AECOM

Prepared for:
BASF Corporation
Florham Park, NJ

Prepared by:
AECOM
Chelmsford, MA
Project No. 60311303
April 2018

Hudson River Operable Unit 2
Sediment Remediation

Upland Site Preparation Work Plan
BASF Rensselaer
Rensselaer, New York

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Rensselaer, New York

NYSDEC Site No. 442027

Prepared By: John A. Bleiler, Project Manager

Reviewed By: Michael Gardner, PE, Senior Engineer

Professional Certification

I, Michael J. Gardner, certify that I am currently a NYS Professional Engineer and that this Remedial Design/Remedial Action Work Plan was prepared in accordance with all applicable statues and regulations and in substantial conformance with the Department of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in accordance with the DER-approved work plan and any DER-approved modifications.

Signature Michael Gardner Date 4/11/2018

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Appendices

List of Figures

List of Acronyms

AECOM	AECOM Technical Services
BASF	BASF Corporation
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulations
CLSM	Controlled Low Strength Material
COCs	Constituents of Concern
CY	Cubic Yards
DER	Department of Environmental Remediation
EWP	Excavation Work Plan
FS	Feasibility Study
ft.	Feet
Hudson River OU-1	All upland portions of the former BASF facility
Hudson River OU-2	Hudson River area adjacent to the OU-1 upland area, including the NFSSA and SFSSA
MNR	Monitored Natural Recovery
NAVD	North American Vertical Datum
NFSSA	Northern Feasibility Study Area
NWP	Nationwide Permit
NYCRR	New York Code Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSOGS	New York State Office of General Services
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
RD/RA Work Plan	Remedial Design Work Plan
RI	Remedial Investigation
ROD	Record of Decision
SFSSA	Southern Feasibility Study Study Area
Site	Former BASF Facility
SMP	Site Management Plan
TSCA	Toxic Substances Control Act
USACE	Unites States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

1.0 Introduction

AECOM Technology Services, Inc. (AECOM) has prepared this Upland Site Preparation Work Plan, on behalf of BASF Corporation (BASF). The Work Plan describes upland site preparation activities to be performed at the Former BASF Facility (the "Site") in Rensselaer, New York (Figure 1-1) (NYSDEC Site 442027). The Site is currently listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 442027.

Upland site preparation activities include the installation of temporary sediment off loading facilities, sediment staging facilities, and water treatment facilities (described in detail below) on the Former Lagoon Area portion of the Site located directly along the Hudson River. The facilities will support remediation (dredging and soil cover placement) of Hudson River sediments located in Operable Unit 2 (OU-2) of the Site. BASF has already remediated the former Lagoon Area as part of the Operable Unit 1 (OU-1) remediation.

A Site Management Plan (SMP), (Site Management Plan BASF Manufacturing Plant Site Operable Unit 1, Remedial Engineering, P.C. and Roux Associates, Inc., May 7, 2014) places institutional and engineering controls on future upland site activities to manage potential exposure to residual contamination remaining on OU-1.

The New York State Department of Environmental Conservation (NYSDEC) request that BASF prepare this Work Plan to:

- Provide the SMP notification requirements for the upland site preparation activities.
- Ensure that the activities, including importation of fill materials from off-Site, employed during the upland site preparation are conducted in accordance with the SMP requirements.

A detailed description of proposed upland site preparation activities, including procedures and controls to manage any residual contamination (from on-site or off-site sources), is provided in the 90% Design for the Hudson River OU 2 Remediation. The Draft Upland Site Preparation Work Plan was submitted to the NYSDEC on March 2, 2018. Comments on this work plan were received from NYSDEC on April 6, 2018. The response to comments is included as Attachment A to this work plan, and this final work plan has been updated to address all NYSDEC comments.

A summary of the Site background is provided below. Section 2 of this Work Plan describes the proposed upland site preparation activities. Section 3 describes measures ensure the upland site preparation complies with the SMP requirements.

