 23.

2.1.2.3.1 Dredging Surveys

As described in Technical Specification 35 20 23.13, the Owner's Representative will contract an independent third-party hydrographic surveyor to complete a before dredge (BD) survey prior to the start of Work. The Contractor is to perform a BD survey also, and the Contractor is to perform weekly hydrographic surveys to maintain a record of the Work and to support requests for progress

payments. In addition, the Contractor is to perform after dredge (AD) hydrographic surveys to verify the completion of each phase of dredging and completion of the ISS treatment layer as described in Technical Specifications 01 71 23 and 35 20 23.13. Following the completion of treatment of areas by ISS and notification from the Contractor, the Owner's Representative will have a hydrographic survey performed by an independent third-party hydrographic surveyor for quality assurance and used as a basis for measurement for payment for Phase III. The Contractor survey will be used for verification and measurement for payment during slotted excavation of Phase III, if necessary, due to the required daily or more frequent surveys required for slotted excavation.

During any required slotted excavation (Phase III), the Contractor is to conduct and present surveys prior to backfill to the Owner's Representative to show the target dredge depths have been achieved. The Owner's Representative must approve the Contractor surveys during Phase III dredging before the Contractor may proceed with placement of leveling layer or engineered leveling layer in the dredged areas. AD surveys will also be collected following placement of leveling layer or engineered leveling layer, and the Contractor is to present the results showing the target elevations have been achieved to the Owner's Representative for approval. Note that in areas where slotted excavation is required, the Contractor may perform several AD surveys per day as they alternate between excavation and backfilling in accordance with requirements specified on the Construction Drawings and in Technical Specification 35 20 23.13. While an independent AD survey is completed by the Owner's Representative following the completion of Phase III, including backfill, independent AD surveys will not be completed for areas where slotted excavation is required during Phase III dredging.

2.1.2.3.2 Capping Surveys

As described in Technical Specifications 35 20 23.13, 35 43 00, and 35 43 29, the Contractor is required to conduct hydrographic surveys during capping activities to: (i) document the baseline elevation measurement for subsequent cap layer placement, (ii) document the areal coverage of the treatment layer, and final cap; and (iii) for purposes of measurement for payment for the leveling layer.

Under Section 35 20 23.13, hydrographic surveys are required after placement of the leveling layer. Under Section 35 43 00, hydrographic surveys are required: (i) after placement of the OC+sand Treatment Layer and (ii) after placement of the GAC+sand Treatment Layer. Under Section 35 43 29, hydrographic surveys are required (i) after placement of the Isolation Layer and (ii) completion of the cap and backfilling at the southern termination of the cap (i.e., the final cap Survey).

Hydrographic surveys are conducted in accordance with Technical Specification 01 71 23.

Placement of the structural concrete for underwater applications is verified by probing in accordance with Technical Specification 35 43 29.

2.1.2.4 Task 4 – Sediment and Floatables Management

Sediment and floatables containment is being used for the duration of bulkhead support installation (Technical Specification 31 41 00, dredging (Technical Specification 35 20 23.13), ISS (Technical Specification 03 11 00), and capping (Technical Specification 35 43 00 and 35 43 29) in accordance with Technical Specification 02 60 16.

The Contractor is to control floating debris, turbidity, and sheens in accordance with Technical Specification 02 60 16. Air curtains, turbidity curtains, and booms will be required for managing resuspended sediment and floatable material at different times during construction, as described herein and in Technical Specification 02 60 16. The air and turbidity curtains are to be installed prior to beginning dredging.

During working hours, as defined in the specifications, the air curtain will be operational and follow the performance specifications outlined in Technical Specification 02 60 16. After working hours (nights and weekends), the turbidity curtain and booms will be used to control resuspended sediment, sheen, or other floatables.

If threshold turbidity criteria are exceeded (as defined in Technical Specification 01 57 19) during Work in the Canal, the Contractor will implement water quality controls in accordance with Technical Specifications 01 57 19 and 02 60 16, including but not limited to, slowing or halting operations, modifying operational procedures, and modifying turbidity control measures.

When turbidity or air curtains are deployed, the Contractor will collect and remove floating debris and visual surface sheen resulting from project activities in accordance with Technical Specifications 02 60 16 and 02 51 19. Any absorbent materials are to remain in place until appropriate to remove as specified in Technical Specification 02 60 16. The Contractor is to discard spent materials in accordance with Technical Specification 02 51 19.

