

LONG TERM MONITORING PLAN

STUDY AREA 6 NORTH
(NJDEP SITES 087 AND 088)

AND

STUDY AREA 6 SOUTH
(NJDEP SITES 073, 124, 125, 134, 140, AND 163)

OPEN SPACE AREAS AND OTHER DEED NOTICE AREAS

JERSEY CITY, NEW JERSEY

Prepared for:

Honeywell

115 Tabor Road
Morris Plains, NJ 07950

Prepared by:

Amec Foster Wheeler Environment & Infrastructure, Inc.
200 American Metro Boulevard, Suite 113
Hamilton, New Jersey 08619



FEBRUARY 2018

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
1.1	Purpose and Scope	1
1.2	Standard for Repair or Replacement of the Chromium Remedy.....	9
1.3	Document Organization	10
2.0	SITE BACKGROUND.....	11
2.1	Site Description	11
2.1.1	SA-6 North	12
2.1.2	SA-6 South.....	15
2.1.3	Administrative and Institutional Controls.....	18
3.0	MONITORING PLAN	27
3.1	Inspections and Monitoring.....	29
3.1.1	Timing and Schedule of Inspections	29
3.1.2	Chromium Remedy Visual Inspections	30
3.1.3	Surface Grade Visual Inspections.....	32
3.1.4	Differential Settlement Visual Inspections	33
3.1.5	Disturbance Visual Inspections	34
3.1.6	Burrowing Animals Visual Inspection	34
3.1.7	Vegetative Cover Visual Inspection.....	35
3.1.8	Groundwater Elevation Monitoring	35
3.1.9	Groundwater Sampling.....	40
3.1.10	Gas Venting System & Vented Gases.....	41
3.1.11	Sign Inspections	42
3.1.12	Topographic Survey	43
3.1.13	Soil Sampling at In-Situ Injection Areas.....	43
3.1.14	Other Inspections.....	44
3.2	Contingency Plan.....	45
3.2.1	Chromium Remedy Disturbance	46
3.2.2	Vegetative Cover Degradation and Differential Settlement....	58
3.2.3	Contingent Groundwater Extraction System.....	59
3.2.4	SA-6 South L-Well Monitoring	60
3.2.5	SA-6 South Development AOC	60
3.2.6	Methane Monitoring	61
3.2.7	Routine Maintenance and Repairs	62
4.0	REPORTING	64

4.1	Quarterly and Annual Reporting	64
4.2	Biennial Certification Reports	65
4.3	Chromium Remedy Disturbance Reports	66
4.4	Monitoring Plan Update and Procedures for Changes	66
4.5	Contingency Plan And Notification Plan	67
4.6	Notice to Stakeholders.....	67
4.7	Annual Report By Title Owner	68
5.0	HONEYWELL PROGRAM ORGANIZATION	70
6.0	REFERENCES	72
7.0	LIST OF ACRONYMS AND ABBREVIATIONS	74

ILLUSTRATIONS

Illustration 1:	SA-6 North, SA-7, and SA-6 South.....	3
Illustration 2:	Major Elements of the SA-6 North Chromium Remedy and Current Site Conditions.....	14
Illustration 3:	Major Elements of the SA-6 South Chromium Remedy and Current Site Conditions.....	18

TABLES

Table 1:	LTMP Implementation
Table 2:	Contingency Plan Trigger Cross-References
Table 3:	LTMP Inspection Timetable
Table 4:	LTMP Reporting Timetable
Table 5:	Applicability of LTMP Elements to the Deed Notice Areas

FIGURES

Figure 1:	Site Location Map
Figure 2A:	Implemented Remedial Actions for Study Area 6 North
Figure 2B:	Implemented Remedial Actions for Study Area 6 South
Figure 3A:	Cap Cross Section
Figure 3B:	Cap System Detail
Figure 4A:	Shallow Groundwater Monitoring Well Location Map for Study Area North
Figure 4B:	Shallow Groundwater Monitoring Well Location Map for Study Area South
Figure 5:	Proposed Deed Notice and Conservation Restriction Areas
Figure 6:	Notification and Response Flow Chart

Figure 7:	Placeholder – To Be Provided with First Annual Update
Figure 8:	Placeholder – To Be Provided with First Annual Update

APPENDICES

Appendix A:	Relevant Regulatory Correspondence
	A-1: Design Change Bulletin Log
	A-2: Record Drawings for Engineering Controls Constructed by Honeywell
	A-3: Conservation Restrictions
	A-4: Deed Notices
	A-5: Classification Exception Area
	A-6: Remedial Action Permits
Appendix B:	Example Forms
	B-1: Annual/Quarterly Inspection Form and Deed Notice Checklist
	B-2: Subsurface Work Authorization Form/Dig Permit
	B-3: Methane Monitoring Recording Form
	B-4: Groundwater Elevation Monitoring Form
Appendix C:	NJDEP Remedial Action Protectiveness/Biennial Certification Form
Appendix D:	Relevant Previous Reports
	D-1: Open Space Design Standards
	D-2: Integrated Groundwater Sampling and Analysis Plan
	D-3: L-Well Groundwater Monitoring Plan
	D-4: In-Situ Treatment Monitoring Workplan
Appendix E:	Engineering Control Figures from Deed Notices

This Long Term Monitoring Plan is hereby approved by the following parties and each agrees to abide by the obligations placed upon them by this Long Term Monitoring Plan.

Honeywell
William J. Hague, Global Director, Remediation
Design and Construction

Date

The City of Jersey City
Joe Cunha, City Engineer

Date

Jersey City Municipal Utilities Authority
Richard Haytas, Engineer

Date

Plaintiffs Hackensack Riverkeeper, Inc.,
William Sheehan, Lawrence Baker,
Rev. Winston Clarke

Date

ENTITY	INDIVIDUAL SIGNING	MAILING ADDRESS	PHONE NUMBER	E-MAIL ADDRESS
Honeywell	William Hague	Health, Safety, Environmental, Product Stewardship and Sustainability 115 Tabor Road, 4-D4 Morris Plains, New Jersey 07950	(973) 455-2175	William.hague@honeywell.com
City of Jersey City	TBD	280 Grove Street, City Hall Jersey City, NJ 07302	(201) 547-5000	TBD
Jersey City Municipal Utilities Authority	Jeremy Farrell	555 Route 440 Jersey City, NJ 07305	(201) 432-1150	FarrellJ@jcnj.org
Hackensack Riverkeeper, Inc.	Alicia C. Alcorn	Terris, Pravlik & Millian, LLP 1816 12th Street, NW, Suite 303 Washington, DC 20009-4422	(202)682-2100	aalcorn@tpmlaw.com

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

Honeywell has prepared this Long Term Monitoring Plan (LTMP) to protect the remedial actions implemented for chromium at Study Area 6 North (SA-6 North) and Study Area 6 South (SA-6 South) in Jersey City, Hudson County, New Jersey (also referred to herein as the “Sites”) as shown on **Illustration 1**. The Sites are referred to by the New Jersey Department of Environmental Protection (NJDEP) as Hudson County Chromate Sites and include:

SA-6 North Site Name	NJDEP Site No.
Jersey City Incinerator Site	087
JCIA Well Site	088
SA-6 South Site Name	NJDEP Site No.
Degen Oil	073
Roosevelt Bowling Lanes	124
Delphic Consolidated	125
Old Dominion	134
ABF Trucking	140
Posnak & Turkish	163

The LTMP satisfies the requirements for long term monitoring, maintenance, and protection of engineering and institutional controls as set forth in the following documents:

- “First Amended Consent Decree regarding the Remediation and Redevelopment of Study Area 6 North,” ECF No. 435, entered by the United States District Court, District of New Jersey on August 2, 2012, in Civil No. 05-05955, later consolidated with Civil No. 95-2097 (SA-6 North Consent Decree) Paragraphs 60 through 68; and
- “First Amended Consent Decree Regarding Remediation and Redevelopment of Study Area 6 South between Honeywell, Hackensack Riverkeeper, Inc. and the City of Jersey City,” ECF No. 434, entered by the United States

District Court, District of New Jersey on August 2, 2012, in Civil No. 05-05955, later consolidated with Civil No. 95-2097 (SA-6 South Consent Decree) Paragraphs 74 through 81.¹

This LTMP also satisfies post-remediation operation, maintenance, and monitoring provisions outlined in the following documents:

- NJDEP-approved Remedial Action Work Plans (RAWPs) for both Sites discussed more fully in Sections 2.1.1 and 2.1.2;
- Deed Notices (see **Appendix A-4**); and
- NJDEP-issued Remedial Action Permits (see **Appendix A-6**)

These Consent Decrees amended the original Consent Decrees for SA-6 North and SA-6 South dated April 21, 2008 and December 19, 2008, respectively. The “Parties” referenced in this report are the signatories to the Consent Decrees: Jersey City Entities (City of Jersey City [Jersey City], Jersey City Municipal Utilities Authority [JCMUA], Jersey City Incinerator Authority [JCIA]), Hackensack Riverkeeper (Riverkeeper), and Honeywell.

¹ The Consent Decrees are available from the United States District Court for the District of New Jersey and a website maintained by Honeywell. The Honeywell website url is: <http://www.jerseycitychromiumcleanup.com/>



Illustration 1: SA-6 North, SA-7, and SA-6 South

Remedial actions at SA-6 North and South were implemented by Honeywell and were completed from May 2013 to December 2016. Work was conducted in accordance with:

- Administrative Consent Order (ACO) between Honeywell and the NJDEP dated June 17, 1993 and modified pursuant to a Consent Judgment between Honeywell and the NJDEP dated September 7, 2011 (Consent Judgment).
- New Jersey Technical Requirements for Site Remediation (TRSR) (N.J.A.C. 7:26E) (NJDEP, 2012).
- NJDEP's Chromium Policy Directive dated February 8, 2007.
- The SA-6 North and SA-6 South Consent Decrees.
- The SA-6 North and SA-6 South Combined 100% Design dated June 2013 (Amec 2013) and related Design Change Bulletins (DCBs).² Whenever the 100% Design is referenced in this LTMP, it is inclusive of any changes created by DCBs.

² The 100% Design Reports are available from the United States District Court for the District of New Jersey and a website maintained by Honeywell. The specific url for the Honeywell maintained website is: <http://www.jerseycitychromiumcleanup.com/>.

- As required by the TRSR, Honeywell has submitted Remedial Action Reports (RARs) for SA-6 South and SA-6 North to NJDEP. The NJDEP approved the SA-6 South RAR on March 30, 2017 and the SA-6 North RAR on June 1, 2017. Pursuant to the Consent Decrees, Honeywell will also file with the United States District Court for the District of New Jersey in Docket No. 95-2097 Construction Completion Reports (“CCRs”) for Study Area 6 North and for Study Area 6 South after the CCRs have been approved by the Special Master and Parties. The RARs and CCRs include Record Drawings which show the manner in which the 100% Design was modified based on field conditions through the DCBs.

The Areas of Concern (AOCs) for this LTMP include the Open Space Areas at SA-6 North (referenced as AOC-1 Open Space Area in the SA-6 North Consent Decree) and SA-6 South (referenced as Open Space AOC in SA-6 South Consent Decree) which encompass approximately 11 acres and 8 acres, respectively. In this document, the Open Space Areas at SA-6 North and SA-6 South are referred to as the “Open Space Areas.” This LTMP also applies to several other areas where hexavalent chromium contamination remains that are identified as Deed Notice Areas 2, 3, 4, 6, 7, 9, and 10 (described later in this section) and shown on **Figure 5** (collectively referred to herein as “Deed Notice Areas”).³ Although this LTMP is only required by the Consent Decrees governing implementation of the Chromium Remedy at SA-6 North and South, because the two deed notices for the Open Space Areas and the deed notice for Deed Notice Area #4 include features of the Chromium Remedy implemented on and for SA-7 (as described further below in this Section), this LTMP also pertains to those applicable portions of SA-7. The LTMP elements applicable to the Deed Notice Areas are summarized on **Table 5**. However, failure to include an activity in Table 5 otherwise required by this LTMP, does not excuse the failure to conduct the activity. Record Drawings that were included in the SA-6 North and SA-6 South RARs for Deed Notice Areas where engineering controls were constructed by Honeywell are included in **Appendix A-2**. Figures illustrating the engineering controls and depth to chromium-impacted soils for each of the Deed Notice Areas are included in Appendix E.

³ Although deed notices apply to the Open Space Areas at SA-6 North and SA-6 South, the term “Deed Notice Area” in this LTMP means the seven areas designated as Deed Notice Areas 2, 3, 4, 6, 7, 9, and 10 and does not refer to the Open Space Areas.

The term “Chromium Remedy” shall refer to the remedies implemented within SA-6 North and South pursuant to the Consent Decrees, including the capped Open Space Areas, the groundwater remedies, and the engineering controls (e.g., hardscape cement/asphalt or soil/gravel caps) covering the hexavalent chromium contamination that remains within the Deed Notice Areas.

The horizontal extents of the capped areas of both SA-6 Open Space Areas are defined by an existing soil-cement bentonite (SCB) wall along the common boundaries with SA-7 and the hydraulic barrier walls installed on the other three sides as part of the Chromium Remedy (the northern border of the SA-6 North Open Space Area has been modified to address areas where treatment of soils was ineffective or impractical (see Sections 2.1.3 and 3.1.13)). The final borders of the SA-6 North and SA-6 South Open Space Areas are defined in the Record Drawings provided in the RARs and CCRs and metes and bounds provided in the Deed Notices of these areas. Remedial actions in the Open Space Areas include engineering and institutional controls as set forth in the Consent Decrees and specified in the Chromium Remedy 100% Design Reports for the Sites dated June 2013 (Amec, 2013).

Specifically, the Chromium Remedy for the Open Space Areas is defined in the SA-6 North Consent Decree, Paragraph 56(a), and SA-6 South Consent Decree, Paragraph 65(a), as an engineered Resource Conservation and Recovery Act (RCRA) cap that consists of a gas collection system, base protective layer, geomembrane liner, geocomposite drainage layer, filter fabric, and warning layer.

The Chromium Remedy in SA-6 North AOC 1 and SA-6 South Development AOC also includes excavation as shown on **Figures 2A** and **2B**. AOC 2 at SA-6 North is defined in the SA-6 North Consent Decree as the Historic Fill Remedy area. In the SA-6 South Development AOC, future groundwater monitoring will be implemented as part of this LTMP.

Several other areas, designated as the Deed Notice Areas, exist where soils exceed 20 milligrams per kilogram (mg/kg) for hexavalent chromium and where the provisions of this LTMP apply until such time that soils within these areas no longer contain hexavalent chromium concentrations exceeding 20 mg/kg. Honeywell will establish deed notices for each of these areas. Site 163 as described below, Deed Notice Area 3, will also receive a conservation restriction and the title to this area

will be transferred to Jersey City. Each of these areas is shown on **Figure 5** (with their designated identification labels) and is described as follows:

- Deed Notice Area 2: A small area on SA-6 South within the Route 440 Right of Way (ROW) where Public Service Electric & Gas (PSE&G) owns and operates a gas main located adjacent to the hydraulic barrier alignment along the eastern edge of the SA-6 South Open Space AOC. It is anticipated that this gas main will be relocated during the Route 440 Road Widening Project. Excavation of residual chromium contamination proximate to the gas line in this area will be deferred by Honeywell until the gas line is relocated, as required by the Consent Order Entering the Combined 100% Design for Study Area 6 North and Study Area 6 South, ECF No. 1180, entered by the United States District Court, District of New Jersey on July 9, 2013, in Civil No. 95-2097 (“Order Entering the 100% Design”).
- Deed Notice Area 3: A portion of Site 163 at SA-6 South where remaining chromium-impacted soils⁴ were identified in the area south of the northern curblineline of the future Kellogg Street/Riverside Drive which is also partially within the future River Front Park. As documented by Honeywell in DC 2015-09-28, and as further agreed to by the Parties, Honeywell will restrict the future use of this area by a deed notice, implement a conservation restriction, and transfer title to Jersey City (as called for in Paragraph 61(c)(ii)(3) of the Study Area 6 South Consent Decree).
- Deed Notice Area 4: An area along the Hackensack River bulkhead at SA-6 South (Site 073) and SA-7. This area is divided into two tracts as shown in Figure 5. Tract 1 is adjacent to SA-7 and Tract 2 is adjacent to SA-6 South (Site 073). Excavation of residual chromium contamination in the Tract 2 area will be deferred by Honeywell until a future date when the bulkhead will either be repaired or replaced (as part of the Bayfront Redevelopment project) as required by the Order Entering the 100% Design. During the SA-7 Remedy, the SA-7 deferred area known as the “Wedge” was excavated to remove hexavalent chromium-impacted soil to 240 mg/kg. Post-excavation samples collected at that time indicate that hexavalent chromium-impacted soil above 20 mg/kg, but less than 240 mg/kg remains in the “Wedge” area.

⁴ “Chromium-impacted soils” are those soils containing hexavalent chromium concentrations exceeding 20 mg/kg.

This area is included in Tract 2 and will be remediated as part of the bulkhead repair or replacement. The chromium-impacted soils in the Tract 1 area will remain in place.