1.1 Site Background

1.1.1 Environmental Conditions

The Site is being closed under the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program, also known as the NY State Superfund Program. There are two Operable Units (OUs) at the Site:

- OU-1 consists of all upland portions of the Site including the former Lagoon Area, and

- OU-2 includes approximately 14 acres of the Hudson River adjacent to and downstream of the Site.

The OU-1 remediation has been completed. Remediation included decommissioning of the former plant facilities, removal of soils acting as a source to groundwater, installation and operation of groundwater containment and treatment systems, and construction and maintenance of a site-wide cover system. OU-1 includes the Former Lagoon Area that adjoins Hudson River (OU-2) to the west of River Side Drive. During the OU-1 remediation, the contents of the lagoons were removed and vegetative cap consisting of a 6-inch biota layer, 18-inches common fill, and 6-inches top soil seeded with native species. The 2014 SMP establishes controls to manage any future Site activities on OU-1 that may encounter residual contamination.

The remedy for the Hudson River OU-2 is summarized in the March 2016 Record of Decision (ROD) for this portion of the Site (NYSDEC, 2016a). As described in the ROD, the Hudson River OU-2 has been sub-divided into two areas known as the Northern Feasibility Study (FS) Study Area, currently referred to as the Northern Sediment Management Area (NSMA) and the Southern FS Study Area, currently referred to as the Southern Sediment Management Area (SSMA). The primary Constituents of Concern (COCs) in NSMA sediments are related to former operations on the Site and the adjacent property to the north. These COCs include volatile organic compounds (VOCs) (primarily chlorobenzene, dichlorobenzenes, and benzene), as well as several metals, including lead.

Sediments in the Hudson River OU-2 are also impacted with non-Site related polychlorinated biphenyls (PCBs). BASF will manage the PCB's in the area requiring remediation for site related compounds. PCB-containing materials in excess of the 50 mg/Kg Toxic Substances Control Act (TSCA) standard in accordance with Code of Federal Regulations (CFR) 40 CFR Part 761. In addition, NY State regulations (6 CRR-NY 371.4NY-CRR) consider "all solid wastes containing 50 parts per million (ppm) by weight (on a dry weight basis for other than liquid wastes) or greater of polychlorinated biphenyls (PCBs) are listed hazardous wastes".

The selected remedy for the NSMA and SSMA is a combined remedy that includes dredging impacted sediments, installing backfill and cover materials, habitat restoration activities, and monitored natural recovery (MNR). Details for the OU-2 remedy are provided in the Draft Remedial Design/Remedial Action Work Plan (RD/RA) (Hudson River OU-2 Remedial Design/Remedial Action Work, AECOM, April 2017). The OU-2 remediation activities will begin in 2018.

2.0 Upland Site Preparation Activities

The upland site preparation activities include installation of:

- A temporary dock and paved offloading pad to transfer dredged sediment from the Hudson River to a temporary fabric structure (TFS) and a temporary dock to off load backfill for the sediment cover.
- A TFS where sediment will be dewatered (by gravity drainage and addition of a pozzolanic reagent) and loaded for off-site disposal.
- A water treatment system where water generated from TFS will be treated
- Office trailers and other support general facilities required to support the OU-2 sediment remediation.

A drawing showing the proposed upland site grading and locations for the proposed features is provided in Appendix A. The design elements and construction procedures are described below.

2.1 Temporary Docks and Off Loading Areas

BASF will install two temporary docks at the approximate locations shown in Appendix A. Prior to constructing the docks, trees and stumps will be cleared from the work areas. The wood debris may be reused on site (with DEC approval) or disposed of off-site.

The southern dock will be used to transfer backfill from the upland support area to the barges used for place the backfill in the dredge areas. This dock will consist of a steel sheet pile box placed in the river against the existing bulkhead. The box will be filled with gravel. During dock construction the gravel fill and sheet pile may be staged in the upland support area. The dock construction will not disturb the existing OU-1 soil cover.