2.1.2.5 Task 5 –Dredging

2.1.2.5.1 General

There will be three distinct phases of dredging:

1. Phase I Dredging – Dredging of soft sediment, as presented in the Construction Drawings, to provide access from just below the Union St. Bridge to the head of the Canal for bulkhead support work. Areas at the Carroll Street Bridge noted on the Construction

Drawings will also be dredged during Phase I for bridge support work. Phase I Dredging also includes production dredging between the Carroll Street and the Union Street Bridges.

2. Phase II Dredging – High production dredging conducted prior to ISS throughout RTA1, but not beneath or within a 25-foot offset from the bridges with the exception of areas around the Carroll Street Bridge dredged during Phase I.

3. Phase III Dredging – Dredging to the final surface, presented in the Construction Drawings, throughout RTA1 after ISS, including the offset areas within 25 feet of and beneath the bridges, with the exception of areas around the Carroll Street Bridge dredged during Phase I. Phase III Dredging includes backfilling of the final surface presented in the Construction Drawings.

Bulkhead support (Technical Specification 31 41 00) is performed following Phase I dredging. ISS (Technical Specification 03 11 00) is performed following Phase II dredging. Placement of the leveling layer occurs following Phase III Dredging. Bulkhead stability is monitored during dredging, in accordance with Technical Specifications 02 22 00 and 35 20 23.13.

Some areas of Phase III dredging could require dredging by the slotted excavation method and daily backfilling of dredged areas. The sequence for removing sediment and backfilling by the slotted excavation method is shown in the Construction Drawings.

Hydrographic surveys will be conducted during dredging in accordance with this Plan and Technical Specifications 35 20 23.13 and 01 71 23. Environmental monitoring will be conducted in accordance with this Plan and Technical Specification 01 57 19.

2.1.2.5.2 Canal Restrictions

Several areas along the Canal, such as bridge crossings, have restricted horizontal and vertical clearances. The Contractor is to demonstrate that all equipment and materials to be used can pass through these areas in accordance with Technical Specification 35 20 23.13. The Contractor is responsible for coordination with the bridge operators and keeping the Owner's Representative informed of these coordination activities in accordance with Technical Specification 01 32 00. Information on the bridges is provided on Construction Drawing G-3.

2.1.2.5.3 Dredge Equipment

The Contractor will furnish equipment necessary to perform debris removal, dredging, dewatering, and leveling layer placement operations in accordance with Technical Specification 35 20 23.13, Technical Specification 02 51 19, and the Construction Drawings.

Dredging is performed with an environmental clamshell bucket unless Site conditions necessitate the use of a conventional clamshell bucket or excavator bucket with a closing mechanism in accordance with Technical Specification 35 20 23.13. The environmental clamshell bucket is designed to completely enclose the captured dredged sediment and water and is equipped with valves that close when the bucket is withdrawn from the water column. If the Contractor deems a conventional clamshell bucket is necessary, they will provide the basis of the request to the Owner's Representative for recommending the use of a conventional clamshell bucket. The design objective is to use the environmental clamshell bucket to the greatest extent practical and to reserve the conventional clamshell bucket or excavator bucket with a closing mechanism for use where debris or other site conditions interfere with the operation of the environmental bucket to a degree that control of sediment resuspension is ineffective, or production is greatly affected.

Large Debris Handling

Large debris that may inhibit dredge production will be removed during Phase I Dredging. Large debris that requires washing may be washed on the barge, asphalt pad at the Staging Site, or at the off-Site sediment processing facility. Large debris is to be evaluated for cultural significance and managed in accordance with the most recent Cultural Resources Monitoring Plan prepared by AHRS. Large debris that is not determined to be potentially culturally significant will be discarded in accordance with applicable laws and regulations. Large debris that meets facility acceptance criteria may be recycled in accordance with Technical Specification 02 51 19. Debris not meeting recycling criteria is discarded as nonhazardous waste at a permitted Construction and Demolition Debris landfill or Subtitle D landfill subject to conditions of the operating permits of the facility. The Contractor is responsible for identifying permitted recycling and disposal facilities.

2.1.2.6 Task 6 – In Situ Stabilization/Solidification (ISS)

2.1.2.6.1 General

The Contractor will supply, receive, store, and mix ISS reagents to stabilize and solidify impacted sediment within the ISS Area limits in RTA1 to elevations indicated on the Construction Drawings and in accordance with Technical Specification 03 11 00. ISS treatment will be implemented after Phase II Dredging and prior to Phase III Dredging.