- Deed Notice Area 6 & Deed Notice Area 9: Three small areas on SA-6 North within the Route 440 ROW where the PSE&G gas main is located north of the SA-6 North Open Space AOC. One area was within Excavation Area 1 and the other within Excavation Area 2/3. It is anticipated that this gas main will be relocated during the Route 440 Road Widening Project. Excavation of residual chromium contamination proximate to the gas line in this area will be deferred by Honeywell until the gas line is relocated as required by the Order Entering the 100% Design.
- Deed Notice Area 7: In-situ treatment area 10 (TA-10) is located immediately proximate to and north of the hydraulic barrier and overlies a section of the 72-inch force main (FM). Because of the proximity of chromium-impacted soils requiring treatment to the FM, in-situ treatment and/or excavation of chromium-impacted soils were not technically feasible for the entire TA-10 due to potential structural impact to the FM. Therefore, Honeywell implemented an in-situ injection program in the portion of TA-10 (subarea TA-10-1) that lies north of the northern curblineline of the future Stegman Boulevard to be constructed during the Bayfront Redevelopment project. Honeywell has conducted additional in-situ injections to further treat residual chromium contamination in subarea TA-10-1, and will conduct further sampling in the Spring of 2018 to verify that concentrations of hexavalent chromium in these soils have been reduced to below 20 mg/kg. The TA-10-1 area, *i.e.*, the area north of the northern curblineline of the future Stegman Boulevard, will be deed noticed until the additional sampling confirms that hexavalent chromium concentrations have been reduced to below 20 mg/kg. The remainder of TA-10, the portion that lies south of the northern curblineline of the future Stegman Boulevard, will be capped by Stegman Boulevard, and incorporated into the Deed Notice and Conservation Restriction for the Study Area 6 North Open Space Area.
- Deed Notice Area 10: In-situ Treatment Area 7 (TA-7) is an area where a limited amount of shallow soils contain hexavalent chromium at concentrations exceeding 20 mg/kg. Honeywell will excavate the shallow soils following relocation of the fueling system in this area by JCMUA. In the

meantime, Honeywell will establish a deed notice for this area. Once the shallow soils have been excavated, the deed notice will be terminated.

- Deed Notice Area 14: The eastern portion of the Soil-Cement-Bentonite (SCB) underground hydraulic barrier wall of SA-7, the associated eastern perimeter pools, and associated shallow piezometers, together, serve as a portion of the chromium remedy for SA-7 in order to protect SA-7 from re-contamination from the east. This area is approximately 0.6 acres. An isolated portion of the SA-7 SCB wall included in this deed notice was sampled during the implementation of the SA-7 chromium remedy and is >20 mg/kg for hexavalent chromium, but less than 240 mg/kg.

According to Paragraph 61 of the SA-6 North Consent Decree and Paragraph 75 of the SA-6 South Consent Decree,

Honeywell shall be responsible for implementing, monitoring, maintaining, repairing, and replacing the Chromium Remedy in perpetuity. Honeywell shall satisfy this responsibility through establishment and implementation of a Long-Term Monitoring Plan.

The activities related to the LTMP implementation are outlined in **Table 1**. However, failure to include an activity in Table 1, otherwise required by this LTMP, does not mean that the activity does not need to be conducted. The implementation of this LTMP will occur as set forth within this LTMP and as outlined in **Table 1**.

Honeywell may elect to implement certain activities under this LTMP in conjunction with the routine maintenance activities undertaken by the title owner, consistent with the Consent Decrees, and the title owner may undertake certain routine maintenance activities on Honeywell's behalf as defined in Section 3.2.7. Any such monitoring activities conducted by the title owner as part of routine maintenance activities shall be overseen by Honeywell, shall be performed by workers properly trained concerning the Chromium Remedy, and shall be reported by Honeywell in quarterly and annual reports.

The provisions of this LTMP will be reviewed and evaluated annually. In addition, regardless of what entity undertakes LTMP activities on Honeywell's behalf,

Honeywell remains responsible for the long term maintenance and protection of the Chromium Remedy.

The objectives of the LTMP are:

- Monitor and maintain the integrity and effectiveness of the Chromium Remedy;
- Monitor and enforce the requirements of the Open Space Design Standards (OSDS), which are part of the 100% Design Report and are included in this LTMP as **Appendix D-1**; and
- Monitor and enforce the restrictions of the institutional controls (including applicable prohibitions on excavation and allowable development in the Open Space Areas as defined in the Consent Decrees and OSDS).

1.2 STANDARD FOR REPAIR OR REPLACEMENT OF THE CHROMIUM REMEDY

Pursuant to the Consent Decrees, Honeywell is preparing a Study Area 6 South CCR and a Study Area 6 North CCR. Once the CCRs are approved by the Parties, they will be entered with the Court, along with a Consent Order explaining that the CCRs supersede the 100% Design, pursuant to paragraph 5 of the Consent Order Entering Consolidated 100% Design for Study Area 6 North and Study Area 6 South Jersey City Municipal Utilities Auth. v. Honeywell, D.N.J., Consol. Cases, Civ. No. 95-2097, July 9, 2013, ECF No. 1180. Honeywell will prepare additional CCRs upon completion of each of the deferred areas, and enter the CCRs for each deferred area with the Court, along with an appropriate Consent Order.

Therefore, the Order to be entered following the final approval of the CCRs for Study Areas 6 South and 6 North, including the attached record drawings, the 100% Design as modified by the Design Change Bulletins (DCBs), and CCRs, will become the “100% Design” standard to which the Chromium Remedy will be repaired or replaced as necessary under this LTMP. The 100% Design includes the Chromium Remedy as-built grades and the development grades for both SA-6 North and SA-6 South Open Space Areas. For the purposes of any restoration or repairs necessary to either the SA-6 North or SA-6 South Open Space Areas, the grade to which a restoration or repair will be made is the appropriate as-built or development grade that is applicable at the time of the restoration or repair.

As of the date this 2017 LTMP is approved by the Parties and the Special Master, the Order entering the CCR has not yet been submitted to the Court for approval and entry. In this LTMP, the term “100% Design” means the set of documents to be submitted to the Court with the CCR, setting forth in detail, with drawings and text, the completed as-built remedy for Study Area 6 North and Study Area 6 South.

1.3 DOCUMENT ORGANIZATION

This document was prepared in accordance with the requirements specified in the SA-6 North and South Consent Decrees, the NJDEP TRSR and applicable provisions of the United States Environmental Protection Agency (USEPA) Comprehensive Five-Year Review Guidance (OSWER Directive 9355.7-03B-P, dated June 2001), and contains the following sections:

Section 1: Introduction. This section describes the purpose, scope, and organization of the document.

Section 2: Site Background. This section provides site background information including location, contaminants of concern and remedial action work implemented.

Section 3: Monitoring Plan. This section provides details of the monitoring program and contingency plan.

Section 4: Reporting. This section describes the monitoring and certification reporting requirements.

Section 5: Honeywell Program Organization. This section describes Honeywell’s program organization for the monitoring program.

Section 6: References. This section lists references used in preparing this document.

Section 7: List of Acronyms/Abbreviations. This section includes a list of commonly referenced acronyms found throughout this document.

2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION

This section presents background information on the Sites and remedial measures. A site location map is included as **Figure 1**. **Figures 2A (SA-6 North) and 2B (SA-6 South)** show the implemented remedial actions associated with each Site. Relevant regulatory correspondence related to the remedial action is included in **Appendix A**.

The remedial actions support the Bayfront Redevelopment Plan and future land uses. Honeywell is working closely with Jersey City to implement a sustainable, mixed-use development for the approximately 100 acres of land comprising SA-6 and Study Area 7 (SA-7) (collectively referred to as Bayfront I) that includes residential, commercial and open “green” space areas.

The remedial actions for chromium support two general use areas at both SA-6 North and South: Residential Development Area and Open Space Area. Mixed uses, including commercial and retail, may be incorporated into the Residential Development Area depending on the details of the development. The Open Space Areas provide for recreational uses and create a green corridor that improves public access and view of the waterfront.

The remedial actions in the Residential Development Areas allow for unrestricted uses in most of these portions of the Site with respect to chromium impacts. However, the Deed Notice Areas within the Residential Development Area have use restrictions consistent with the Consent Decrees and deed notices. In the Deed Notice Areas, engineering controls in the form of concrete and asphalt cover materials will prevent contact with contaminated soils. Deed Notice Area 3 will also be conservation restricted so that it must remain open space, recreational parkland that is part of the future Kellogg Street/Riverside Drive/River Front Park. In the Open Space Areas, engineering controls in the form of a RCRA-type cap prevent contact with contaminated soils and allow for open space, recreational, and parkland uses consistent with the Consent Decrees. The Groundwater Remedy engineering controls include hydraulic barrier walls and a contingent groundwater extraction system in order to prevent contact by ensuring the containment of contaminated shallow groundwater.

The engineering controls for the SA-6 North and South Open Space Areas are shown schematically on **Figures 3A** and **3B**. The engineering controls for the shallow groundwater are shown on **Figures 4A and 4B**. The engineering controls and depth to chromium-impacted soils for the Deed Notice Areas are shown on figures from the Deed Notices provided in **Appendix E**. In accordance with Section 3.1.8, groundwater gradients will be monitored to contain groundwater contamination by means of an inward hydraulic gradient within the SA-6 North and South Open Space Areas and an outward hydraulic gradient from SA-7 at all times. Institutional controls ensure that engineering controls for the Open Space Areas, Deed Notice Areas, and shallow groundwater will be maintained in the future. More details about the Chromium Remedial actions are discussed in the following sections.

2.1.1 SA-6 North

SA-6 North encompasses 42 acres and extends from Route 440 on the east to the Hackensack River on the west, bordered on the north by a car dealership and on the south by SA-7. The Site is the former location of the JCIA and the Jersey City Department of Public Works (JCDPW). The JCMUA still operates on a portion of SA-6 North. At SA-6 North, Chromium and Non-Chromium Remedies have been implemented in accordance with two NJDEP-approved RAWPs:

- January 4, 2008 (amended February 2008): *Remedial Action Selection Report and Remedial Action Work Plan for Chromium* to address chromium contamination at SA-6 North (SA-6 North Chromium RASR/RAWP). This document was approved by the NJDEP in a letter dated February 19, 2009.
- November 30, 2008: *Remedial Investigation Report/Remedial Action Selection Report/Remedial Action Work Plan for Non-Chromium Contaminants of Concern to address non-chromium contamination at SA-6 North (SA-6 North Non-Chromium RIR/RASR/RAWP)*. This document was approved by NJDEP in a letter dated November 10, 2009.

The overall Chromium Remedy for SA-6 North incorporated a combination of excavation, capping, and physical and hydraulic containment of shallow groundwater, as summarized below and as discussed in Section 1.1. The major components of the Chromium Remedy relative to the Jersey City Entities designated

portions of SA-6 North, and the current status of structures at SA-6 North are shown on **Illustration 2** (see **Figure 2A** for an enlarged view of Illustration 2 with more detail and **Figure 5** for the Deed Notice Areas).

- Within the designated Residential Development Area (AOC-2), chromium-impacted soils exceeding 20 mg/kg hexavalent chromium within 20 feet of the ground surface were excavated in accordance with the NJDEP Chromium Policy Directive (2007), except for the Deed Notice Areas. Excavated soils with concentrations of hexavalent chromium above 240 mg/kg were disposed of offsite. Excavated soils with concentrations of hexavalent chromium between 20 and 240 mg/kg were consolidated under the Open Space Area cap.
- Within the designated Open Space Area (AOC-1), chromium-impacted soils have been isolated using an engineered barrier consisting of a RCRA-type cap and a vertical steel sheet pile hydraulic barrier. The hydraulic barrier ties into the existing hydraulic barrier associated with the SA-7 remedy along the southern boundary of SA-6 North. The cross-section of the cap is shown on **Figure 3A**.
- Within the Deed Notice Areas, chromium-impacted soils are isolated by cement/asphalt cover and/or clean soil engineering controls. Figures illustrating the engineering controls and depth to chromium-impacted soils for the Deed Notice Areas in Study Area 6 North are contained in **Appendix E**.
- Within the designated Open Space Area, a contingent groundwater extraction system will be operated if necessary to hydraulically contain the shallow groundwater.
- Bedrock and deep overburden groundwater at SA-6 North is being contained and monitored and is addressed in the Integrated Groundwater Sampling and Analysis Plan. Long-term monitoring of the bedrock and deep overburden groundwater at SA-6 North is outside the scope of this LTMP.
- Post-remediation shallow groundwater monitoring will be performed to verify the effectiveness of the groundwater containment, extraction and treatment remedy.
- Institutional controls per NJDEP Technical Regulations, New Jersey Administrative Code (N.J.A.C.) N.J.A.C. 7:26E-1.8, include a Deed Notice for

capped contaminated soils in the SA-6 North Open Space Area, 4 additional areas to be deed noticed as described in Section 1.1, a Classification Exception Area (CEA) for residual chromium groundwater impacts, and Notice to Stakeholders regarding contamination and remedial actions. Additional institutional controls for the SA-6 North Open Space Area pursuant to the Consent Decrees include transferring ownership to Jersey City after construction of roads and utility corridors and the granting of a Conservation Restriction. The OSDS (**Appendix D-1**) acts as an administrative control to define and control permitted site activities, development, and usage.

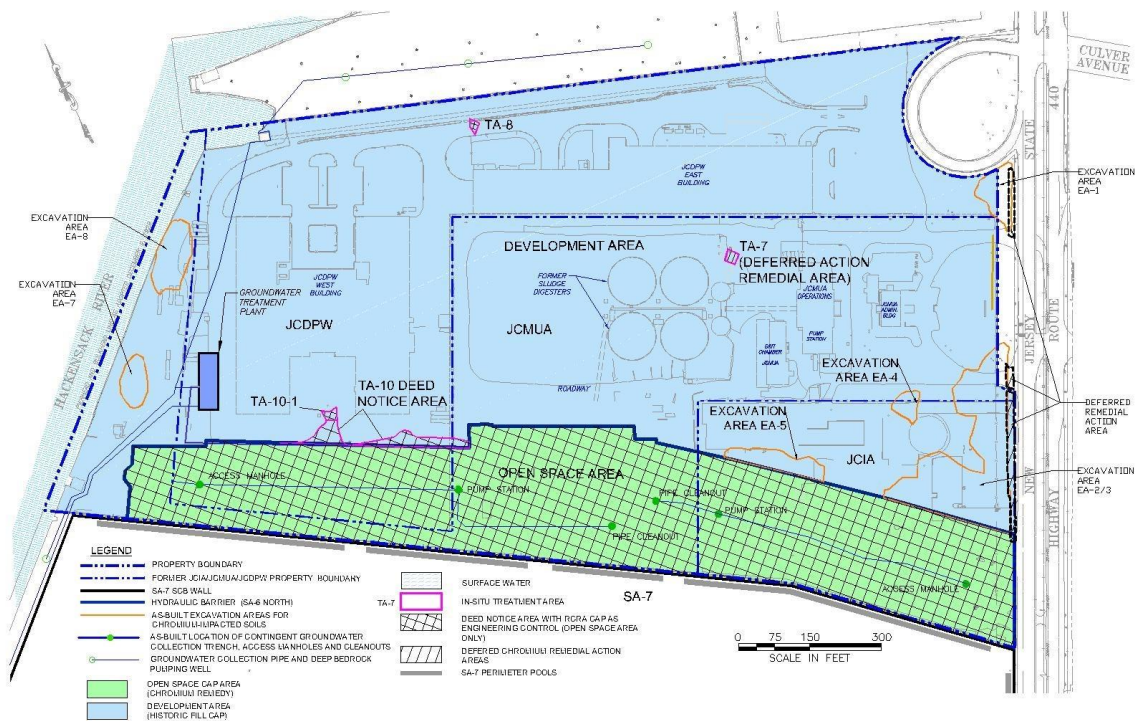


Illustration 2: Major Elements of the SA-6 North Chromium Remedy and Current Site Conditions

Remedial actions related to non-chromium contamination resulting from historic industrial, commercial and municipal operations are being coordinated with the Chromium Remedy. Honeywell is implementing the Non-Chromium Remedial actions pursuant to an agreement with Jersey City (Settlement Consent Order By

and Between the Jersey City Entities and Honeywell International Inc., which was entered by the United States District Court, District of New Jersey on April 21, 2008). The Non-Chromium Remedial actions are being implemented under the oversight of a Licensed Site Remediation Professional (LSRP)⁵. The main non-chromium contaminants subject to remediation include:

- Petroleum-related impacts associated with underground storage tank areas;
- Metals (lead, zinc, and mercury); and
- Polycyclic aromatic hydrocarbons (PAHs) and other metals associated with historic fill.

Monitoring and maintenance of the Non-Chromium Remedial Actions are not part of this LTMP and are/will be governed by provisions of the non-chromium RAWP.

Remedial Action Permit Applications for soil and groundwater for the non-Chromium Remedial Actions will be submitted by Honeywell after the recording of the deed notice for historic fill. The Remedial Action Permits issued for the Chromium Remedy by the NJDEP will be included as **Appendix A-6** of this LTMP.