The northern dock will be used to transfer dredged sediment from barges to an off loading pad where an enclosed conveyor system will transfer the sediment into the TFS. This dock will also consist of a steel sheet pile box placed in the river against the existing bulkhead. The box will be filled with gravel and the deck will be paved with approximately 4-inches of asphalt. During dock construction the gravel fill and sheet pile may be staged in the upland support area. The sediment offloading area will included fill material (approximately 200 cubic yards (cy)) to level existing grade. Geotextile, HDPE liner (40 mil) and a bermed asphalt pavement (approximately 4 inches thick) will line the surface of the offloading area. .The pavement will be graded to a low point where a drain and sump will collect water that is discharged during sediment offloading. Separate bermed areas and sumps will be maintained for TSCA and non-TSCA sediment. Water collected in each sump will be pumped (in separate streams) to the water treatment system through underground piping. The northern dock will generally be constructed from fill and will not disturb the existing OU-1 soil cover. The water collection sump and piping may penetrate the cover. Soil excavated from beneath the cover will be containerized and shipped off-site for disposal.

The docks and offloading area (asphalt and fill) will be removed when the OU-2 sediment remediation is complete and the site will be returned to existing grade. All disturbed areas will be reseeded.

2.2 TFS

Location of the TFS is shown in Appendix A. The structure foot print will be graded level at near elevation 16. This will require cutting approximately 1,800 cy from topographically higher areas and moving and placing it in lower areas, and import and placement of 4,000 cy of offsite fill to achieve the grading. Prior to grading trees and stumps will be cleared from the work areas. The wood debris may be reused on site (with DEC approval) or disposed of off-site.

The cut depth will be in the upper two feet and will not extend below the existing demarcation (biota) layer of the existing cover. The TFS foundation will consist of steel I beam attached to concrete bin spaced along the TFS perimeter. The blocks will most likely be set in the 2 foot thick soil cover. If set the blocks requires excavation through the cover, then soil generated beneath the cover will be containerized and shipped off-site for disposal.

After grading, the TFS footprint will be lined with bermed asphalt. Geotextile, HDPE liner (40 mil) will also line the TSCA portion of the TFS footprint. The pavement will be graded to a low point where separate drains and sumps will collect water that is generated during the TSCA and non-TSCA sediment dewatering. Water collected in each sump will be pumped to the water treatment system through underground piping. In addition a perimeter subsurface drain pipe may be installed to capture stormwater runoff from the roof and transfer it to the existing stormwater pond. This storm water will not contact any sediment or contaminated areas.

Excavation to install the sumps and piping may extend below the existing OU1 soil cover. All soil excavated from beneath the soil cover will be containerized and shipped off-site for disposal.

The TSF footprint (asphalt and fill) will be removed when the OU-2 sediment remediation is complete and the site will be returned to existing grade. All disturbed areas will be reseeded.

2.3 Water Treatment Area

The water treatment system used to treat water generated during the OU2 sediment remediation. The system will be located in the Former Building Foundation area, to the north of the proposed TFS footprint shown in Appendix A. Like the sediment offloading area and TFS footprint, the water treatment system will be installed on a level pad lined with geotextile, HDPE liner (40 mil) and a bermed asphalt pavement (approximately 4 inches thick).

Prior to grading the pad, trees and stumps will be cleared from the work areas. The wood debris may be reused on site (with DEC approval) or disposed of off-site. These facilities will be removed when the OU-2 sediment remediation is complete and the site will be returned to existing grade.

The water treatment system will include 20,000 gallon frac tanks, weir tanks and clarifiers for solids and non-aqueous phase liquid removal equipped with flocculate addition as needed, and bag filters and solids removal, and liquid phase granulated active carbon (GAC) to treat dissolved phase organic constituents. Separate settling tank and bag filters will be operated for the TSCA and non-TSCA water streams. Following solids removal, the streams will be combined before dissolved phase treatment.

Solids generated from any required tank clean out will be trucked to the TFS, staged, and loaded out for disposal.