ISS Columns will be implemented from the final Phase III Dredging elevation to the target depth or to refusal as described in Technical Specification 03 11 00. If obstructions are encountered, the Contractor will remove the obstruction to the extent practical prior to ISS implementation. Note that some swell is expected to occur during/following ISS Work. Swell material above the Phase III dredge elevation is expected to be removed by the Contractor during Phase III dredging to the Phase III dredge elevation or to an alternate surface above the Phase III dredge elevation that does not impact final navigation depth or placement of the leveling layer or various cap layers.

ISS treatment will be laid out in a manner to solidify all areas specified for treatment and provide a "neat line" overlap between adjacent passes. Overlap for adjacent ISS treatment areas completed with equipment other than a large diameter auger should be a minimum of one foot and shall conform to a honeycomb overlay layout as detailed in the Construction Drawings. Vertical overlap of ISS Columns should be a minimum of three feet. The Contractor will establish survey controls for each ISS Column.

Approximately four weeks prior to full-scale ISS operations, the Contractor will perform a Startup/Demonstration Evaluation as described in Technical Specification 03 11 00 to confirm application parameters of the selected mix design(s) across a range of reagent percentages. These application parameters may include total cementitious dosage percentages, grout flows and pressures, water-to-reagent ratios, auger/tool advance and retraction rates, and grout specific gravity.

2.1.2.6.2 Equipment

The Contractor will furnish the equipment necessary to perform ISS operations in accordance with Technical Specification 03 11 00 and the Construction Drawings. ISS is expected to be performed using a large diameter auger mounted to a drill rig or excavator. To prevent damage to bulkheads and critical structures (Union Street Bridge and Flushing Tunnel culvert), the Contractor will provide alternate ISS equipment (i.e. excavator mounted mixing tools) within 2 feet of the bulkheads and other critical structures.

2.1.2.6.3 Performance Criteria

Discrete Construction Quality Assurance (CQA) samples will be collected from selected ISS Columns immediately following installation to verify the ISS application meets the Performance Requirements as defined in Technical Specification 03 11 00. Performance Requirements include visual inspection of sample and physical testing (unconfined compressive strength). Samples will also be tested for hydraulic conductivity for recording purposes.

2.1.2.7 Task 7 – Capping

A multilayered capping system ("cap") will be constructed within the Canal after dredging and preparation for the capping surface is completed in accordance with Technical Specification 35 20 23.13, Technical Specification 01 71 23, and the Construction Drawings.

The cap will consist of three primary layers as follows from the base layer to the surface: (i) an adsorptive Treatment Layer, designed to sequester contaminants; (ii) a sand Isolation and Filter Layer; and (iii) an Armor Layer. The Treatment Layer will incorporate active (e.g., activated carbon, oleophilic clay) and passive (e.g., sand) capping materials as described in Technical

Specification 35 43 00 and in the Construction Drawings. In the vicinity of monopiles and pipe piles, AquaBlok® 3070SW(AB) will replace the Treatment Layer. The Isolation and Filter Layer, along with gravel integrated into the Armor Layer, will also serve as an ecological habitat layer. The Armor Layer will consist of open articulated concrete block (ACB) mats over most of the Canal. In select areas of the Canal closed ACB mats will be required (e.g., in front of Flushing Tunnel and headend CSO Outlets). A structural concrete for underwater applications will be placed between the edge of the armor layer and the bulkheads.

Capping materials will be staged and mixed in accordance with Technical Specifications 01 60 00 and 35 43 00. The Contractor will track volume of material delivered and perform quality control checks of the delivered materials in accordance with Technical Specifications 35 43 00 and 35 43 29.

Cap installation will not begin until all dredging and backfilling operations are complete; however, capping will be conducted as soon as practically feasible after dredging. The Contractor will perform installation of each cap layer in accordance with the approved Treatment Layer Construction Plan and Isolation and Armor Layers Construction Plan. The lateral limits and final elevations of the cap are provided on the Construction Drawings. The thickness of the treatment layers and the Isolation and Filter Layer will be verified by collecting in situ samples or hydrographic surveying in accordance with Technical Specifications 35 43 00 and 35 43 29. Hydrographic surveys will also be conducted to confirm coverage of the treatment layers, AB, and final cap.