2.1.2 SA-6 South

SA-6 South encompasses 25 acres and extends from Route 440 on the east to the Hackensack River on the west, bordered on the north by SA-7 and on the south by Kellogg Street (and a jug-handle between Kellogg Street and Route 440), and Droyers Cove. The La Mexicana Diner, a shopping center and the Droyers Point Society Hill development are also located to the south. At SA-6 South, Chromium and Non-Chromium Remedies are being implemented in accordance with four NJDEP-approved RAWPs:

- December 23, 2008: *Supplemental Remedial Investigation Report, Remedial Action Selection Report, and Remedial Action Work Plan for Chromium* to address chromium contamination at SA-6 South, exclusive of Site 163 (SA-6 South Chromium SRIR/RASR/RAWP). This document was approved by the NJDEP in a letter dated March 24, 2009.

⁵ An LSRP was not engaged to oversee the Chromium Remedy since the Sites were subject to federal court Consent Decrees and the NJDEP retained traditional case oversight responsibilities under their Site Remediation Program.

- March 21, 2011: *Remedial Action Selection Report/Remedial Action Work Plan for Non-Chromium Contaminants of Concern* to address non-chromium contamination at Site 163 only (Site 163 Non-Chromium RASR/RAWP). This document was prepared and submitted under the LSRP program and is subject to NJDEP's Industrial Site Recovery Act (ISRA) requirements triggered by Honeywell's acquisition of the property in January 2010 (ISRA Case Number E20100027). By virtue of the fact that it was submitted under the LSRP program, this document is approved.
- March 30, 2012: *Remedial Investigation Report/Remedial Action Selection Report/Remedial Action Work Plan for Non-Chromium Contaminants of Concern* to address non-chromium contamination at SA-6 South, exclusive of Site 163 (SA-6 South Non-Chromium RIR/RASR/RAWP). This document was approved by NJDEP in a letter dated June 28, 2012.
- May 18, 2012: *Supplemental Remedial Investigation Report, Remedial Action Selection Report, and Remedial Action Work Plan* to address chromium contamination at Site 163 only (Site 163 Chromium SRIR/RASR/RAWP). This document was approved by NJDEP in a letter dated June 22, 2012.

The overall Chromium Remedy for SA-6 South incorporated a combination of excavation, capping, treatment and physical and hydraulic containment of shallow groundwater, as summarized below and as discussed in Section 1.1. The major components of the Chromium Remedy relative to the six designated NJDEP sites at SA-6 South are shown on **Illustration 3** (see **Figure 2B** for an enlarged view of Illustration 3 with more detail and **Figure 5** for the Deed Notice Areas).

- Within the designated Development AOC, except in the Deed Notice Areas, chromium-impacted soils within 20 feet of the ground surface were excavated and/or treated. Excavated soils with concentrations of hexavalent chromium above 1,000 mg/kg were disposed offsite. Excavated soils with concentrations of hexavalent chromium between 20 and 1,000 mg/kg were consolidated under the Open Space AOC cap.
- Within the Deed Notice Areas, chromium-impacted soils are isolated by cement/asphalt cover and/or clean soil engineering controls. Figures illustrating the engineering controls and depth to chromium-impacted soils for the Deed Notice Areas in Study Area 6 South are contained in **Appendix**

E. In addition, Deed Notice Area 3 will be subject to a conservation restriction and title to this area will be transferred to Jersey City.

- Within the designated Open Space AOC, chromium-impacted soils are isolated using an engineered barrier consisting of a RCRA-type cap and a vertical steel sheet pile hydraulic barrier. The hydraulic barrier ties into the existing hydraulic barrier associated with the SA-7 remedy along the northern boundary of SA-6 South.
- Within the designated Open Space AOC, a contingent groundwater extraction system will be operated if necessary to hydraulically contain the shallow groundwater.
- Bedrock and deep overburden groundwater at SA-6 South is addressed in the Integrated Groundwater Sampling and Analysis Plan. Except for the L-Well monitoring discussed in Section 3.1.9, long-term monitoring of the bedrock and deep overburden groundwater is outside the scope of this LTMP.
- Post-remediation groundwater monitoring will be performed to verify the effectiveness of the groundwater containment, extraction and treatment remedy.
- Institutional controls per NJDEP Technical Regulations N.J.A.C. 7:26E-1.8 will be established, including a Deed Notice for capped contaminated soils in the SA-6 South Open Space AOC, 3 additional areas to be deed noticed as described in Section 1.1, a CEA for residual groundwater impacts, and Notice to Stakeholders regarding contamination and remedial actions. Additional institutional controls for the SA-6 South Open Space Area pursuant to the Consent Decrees include transferring ownership to Jersey City after construction of roads and utility corridors and granting of a Conservation Restriction. The OSDS (**Appendix D-1**) acts as an administrative control to define permitted site activities, development, and usage.

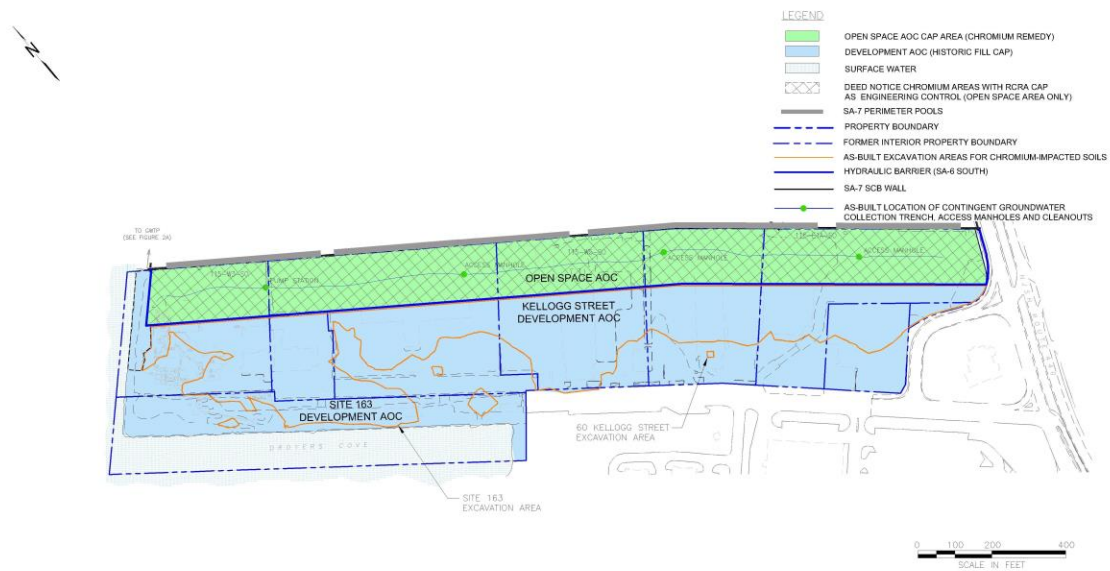


Illustration 3: Major Elements of the SA-6 South Chromium Remedy and Current Site Conditions

Similar to SA-6 North, the Non-Chromium Remedial actions are being implemented under the oversight of an LSRP and include the following contaminants:

- Petroleum-related impacts associated with historic fill;
- Isolated areas of chlorobenzene and trichloroethylene;
- Metals (mercury); and
- PAHs and other metals associated with historic fill.

Similar to SA-6 North, the monitoring and maintenance of these Non-Chromium Remedial actions are not part of this LTMP, but instead are governed by provisions of the non-chromium RAWPs. Remedial Action Permit Applications for soil and groundwater will be submitted by Honeywell after the recording of the deed notice for historic fill. The Remedial Action Permits issued for the Chromium Remedy by NJDEP will be included as **Appendix A-5** of this LTMP.

2.1.3 Administrative and Institutional Controls

Key administrative/institutional controls for the protection of the Chromium Remedial measures include:

- The SA-6 North and South Consent Decrees
- This Long Term Monitoring Plan
- Deed Notices (see **Appendix A-4**)
- 100% Design, including the OSDS (see **Appendix D-1**) and DCBs (see DCB Log in **Appendix A-1**) (in the next annual update the record drawings for SA-6 North and South from the Construction Completion Reports, as well as the Consent Order explaining how the drawings entered with the CCR supersede the 100% Design, will also be included. As built drawings for the Deferred Areas will be added in subsequent annual updates to this LTMP as the Deferred Areas are remediated.)
- Conservation Restrictions (see **Appendix A-3**)
- Remedial Action Soil and Shallow Groundwater Permits (see **Appendix A-6**)
- Subsurface Work Authorization Form/Digging and Excavation Permit for Open Space Areas and Deed Notice Areas (see **Appendix B-2**)
- Terradex LandWatch System
- Periodic communications to Honeywell concerning disturbances of the Chromium Remedy via calls or meetings
- Onsite monitoring and inspection
- Historic Displays
- Notice to Stakeholders
- Notice provided in contract documents
- Monitoring of groundwater under the Integrated Groundwater Sampling and Analysis Plan (see Appendix D-2)
- CEA and associated biennial updates for groundwater (see Appendix A-5)
- After Initial Development, if any signs are placed in the Open Space Areas by the City of Jersey City, the signs will include a prohibition on digging in the Open Space Area (e.g., No Digging per Jersey City Code Ch. 239).

Deed Notices

As shown on **Figure 5**, Deed Notices will be prepared and recorded at the office of the Hudson County Register for all areas where chromium-impacted materials

remain following completion of remedial actions. The signed, recorded Deed Notices will be included in **Appendix A-4** of this LTMP as part of the first annual review of the LTMP. Changes to Deed Notices will be summarized in future LTMP reports in tabular form as follows:

Changes in Deed Notices

Change Date	Description of Change	Recording Date	Record Number

The Deed Notices will specify conditions for any alteration, improvement, and/or disturbance of the engineering controls, and provide monitoring, maintenance, notification and reporting requirements. These requirements include notification by the site owner/operator to Honeywell and the NJDEP prior to disturbance of engineering controls, and documentation that applicable worker health and safety laws and regulations are followed during the disturbance and restoration of those controls. The Deed Notices will contain figures and cross-sections showing the engineering controls and details regarding notification and reporting requirements. Pursuant to the deed notices and the Remedial Action Permits, Honeywell shall submit Biennial Certification Reports regarding the effectiveness and integrity of the institutional and engineering controls.

Honeywell's additional reporting requirements with respect to the Deed Notice Areas are set forth in Sections 3.1, 3.2 and 4.0 of this Long Term Monitoring Plan.

Open Space Design Standards ("OSDS")

The OSDS must be complied with by all entities, including contractors, performing work in the Open Space Areas. Honeywell and the site owner shall use their best efforts to ensure the use of, and to monitor and enforce compliance with the OSDS. The OSDS for the SA-6 North and South Open Space Areas, also referred to within the OSDS as "Central Park" at SA-6 North and "Promenade" at SA-6 South, were included as Appendix L to the 100% Design. The OSDS specifies conditions to protect the Chromium Remedy including prohibiting excavation except for limited purposes; requiring excavation plans; and defining permitted uses, intrusive excavation, permitted landscape, and development.

The OSDS is included in **Appendix D-1**.

Conservation Restrictions

Conservation Restrictions were prepared for both SA-6 Open Space Areas at the time of property transfer from JCRA to Bayfront Redevelopment LLC per Paragraph 60(b) of the SA-6 North Consent Decree and at the time of the granting of the option to buy to Jersey City per Paragraph 74(b) of the SA-6 South Consent Decree (see **Appendix A-3**). The Conservation Restrictions allow for implementation, monitoring, maintenance, repair and replacement of the Chromium Remedy and permissible development pursuant to paragraph 74(k) of the SA-6 South Consent Decree and paragraph 60(k) of the SA-6 North Consent Decree, including construction and placement of roads and utilities. The Conservation Restrictions were recorded at the office of the Hudson County Register. The Conservation Restrictions for the SA-6 North and SA-6 South Open Space Areas will be updated to reflect the as-built surveyed locations of the hydraulic barrier walls. In addition, the Conservation Restriction for the SA-6 North Open Space Area will be modified to include the TA-10 area that lies south of the northern curblineline of the future Stegman Boulevard that will be capped by Stegman Boulevard.

A conservation restriction will be developed for the Site 163 deed notice area (Deed Notice Area 3) and recorded with the Hudson County Register. The Conservation Restriction for Deed Notice Area 3 will allow for implementation, monitoring, maintenance, repair and replacement of the Chromium Remedy and permissible development including construction and placement of River Front Walk, roads and utilities.

All new and/or updated Conservation Restrictions will be recorded with the Hudson County Register once completed and approved. The recorded Conservation Restrictions will be attached to this LTMP as part of **Appendix A-3**.

If subsequent changes are made to any Conservation Restriction(s), the amended Conservation Restriction(s) will be recorded with the Office of the Hudson County Register, substituted in **Appendix A-3** of this LTMP as part of the annual review of the LTMP, and provided and summarized in future LTMP reports in tabular form as follows:

Changes in Conservation Restrictions

Change Date	Description of Change	Recording Date	Record Number

NJDEP Remedial Action Soil and Shallow Groundwater Permits

Honeywell will submit Remedial Action Permit Applications for Soil and Shallow Groundwater for the SA-6 Open Space AOCs to the NJDEP following completion of remedial actions. The permits will contain requirements for monitoring, maintenance and reporting to document the protectiveness of the remedial actions and engineering controls. The permits will include requirements for monitoring of engineering controls in accordance with the Deed Notice, schedule for submittal of Biennial Certification Reports to the NJDEP, and requirements pertaining to financial assurances and permit transfer, modification and termination.

Groundwater monitoring and reporting requirements will be consistent with the Integrated Groundwater Sampling and Analysis Plan (SAP) prepared by Cornerstone Environmental Group, Inc. dated November 13, 2013; revised April 29, 2014 (Cornerstone, 2014), and future amendments to the Integrated Groundwater SAP.

Separate Remedial Action Permits for Regional Groundwater are anticipated for the deep overburden and bedrock zones.

Subsurface Work Authorization Form/Digging and Excavation Permit

Completion of a Subsurface Work Authorization Form/Digging and Excavation Permit (“Dig Permit”) checklist is required prior to any subsurface work within the Deed Notice Areas, and prior to any subsurface work within the Open Space Areas conducted after completion of the Initial Development (as that term is defined in the Consent Decrees) consistent with Section 3.2.1.5.2. The Dig Permit controls and coordinates work by other entities with Honeywell prior to conducting utility work or any other subsurface work that may disturb the engineering controls and/or expose chromium-impacted materials. Honeywell shall use its best efforts to ensure all entities planning to conduct subsurface work comply with the Dig Permit process, as described in Section 3.2.1.5.2. The Dig Permit Form is included in **Appendix B**.

Terradex LandWatch System

Honeywell is incorporating into the administrative controls the use of the Terradex LandWatch system to obtain notification of any proposed soil disturbances at the sites through the New Jersey One Call system.

Terradex, Inc., a private company, works in conjunction with the New Jersey One Call system to obtain notification of soil disturbances at subject sites. Terradex installs a transmitter, which qualifies as an “underground utility” under the New Jersey Underground Utility Protection Act, which in turn triggers the requirements of the One Call process. Under this process, any person seeking to disturb soil at a site is required to notify One Call, which in turn notifies operators of registered utilities prior to the soil disturbance activity. Installation of the Terradex LandWatch system allows Honeywell and its contractors to be notified through One Call of soil disturbing activities at the sites, similar to the way in which a utility would be notified.

The Terradex LandWatch system shall be used pursuant to this LTMP both during and after the Initial Development construction (as defined in the Consent Decrees). Honeywell’s use of this system as an institutional control at the Sites is necessarily dependent on the ongoing operations of Terradex LandWatch, as well as on Terradex’s ability to continue to work in conjunction with the New Jersey One Call system. Use of this system also assumes there are no changes in New Jersey law or regulation that would preclude Honeywell’s use of the system in this manner. Accordingly, Honeywell will review the viability of continued use of the Terradex LandWatch system during the annual reviews of the LTMP. Provided that Terradex continues to offer Terradex LandWatch service at a price that is cost-effective, that One Call continues to allow Terradex to operate in this manner, and that no changes to New Jersey law or regulation bar Honeywell from using the Terradex LandWatch system in cooperation with the One Call system, Honeywell will continue to use the Terradex LandWatch system as a component of the institutional controls at the sites to provide for the protectiveness of the remedy. If Honeywell intends to terminate the Terradex system because it becomes unavailable, ineffective or not cost-effective, then Honeywell shall report, at least 90 days in advance of its intended action, to the Special Master and non-Honeywell Parties Honeywell’s decision to terminate Terradex, Honeywell’s reasons for doing so, and will discuss with the Special Master and Parties alternative institutional controls to be considered. The 90-day period shall not apply if Honeywell becomes aware that the Terradex LandWatch system

will be unavailable with less than 90 days advance notice. In this case, Honeywell will report to the Parties as much in advance of the termination due to unavailability as is feasible.

The use of the Terradex LandWatch system will commence following completion of the remedial activities and be in place for all work related to the Bayfront Redevelopment project at Study Areas 6 and 7.

Onsite Monitoring and Inspections During the Initial Development

During the Initial Development as defined in the Consent Decree, Honeywell will provide one or more full-time inspectors on-site to review development activities, to monitor any activities involving disturbances of the Open Space Areas or the Deed Notice Areas, and to verify that any disturbances are conducted in compliance with the Consent Decrees, the Long Term Monitoring Plan, the Deed Notices and, for the Open Space Areas, with the OSDS. Reports from Honeywell's inspectors on development activities, and a 6-month look ahead schedule of anticipated activities, will be included in monthly reports from Honeywell to the Special Master and the Parties. Any Party may request that the frequency of the reports be modified due to site conditions or development activities.