2.4 General Site Facilities

Office trailer and gravel lined vehicle parking will be installed to the south of the proposed TFS footprint and just north of the stormwater pond. Gravel lined haul roads will be installed at the locations shown in Appendix A. These facilities will be constructed at existing grade or on imported fill and will not impact the existing OU1 soil cover. An electrical service will be brought to the site from an overhead source on Riverside Avenue. Poles set to bring in the service will penetrate the soil cover. A water service will also be installed below the existing cover. Soil excavated below the soil cover during utility service installation will be containerized and shipped off-site for disposal. In areas where the cover is disturbed, it will be restored when the work is complete.

Haul road gravel will be removed and disturbed areas will be reseeded when the sediment remediation is complete. The gravel lined parking may be left behind when the works is complete.

BASF Performance Network Monitoring Wells (LG-PZ15R, LG-PZ-14R, LG-MW-5R, LG-PZ-6R, LG-MW-2R, LG-PZ-10R, LG-MW-26, and LG-MW-25) are located in the upland support area. Prior to the start of site work, the well stickups and casings will be cut and flush mount road boxes (H-20 rated) will be installed over the well casing. Horizontal and vertical position of the wells will be surveyed. After the site work is complete the road boxes will be removed and steel stickups will be reinstalled. The well locations will be surveyed after they are restored.

3.0 Environmental Controls

During implementation of the upland site preparation activities debris, soil and sediment impacted with COCs and non-Site related PCBs may be encountered. The Lagoon Area vegetative cap will be disturbed and will require restoration. Backfill materials from off-site source will be placed on-Site.

Environmental controls employed to ensure that the construction procedures comply with the SMP, NYSDEC standards, and other applicable State and Federal standards for handling regulated waste materials are described below.

3.1 Soil, Sediment and Debris Management

Grading excavation, handling and disposal of materials generated during the upland site preparation activities will be conducted in accordance with the Excavation Work Plan (EWP)(Excavation Work Plan for OU-1, Remedial Engineering, P.C. and Roux Associates, Inc., May 7, 2014) found in Appendix D of the SMP.

Soil removed below the demarcation layer (approximately 200 to 500 CY) will be staged in a stockpile area with a berm and liner installed according to the EWP. This soil will be sampled to determine if it meets the criteria for reuse onsite as presented in the SMP. If the requirements are met, then this soil will be returned to the excavation below the demarcation layer elevation. If the criteria are not met then the soil will be transported off-Site for disposal as described below. If required, backfill from an approved off-Site source (as described below) will be placed to return the excavation to the demarcation barrier elevation. The demarcation barrier and vegetative cap will then be reinstalled as described below.

All debris and soil that cannot be reused onsite will be characterized for disposal facility acceptance and transported to facilities permitted to accept the material. Any debris removed from TSCA regulated sediment will be shipped to a TCSA regulated disposal facility. Loading and transportation will be conducted according to the EWP.

When the sediment remediation is complete all asphalt, liner material, sumps, piping and haul road gravel will be removed and disposed of off-site. If this material was in contact with TSCA regulated sediment, then it will be shipped to a TCSA regulated disposal facility. Loading and transportation will be conducted according to the EWP.

Gravel fill placed beneath the liner and asphalt will be tested to determine if it meets the criteria for reuse onsite as presented in the SMP. If it does it may be reused on-site with DEC approval or transported for off-site disposal as described above.

3.2 Vegetative Cap Restoration

At the completion of the OU-2 Sediment Remediation, the upland support facilities will be remove as described above. The vegetative cover will be restored to include: a demarcation layer (geotextile marker fabric or 6-inch biota layer), 18–inch minimum thickness of common fill, 6-inches of topsoil and seed. The existing cap materials will be used where possible. If necessary, off-site backfill will be used to achieve the thickness requirement presented in the SMP.