2.1.2.8 Task 8 – Dredged Material Processing and Dewatering

2.1.2.8.1 General

Dredged sediment will be managed in accordance with Technical Specification 02 51 19. The Contractor will perform all testing and inspections required to evaluate compliance with end-placement acceptance criteria for beneficial use or thermal treatment in accordance with Technical Specification 02 51 19. Water resulting from dredging activities will be treated and discharged into the Canal. For Phase I Dredging, dredge water may be treated via an alternative water treatment approach such as off-Site treatment at a licensed disposal facility (Technical Specification 44 08 40).

2.1.2.8.2 On-Site Debris Staging and Decontamination

The asphalt pad at the Staging Site is shown in the Construction Drawings and may be used for temporary storage of debris to allow for inspection by the RD Group's archaeologist in accordance with the most recent Cultural Resources Monitoring Plan prepared by AHRS. The Contractor may

choose to wash debris on the asphalt pad and/or perform decontamination activities on the asphalt pad.

2.1.2.8.3 Dewatering

The Contractor will decant excess water from the dredged material and pump it to the Dredge Water Treatment System on the Staging Site for treatment prior to discharging the treated water back into the Canal in accordance with Technical Specifications 02 51 19 and 44 08 40. For Phase I Dredging, excess dredge water may be treated via an alternative treatment approach such as off-Site treatment at a licensed disposal facility (Technical Specification 44 08 40).

2.1.2.8.4 Off-Site Dredged Sediment S/S

Dredged sediment that is transported off-Site to a commercial sediment processing facility must undergo S/S in accordance with Technical Specification 02 51 19. It is the responsibility of the Contractor to ensure that dredged sediment meets any requirements for transport and acceptance to the commercial processing facility. Dredged sediment to be thermally treated will be managed separately.

Debris Screening and Management

Dredged material will be screened for debris at the off-Site sediment processing facility. Debris will then be segregated and evaluated for potential cultural significance. Items identified as potentially culturally significant will be washed and managed in accordance with the Cultural Resources Monitoring Plan prepared by AHRS. Debris removed from the Canal that has not been identified as potentially culturally significant and that meets facility acceptance criteria may be recycled in accordance with Technical Specification 02 51 19. Debris not meeting recycling criteria is discarded as nonhazardous waste at a permitted Construction and Demolition Debris landfill or Subtitle D landfill, subject to the conditions of the operating permits of the facility. The Contractor is responsible for identifying permitted recycling, treatment, and disposal facilities.

2.1.2.9 Task 9 – PDM End-Placement and Thermal Treatment

The Contractor will be responsible for identifying facilities accepted by EPA and the RD Group to beneficially use Processed Dredged Material (PDM) and providing the information about the proposed facilities as part of the Dredged Material Management Work Plan for review by the Owner's Representative and EPA. End-placement options for PDM will be evaluated as an integral part of the Contractor's Dredged Material Management Work Plan.

After S/S treatment, depending on pre-characterization testing of PDM and EPA directive for determining thermal treatment suitability, PDM will either be transported directly to an end-

placement facility for beneficial use or transported to a thermal treatment facility for thermal treatment prior to beneficial use end-placement.

The Contractor is responsible for treating the PDM adequately through S/S alone or S/S followed by thermal treatment such that PDM meets the acceptance criteria of the end-placement facility for beneficial use. Waste characterization sampling is the responsibility of the Contractor. The Predesign Treatability Study Report (PD-10/21) includes laboratory analytical testing results for untreated soft and native sediment as well as soft and native sediment treated with Portland cement. The addendum to the report provides a list of potential thermal treatment and end-placement facilities that may accept Gowanus-dredged material. The Contractor may use the PD-10/21 Treatability Study Report as a reference. However, waste profiling and identifying facilities for end-placement is the responsibility of the Contractor. The Contractor will demonstrate that the facility is approved by EPA for acceptance of waste per the Off-Site Rule for Superfund sites.

The Contractor transports PDM to end-placement facilities in accordance with Technical Specification 02 51 19 and all applicable laws and regulations.

2.1.2.10 Task 10 – Water Treatment

Effluent from the dredge water treatment system (DWTS) will be discharged to the Gowanus Canal, provided it meets discharge requirements in accordance with Technical Specification 44 08 40.