Historic Displays and Other Signage

Per SA-6 North and South Consent Decrees (Paragraphs 60(l) and 74(l), Honeywell will develop a permanent plan to inform visitors to the Open Space Areas of the history of chromium production, contamination, and remediation. Additional signage providing a phone number to call prior to any digging will be installed in the Deed Notice Areas so that Honeywell is notified prior to any subsurface work. Once developed, the plan for historic displays and additional signage will be attached to this LTMP and shall be subject to periodic monitoring and maintenance as described in Section 3.1.11.

After development, if any signs are placed in the Open Space Areas by the City of Jersey City, the signs will include a prohibition on digging in the Open Space Area (e.g., No Digging per Jersey City Code Ch. 239).

Jersey City will post signs prohibiting through trucks on roads within the Open Space Areas as required by OSDS Section 2.2.1.

Contract Documents

This section sets forth the obligations of Honeywell and the City of Jersey City to inform those with whom they enter contracts to purchase, lease or perform work on the areas where hexavalent chromium contamination remains **about** the Chromium Remedy and precautions that must be taken to protect workers, the public, and ensure the continued protectiveness of the Chromium Remedy.

The requirements of this Section of the LTMP apply to intra- and inter-governmental agreements among Jersey City departments or entities and agreements between Jersey City and any County, State, or federal government entity.

All documents transferring title or leasing of any portion of the Deed Notice Areas, and all contract documents entered into with respect to any portion of the Open Space Areas or Deed Notice Areas that allow for the installation, repair, replacement, or maintenance of any permissible development, and all contract documents that allow for subsurface work in the Open Space Areas or Deed Notice Areas will include in such documents the notices set forth in sub-paragraphs (a) and (b) of this section.

- (a) In bold noticeable format, a notice of the Chromium Remedy and the requirement that all work in and/or operation of facilities within the Open Space Areas or Deed Notice Areas must comply with the SA-6 North and South Consent Decrees, Deed Notices, Open Space Design Standards (if applicable), the Long Term Monitoring Plan, and worker training materials to be developed by Honeywell.
- (b) Such contract documents shall also include a copy of the Consent Decrees and Deed Notices applicable to the property at issue, Long Term Monitoring Plan, and, if applicable, Open Space Design Standards and the requirement that all subsurface work in the Open Space Areas and Deed Notice Areas and work that impacts the Chromium Remedy must comply with those documents.

Any pre-contract bidding documents related to subsurface work or activities within the Open Space Areas or Deed Notice Areas must include a notice of the Chromium Remedy and the statement that the winning contract bidder must comply with the

Consent Decrees, Deed Notices, Long Term Monitoring Plan and OSDS (if applicable) in connection with its performance of any awarded contract.

Classification Exception Areas for Groundwater

A regional CEA for groundwater has been established for the SA-5-7 sites as an institutional control to identify chromium groundwater impacts above the NJDEP groundwater quality standards (GWQS) and prevent the use of groundwater within the designated CEA areas (see **Appendix A-5**). The CEAs will address the shallow, deep overburden, and bedrock zones. The shallow zone refers to groundwater within fill material (above the meadow mat and underlying native soils), generally to a depth of 20 feet below grade. The deep overburden zone refers to groundwater below the fill and meadow mat down to bedrock, generally from approximately 20 feet to 90 feet below grade. The bedrock zone refers to groundwater within the upper 20 to 40 feet of fractured bedrock. The shallow groundwater CEA may be modified in the future following completion of remedial actions.

The LTMP monitoring and contingency plan is provided in Section 3. LTMP reporting requirements are indicated in Section 4.

3.0 MONITORING PLAN

Pursuant to Paragraph 61 of the SA-6 North Consent Decree and Paragraph 75 of the SA-6 South Consent Decree, Honeywell shall be responsible for monitoring, maintaining, repairing and replacing the Chromium Remedy in perpetuity. Honeywell shall conduct monitoring that will ensure that the integrity and effectiveness of the Chromium Remedy are maintained, and to ensure that the restrictions of the institutional and administrative controls are being satisfied. Honeywell will conduct on-site monitoring during any investigation, development, construction, or other activities in the Open Space Areas or Deed Notice Areas that involve disturbance of the Chromium Remedy.

This section provides the details of the LTMP and Contingency Plan addressing the integrity of the engineered barrier(s) and Chromium Remedies for the SA-6 North and South Open Space Areas and Deed Notice Areas. The primary purpose of the monitoring plan is to monitor and verify the effectiveness of the Chromium Remedy in protecting human health and the environment. **Table 2** provides a summary list of contingency plan triggering events. **Table 3** provides a timetable containing the LTMP inspection/monitoring requirements. **Table 4** summarizes reporting requirements. Monitoring requirements specified in the SA-6 North Consent Decree Paragraphs 60 and 64 and SA-6 South Consent Decrees Paragraphs 74 and 78 include:

- Quarterly inspections to ensure permitted land usage;
- Quarterly inspections to ensure the integrity and effectiveness of the Chromium Remedy;
- Quarterly visual inspection monitoring of the grade and slope to verify the integrity of the Chromium Remedy;
- Quarterly visual inspection monitoring to determine if settlement or subsidence has occurred that could impair the integrity of the Chromium Remedy;
- Quarterly visual inspection monitoring to determine if disturbance has occurred that could impair the integrity of the Chromium Remedy;

- Quarterly visual inspection monitoring to ensure that burrowing animals are not materially impairing the integrity of the Chromium Remedy;
- Quarterly visual inspection monitoring of the vegetative cover to ensure that vegetative cover is in conformance with the landscaping provisions of the 100% Design, including the OSDS, and the Redevelopment Plan and will not materially impair the integrity of the Chromium Remedy;
- Maintenance of the vegetative cover to include mowing to ensure tree species cannot become established except in designated areas and removal of any vegetation not permitted by the OSDS that would impair the integrity of the Chromium Remedy;
- Quarterly groundwater elevation monitoring to ensure specified hydraulic gradients across the hydraulic barriers;
- At least one round of L-Well groundwater sampling;
- Quarterly shallow groundwater sampling in the SA-6 South Development AOC to measure total chromium levels;
- Monthly monitoring of vented gases and the gas venting system for 1 year. Frequency will be reduced to quarterly after 1 year if data are stable;
- Quarterly inspection of all signage;
- Baseline topographic survey at completion of the Chromium Remedy and additional surveys every 5 years for an additional 15 years; and
- Inspection of visible utility lines and manholes for disturbance.

The Long Term Monitoring Plan specifies monitoring activities in accordance with the monitoring requirements of the SA-6 Consent Decrees. In the event that the Consent Decree requirements with respect to long term monitoring are modified in the future (either by the consent of the Parties, or by order of the Court upon a motion by any party), Honeywell will revise the Long Term Monitoring Plan to reflect any such modified requirements of the Consent Decree.

Additional details for each inspection or monitoring activity are provided in Section 3.1. A Contingency Plan is provided in Section 3.2 that describes the corrective actions and remedy procedure to be implemented if the inspection program identifies evidence of deterioration or disturbance of the engineering controls or their failure to

perform as designed, and requirements in the event of any planned or unplanned disturbance of the Chromium Remedial measures. Honeywell shall be responsible for implementing the Contingency Plan.

Routine maintenance and repairs are addressed in **Section 3.2.7** that details training for future workers who will perform work at the areas encompassed within the Chromium Remedy.

3.1 INSPECTIONS AND MONITORING

Inspections will be conducted as detailed in the following sections and as summarized on **Table 3**. The observations will be recorded on an inspection form and photo documentation will be provided. The NJDEP Field Sampling Procedures Manual (FSPM), August 2005, updated 2011 (NJDEP, 2005), Chapter 10 – “Documentation” provides guidance for recordkeeping and photo documentation. An example inspection form is included in **Appendix B**. Completed forms will be submitted on a quarterly basis to the Special Master (during the term of his appointment), Riverkeeper, and Jersey City. The Inspection Forms will include a section on Dig Permits and Intrusive Excavation Plans completed or submitted during the quarterly period. Only those Dig Permits and Intrusive Excavation Plans not previously submitted to the Parties will be attached to the Inspection Forms. However, Dig Permits are not applicable to the Open Space Areas during Initial Development for the Open Space Areas when Honeywell’s onsite construction management personnel will inspect and monitor activities at the Open Space Areas. Once Initial Development is over at an Open Space Area, and Honeywell’s construction management personnel are no longer on site at that Open Space Area, Dig Permits will be necessary for that Open Space Area.

3.1.1 Timing and Schedule of Inspections

With the exception of groundwater monitoring at SA-6 North and methane gas monitoring as detailed in Sections 3.1.8 and 3.2.3 through 3.2.6, the quarterly inspections and measurements will start in 1st Quarter 2017 as set forth in SA-6 North Consent Decree Paragraph 64 and SA-6 South Consent Decree Paragraph 78 (see **Table 3**). The inspections will be timed to coincide with other inspections or activities at the Sites. The Contingency Plan, referenced in Section 3.2, will be implemented if inspection reveals evidence of erosion, differential settlement, deterioration of the integrity or effectiveness of the Chromium Remedy, or recent

activities impacting the Chromium Remedy. **Table 2** cross-references the subsections within Section 3.1 to summarize the inspection triggers that may warrant corrective actions as identified in Section 3.2.

With the exception of groundwater monitoring in the SA-6 South Development Area (see Section 3.2.5), after two years of quarterly inspections and annual reporting, Honeywell will evaluate the inspection results with respect to maintenance of the integrity and effectiveness of the Chromium Remedy. Following this evaluation, Honeywell will confer with the Special Master and Parties. The Special Master and any Party may propose modification of the frequency of inspections and monitoring based on the first two years of results, subject to review and approval by the Parties and the Special Master. Any proposal to modify monitoring will consider NJDEP guidelines under Remedial Action Permits and be consistent with the requirements of the SA-6 Consent Decrees.

3.1.2 Chromium Remedy Visual Inspections

Quarterly visual inspections of the Chromium Remedy will be conducted to verify that there are no prohibited or other activities (e.g., digging, drilling, and excavation) or site use that could jeopardize the integrity or effectiveness of the Chromium Remedy.

In addition, evidence of deterioration of vegetative coverage, erosion, differential settlement, or surface drainage that requires maintenance will be recorded and evaluated. Erosion or excavation in the Open Space Areas that exposes or penetrates the root barrier or exposes the orange warning layer is a condition that could impact the integrity of the Chromium Remedy and will require corrective action by Honeywell pursuant to the Contingency Plan. Erosion of the surface cover or excavation in the Deed Notice Areas that penetrate the surface cover or hardscape engineering controls (e.g., cement/asphalt/soil caps) would be considered a condition that could impact the integrity of the Chromium Remedy and will require investigation and corrective action by Honeywell pursuant to the Contingency Plan.

Field observations will include information on the extent of deterioration including dimensions and depth of erosion, differential settlement or other disturbance of the cover/capped area, including whether such deterioration or disturbance fully penetrates the vegetative cover down to the underlying Horizon B or C soils. Field

observations regarding evidence of deterioration or disturbance of the Chromium Remedy will be addressed as indicated in the Contingency Plan.

Field observations for each of the Open Space Areas and Deed Notice Areas will be recorded on an inspection form and photo documentation provided. The NJDEP August 2005 Field Sampling Procedures Manual provides guidance for recordkeeping and photo documentation. An example quarterly inspection form is included in **Appendix B**.

If field observations indicate that a disturbance occurred that caused deterioration or full penetration of the surface cover or hardscape engineering controls (e.g., cement/asphalt/soil caps) in the Deed Notice Areas, or the surface cover and the underlying cap components (i.e., root barrier, clean soil layer, orange demarcation layer, drainage layer and geomembrane liner) in the Open Space Areas, then soil sampling and analysis for hexavalent chromium shall be performed by Honeywell to evaluate whether there has been any migration of contaminated soils and determine requirements for corrective action.

Prohibited use or unplanned use of the Open Space Areas or Deed Notice Areas shall be documented. Honeywell shall notify all appropriate parties of any prohibited or unplanned uses of which it becomes aware, and Honeywell shall use its best efforts to cause such use to cease.

Prohibited or restricted uses of the Deed Notice Areas will be outlined in the deed notice for each area, and include prohibition of residential use and use of the property as a school or childcare facility. Additional prohibited and permissible uses of Deed Notice Area 3 are outlined in the SA-6 South Consent Decree Paragraph 61(c)(ii)(3), which includes the requirement that the area be covered with road, walkway or other hardscape.

Prohibited and permissible uses of the Open Space Areas are outlined in SA-6 North Consent Decree Paragraphs 60 (j and k), SA-6 South Consent Decree Paragraphs 74 (j and k), and the OSDS Section 2, and include:

Prohibited:

- Development not permitted by the Consent Decrees or OSDS;

- Development that would jeopardize the Chromium Remedy or not meet the Consent Decrees, OSDS, and related permits;
- Development that would not maintain 75% landscaping in the Open Space Areas (exclusive of roads and pedestrian thoroughfare);
- Utilities within 2 feet of the warning layer unless in utility corridor;
- Irrigation or sprinkler lines within 2 feet of warning layer (unless within utility corridor); and
- Permanent concession facilities.

Permissible (with restrictions):

- Roads and pedestrian thoroughfares (per the OSDS and Redevelopment Plan);
- Curbing and fences;
- Sidewalks, paths, walkways, and nature trails;
- Utilities and utility corridors, lighting, and restrooms;
- Irrigation or sprinkler components or systems;
- Water features;
- Above-ground storm water cisterns;
- Signs;
- Benches, trash receptacles, and bicycle racks;
- Recreational facilities; and
- Landscaping consistent with the OSDS that will not jeopardize the Chromium Remedy.

3.1.3 Surface Grade Visual Inspections

Quarterly visual inspections of the Open Space Areas and Deed Notice Areas cover will identify erosion that has occurred and the signs of potential erosion.

Disturbances to the Chromium Remedy components observed during quarterly visual inspections will identify situations that may require further evaluation. Prior to conducting repair of a visually-observed depression (which holds water for more than 24 hours after a storm event), the depression dimensions will be checked by use

of a GPS or other acceptable survey method to verify if the depression or settlement may impair the integrity or effectiveness of the Chromium Remedy and/or has resulted in a loss of positive drainage. The results will be evaluated and a determination made as to whether simply filling the depression to restore positive drainage is adequate or more extensive corrective action is required.

Quarterly visual inspections will look for signs of erosion of the cover soils. Field observations regarding evidence of erosion shall be further reviewed and addressed by Honeywell as indicated in the Contingency Plan to maintain the cap integrity.

3.1.4 Differential Settlement Visual Inspections

Quarterly visual inspections will identify noticeable settlement or elevation changes of the cover in the Open Space Areas and Deed Notice Areas. Settlement would be indicated by subsidence of surface features (e.g., vegetative cover, roads, pedestrian thoroughfares, foundations). If such settlement has occurred, it will be evaluated to establish the cause. If the cause cannot be readily identified, Honeywell will propose further investigative measures.

Benchmarks will be established on the installed Pump Station, Vaults, and access manhole structures associated with the contingent groundwater extraction system as shown on **Figure 2A** and **2B**. Quarterly visual inspections will include measurement of the reveal (distance from the ground to the benchmark) in order to determine if settlement is occurring. The locations of benchmarks will be included in the quarterly monitoring logs and the measurements at each location shall be recorded in the logs.

The Open Space Areas were surcharged prior to cap placement to remove 100% of primary consolidation related to development grading. Therefore, Honeywell anticipates that future settlement in the Open Space Areas should be limited to long term secondary consolidation below the cap and settlement of the loosely placed planting soils.

Settlement will be evaluated to determine if it may impair the integrity or effectiveness of the Chromium Remedy. Settlement will also be evaluated to determine if it will result in a loss of positive drainage. Such conditions will trigger corrective actions by Honeywell pursuant to the Contingency Plan.

A loss of positive drainage may be indicated by ponded water remaining 24 hours after a storm event, or an increase in “reveals” of fixed structures (e.g., planting soils adjacent to contingent groundwater pump vaults). An increase in “reveals” will be evaluated to determine if they are a safety concern (e.g., a tripping hazard) or a maintenance concern (e.g., an impediment to mowing). If settlement in excess of 3 inches is observed adjacent to structures in the landscaped areas, and Honeywell determines that such settlement does not impair the integrity or effectiveness of the Chromium Remedy, the areas will be backfilled to restore the grades to in accordance with the “As Built” grades. The evaluation will assess whether the settlement is due to a loss of ground or consolidation of the cover soils.

If warranted, corrective actions will be implemented by Honeywell to restore affected areas to the 100% Design and the “As Built” grades, or to a level of protection at least equivalent to the original Chromium Remedy. If Honeywell deems it necessary to restore to a standard different from those defined in the 100% Design and “As Built” grades, the proposed restoration plan will be submitted to the Parties and the Special Master for review and approval.

3.1.5 Disturbance Visual Inspections

Quarterly visual inspections of the Open Space Areas and Deed Notice Areas will identify evidence of a disturbance, other than planned disturbances. In the Open Space Areas, evidence of a disturbance that exposes or penetrates the root barrier or exposes the distinctive warning layer, or which otherwise indicates that the integrity of the Chromium Remedy has been compromised, is a trigger for corrective action. In the Deed Notice Areas, evidence of a disturbance of the surface cover or hardscape engineering controls (e.g., cement/asphalt/soil caps) is a trigger for corrective action by Honeywell.