3.3 Stormwater Pollution Prevention

There will be more than 1 acre of ground disturbance to complete the upland site preparation activities. BASF will apply of a Stormwater Pollution Discharge Elimination System (SPDES) Construction Permit. Stormwater pollution prevention controls will include hay bales and silt fence and gravel construction entrances installed and maintained according to the EWP.

BASF will notify the NYSDEC Region 4 Division of Water before beginning the OU-2 Sediment Remediation. . Prior to commencement of work, a Notice of Intent (NOI) will be prepared and submitted for Region 4 Division of Water informational review purposes. This NOI will indicate that the Hudson River OU-2 sediment remediation is being done under a Department approved Remedial Design/Remedial Action Work Plan.

3.4 Imported Backfill

All backfill materials imported to the Site will be from certified clean off-Site sources in accordance with the SMP. Approximately 5,000 CY of material used to grade the upland support facilities. This material will be tested according to DER-10 (Technical Guidance for Site Investigation and Remediation, NYSDEC, 2010) to ensure the acceptance criteria presented in the SMP are achieved.

3.5 Air Monitoring

During periods of excavation and debris removal, perimeter air monitoring will be conducted in accordance with Community Air Monitoring Plan (CAMP) (General Community Air Monitoring Plan, Remedial Engineering, P.C. and Roux Associates, Inc., May 7, 2014) found in Appendix F of the SMP.

3.6 Dust and Odor Control

Excavation areas will be wetted as need to control dust. Debris will be stored in covered roll off boxes and excavated soil will be staged in covered stockpiles. Rusmar foam will be employed to control odors if needed.

4.0 Schedule

BASF plans to begin the upland site preparation activities in the summer of 2018. The proposed facilities will be installed by September 2018 and will operate until the sediment remediation is complete, currently scheduled for the spring 2020. A detailed schedule will be provided to NYSDEC at least 2 weeks prior to the start of construction, once all permits and authorizations are in place.

5.0 References

AECOM, 2015. Final Hudson River Operable Unit 2 Feasibility Study, BASF Rensselaer, Rensselaer, New York. March 2015.