2.1.2.10.1 Performance Criteria

The Contractor will design the water treatment system to meet the following performance criteria:

1. **Sizing Treatment System.** The treatment system accommodates the anticipated daily volume of dredge water and additional inputs generated during dredging activities so as to not adversely impact production.
2. **Dredging Rate.** The treatment system is designed to treat the volume of water generated during dredging with built-in redundancy during Phase II and Phase III dredging as described in Technical Specification 44 08 40. The Contractor considers local restrictions regarding operational hours during design.
3. **Additional Inputs.** The treatment system accommodates stormwater that comes into contact with contaminated sediment on the barge/scow and on the Staging Site. The system also accommodates water from equipment decontamination and debris wash water.
4. **Pollutant Discharge Requirements.** The Contractor designs the treatment system to meet the permit equivalency requirements presented in the Contract Documents.

Responsibilities for monitoring by the Contractor and the Owner's Representative are described in Technical Specification 44 08 40.

5. **Operational Constraints.** Operational constraints may include restrictions on daily operating times and number of days of operation per week based on local ordinances. Additional operational constraints include scheduled maintenance times. The treatment system is designed for a minimum anticipated dredging period of 8 hours per day, Monday through Friday.

6. **Redundancy.** The system is designed with sufficient redundancy to accommodate system maintenance and unanticipated failure of any single component. Providing redundancy may require extra dredge water equalization storage and backwash water, oversized treatment units, and/or parallel treatment units to allow for repairs/maintenance during operation.

For Phase I Dredging, alternative water treatment approaches such as off-Site treatment at a licensed disposal facility are allowed. Use of alternative water treatment approaches will be described in the Dredge Water Treatment and Management Plan, and applicable permit requirements will be provided. Alternative water treatment plans will be approved by the Owner's Representative and the EPA before being allowed as indicated in Technical Specification 44 08 40.

2.1.2.11 Task 11 – Waste Management

Management of waste is the responsibility of the Contractor. Waste streams generated during the Work will be disposed of in compliance with all applicable local, state, and federal regulations. Waste includes dredge water treatment system waste such as solid waste and sludges, oil from the oil/water separator, and spent treatment media, and other waste generated from day-to-day operations.

Specifications regarding management of waste from the dredge water treatment system and other waste generated from day-to-day operations are provided in Technical Specification 02 51 19.

2.1.2.12 Task 12 – Cultural Resources Management

Cultural resources refer to archaeological remains located within the Canal that are potentially eligible for the National Register of Historic Places (NRHP) designation. In general, properties (including objects and vessels) that are in excess of 50 years old are eligible for the NRHP.

Training by the project Archaeologist will be provided for Contractor staff working on sediment and debris sorting and management in accordance with Technical Specification 35 20 23.13. This training will help non-archaeological staff to identify potential cultural resources and understand

the protocol in the event any cultural resources are encountered during debris removal activities. For Dredging in Level 2 Monitoring Areas as indicated in the Construction Drawings, an on-Site Archaeologist may be required to observe dredge-related activities in accordance with the most recent Cultural Resources Monitoring Plan prepared by AHRS. Debris screened at the off-Site processing facility will be inspected by the project Archeologist provided by the Owner's Representative. Debris will not be discarded until approved by the Owner's Representative. The Contractor will be responsible for reviewing the requirements listed in Technical Specification 35 20 23.13, Technical Specification 02 51 19, and the Cultural Resources Monitoring Plan and coordinating construction activities with inspections by the project Archeologist.

2.1.2.13 Task 13 – Environmental Management

Environmental monitoring for air emissions, odor, and water quality will be conducted by others throughout the Work, but the Contractor is to implement appropriate controls at the direction of the Owner's Representative in accordance with Technical Specifications 01 57 19 and 02 60 16. Noise monitoring will be performed by the Contractor in accordance with Technical Specification 01 57 19. Discharges of sediment, fuel, oil, or other materials into the Canal are prohibited. The Contractor will notify the Owner's Representative immediately if accidental discharge occurs and take appropriate actions to mitigate the spill/release.

The Contractor will comply with all applicable local, county, and municipal rules, ordinances, codes, and regulations. The Contractor is not responsible for obtaining Federal and State permits. However, the Contractor will be responsible for obtaining all necessary local permits. The Owner's Representative will work directly with EPA to obtain permit equivalency for federal and state permits in accordance with Technical Specification 01 41 00. Therefore, the Contractor is not required to submit a Notice of Intent (NOI) to discharge under the Construction General Permit. However, the Contractor must implement and comply with the Stormwater Pollution Prevention Plan (SWPPP) and with the Sediment and Erosion Control (S&EC) Plan outlined in Technical Specification 01 57 13. The Contractor must also comply with requirements of the State Pollution Discharge Elimination System (SPDES) Permit and implement water treatment in accordance with the Construction Drawings and Technical Specification 44 08 40.