Corrective action requirements are described in the Contingency Plan. If Honeywell deems it necessary to restore to a standard different from those defined in the 100% Design and “As Built” grades, the proposed restoration plan will be submitted to the Parties and the Special Master for review and approval.

3.1.6 Burrowing Animals Visual Inspection

Quarterly visual inspections of cover will be conducted to determine if any disturbance caused by burrowing animals is affecting the integrity of the Chromium Remedy. In the event of a disturbance affecting the integrity of the Chromium

Remedy, the burrowing animals will be humanely removed and the Chromium Remedy repaired or replaced to the 100% Design by Honeywell. Corrective action requirements are indicated in the Contingency Plan.

3.1.7 Vegetative Cover Visual Inspection

Quarterly visual inspections of vegetative cover above the cap will be conducted to determine whether there has been any vegetative cover disturbance that could affect the integrity of the Chromium Remedy. Damage to or impairment of vegetative cover could allow erosion of the Chromium Remedy cover soils; therefore, the integrity and health of vegetative cover will be inspected. The varieties of vegetation will be inspected for compliance with the 100% Design, including OSDS Section 2.2.9, and the Redevelopment Plan. Additionally, inspections will include observations of whether maintenance activities are being performed adequately. The inspection form includes a notation for the status of compliant vegetation and proper maintenance of the vegetative cover. Maintenance activities will need to be tailored to the type and species of the vegetative cover as well as seasonal criteria.

Field observations will include information on the extent of degradation or disturbance including dimensions and depth of erosion or missing vegetation, and any evidence of damage to surface cover or hardscape cover materials (e.g., cement/pavement) from tree roots. Field inspection reports will identify generalized areas of erosion rills on a site map and include photographic documentation. In the event of material disturbance to the Chromium Remedy, Honeywell shall implement appropriate restoration procedures to repair or replace the Chromium Remedy to the 100% Design, including the OSDS. If Honeywell deems it necessary to restore to a standard different from those defined in the 100% Design and the OSDS, the proposed restoration plan will be submitted to the Parties and the Special Master for review and approval. Corrective action requirements for vegetative cover are indicated in the Contingency Plan.

3.1.8 Groundwater Elevation Monitoring

Honeywell must demonstrate that (a) the groundwater elevation gradient along the boundary between SA-7 and Route 440 is outward from SA-7; (b) the groundwater elevation gradient along the boundaries between SA-6 and SA-7 is outward from SA-7 and inward into SA-6, and (c) along all other boundaries of the SA-6 containment areas, an inward gradient is present in the entire area of contaminated shallow groundwater.

The Integrated Groundwater Sampling and Analysis Plan (SAP) encompasses monitoring throughout SA-5, SA-6 and SA-7. Water levels at the boundary between SA-6 and SA-7 have been monitored since 2009. Results of this groundwater monitoring are documented annually in the Integrated Groundwater Monitoring Reports (IGWMRs). The SAP is updated annually to reflect changes in monitoring well locations/availability and changes in individual Study Area requirements. All groundwater monitoring requirements in this LTMP will be incorporated into the SAP, as will future changes to these requirements.

Measurements Within SA-6

Groundwater monitoring well location maps for SA-6 North and SA-6 South are included as Figure 4A and Figure 4B, respectively. Groundwater elevations will be monitored at the following locations within SA-6 North and SA-6 South:

- Five piezometer pairs along the western, northern, and eastern borders of the SA-6 North Open Space Area;
- Five piezometer pairs along the western, southern, and eastern borders of the SA-6 South Open Space Area; and
- Seven monitoring wells located in the SA-6 North and South Open Space Areas near the boundary with SA-7: 115-E1A-SO, 115-W5-SO, 115-W3-SO, 115-E4-SO, 115-E5-SO, 115-W1-SO, and 115-W6-SO.

Groundwater elevations at all monitoring locations will be measured quarterly. At some locations, initial measurements will be more frequent. Groundwater level measurements within SA-6 North and SA-6 South Open Space Areas will be continuously collected using automatic data loggers and manually collected monthly for a period of at least one year from the respective completion dates of the caps (4th quarter 2015 for SA-6 South and 4th quarter 2016 for SA-6 North). After one year, Honeywell may evaluate whether the automatic data loggers are still necessary, and, if the Parties agree, automatic data logging may be discontinued and manual measurements may be reduced to quarterly. Manual groundwater elevation measurements will be recorded on the Groundwater Elevation Monitoring Form in **Appendix B-4**.

Measurements Within SA-7

In April 2017, Honeywell completed initial water level monitoring in four piezometers installed in January 2017 within the interior pool of SA-7.⁶

Groundwater elevation monitoring for SA-7 is discussed below relative to continued operation of the perimeter pools. Honeywell plans to decommission the perimeter pools along the northern and southern borders of SA-7. Honeywell will continue to operate and monitor the eastern perimeter pool to maintain an outward gradient from SA-7 towards Route 440.

Water levels will be monitored along the eastern boundary of SA-7 pursuant to the SAP in order to determine whether the gradient along the boundary between SA-7 and Route 440 remains outward from SA-7.

The SA-6 remedial designs anticipate that water levels within the Open Space Areas will be below elevation +4.0 feet above mean sea level (ft msl based on the National Geodetic Vertical Datum 1929 elevation reference datum), while the water table within SA-7 will be controlled by the top of the westernmost barrier wall along the Hackensack River, which is set at +4.0 ft msl.

Currently, perimeter pools are used to ensure an outward gradient from SA-7. Water levels in the perimeter pools are measured manually each month and compared to water levels in adjoining portions of SA-6 per the procedures in the SAP. This monitoring began with the completion of the SA-7 remedy in 2009 and will continue while the pools are in operation. The data collected to date indicate that the clay check dam and weir system that controls the pools function as designed to maintain specified groundwater levels. With few exceptions, the pools have maintained an outward gradient from SA-7.

When the northern and southern perimeter pools are decommissioned, the current monthly monitoring of water levels at the northern and southern perimeter pools will be replaced with quarterly water-level measurements of the four piezometers in

⁶ The term “interior pool of SA-7” refers to the zone of shallow groundwater located within SA-7, inside of the SCB hydraulic barrier walls to the north, east, and south and the sheet-pile hydraulic barrier wall to the west. This area was remediated via excavation to the meadow mat or overlying natural sediments and must be protected from recontamination pursuant to the January 13, 2012 Amended Order Modifying Injunction, ECF No. 1116.

SA-7. After 5 years of monitoring, Honeywell may propose, subject to review by the Parties and approval by the Special Master, to decrease the frequency of groundwater level monitoring.

If activities are instituted, such as construction, within the SA-7 interior pool that are of a nature that may lower the groundwater elevations, Honeywell will initiate an initial month of twice a week groundwater elevation monitoring and, after the initial month, conduct quarterly groundwater level monitoring for the duration of the activities.

Criteria for Operating Contingent Pumping System

The Chromium Remedy includes contingent pumping systems designed to be capable of maintaining an inward gradient into the SA-6 North and South Open Space Areas. The 100% Design specified the installation of nine contingent pumping wells within each Open Space Area. However, a DCB dated February 12, 2015 modified the design to a perforated pipe installed in a stone-filled trench or "French Drain" system installed below the water table with sumps outfitted with pumps along the trenches. The French Drain systems have been installed, and they were operated during construction of both caps to lower the groundwater level.

Water levels will be monitored at the locations set forth in the beginning of Section 3.1.8 as shown on Figures 4A and 4B to determine whether to operate the contingent pumping systems. A "Head Difference" will be calculated by subtracting the water-level elevation at each monitoring point inside the Open Space Areas from the elevation at the nearest monitoring point on the opposite side of the adjacent SCB or sheet pile. The two points being compared constitute a "Piezometer Pair." In the event that the water level data is generated by automatic data loggers in Piezometer Pairs, the Head Difference determination will be calculated by using the arithmetic mean values over the monitoring period, or one month, whichever is shorter.

Following excavation of chromium-impacted soils in the SA-6 South deferred bulkhead area, Honeywell will backfill the excavated area between the bulkhead and the western SA-6 South hydraulic barrier wall with a permeability which is agreeable to the Parties and Special Master. The purpose of such material will be to minimize pore velocity of water flow adjacent to the western SA-6 South hydraulic barrier wall during tidal cycles. Honeywell will include specifications for the backfill material in the workplan for the deferred bulkhead area Chromium Remedy that

will be subject to the Special Master review and approval requirements of the SA-6 South Consent Decree. When water levels are monitored continuously, head differences between the interior and exterior piezometers across the hydraulic barrier wall in this area after remediation will be calculated using the arithmetic mean values over the monitoring period, or one month, whichever is shorter.

Whenever a calculated Head Difference falls below 0.5 ft, the frequency of manual water-level measurements at that Piezometer Pair (including downloading of the data from the automatic data loggers, if installed) will increase to monthly until the Head Difference exceeds 0.5 ft for three consecutive months. At inboard piezometers not adjacent to SA-7 where the head difference is less than 0.5 ft, Honeywell will sample groundwater quality quarterly until the head difference returns to greater than 0.5 ft. At all inboard piezometers adjacent to the piezometer where the head difference is less than 0.5 ft along the same hydraulic barrier wall, Honeywell will sample groundwater quality for two consecutive quarters or until the head difference returns to greater than 0.5 ft, whichever comes first. If groundwater quality at the adjacent piezometer is less than 70 µg/L in these two quarters, then no further sampling at this location is needed. If groundwater quality at the adjacent piezometer is greater than 70 µg/L, then sampling will continue until the Head Difference returns to greater than 0.5 ft.

A Head Difference less than 0.1 ft between SA-6 and SA-7 triggers operation of the pumping system in the affected Open Space Area. A Head Difference of 0.1 ft across any other side of an SA-6 Open Space Area triggers operation of its pumping system unless water quality sampling as described above demonstrates it to be unnecessary. Water quality sampling demonstrates pumping to be unnecessary only if all inboard piezometers with Head Differences of less than 0.1 ft and all adjacent inboard piezometers along the same sheet pile barrier wall contain less than 70 µg/L of dissolved (filtered) total chromium in the two most recent quarterly sampling rounds (or in an initial round if results of a second sampling round are not yet available). In lieu of sampling adjacent inboard piezometers, Honeywell may alternatively elect to operate the pumping system.

If the Head Difference remains below 0.5 ft and above 0.1 ft for 12 months, Honeywell may propose reduction of the head measurement frequency to quarterly and reduction of the water quality sampling frequency to annually. If a pumping system is in operation, Honeywell may propose less frequent or no water quality

sampling. These proposals are subject to review by the Parties and approval by the Special Master.

If 5 years of groundwater level monitoring demonstrate that there have been and will continue to be inward gradients across the SA-6 hydraulic barriers without the need for pumping, Honeywell may propose to further reduce the frequency of groundwater level monitoring. Such a proposal will be documented in a revision to the LTMP during the annual review and evaluation process as described in Section 1.1, be subject to review and approval by the Parties and Special Master, and comport with Consent Decree requirements or, if necessary, be submitted to the Court in a motion to amend the Consent Decree.

3.1.9 Groundwater Sampling

L-Well

Paragraph 72 of the SA-6 South Consent Decree specifies that one round of monitoring be conducted to evaluate whether the hexavalent chromium-contaminated groundwater in the plume diversion area (“L-Wells”), which is found in the middle and lower portions of the deep overburden, remains contained following implementation of the Chromium Remedy. In accordance with the L-Well Groundwater Monitoring Plan (L-Well GWMP) included in **Appendix D-3**, baseline groundwater sampling of the ten (10) L-Wells specified in the L-Well GWMP was conducted in May 2013 prior to initiation of the Chromium Remedy. Additionally, as indicated in the L-Well GWMP and subsequent communications between Honeywell and the Parties, construction activity constraints restricted the access for interim sampling of four of the ten L-Wells prior to the completion of the SA-6 South cap. The L-Well GWMP proposed that the groundwater samples from these locations be collected using a GeoProbe® (or another appropriate drilling method) before the start of cap construction. All Parties agreed to this interim sampling and methodology.

The interim sampling of the four L-Wells was conducted in June 2015 after surcharging of the cap area, but prior to the installation of the cap. The samples were analyzed for total and hexavalent chromium and major ion chemistry per the L-Well GWMP. The baseline and interim sampling results were submitted to the Parties on July 10, 2015. Honeywell implemented additional post-remediation L-Well sampling in June 2016 and March and April 2017. This post-remediation L-Well sampling is discussed further in Section 3.2.4.

SA-6 South Development AOC

In accordance with the Development AOC Shallow Groundwater Monitoring Plan (SGWMP) included as Appendix D of the SA-6 South 100% Design Report (Amec, June 2013), 12 monitoring wells were installed south of the SA-6 South Open Space AOC within the Development AOC to monitor groundwater quality (see **Figure 4B**). The first groundwater sampling event occurred in April 2016. To date, six quarters of groundwater samples have been collected in the SA-6 South Development AOC. The SGWMP for SA-6 South indicated that groundwater sampling would be conducted for a one-year period (4 rounds of monitoring), at which point, groundwater sample results and continuation of groundwater monitoring would be evaluated. Based upon detection of total chromium results of groundwater samples greater than 70 µg/L in unfiltered samples from several wells in the SA-6 South Development AOC during the first year of sampling, Honeywell elected to continue sampling for an additional four quarters. Once the results of the remaining quarterly groundwater sampling rounds are evaluated, Honeywell plans to present an amended RAR to NJDEP, proposing cessation of quarterly groundwater sampling and abandonment of the Development AOC shallow groundwater monitoring wells in accordance with N.J.A.C. 7:9D.

Samples will be collected via low-flow purging/sampling protocols per the FSPM and the Data Validation Report (Appendix H of SA-6 North 100% Design Report). The Riverkeeper and NJDEP will be notified prior to each sampling event. The samples will be analyzed for total and hexavalent chromium (filtered and unfiltered).

A report of these data will be submitted per the SA-6 South Consent Decree Paragraphs 70 and 86(c)(vii). The contingency plan in Section 3.2 will be implemented if the groundwater analytical results are above the NJDEP GWQS of 70 µg/L.

3.1.10 Gas Venting System & Vented Gases

Monthly monitoring of vented naturally-occurring methane from the SA-6 North and SA-6 South Open Space Areas is being conducted for the first year to evaluate whether methane gas levels are a concern. The methane monitoring form is included in **Appendix B-3**. Sample ports were installed in the gas vents. The size and location of the ports were based on the specific instruments selected for conducting the sampling. Monitoring events are scheduled based on barometric conditions. To the extent possible, the majority of events should be timed to collect

information at intervals during the low pressure barometric conditions, but not at the beginning of low pressure barometric conditions to avoid sampling atmospheric air that enters through the vents during high pressure.

The initial two events recorded conditions at all vents. The collected data was evaluated to select specific vents for on-going monitoring. At a minimum, one of the events recorded flow velocities at selected gas vents at intervals (minimum of 6 data points) over a full barometric cycle. Monitoring events included measuring the percentage of methane (with a multi-gas meter capable of detecting methane, oxygen, and carbon dioxide), barometric pressure, and velocity. The readings were recorded on the inspection form found in **Appendix B-3**.

The monthly inspections have commenced in January 2017. If the Parties and the Special Master agree that the system has been stable for a year, then Honeywell may propose to modify the monitoring frequency to quarterly consistent with the Consent Decree. Such a proposal by Honeywell would be subject to review and approval by the Parties and the Special Master. In the event of detections per the Health and Safety Plan (HASP), as indicated in Section 3.2.6, treatment of the gases by Honeywell may be implemented. The HASP will be maintained at the Site.

3.1.11 Sign Inspections

Pursuant to Paragraph 60(l) and Paragraph 74(l) of the SA-6 North and South Consent Decrees, respectively, Honeywell is required to install signs or displays that discuss the history of the chromium production, contamination, and remediation for visitors to the Open Space AOCs. In addition, in the Deed Notice Areas, Honeywell will install signs prohibiting digging and providing a telephone number to call prior to any digging. The signs and displays will be inspected by Honeywell during the regular quarterly visual inspections. When necessary, signs and displays shall be repaired and/or replaced.

Jersey City will post signs prohibiting through trucks, as required by OSDS Section 2.2.1, after the completion of construction of the roadways. Honeywell will work with the City of Jersey City to ensure that the appropriate signs are posted after the roadways are built. When necessary, the signs prohibiting through trucks shall be repaired and/or replaced by Jersey City.

The next annual update to this LTMP will include as an appendix a signage plan (developed in a separate submittal) which will include examples of the three types of signs required (i.e., Site History, Call Before Digging, and No Through Trucks) and a figure showing the locations of the signs.

Once Jersey City posts signs that include the prohibition on digging per Jersey City Code Ch. 239 in the Open Space Areas, those signs will be documented in the sign appendix to this LTMP.

3.1.12 Topographic Survey

A baseline topographic survey was performed at the completion of the Chrome Remedy as stipulated in Paragraph 64(a)(iv) and Paragraph 78(a)(iv) of the SA-6 North and South Consent Decrees. The baseline topographic survey is included in **Appendix A-2**. In addition, topographic surveys will be performed at five-year intervals following the baseline survey for up to 15 years post construction. Each topographic survey will be presented with 1-foot contours.