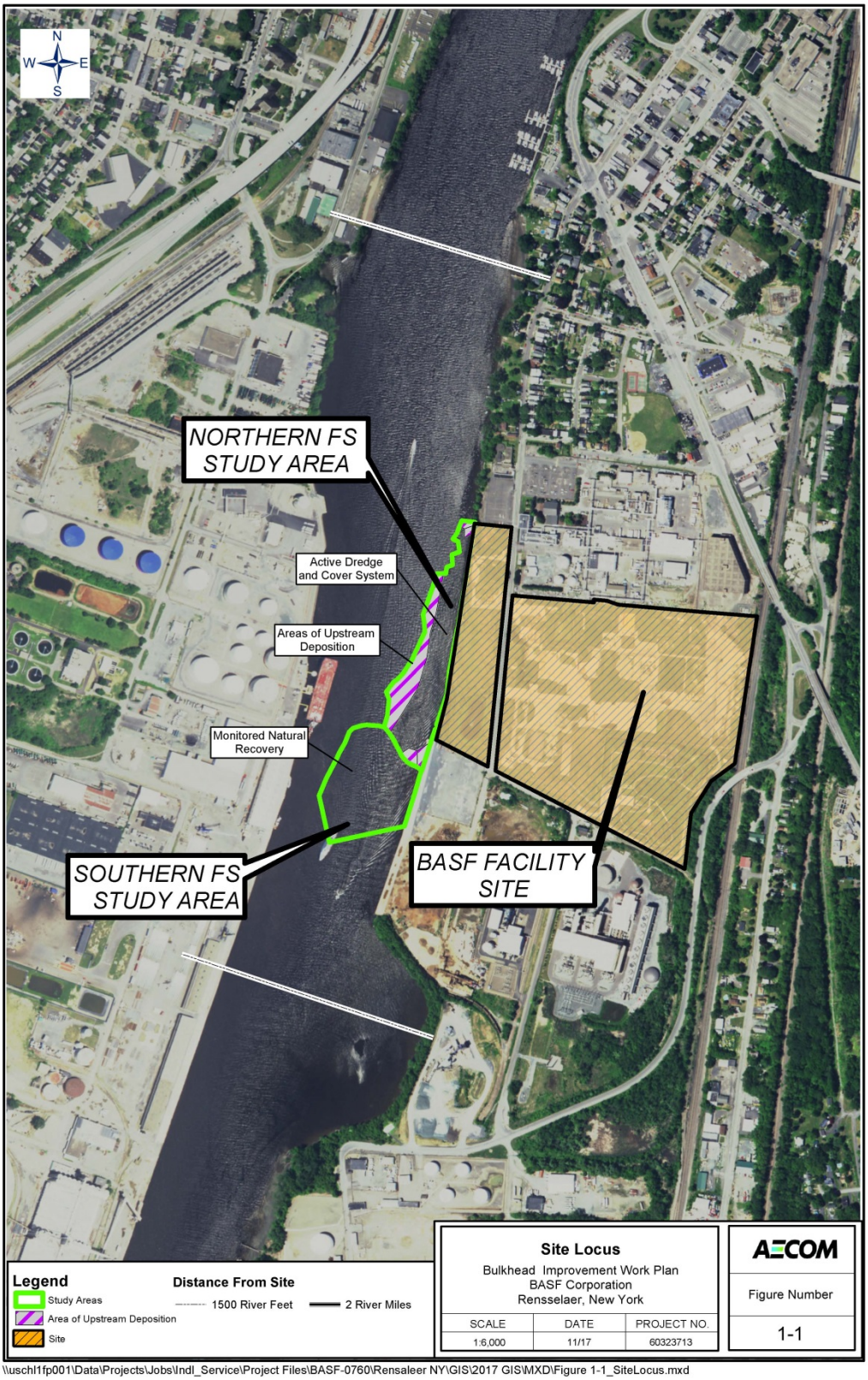
New York State Department of Environmental Conservation (NYSDEC), 2016a. Record of Decision, BASF- Manufacturing Plant Operable Unit Number 02: Hudson River Sediment and Off-site Areas, State Superfund Project, Rensselaer, Rensselaer County, March 2016

NYSDEC, 2010a. DER-10: Technical Guidance for Site Investigation and Remediation. May 2010.

NYSDEC, 2005. Division of Water New York Standards and Specifications for Erosion and Sediment Control. August 2005.

Remedial Engineering, P.C. /Roux Associates, 2014. Site Management Plan BASF Manufacturing Plant Site Operable Unit NO.1 (OU1) Former BASF Manufacturing Plant, Riverside Avenue Rensselaer, New York

Figures



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Appendix A

Response to Comments

AECOM
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Chelmsford, MA 01824
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April 11, 2018

BASF Manufacturing Plant, Site No 442027
Rensselaer Hudson River Operable Unit 02
Response to Comments

Response to Comments

The following are the responses to New York State Department of Environmental Conservation (Department) review-comments of the Upland Site Preparation Work Plan.

Comment 1: Section(s) 2.0 Upland Site Preparation Activities and 2.2 Temporary Fabric Structure
There is a discussion regarding drain and sump systems for the sediment offloading platform and the sediment dewatering area. There should be a statement, in both sections, as to where the water in the drain and sump systems will be directed.

Response 1: Water from the sumps will drain to the water treatment system. A discussion of this has been addded to the document.

Comment 2: Section 2.2 Temporary Fabric Structure (TFS). states that a drainage system will collect storm-water from the roof of the TFS area and convey it to the existing storm-water drainage pond. If there is any potential for storm-water to be in contact with contaminants, especially from the TFS in the TSCA area, then this drainage system should direct the collected storm-water to the water treatment system and not to the onsite storm-water drainage pond.

Response 2: This stormwater will not contact contaminated material. A discussion of this has been added to the document.