2.1.2.14 Task 14 – Other Support Services

The Contractor may be required to provide additional support services as requested in change orders prepared by the Owner's Representative. The Owner's Representative will provide a change order to the Contractor describing a scope of work for the desired support services, and the Contractor will subsequently provide a proposal for completing the work.

3. CONSTRUCTION COMMUNICATION PLAN

3.1 Project and Construction Management, Oversight, and Communication

This section describes the various project entities, the roles each plays in the project, and the responsibilities each carries to ensure successful implementation of the RTA1 Remedial Design. The communication and oversight between the RD Group and EPA is also discussed. The proposed process generally follows EPA Guidance for Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties (PRPs) (EPA, 1990).

3.1.1 Definition of Roles

Environmental Protection Agency. The EPA is responsible for oversight of the RD Group-led RTA1 Remedial Design with the goal of ensuring that activities are conducted in compliance with the agreed upon scope of work from all applicable UAOs and that the activities are protective of public health and the environment. The EPA Remedial Project Manager (RPM) will have primary oversight and communication with the RD Group Project Coordinator. The RPM receives assistance from a designated in-field Oversight Official (e.g., a representative from EPA's oversight contractor), to serve this function during field activities. EPA is also responsible for communications with the community.

RD Group. The RD Group is responsible for the successful completion of the proposed Scope of Work. The RD Group project team will be assembled based on their experience and expertise with the specific Scope of Work. Certain project team roles have been defined, but others will be after the 100% design is complete and approved by EPA. An overview of the roles and responsibilities of the project team is provided below. The RTA1 Remedial Design Project Organization and lines of communication are shown in Figure 1.

3.1.2 Project and Construction Management Team

RD Group

The RD Group is responsible for maintaining all contractual documents and associated communication records (e.g., invoices, RFIs, the project contract including attachments and addenda, change notices, etc.).

Project Coordinator - B&B serves as the Project Coordinator. As indicated in the Order, the Project Coordinator shall be responsible for oversight of the implementation of the Work to be carried out under the applicable Orders. The Project Coordinator acts as the liaison between the project team and EPA.

Project Administrator - Project Administrator (PA), de maximis, serves as Project Administrator for the overall administration of contracts on behalf of the RD Group (i.e., Owner), and is the Contract Administrator. Contract administration services include project performance monitoring; ensuring that work meets performance objectives for cost, schedule, and quality; reviewing Change Order proposals; approving costs; administering subcontractor arrangements; and ensuring compliance with contract requirements.

Owner's Representative - An individual or entity representing the RD Group during construction. In this role, the Owner's Representative is responsible for interfacing between the Contractor and other project entities (e.g., Project Administrator, Engineer-of Record, etc.) as requested by the RD Group.

Engineer of Record (EoR)/Construction Quality Assurance (CQA) Consultant - As the RD Group's design engineer, B&B serves as the EoR/CQA Consultant. The EoR Consultant is responsible for reviewing submittals critical to the performance of the remedy and documenting design changes that arise during construction. The CQA Consultant is independent of the Contractor and monitors the Work to document that the Work is being constructed according to design specifications. CQA activities will be conducted by the CQA Consultant in accordance with the CQA Plan.

A surveyor will be contracted under the CQA Consultant to perform independent quality assurance hydrographic surveys to calculate dredge volume for final payment and approve dredge clearance. The independent surveyor will be retained throughout capping activities to verify quality control survey performance as warranted by the CQA Consultant and to approve final cap placement. These surveys are in addition to those performed by the Contractor as required by the Technical Specifications.

Contractor

Cashman will serve as the Contractor. The Contractor is responsible for the successful management and completion of the in-field construction project, facilitating communication among other project team members, and coordinating and managing all field activities including the scope, schedule, and budget of all construction activities. The Contractor is responsible for provision of all labor, supervision, materials, and equipment, including subcontractors, necessary to construct the RTA1 Remedial Design. The Contractor is responsible for maintaining documents produced during the Work, including field notes, daily reports, calibration logs, photo logs, and all other forms that will be used to perform and document the Work in accordance with Technical Section 01 33 00. All work is performed in accordance with the requirements outlined in the Technical Specifications and Construction Drawings.

Additionally, the Contractor is responsible for selection of a Construction Quality Control (CQC) Representative, or team to implement and oversee all CQC activities throughout construction. The CQC requirements for the Remedial Design are included in the specifications in the Contract Documents.