In the event that permanent changes to the topography occur during the 5-year periods between topographic surveys (for example, due to development or other activities that raise the elevation of the area), the next required topographic survey will replace the baseline survey in Appendix A-2. The permanent topography changes set forth in the updated baseline survey in Appendix A-2 will be the basis for evaluating whether there has been subsidence or settlement in subsequent years.

Additional topographic surveys may be performed on limited areas in the event that surveying is needed to confirm that corrective action activities were restored to the 100% Design. All future topographic surveys will be included in this LTMP as part of the annual review and update of the LTMP.

3.1.13 Soil Sampling at In-Situ Injection Areas

In-situ injections of calcium polysulfide designed to treat low-level hexavalent chromium-impacted soil have been performed at several areas at SA-6 North and SA-6 South in accordance with site-specific Work Plans for the in-situ injection programs.

Treatment Area 10-1 (“TA-10-1”) in SA-6 North, required an additional injection to treat one recalcitrant location. Following this additional injection, initial soil

sampling was conducted, which confirmed that hexavalent chromium concentrations in the soils in this area were below 20 mg/kg. (These results were shared with the Parties.) Final confirmation sampling of this area will take place in Spring 2018 pursuant to Honeywell's submittals, dated June 20, 2017 and September 6, 2017. Plaintiffs approved Honeywell's sampling plan via email on September 11, 2017.

Treatment Area 7 ("TA7") in SA-6 North, requires additional remediation. Results of soil sampling conducted three years after in-situ treatment indicated that one recalcitrant location within the shallow soils in TA-7 continues to exceed 20 mg/kg hexavalent chromium. Once JCMUA relocates the existing fuel island and aboveground storage tanks in this area, this isolated location of shallow soils that exceeds 20 mg/kg for hexavalent chromium in the TA-7 shallow soils will be excavated and disposed of offsite. In the meantime, Honeywell will deed notice this area (Deed Notice Area 10) until the excavation can occur. After excavation, the deed notice for the area will be terminated and the LTMP updated accordingly.

3.1.14 Other Inspections

An annual inspection of disturbance to visible utility lines and manhole covers within the SA-6 North and South Open Space Areas will be conducted by Honeywell. The inspection will include observations of any development, disturbance or utility repair work. When necessary, manhole covers will be repaired and/or replaced.

Inspection of road surface conditions by a licensed New Jersey Professional Engineer will be undertaken by Honeywell or the City of Jersey City at least once every five years to ensure roads remain in good repair and are maintained as required by OSDS Section 2.2.1.

Honeywell will provide notice to Jersey City of any damage observed during the quarterly visual inspections of the Open Space Areas, and, as necessary, Honeywell will inform Jersey City of the need to perform maintenance or repairs.

The contingency plan will be implemented by Honeywell or the City of Jersey City if inspection reveals evidence of deterioration of utility lines, manhole covers or road surfaces in the SA-6 North and SA-6 South Open Space Areas or the Deed Notice Areas. However, as provided in the Consent Decrees, Honeywell is responsible for repair and replacement of the Chromium Remedy as necessary.

3.2 CONTINGENCY PLAN

The contingency plan addresses requirements to provide for the continued integrity of the Chromium Remedy in the Open Space Areas and the surface cover and hardscape engineering controls (e.g., cement/asphalt/soil caps) in the Deed Notice Areas in the event of:

- (a) a planned penetration or disturbance of the Deed Notice Areas, Open Space Areas, underground barrier walls, or other planned activity that could compromise the integrity of the Chromium Remedy; or
- (b) an unplanned event or accident that causes a disturbance or penetration of the Deed Notice Areas, Open Space Areas, or remedial measures associated with the Chromium Remedy.

This Contingency Plan also addresses maintenance and repair due to field observations of degradation during inspections. Any disturbance of the Chromium Remedy may trigger corrective action pursuant to this Contingency Plan. Additional triggering events are described in Section 3.1 and summarized in **Table 2**.

In the event of disturbance, further evaluation or investigative measures will be undertaken to evaluate whether the integrity of the Chromium Remedy in the Open Space Areas or the Deed Notice Areas has been compromised, or whether the contingent groundwater system for water level maintenance has been disturbed. Based on the results of the evaluation, appropriate action will be taken in accordance with SA-6 North Consent Decree Paragraph 61 and SA-6 South Consent Decree Paragraph 75 to repair or replace the Chromium Remedy so as to conform to the 100% Design. The need for the operation of the groundwater pumping system will also be evaluated.

Corrective actions will be implemented to conform to the 100% Design or to a level of protection at least equivalent to the original Chromium Remedy. If Honeywell deems it necessary to restore to a standard different than those defined in the 100% Design, the proposed restoration plan will be submitted to the Parties and the Special Master for review and approval.

The Contingency Plan requires an annually updated plan to notify NJDEP, the Special Master and Parties, as specified in the SA-6 North and SA-6 South Consent

Decrees, of (a) any event penetrating or compromising the cap; or (b) compromising the integrity of the Chromium Remedy; and (c) the steps taken to identify the extent of the problem; and (d) the standards for remedying the problem. Refer to Section 3.2.1 below for details regarding notification and reporting for any event penetrating the cap or otherwise compromising the integrity of the Chromium Remedy. Annual plan updates, notification and reporting requirements are discussed in Section 4.0.

3.2.1 Chromium Remedy Disturbance

3.2.1.1 Notification

In accordance with SA-6 North Consent Decree Paragraph 64(c) and SA-6 South Consent Decree Paragraph 78(c), in the event of any planned or unplanned activity that penetrates the cap or otherwise compromises the integrity of the Chromium Remedy in the Open Space Areas or the Deed Notice Areas, Honeywell shall provide notice to the Special Master and Parties. In the event of planned events, Honeywell shall provide notice at least five business days in advance of any actions. In the event of unplanned or emergency events, Honeywell shall provide notice within 48 hours of learning of any unplanned or emergency event. **Figure 7** summarizes the notification and response actions required for planned or unplanned actions in flow chart format.

In accordance with proposed Deed Notice requirements of N.J.A.C. 7:26E-8, the site owner/operator will be required to provide notification to the NJDEP and Honeywell prior to any alteration, improvements, or disturbance of engineering controls, and to take steps so that all applicable worker health and safety laws and regulations are followed during the work. A Soil Remedial Action Permit modification is required prior to disturbance of engineering controls, except when certain conditions are met as set forth in Paragraph 7A of the Deed Notices. In the event of an emergency that necessitates disturbance to engineering controls, immediate notification to the NJDEP and then Honeywell is required by the person causing such disturbance (see Section 3.2.1.3 of this LTMP on unplanned or emergency cap disturbances for details). The Deed Notices contain specific details on notification and reporting requirements in the event of alterations, improvements or disturbances of engineering controls.

3.2.1.2 Planned Disturbance of Chromium Remedy or Deed Notice Areas

For any planned disturbances of the Open Space Areas, or planned disturbances in the Deed Notice Areas, all entities will notify Honeywell at least seven business days

prior to any planned disturbance of the Chromium Remedy and initiate completion of the Dig Permit Form. However, Dig Permits are not applicable to the Open Space Areas during Initial Development for the Open Space Areas when Honeywell's onsite construction management personnel will inspect and monitor activities at the Open Space Areas. Once Initial Development is completed and Honeywell's construction management personnel are no longer on site, Dig Permits will be necessary for the Open Space Areas.

Prior to performing subsurface work in the area of the existing engineering controls, parties conducting work are required to notify Honeywell to enable coordination of work; and establish requirements for worker protection, handling and disposal of chromium-impacted media (if applicable), and repair and restoration of the engineering controls. As indicated on the Dig Permit Form, mechanical digging is restricted within the Open Space Areas below the root barrier. Excavations that will penetrate the root barrier must be performed using hand/soft dig techniques or other method(s) approved by Honeywell for those soils below the root barrier. Honeywell has established a telephone notification and response system (referred to as the Chromium Response Hotline: **855-727-2658**) to notify Honeywell of any work activities in the Open Space Areas or Deed Notice Areas, planned or required on an emergency basis, that may disturb engineering controls or underlying chromium-impacted soil.

Pursuant to the Consent Decrees, Honeywell is responsible for the restoration of the Chromium Remedy. Upon conclusion of a disturbance, the engineering controls and any other impacted remedial measures must be restored by Honeywell and Honeywell must prepare and submit any required reports to the Special Master, the Parties, and the NJDEP.

In the Open Space Areas, any restoration of the Chromium Remedy, including the root barrier and the first 12 inches of cover soils above the root barrier, will be conducted by Honeywell and certified by a licensed New Jersey Professional Engineer to be in conformance with the 100% Design and OSDS. Where cover soils above the root barrier exceed 12 inches in thickness (as will be shown on **Figures 7 & 8** in the next version of this LTMP), any restoration of the cover soils between the ground surface and 12 inches above the root barrier may be conducted by Honeywell, or another entity and inspected by Honeywell, and verified to be in conformance with the 100% Design and OSDS, including the requirements of OSDS Section

2.1.1.D that the excavated soils were segregated by type (*i.e.*, Horizon A, B, or C) and that the last out/first in principle (*i.e.*, where the last soils excavated are the first soils returned to the excavation) was followed. Provided however that, until **Figures 7 & 8** are attached to a future version of this LTMP, any restoration of the Chromium Remedy will be conducted by Honeywell and certified by a licensed New Jersey Professional Engineer to be in conformance with the 100% Design and OSDS.

In the Deed Notice Areas, restoration of the surface cover or hardscape engineering controls may be conducted by Honeywell, or another entity and inspected by Honeywell, and certified by a licensed New Jersey Professional Engineer to be in conformance with the 100% Design.

Remedial measures must be restored to conform to the 100% Design or to a level of protection at least equivalent to the original Chromium Remedy. If Honeywell deems it necessary to restore to a standard different than those defined in the 100% Design, the proposed restoration plan will be submitted to the Parties and the Special Master for review and approval.

3.2.1.3 Unplanned or Emergency Disturbance of the Chromium Remedy or Deed Notice Areas

In the event of any inadvertent disturbance to the engineering controls or underlying soils by workers, Honeywell and/or the title owner of the Open Space Areas and/or Deed Notice Areas will advise workers to stop work, cover and secure the area using appropriate measures (e.g., plastic sheeting, traffic cones or barrier) and notify appropriate site management personnel. Further work will then be coordinated with Honeywell with respect to the management of chromium-contaminated materials and repair/restoration of engineering controls.

In the event of an emergency that involves disturbance of engineering controls in the Open Space Areas or Deed Notice Areas and/or presents the potential for exposure to workers or the public or environment to contaminated materials, the current owner and/or the party causing such disturbance shall provide notification to the NJDEP Hot Line (1-877-WARNDEP or 1-877-927-6337) upon discovery of such conditions. The Honeywell Remediation Manager must also be notified via the Chromium Response Hotline (**855-727-2658**) by the current owner and/or the party causing the disturbance upon discovery of such conditions (additional Honeywell contact is provided in Section 5). The Special Master and Parties must also be notified by

Honeywell within 48 hours of Honeywell receiving notice of the emergency disturbance.

Pursuant to the Consent Decrees, Honeywell is responsible for the restoration of the Chromium Remedy. Upon conclusion of the emergency, the engineering controls and any other impacted remedial measures must be restored by Honeywell and any required reports must be prepared and filed with the Special Master, the Parties, and NJDEP, by Honeywell and/or the owner/operator, as may be necessary for the particular emergency.

In the Open Space Areas, any restoration of the Chromium Remedy, including the root barrier and the first 12 inches of cover soils above the root barrier, will be conducted by Honeywell and certified by a licensed New Jersey Professional Engineer to be in conformance with the 100% Design and OSDS. Where cover soils above the root barrier exceed 12 inches in thickness (as will be shown on **Figures 7 & 8** in the next version of this LTMP), any restoration of the cover soils between the ground surface and 12 inches above the root barrier may be conducted by Honeywell, or another entity and inspected by Honeywell, and verified to be in conformance with the 100% Design and OSDS, including the requirements of OSDS Section 2.1.1.D that the excavated soils were segregated by type (*i.e.*, Horizon A, B, or C) and that the last out/first in principle (*i.e.*, where the last soils excavated are the first soils returned to the excavation) was followed. Provided however that, until **Figures 7 & 8** are attached to a future version of this LTMP, any restoration of the Chromium Remedy will be conducted by Honeywell and certified by a licensed New Jersey Professional Engineer to be in conformance with the 100% Design and OSDS.

In the Deed Notice Areas, restoration of the surface cover or hardscape engineering controls may be conducted by Honeywell, or another entity and inspected by Honeywell, and certified by a licensed New Jersey Professional Engineer to be in conformance with the 100% Design.

Remedial measures must be restored to conform to the 100% Design or to a level of protection at least equivalent to the original Chromium Remedy. If Honeywell deems it necessary to restore to a standard different than those defined in the 100% Design, the proposed restoration plan will be submitted to the Parties and the Special Master for review and approval.

Deed Notice requirements for emergency situations include taking measures to limit the disturbance of engineering controls and minimizing the time of such disturbance as needed to respond to the emergency; taking measures to limit the risk of exposure of persons and the environment to contaminants; restoring the engineering control to pre-emergency conditions as soon as possible; and submittal of a Deed Notice Disturbance Report to the NJDEP within 60 days after completion of the restoration of the engineering control (refer to the Deed Notice for specific requirements for emergency situations). The Deed Notice Disturbance Report will be submitted to the Special Master and Parties concurrent with submission to NJDEP.

3.2.1.4 Post-Work Documentation

Following completion of work involving the planned or unplanned disturbance and restoration of the Chromium Remedy in the Open Space Areas (e.g., engineering controls or cap materials) and surface cover or hardscape engineering controls (e.g., cement/asphalt/soil caps) in the Deed Notice Areas, Honeywell, and/or their contractor/engineer will document that the work was completed in compliance with the Consent Decrees and OSDS for the Open Space Areas and in conformance with the Deed Notice requirements in the Deed Notice Areas, and a licensed New Jersey Professional Engineer will certify that remedial measures were restored in conformance with the 100% Design to a level of protection at least equivalent to the original Chromium Remedy, as applicable and approved by Parties and the Special Master.

Within 60 days of completion of the restoration, Honeywell will provide a report documenting restoration completion in conformance with the 100% Design to the Special Master and the Parties. If the disturbance or restoration extends beyond 60 days, Honeywell will submit monthly notices documenting the status and progress of the disturbance and restoration work, and include a look-ahead schedule for the restoration work. The final documentation will also be filed with NJDEP as required by the Deed Notice.

3.2.1.5 Coordination of Work Between Honeywell and Other Parties

Various parties may perform subsurface work at the Open Space Areas and in the Deed Notice Areas. These parties may include private developers, Jersey City entities, PSE&G, Comcast, Verizon, NJDOT and/or other utilities and their contractors. Honeywell will undertake reasonable efforts to work with such parties to make them aware of the Chromium Remedy, specifically, the cap components in

the Open Space Areas, the underground barrier walls, the groundwater remedy engineering controls, and the hexavalent chromium contamination present under the surface cover or hardscape engineering controls (e.g., cement/asphalt/soil caps) in the Deed Notice Areas. In consultation with the City of Jersey City, Honeywell will develop the worker training materials required by paragraph 64(d) of the SA-6 North Consent Decree and paragraph 78(d) of the SA-6 South Consent Decree. The worker training materials will address the chromium contamination, protection of the Chromium Remedy, as well as safe procedures in the vicinity of the methane gas vents in the Open Space Areas. Honeywell will append worker training materials to this LTMP once the materials are approved by the City of Jersey City. The Parties anticipate that the worker training materials will be attached to the 2018 update to this LTMP. All such approved worker training materials will be made available to such other parties intending to work in the Open Space Areas or the Deed Notice Areas.

Currently, Honeywell provides annual notification letters to utilities and other entities in accordance with the Consent Decrees; these notification letters include information on site conditions in the Open Space Areas and in the Deed Notice Areas, remedial measures, engineering and institutional controls, and instructions for contacting Honeywell prior to performing ground-disturbing work at the sites. Honeywell may also receive notification of work by other parties through the Terradex LandWatch system or the Chromium Response Hotline.

For emergency situations including ground-disturbing activities where subsurface work needs to be done within a short timeframe before a determination can be made on whether or not the work is in an area of chromium-impacted soils, the entity conducting the work should assume work is being conducted in chromium-impacted soils and should only proceed with work using properly trained contractors (i.e., OSHA 40-hour HAZWOPER training) until such time that Honeywell can respond and review the location and nature of the emergency work with the contractor. Honeywell will provide technical assistance and field support (to be determined in cooperation with the party conducting the work). Once Honeywell reviews the work with the party and determines that the location and nature of the emergency work does not correspond to impacted soils, a reduction in such conservative and protective measures may be warranted.

For non-emergency work in the Open Space Areas, there are two distinct procedures that Honeywell will follow for coordination and inspection of subsurface activities, dependent upon whether these activities occur prior to or after completion of the Initial Development in the Open Space Area to be performed in accordance with the Initial Development Plan. The steps outlined in 3.2.1.5.1 will be followed in the Open Space Areas during the period of initial construction while Honeywell maintains full-time inspector(s) at the Site. Full-time on-site inspector(s) will be available throughout all construction activities for the future development up until such time as the Open Space Areas hardscaping/landscaping/roadways are constructed in accordance with the approved Initial Development Plan. The steps outlined in 3.2.1.5.2 will be followed in the Open Space Areas post-construction of the Initial Development Plan, when full-time inspector(s) will no longer be maintained by Honeywell at the Site.