Comment 3: Section 2.0 Upland Site Preparation Activities. Due to the planned construction on the Site Layout (Drawing C-102) the BASF Performance Network Monitoring wells and piezometers need to be protected so they remain available for future monitoring. The monitoring points include LG-PZ-15R, LG-PZ-14R, LG-MW-SR, LG-PZ-6R, LG-MW-6R, LG-MW-2R, LG-PZ-10R, LG-MW-26 and LG-MW-25. Add a paragraph in this section detailing how the monitoring points will be protected.

Response 3: A discussion of measures to protect the monitoring well has been added to the document.

Comment 4: Section 2.3 Water Treatment Area

a. Unit operations of the water treatment plant, if known, should be described in the work plan and depicted on drawing number C-102.

Response 4a: A discussion of the water treatment components has been added to the document.

b. The work plan should describe how any contaminated or non-contaminated water treatment-generated solids from settling tank cleanout operations will be handled. If there will be any separate storage/handling areas, these should be described and depicted on drawing number C-102.

Response 4b: A discussion of measure to manage the solids has been added to the document.

Comment 5: Section 3.3 Stormwater Pollution Prevention. BASF should submit a Notice of Intent (NOi) for Region 4 Division of Water for informational purposes only, which indicates that this Hudson River Operable Unit 02 Remediation project is being done under a Department-approved Remedial Design/Remedial Action Work Plan.

Response 5: BASF will notify the Division of Water. A discussion has been added to the document.

Comment 6: Appendix A Drawing C-102

a. The drawing should include a depiction of the pipe routes, including those from the dewatering area, the sediment offloading area, and from the water treatment plant to the discharge location in the Hudson River (any discharge back to the river will require SPDES equivalent discharge limits and monitoring of the effluent.)

Response 6a: The Drawing has been updated.

b. The work plan indicates that the water treatment plant will be located on the old building foundation, but only the foundation (and not the treatment plant) is depicted on drawing number C-102. Show on the drawing the location of the water treatment plant.