Process Safety Manager. The Process Safety Manager provides oversight of Contractor safety during all phases of the Work. The Process Safety Manager reviews Contractor safety documentation including Process Hazard Analyses generated for work tasks. The Process Safety Manager also performs field audits.

Community Air Monitoring Program (CAMP). The Air Quality Monitoring subcontractor is responsible for providing the equipment, materials, and labor to collect and manage air quality and odor data. Exceedances of threshold criteria are communicated to the Owner's Representative. The Air Quality Monitoring contractor provides all materials necessary to monitor air quality and odors in accordance with the CAMP. In the event of an exceedance, the Owner's Representative and Contractor are notified immediately, and the Contractor will provide equipment, materials, and labor necessary to implement appropriate operational or water quality control measures to address the exceedance in accordance with the Contract Documents.

Water Quality Monitoring – Water quality in the Canal will be performed by B&B in accordance with the Water Quality Monitoring Plan for In-Waterway Construction Activities (B&B, 2020). Water quality monitoring is conducted during in-water construction operations. Monitoring results are communicated on a weekly basis to the Owner's Representative unless an exceedance of the threshold criteria is detected. In the event of an exceedance, the Owner's Representative and Contractor are notified immediately, and the Contractor will provide equipment, materials, and labor necessary to implement appropriate operational or water quality control measures to address the exceedance in accordance with the Contract Documents.

Archeology/Cultural Resources – AHRS will provide cultural resource management guidance and consulting services to the project team, including oversight and training for Contractor personnel. Cultural resources will be managed in accordance with the most recent Cultural Resources Monitoring Plan prepared by AHRS.

3.1.3 RD Group and EPA Communications

During the implementation of the RTA1 RD, questions will need to be answered and adaptations will occur. Proper project communications are critical to a successful project and the goal is for EPA and the RD Group to effectively and efficiently communicate. To effectively communicate, the EPA and the Oversight Official will direct all field inquires and questions to the on-Site Contractor. The Contractor will gather the answer from either their knowledge of the project or in communication with the project team members. Further discussion of the issues and all discussions

of project modifications will be conducted between EPA and the RD Group Project Coordinator (B&B). The Project Coordinator has a direct reporting line to the RD Group to efficiently discuss the issues with the RD Group and EPA and reach resolution. The proposed communications plan is shown Figure 1.

3.1.4 Communication Plan

Figure 1 shows the lines of communication between the parties responsible for performing design, construction, and quality assurance work. Project roles are listed in Table 1.