For non-emergency work in the Deed Notice Areas, the steps outlined in 3.2.1.5.1 and 3.2.1.5.2 will be followed in conjunction with one another immediately after completion of the Chromium Remedy.

3.2.1.5.1 Honeywell's Onsite Inspector is Present to Oversee Work in the Open Space Areas and Deed Notice Areas During Initial Development of Open Space Areas

The following steps summarize procedures for communication and coordination of work between Honeywell and other entities and/or their contractors for performing subsurface work in the Open Space Areas or Deed Notice Areas on SA-6 North, SA-6 South, and SA-7 during Initial Development in the Open Space Areas:

1. During workdays, the on-site inspector inquires with the utility, developer and/or their contractors regarding planned subsurface work activities. All on-site entities performing work in the Open Space or Deed Notice Areas will be informed that they must notify and confer with the on-site inspector prior to beginning any subsurface work.
2. The inspector will provide background information to the supervisor on the nature of the Chromium Remedy in the Open Space Area(s) (e.g. engineering controls) or Deed Notice Area conditions prior to conveying Honeywell approval to proceed with the subsurface work/soil disturbance. Honeywell

- shall only approve work that is consistent with and meets the requirements of the Consent Decrees and the OSDS (where applicable).
3. Depending upon the extent of the planned activity, Honeywell or its inspector may request a follow-up meeting and/or that additional details of the scope be submitted before providing its approval to proceed.
 4. Honeywell coordinates with the party as needed for performance of field work including the use of qualified contractors for excavation of chromium-contaminated materials and disposal at a facility licensed to accept such materials, on-site observation by a licensed New Jersey Professional Engineer of any excavation and work within one foot of the root barrier in the Open Space Areas, backfilling, and site restoration including repair/replacement of engineering controls. Honeywell makes available to the party the worker training materials referenced above in Section 3.2.1.5. Work coordination will also include arrangements as needed between the Parties to observe or inspect cap repairs and site restoration work. Honeywell (or its designated contractor) will observe any planned disturbance of the Chromium Remedy in the Open Space Areas or Deed Notice Areas. Honeywell (or its designated contractor) will provide technical assistance and field support as needed for documentation and reporting requirements and make arrangements for disposal of chromium contaminated materials. Honeywell will be responsible for all repairs to the Chromium Remedy as set forth in Sections 3.2.1.2 and 3.2.1.3.
 5. Honeywell includes a summary of the construction work in its reports to the Special Master and the Parties, which includes the work conducted and the restoration of engineering controls.
 6. Honeywell and/or title owner prepares and submits a Deed Notice Disturbance Report/Post Work Documentation Report in accordance with requirements in the recorded deed notices, the reporting requirements of this LTMP and/or the requirements specified in the Consent Decrees.

3.2.1.5.2 For all Subsurface Work in the Deed Notice Areas, the Dig Permit Requirement Applies

The Dig Permit (see **Appendix B-2**) is required in the Deed Notice Areas as soon as this LTMP becomes applicable for any work with the potential to disturb the Chromium Remedy engineering controls.

3.2.1.5.3 After the Term of Honeywell's Onsite Inspector Ends, the Dig Permit Requirement Applies to Subsurface Work in the Open Space Areas

After the completion of the Initial Development of the Open Space Areas, the Dig Permit (see **Appendix B-2**) is required in the Open Space Areas: (1) for any mechanical excavation that will reach a depth of 12 inches or more from the ground surface at any location in the Open Space Areas; and (2) for any hand excavation in the Open Space Areas deeper than 12 inches from the ground surface that, based on the location of the planned digging in the zones set forth in **Figures 7 & 8**^{7,8}, requires the Dig Permit.

3.2.1.5.4 Procedures for Use of the Dig Permit

The following steps summarize procedures for communication and coordination of work between Honeywell and other parties and/or their contractors for performing subsurface work on SA-6 North, SA-6 South, and SA-7 when the Dig Permit is required:

1. Other party notifies Honeywell regarding work project (e.g., utility repair) or Honeywell is notified of work through the Terradex LandWatch system.
2. Any proposed excavation in the Open Space Areas or a Deed Notice Area will trigger review and oversight by Honeywell. Honeywell shall review all proposed subsurface work to determine if it will disturb the Chromium Remedy.
3. After Honeywell has received notification of planned work, Honeywell will initiate telephone contact with third party contractors and follow-up with electronic mail notification within 24 hours advising the contractor of the

⁷ A Dig Permit is required for all hand digging to a depth of 12 inches or more from ground surface that is also within 12 inches of the root barrier. Figures 7 & 8 will provide zones based on the depth of fill to the root barrier across the Open Space Areas, which must be referenced by workers in the field to determine when a Dig Permit is required for hand digging operations.

⁸ Figures 7 and 8 will be incorporated into this LTMP in the first annual update in 2019. Until Figures 7 and 8 are incorporated into this LTMP, all digging or other intrusive work, regardless of depth, location or scope, shall be subject to the oversight requirements of Section 3.2.1.2 of this LTMP.

- nature of the Chromium Remedy (e.g., engineering controls) or Deed Notice Area conditions, and the need for approval from Honeywell before proceeding with the soil disturbance.
4. Honeywell will communicate with the party intending to work in an Open Space Area or in a Deed Notice Area by electronic mail communication. The electronic mail communication will include a copy of the annual utility notification letter. Honeywell will copy the Special Master and the Parties on the electronic mail communication to parties intending to work in the OpenSpace Areas or Deed Notice Areas. If a Dig Permit is required for the proposed activity, as set forth in Sections 3.2.1.5.2 and 3.2.1.5.3, and is completed prior to the electronic mail communication, it will be attached to the electronic mail communication to the Special Master and the Parties. If a Dig Permit is required for the proposed activity, but is not completed prior to the electronic mail communication, it will be submitted to the Special Master and the Parties once it has been completed.

Depending on the scope and location of the proposed work, the electronic mail notifications shall state:

For work within the Deed Notice Areas

“NOTICE: Confirming our telephone conversation and based on the information provided, you have proposed actions that may disturb a federal court ordered remedy at a chromium contaminated site for which Honeywell is responsible. We request an on-site meeting with a representative of your firm to review the specific scope and location of the proposed work prior to any disturbance. If your proposed actions are found to be within areas known as the Deed Notice Areas, and will disturb the Chromium Remedy engineering controls, we will review work controls and safety measures appropriate for work in this area, including completing a Dig Permit Form. All areas of chromium-impacted soils have a Deed Notice placed upon them that must be complied with. If your proposed actions are found to be within a deed noticed area, the Deed Notice will be provided to you.”

Or

For work within the Open Space Areas

“NOTICE: Confirming our telephone conversation and based on the information provided, you have proposed actions that may disturb a federal court ordered remedy at a chromium contaminated site for which Honeywell is responsible. We request an on-site meeting with a representative of your firm to review the specific scope and location of the proposed work prior to any disturbance. All areas of chromium-impacted soils have a Deed Notice placed upon them that must be complied with. If your proposed actions are found to be within areas of known chromium-impacted soils, the Deed Notice will be provided to you. In addition, Honeywell has prepared Open Space Design Standards to address all work in specific areas referred to as the Open Space Areas. If your proposed actions are found to be within the Open Space Areas, the Open Space Design Standards will be provided to you and must be followed. If your proposed actions are found to be within the Open Space Areas, and will cause a disturbance of soils at a depth of 12 inches or more from ground surface that is also within 12 inches of the root barrier, we will review work controls and safety measures appropriate for work in this area, including completing a Dig Permit Form.”

Or

“NOTICE: Confirming our telephone conversation and based on the information provided, the planned intrusive work is outside of the areas of known chromium-impacted soils. We do not require any additional coordination with Honeywell for this work.”

5. Honeywell determines whether the proposed work location is within an Open Space Area or a Deed Notice Area and provides confirmation to the party as described above. For work in the Open Space Areas that requires a Dig permit as set forth in Section 3.2.1.5.3, Honeywell, in consultation with the party performing work, completes the Dig Permit (see **Appendix B-2**). For work in the Deed Notice Areas that requires a Dig permit as set forth in Section 3.2.1.5.2, Honeywell, in consultation with the party performing the work, completes the Dig Permit (Appendix B-2). If the work location is confirmed to be in an Open Space Area or a Deed Notice Area, then Honeywell coordinates with the party regarding response and fieldwork activities and notifies the Parties and Special Master at least five working days prior to start of field activities. If Honeywell determines that the

proposed work is not in an Open Space Area or a Deed Notice Area, then the party would proceed with work without further coordination with Honeywell.

Note: Excavation within the Open Space Areas must comply with all requirements of the OSDS Section 2.1, including submission of Intrusive Excavation Plans and performance of any excavation work below the root barrier by hand/soft dig techniques or other method approved by Honeywell for those soils below the root barrier.

6. Honeywell provides notice to the Special Master and the Parties regarding the work and schedule for any planned activity involving disturbance and restoration of engineering controls.
7. Honeywell provides notification to the NJDEP, as required in accordance with Deed Notice requirements for disturbance of engineering controls (refer to the Deed Notice section of Section 2.1.3 for notification requirements).
8. Honeywell coordinates with the party as needed for performance of field work including the use of qualified contractors for excavation of chromium-contaminated materials and disposal at a facility licensed to accept such materials, on-site observation by a licensed New Jersey Professional Engineer of any excavation and work within one foot of the root barrier in the Open Space Areas, backfilling, and site restoration including repair/replacement of engineering controls. Honeywell makes available to the party the worker training materials referenced above in Section 3.2.1.5. Work coordination will also include arrangements as needed between the Parties to observe or inspect cap repairs and site restoration work. Honeywell (or its designated contractor) will observe any planned disturbance of the Chromium Remedy in the Open Space Areas or Deed Notice Areas. Honeywell (or its designated contractor) will provide technical assistance and field support as needed for documentation and reporting requirements and make arrangements for disposal of chromium-contaminated materials. Honeywell will be responsible for all repairs to the Chromium Remedy as set forth in Sections 3.2.1.2 and 3.2.1.3.
9. Following the completion of work in an Open Space Area or a Deed Notice Area, Honeywell prepares an updated chromium soils map to be included as part of the next annual update to this LTMP. Such maps will be attached to the Deed Notice (as part of the biennial certification process), the Deed Notice

Disturbance Report/Post Work Documentation Report and included with the annual notifications to stakeholders.

10. Honeywell and/or title owner prepares and submits a Deed Notice Disturbance Report/Post Work Documentation Report in accordance with requirements in the recorded deed notices (within sixty (60) calendar days after the end of each alteration, improvement, or disturbance), the reporting requirements of this LTMP and/or the requirements specified in the Consent Decrees.

3.2.2 Vegetative Cover Degradation and Differential Settlement

Vegetative cover degradation and the need for replacement of vegetation will be determined based on field observations from the quarterly monitoring program and professional judgment regarding the potential for adverse impact to the underlying Chromium Remedy. Disturbances in the vegetative cover such as soil erosion, settlement, or missing vegetation will be promptly corrected by either re-grading, repairing or replacement of vegetation, and if appropriate, the restoration of the area to its original grade set forth in the 100% Design. Additional topsoil will be added along with planting of new grass or other vegetation to repair the erosion or settlement in the vegetative cover areas.

If settlement of three inches or more has occurred in any area within the Open Space Areas, within 30 days of discovery, it will be evaluated by a licensed New Jersey Professional Engineer to determine if it may impair the integrity or effectiveness of the Chromium Remedy. If settlement is determined to impair the integrity or effectiveness of the Chromium Remedy, within 30 days, Honeywell will propose corrective actions to prevent future settlement and to repair or replace the impaired Chromium Remedy. If settlement in excess of 3 inches is observed adjacent to structures in the landscaped areas, and it is determined that such settlement does not impair the integrity or effectiveness of the Chromium Remedy, the areas will be backfilled to restore the grades in accordance with the 100% Design grades.

If field conditions or weather do not permit prompt repairs of vegetative cover, appropriate interim measures will be taken (e.g., geotextile mesh, silt fence or straw bales) so that the affected area is adequately protected until site conditions allow for the implementation of the appropriate corrective actions.

Burrowing animals present a potential problem for maintaining the integrity of the Chromium Remedy and engineering controls, even in an urban environment. Once a burrow has been located, the inhabiting animal(s) will be humanely removed to prevent further damage. If necessary, local animal control experts will be consulted for recommended control or removal methods. After the animal has been removed, the burrow will be inspected to determine the integrity of the underlying Chromium Remedy. Areas exhibiting evidence of damage will be repaired by removing sufficient area of the soil cover to repair the damaged section. Following repairs, the soil will be replaced in accordance with the original condition and will be seeded.

If field observations during the monitoring program indicate that tree roots are causing damage to roadways, the tree or vegetation causing the damage will be promptly removed and the pavement repaired as soon as practicable and in a manner which avoids interference with regular operations.

3.2.3 Contingent Groundwater Extraction System

If the trigger conditions specified in Section 3.1.8 are satisfied in an Open Space Area, Honeywell shall expeditiously activate the Area's contingent groundwater extraction system. The system shall be operated to maintain head differences of 0.5 ft or greater at all piezometer pairs in the Open Space Area. Water levels shall be monitored monthly in all piezometer pairs for six months or until the head difference of 0.5 ft is attained, whichever is longer.

When either groundwater extraction system at SA-6 North or SA-6 South is in operation, flow to the treatment facility will be monitored weekly, including total gallons pumped.

Honeywell may propose to deactivate a groundwater extraction system based on either (a) correction of hydraulic conditions outside the Open Space Areas that created an outward gradient, or (b) for piezometers not adjacent to SA-7, two consecutive quarterly rounds of groundwater sampling that show less than 70 µg/L of dissolved (filtered) total chromium in the relevant previously contaminated piezometers. The proposal to deactivate shall be subject to review by the Parties and approval by the Special Master. The monitoring requirements of Section 3.1.8 apply following deactivation of a pumping system. In addition, if the deactivation is due to correction of hydraulic conditions, water levels shall be monitored monthly in

the piezometer pairs where an inward gradient had been absent earlier for one year or until water levels stabilize, whichever is longer.

3.2.4 SA-6 South L-Well Monitoring

Baseline samples of the prescribed L-Wells were collected in May 2013 in accordance with the L-Well GWMP (see **Appendix D-3**). Additionally, in June 2016 and March and April 2017, Honeywell completed the post-remediation round of L-Well sampling in accordance with Paragraph 72 of the SA-6 South Consent Decree. Honeywell submitted the results to all Parties in correspondence dated April 26, 2017.

The post-remediation round results were compared to baseline sampling results to determine whether or not a “substantial change” in major ion chemistry has occurred or whether the L-Well plume is migrating. Based upon comparison of the baseline and post-remediation data, the April 26, 2017 submittal indicated that the plume does seem to be migrating and recommended additional delineation sampling.

In June 2017, in-situ grab groundwater samples were collected using a GeoProbe drill rig at four locations downgradient of L-Well 124-MW-106T, where previous samples collected in 2016 and 2017 indicated total chromium results greater than the NJDEP GWQS of 70 µg/L. The results were presented in a technical memorandum submittal to all Parties from Honeywell dated July 27, 2017. All sample results were less than 70 µg/L for total chromium and non-detect for hexavalent chromium in all in-situ grab sample locations. Based on these sample results, Honeywell recommended, and the Parties and Special Master agreed, that no further remediation of the L-Well groundwater was required.

3.2.5 SA-6 South Development AOC

In accordance with the SA-6 South Development AOC SGWMP, and detailed in Section 3.1.9, if groundwater sampling shows that total chromium in shallow groundwater in the SA-6 South Development AOC is above the NJDEP GWQS of 70 µg/L for dissolved (filtered) total chromium, an evaluation of remedial measures will be submitted to the Special Master and the SA-6 South Consent Decree Parties. This evaluation could include additional groundwater sampling, delineation, or remedial measures to capture or treat shallow groundwater with dissolved (filtered) total chromium above 70 µg/L.

Following completion of each quarterly sampling event, Honeywell shall provide the

data to the Special Master and Parties. Honeywell shall include these monitoring results in the annual IGWMP for the year in which the data was collected. To date, six quarters of groundwater samples have been collected in the SA-6 South Development AOC. The SGWMP indicated that groundwater sampling would be conducted for a one-year period (4 rounds of monitoring), at which point, groundwater sample results and continuation of groundwater monitoring would be evaluated. Based upon detection of total chromium results of groundwater samples greater than 70 µg/L in unfiltered samples from several wells in the SA-6 South Development AOC during the first year of sampling, Honeywell elected to continue sampling for an additional four quarters. Once the results of the remaining quarterly groundwater sampling rounds are evaluated, Honeywell plans to present an amended RAR to NJDEP proposing cessation of quarterly groundwater sampling and abandonment of the Development AOC shallow groundwater monitoring wells in accordance with N.J.A.C. 7:9D.