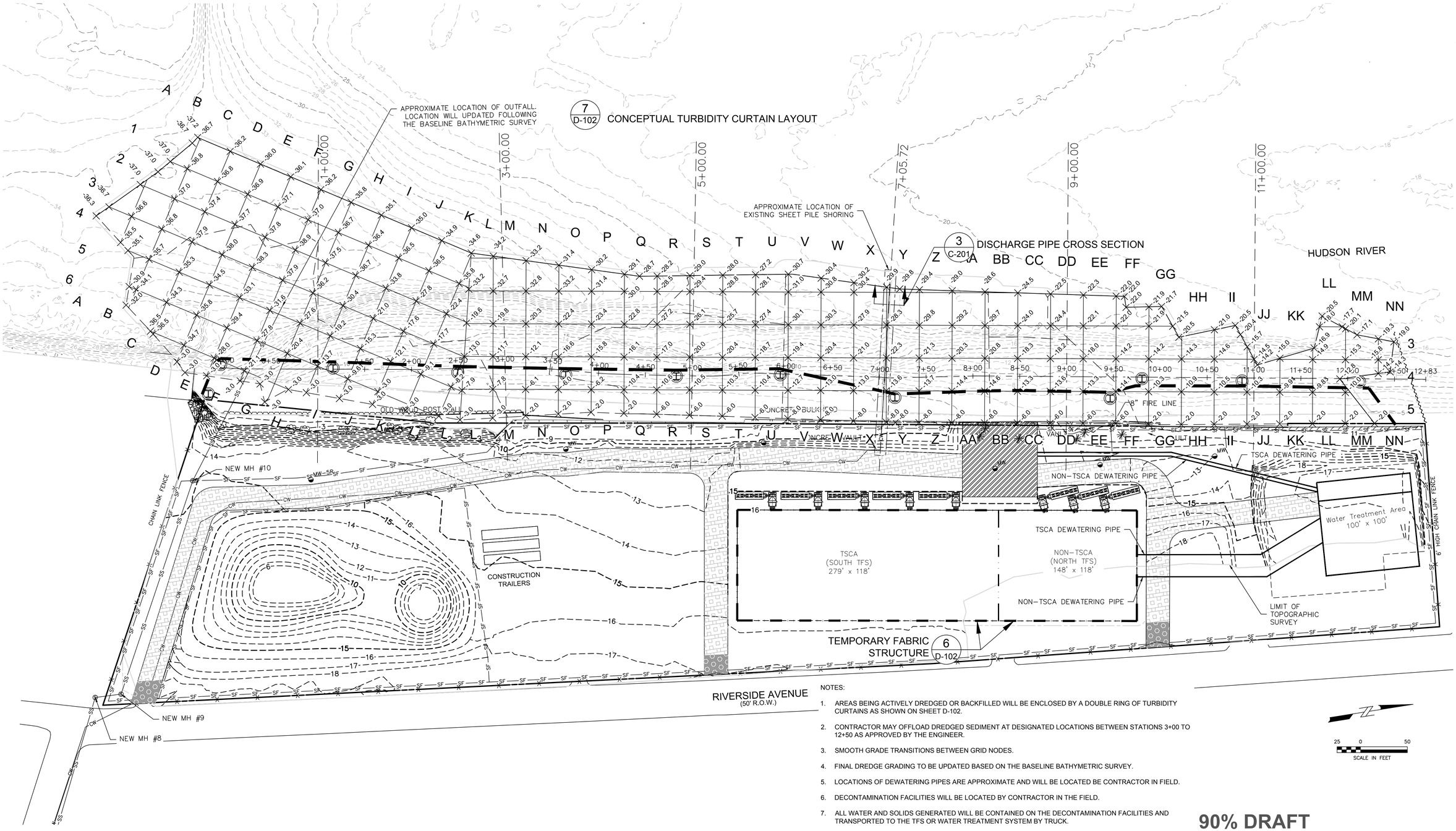
Response 6b The Drawing has been updated.

c. If there will be a decontamination pad/area, it should be depicted on the drawing and described in the work plan. Any drains/sumps for a decontamination area should be described along with a statement as to where the drainage water will be pumped. Pipe routes should be depicted on the drawing.

Response 6c: The Contractor will determine the final location of decontamination facilities. A note has been added to the Drawing.

Appendix B

Upland Site Preparation Drawing



NOTES:

1. AREAS BEING ACTIVELY DREDGED OR BACKFILLED WILL BE ENCLOSED BY A DOUBLE RING OF TURBIDITY CURTAINS AS SHOWN ON SHEET D-102.
2. CONTRACTOR MAY OFFLOAD DREDGED SEDIMENT AT DESIGNATED LOCATIONS BETWEEN STATIONS 3+00 TO 12+50 AS APPROVED BY THE ENGINEER.
3. SMOOTH GRADE TRANSITIONS BETWEEN GRID NODES.
4. FINAL DREDGE GRADING TO BE UPDATED BASED ON THE BASELINE BATHYMETRIC SURVEY.
5. LOCATIONS OF DEWATERING PIPES ARE APPROXIMATE AND WILL BE LOCATED BE CONTRACTOR IN FIELD.
6. DECONTAMINATION FACILITIES WILL BE LOCATED BY CONTRACTOR IN THE FIELD.
7. ALL WATER AND SOLIDS GENERATED WILL BE CONTAINED ON THE DECONTAMINATION FACILITIES AND TRANSPORTED TO THE TFS OR WATER TREATMENT SYSTEM BY TRUCK.

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BASF CORPORATION
HUDSON RIVER OU-2
RENSSELAER, NEW YORK

PROJ. NUMBER: 60323713

DATE: 04/10/18

DREDGE LIMITS AND CONTROLS

HUDSON RIVER OU-2
SEDIMENT REMEDIATION

DRAWING NUMBER: C-102

SHEET NUMBER: 1 OF 1

REVISION 0