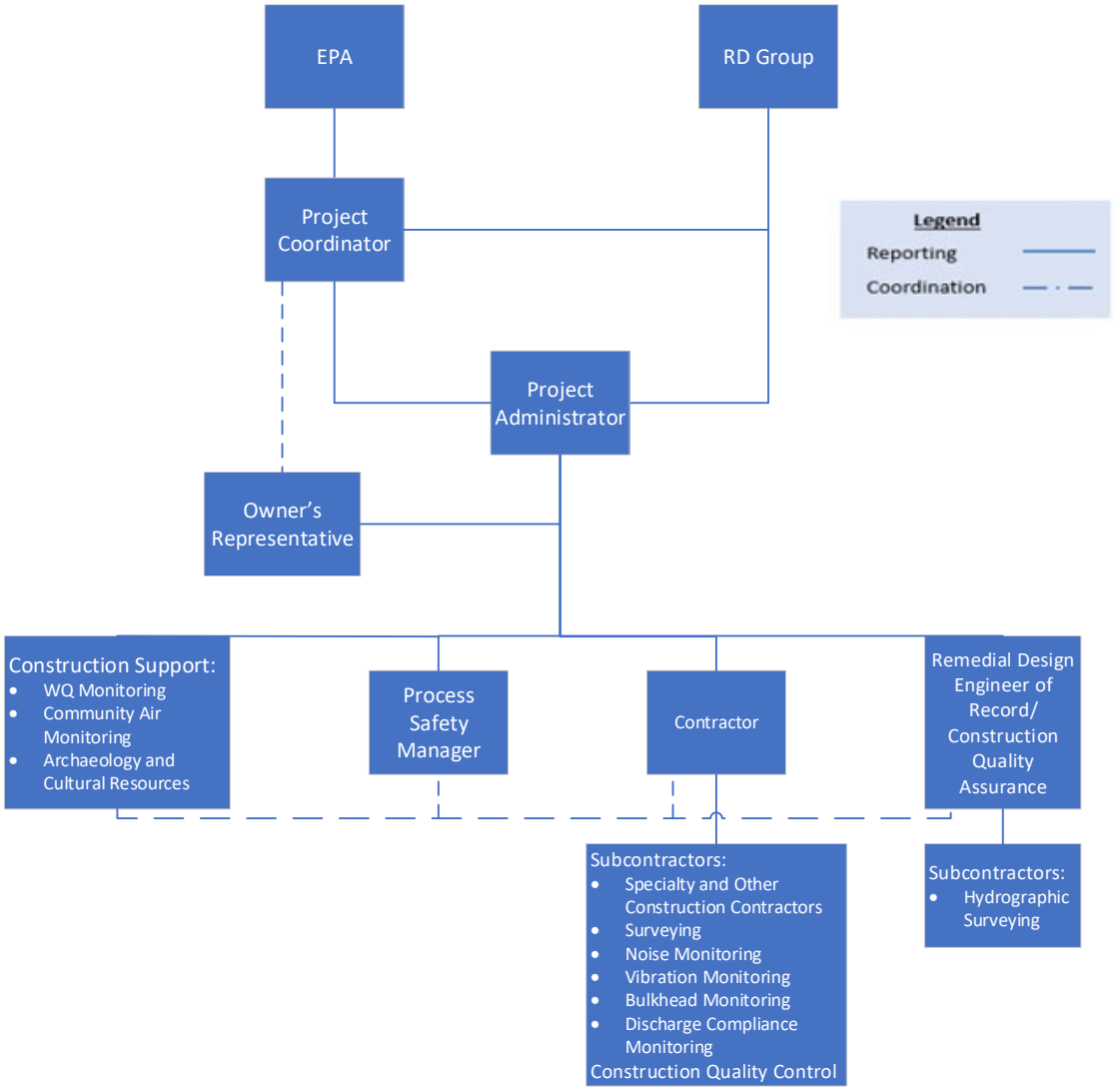

Figure 1 – Communication Plan

Table 1 – Project Roles

Title	Company/Name
Project Coordinator	B&B
Project Administrator	de maximis
Remedial Design Engineer of Record	B&B
Construction Quality Assurance	B&B
Process Safety Manager	Emilcott Associates, Inc.
Archaeology and Cultural Resources	AHRS
Noise Monitoring	Subcontracted to Contractor
Vibration Monitoring	Subcontracted to Contractor
Community Air Monitoring	To Be Determined
Water Quality Monitoring	B&B
Contractor	Cashman

3.1.5 Communication Pathways

Two lines of communication are shown on the organizational chart (Figure 1).

Reporting lines indicate that one member provides direct guidance and supervisions to another member in the chart. For example, subcontractors report to the Contractor. Contractor and construction support contractors (Water Quality Monitoring, Community Air Monitoring, and Archaeology and Cultural Resources Monitoring) report to the Project Administrator.

Coordination lines indicate a relationship that exists to improve efficiency and communication during project implementation. For example, coordination lines exist between the Contractor and construction support contractors (Water Quality Monitoring, Community Air Monitoring, and Archaeology and Cultural Resources Monitoring) to facilitate communication and improve efficiency during the Work.

Project-specific personnel and lines of communication will be further discussed by all parties at the preconstruction meeting and will include a discussion of the following:

- Communication procedures between supervisory and field staff;
- Direct communication procedures between key parties for specific issues and situations;
- Procedures and restrictions for secondary lines of communication within the project organization;
- Procedures for information transfer and confirmation between various parties;

- Procedures for documentation of all communications; and
- Format for meetings, reports, submittals, etc.

4. REFERENCES

AHRS. "Cultural Resources Monitoring Plan." – To be updated prior to start of Phase I Dredging.

B&B, 2020. "Water Quality Monitoring Plan for In-Waterway Construction Activities."

Environmental Protection Agency (EPA), February 1990. "EPA Oversight of Remedial Designs and Remedial Actions Performed by PRPs." USEPA Office of Emergency and Remedial Response. Publication 9355.5-01/FS.

Environmental Protection Agency (EPA), 2014. "Unilateral Administrative Order for Remedial Design, CERCLA-02-2014-2019.

Geosyntec 2017. "PD-10/21 Dredge Material Stabilization and Dewatering Treatability Study Report (Draft)."

Gowanus Community Air Monitoring Plan – To be prepared prior to start of Phase I Dredging.