3.2.6 Methane Monitoring

As reported in the Methane Investigation Report (Appendix M of the SA-6 North 100% Design Report), instantaneous vadose zone methane concentrations were as high as 20% (by volume) at SA-6 North and 17% at SA-6 South. Further, the Methane Investigation Report indicated that the proposed capping system will limit the aerobic oxidation of methane which is currently estimated by stable isotope tracing to be on the order of 25% of current emissions. Therefore, after the caps are installed, emissions are expected to be greater than the levels measured during the preparation of the 100% Design as presented in the Methane Investigation Report prior to cap installation.

A methane venting system is part of the capping systems in the Open Space Areas (see **Figure 3**). In accordance with SA-6 North Consent Decree Paragraph 64(a)(ix) and SA-6 South Consent Decree Paragraph 71(a)(ix), methane levels will be monitored monthly with a combustible gas indicator (CGI) for the first year to document whether levels reach 10% of the lower explosive limit (LEL) per the HASP. Treatment and/or additional monitoring of the methane gas will be evaluated if 10% LEL (5,000 parts per million [0.5%]) is measured during the monitoring event.

As set forth in Section 3.1.10, if the monthly monitoring indicates stable readings (i.e., below 10% LEL) over a year, then Honeywell may propose to modify the

monitoring frequency to quarterly consistent with the Consent Decree. Any such proposal by Honeywell will be subject to review and approval by the parties and the Special Master. Since the Methane Investigation Report indicated that methane may increase during lower atmospheric pressure weather patterns, the monthly monitoring will be conducted during lower pressure time periods, but not at the beginning of low pressure conditions, to the extent possible.

3.2.7 Routine Maintenance and Repairs

Per SA-6 North Consent Decree Paragraph 64(d) and SA-6 South Consent Decree Paragraph 78(d), maintenance of the vegetative cover will include mowing and removal of vegetation that could potentially damage the Chromium Remedy and/or that is inconsistent with the requirements of the OSDS Section 2.2.9.

The title owner of the Open Space Areas (currently Bayfront and in the future the City of Jersey City), in cooperation with Honeywell, will train their maintenance workers to conduct routine maintenance per SA-6 North Consent Decree Paragraph 64(d) and SA-6 South Consent Decree Paragraph 78(d) in methods that will not jeopardize the Chromium Remedy. At the title owner's request, Honeywell will provide initial and annual refresher training to the title owner's maintenance workers. The training will include identifying prohibited uses or features in the Open Space Areas.

In accordance with paragraph 64(d) of the SA-6 North Consent Decree and paragraph 78(d) of the SA-6 South Consent Decree, Honeywell will develop and provide training materials to the City of Jersey City and the Developer of the Open Space Areas and Deed Notice Areas. Honeywell will work with the City of Jersey City and the Developer as appropriate to develop the worker training materials to be used to train maintenance workers coming onsite. The worker training materials will be developed and attached to this LTMP prior to the title owner taking over maintenance responsibilities. The training materials will be reviewed by Honeywell for applicability on an annual basis and updated if necessary, and the LTMP appendix will be updated accordingly.

The title owner will provide annual reports that only trained workers were utilized in the Open Space Areas and Deed Notice Area 3 area (Site 163 deed notice area) and include proof of the type of training of workers to the Parties and the Special Master. The title owner will also annually provide notice of any violations of the

restrictions in the Consent Decrees and the OSDS on the use of the Open Space Areas and Deed Notice Area 3 area found during routine maintenance. The title owner of the Open Space Areas and Deed Notice Area 3 area will establish procedures for training maintenance workers, and will provide that only those properly trained workers are performing maintenance activities. In the event that Honeywell and the title owner decide that any long term monitoring activities can be conducted in coordination with routine maintenance activities, such monitoring activities will be subject to Honeywell oversight, will be performed by workers properly trained, and will be reported by Honeywell in quarterly and annual reports.

Replacement or repairs of the historic displays in the Open Space Areas and “Call Before Digging” signage in the Deed Notice Areas will be conducted by Honeywell as necessary so that they remain in a readable condition.

Replacement or repairs of the “No Thru Trucks” signage will be conducted by Jersey City as necessary so that they remain in a readable condition.

Repair or replacement of roads, manhole covers, and utility lines will be conducted by Honeywell or the City of Jersey City as necessary in conformance with the OSDS.

4.0 REPORTING

This section provides requirements for reporting and periodic plan updates. **Table 3** provides a timetable of the LTMP inspection/monitoring requirements. **Table 4** summarizes reporting requirements.

4.1 QUARTERLY AND ANNUAL REPORTING

Honeywell will maintain written logs and/or other records to document monitoring and remediation activities undertaken as part of this LTMP. Monitoring and remediation activities will be documented in writing, utilizing industry standard methods (such as bound field books). Copies of records, including groundwater data, will be provided to the Parties, quarterly and/or annually, as required in Paragraphs 64 and 65 of the SA-6 North Consent Decree and Paragraphs 78 and 79 of the SA-6 South Consent Decree. A report of all groundwater data for the Development AOC will be submitted annually per the SA-6 South Consent Decree Paragraphs 70 and 86(c)(vii). Honeywell shall maintain written records of any additional monitoring undertaken in response to changes in site conditions and such monitoring and the results shall be promptly reported to the Special Master and the Parties and, insofar as they concern groundwater, shall also be included in the IGWMR for each year samples are collected or field measurements made.

The Deed Notices for SA-6 North and SA-6 South are anticipated to be recorded by the third quarter of 2017. The implementation of the LTMP, including quarterly and annual inspections of the Open Space Areas and Deed Notice Areas, is scheduled to begin in the 1st Quarter 2017 for SA-6 South and in the 2nd Quarter 2017 for SA-6 North in compliance with the requirements of the SA-6 South and North Consent Decrees. Quarterly and annual inspections will be recorded on inspection log forms (example form provided in **Appendix B-1**) and submitted to the Special Master and Parties on a quarterly basis. Honeywell anticipates that copies of inspection logs/records will be provided on or about the 1st Quarter 2017 and quarterly thereafter. Inspection logs will include copies of all Dig Permits, Intrusive Excavation Plans, Deed Notice Disturbance Reports, and Post Work Documentation Reports for the period.

Reporting of groundwater monitoring results is performed on an annual basis as part of the Integrated Annual Groundwater Performance Reports for Study Areas 5,

6 and 7 by Honeywell (currently prepared for Honeywell by Cornerstone); the most recent report was submitted in the 3rd Quarter 2017. It is anticipated that future reports will also include Remedial Action Protectiveness Biennial Certification Reports for SA-6 South Shallow Groundwater, following NJDEP issuance of a Remedial Action Permit for Shallow Groundwater.

4.2 BIENNIAL CERTIFICATION REPORTS

Per N.J.A.C. 7:26E-8 Remedial Action Protectiveness Biennial Certification Reports for soils and shallow groundwater as part of the Deed Notice and/or CEA requirements will be prepared with the first submittal by August 31, 2018 summarizing the observations of the quarterly and annual inspections and documenting any changes or alteration to the engineering controls. The NJDEP reporting form(s) required by the TRSR will be used for this Report. The current form is included in **Appendix C**.

As required by the TRSR, the report will compare New Jersey laws, remediation standards, and other regulations applicable at the time the engineering or institutional controls were established with any relevant subsequently promulgated or modified laws, regulations or remediation standards to determine whether any changes in applicable laws, regulations, or remediation standards have occurred; and whether the institutional controls comply with the requirements of any new laws and regulations. The report will also assess whether the remedy is functioning as intended, whether the exposure assumptions and remedial action objectives used at the time of the remedy selection are still valid, and whether any other information has come to light that requires a reassessment of the protectiveness of the remedy. If necessary, any such decision points will be documented in the appropriate attachments of the NJDEP forms.

Copies of the Biennial Certification Report will be provided to Parties mandated by the TRSR and Paragraphs 60 of the North Consent Decree and Paragraph 74 of the South Consent Decree as follows:

- Office of the Jersey City Clerk
- Hudson County Clerk
- Jersey City Dept. of Health & Human Services
- Hudson Regional Health Commission

- Owner of Property indicated on the Deed Notices
- Current Property Owner/Operator of all portions of SA-6 North and SA-6 South
- Riverkeeper
- NJDEP
- Special Master.

4.3 CHROMIUM REMEDY DISTURBANCE REPORTS

Following completion of work involving the disturbance and restoration of the Chromium Remedy (e.g., engineering controls or cap materials) in the Open Space Areas or Deed Notice Areas, Honeywell will provide documentation of the completed work, and certification by a licensed New Jersey Professional Engineer, that the work was completed in compliance with the SA-6 North or South Consent Decrees and OSDS, and that remedial measures were restored in conformance with the 100% Design or to a level of protection at least equivalent to the original Chromium Remedy. Post-work documentation will be addressed either as part of the Report of Deed Notice Disturbance to the NJDEP when such a report is required, or in the Post Work Documentation Report pursuant to Section 3.2.1 if the Report of Deed Notice Disturbance is not required. A copy of the Report of Deed Notice Disturbance will be provided to the Special Master and Parties concurrent with submittal to the NJDEP. The Report of Deed Notice Disturbance/Post Work Documentation Report shall be completed and submitted within 60 days of restoration of the Chromium Remedy. If the disturbance or restoration extends beyond 60 days of the initial disturbance, Honeywell will provide a monthly notice documenting the status and progress of the disturbance and restoration work, and include a look-ahead schedule for the restoration work.

Based upon the completed work to restore the Chromium Remedy, Honeywell shall make updates, if necessary, to the 100% Design Record Drawings.

4.4 MONITORING PLAN UPDATE AND PROCEDURES FOR CHANGES

In accordance with Paragraph 64(b) of the SA-6 North Consent Decree and Paragraph 78(b) of the SA-6 South Consent Decree, the LTMP will be reviewed annually and updated as needed based on changes to field conditions, regulatory requirements, and/or other relevant project documents for the AOCs. The process for making changes to the LTMP is described below.

In accordance with Paragraphs 64 of the SA-6 North Consent Decree and 78 of the SA-6 South Consent Decree, any Party to the Consent Decree may propose changes to the scope of monitoring activities in the LTMP. If the Parties agree to proposed changes, then the LTMP will be revised to incorporate the agreed upon changes, subject to approval by the NJDEP and Special Master or by the Court. If the Parties are unable to reach agreement, the Party proposing the change may submit the dispute to the court for resolution. Changes to the LTMP that concern groundwater monitoring shall be incorporated into the SAP.

4.5 CONTINGENCY PLAN AND NOTIFICATION PLAN

In accordance with Paragraphs 64, 66 and 68 of the SA-6 North Consent Decree, and Paragraphs 78, 80 and 82 of the SA-6 South Consent Decree, Contingency Plan requirements include a plan to notify relevant parties (NJDEP, Special Master, and Parties) of any event penetrating or disturbing the Deed Notice Areas, Open Space Areas, or underground barrier walls, or harming the integrity of the Chromium Remedy; the steps taken to identify the problem; and the standards for remedying the problem. The Notification Plan is set forth in Section 3.2.1 of this LTMP. This plan shall be updated annually.

4.6 NOTICE TO STAKEHOLDERS

In accordance with Paragraphs 66 and 68 of the SA-6 North Consent Decree, and Paragraphs 80 and 82 of the SA-6 South Consent Decree, stakeholders (including owners and tenants) shall be notified regarding conditions and activities affecting the Sites as follows. Stakeholders include all owners, residents, lessees, and commercial tenants.

- Annual summary notice of the Chromium Remedy that is made available on any Honeywell developed website (current website: <http://www.jerseycitychromiumcleanup.com>) to inform the public of contamination at Study Area 5, Study Area 6 North and Study Area 6 South. This notice will include a description of long term monitoring and additional remediation activities undertaken at each AOC. This annual update is required upon completion of the annual long-term monitoring requirements.

- Written notice at the purchase or lease to the tenants occupying SA-6 or SA-7 describing the long term monitoring or maintenance activities undertaken or planned with respect to the Chromium Remedy.
- Annual notice to all stakeholders describing the long term monitoring and additional remediation activities undertaken and planned with respect to the Chromium Remedy. This notice shall include language that stakeholders report activities seen that may jeopardize the integrity of the engineering controls.

In accordance with Paragraph 67 of the SA-6 North Consent Decree and Paragraph 81 of the SA-6 South Consent Decree, Honeywell will provide annually a letter to the Riverkeeper and Jersey City documenting compliance with the above notification requirements. The annual notice letter sent in or around April each year to Riverkeeper and Jersey City will also include:

- Notifications received through the Terradex system of entities, including utilities, seeking to engage in subsurface activities at the sites (see Section 2.1.3).
- Notice describing an owner/operator or Honeywell-planned or emergency excavation and safety measures implemented to protect individuals near the Sites.

4.7 ANNUAL REPORT BY TITLE OWNER

The title owner shall annually provide to the Special Master and Parties a Training Report describing the training that has been provided to maintenance and other workers who will be working within the Open Space Areas and Deed Notice Area 3 area (Site 163 deed notice area). The Report shall include the training materials used.

The report shall also include notice of any violations of the restrictions of the Consent Decrees, Deed Notices, and the OSDS, relating to the Open Space Areas and the Deed Notice Area 3 area identified by workers, including a description of the violation, when it was discovered, when it was reported to Honeywell, what corrective action(s) were implemented, and any steps taken to prevent the violation from recurring.

In accordance with Paragraph 60(j)(xii) of the SA-6 North Consent Decree and Paragraph 74(j)(xii) of the SA-6 South Consent Decree, after the City of Jersey City takes title to the Open Space Areas, Jersey City shall annually provide to the Special Master, Parties and the holder of the Conservation Restrictions a report describing any alterations or additions to the development of the Open Space Areas.

5.0 HONEYWELL PROGRAM ORGANIZATION

This section provides Honeywell's program organization and key personnel.

Honeywell Project Manager/Remediation Manager

Honeywell will designate a Remediation Manager to act as the primary contact for this project. Honeywell's business address and Project Manager follows:

William J. Hague
Honeywell
115 Tabor Road (4D-8)
Morris Plains, NJ 07950
Phone: (973) 455-2175

NJDEP Primary Contact

NJDEP will maintain a case management team for this project. NJDEP's business address follows:

New Jersey Department of Environmental Protection
Division of Responsible Party Site Remediation
401 E. State Street, P.O. Box 420, Mail Code 401-06
Trenton, NJ 08625-0420
Phone: To Be Determined

Environmental Consultant – Amec Foster Wheeler Environment & Infrastructure, Inc.

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) is responsible for conducting inspections, monitoring and preparing reports and at the direction of Honeywell, and may also provide other services, such as oversight of cap repair, if necessary. Amec Foster Wheeler's business address and general phone number follows:

Amec Foster Wheeler Environment & Infrastructure, Inc.
American Metro Center
200 American Metro Blvd, Suite 113
Hamilton, NJ 08619
Phone: (609) 689-2829

Primary contacts for Amec Foster Wheeler are as follows:

Project Responsibility	Name	Telephone Number
Program Manager	Ed Gaven	609-631-2905
Project Manager	Dennis Nagg	609-631-2928
Engineering Manager/Engineer of Record	Joe Clifford	609-631-2903
Designated Local Health & Safety Officer	Andrew Shust	609-631-2921
Field/Technical Support	Telly Giouzelis Dave Ambrose Brian Shea	609-631-2906 484-542-0980 201-323-2557

6.0 REFERENCES

- Amec Environment & Infrastructure, Inc., 2012a; March 2012; Remedial Investigation Report/Remedial Action Selection Report/Remedial Action Work Plan for Non-Chromium Contaminants of Concern, Study Area 6 South, exclusive of Site 163.
- Amec Environment & Infrastructure, Inc., 2012b; May 2012; Supplemental Remedial Investigation Report/Remedial Action Selection Report/Remedial Action Work Plan Study Area 6 South Site 163.
- Amec Environment & Infrastructure, Inc., June 2013; 100% Design Reports SA-6 North and SA-6 South.
- Cornerstone Environmental Group, April 2014; Integrated Groundwater Sampling and Analysis Plan, Study Areas 5, 6, and 7.
- MACTEC Engineering and Consulting, 2008a, January 2008; Remedial Action Selection Report/Remedial Action Workplan for Chromium, Study Area 6 North, Site 087 and Site 088. January 2008 with amendment February 2008.
- MACTEC Engineering and Consulting, 2008b, November 2008; Remedial Investigation Report/Remedial Action Selection Report/Remedial Action Workplan for Non-Chromium, Study Area 6 North.
- MACTEC Engineering and Consulting, 2008c, December 2008; Supplemental Remedial Investigation Report, Remedial Action Selection Report, and Remedial Action Workplan for Chromium, Study Area 6 South, exclusive of Site 163.
- MACTEC Engineering and Consulting, 2011; March 2011; Remedial Action Selection Report/Remedial Action Workplan for Non-Chromium Contaminants of Concern, Site 163.
- NJDEP, 2005; revised 2011; Field Sampling Procedures Manual, August 2005.
- NJDEP, 2007; Chromium Policy Directive dated February 8, 2007.
- NJDEP, 2012; Technical Requirements for Site Remediation, N.J.A.C. 7:26E. Last amended May 7, 2012.
- United States District Court, District of New Jersey, 1993, modified 2011; Administrative Consent Order (ACO) between Honeywell and the NJDEP

- dated June 17, 1993 and modified pursuant to a Consent Judgment between Honeywell and the NJDEP dated September 7, 2011.
- United States District Court, District of New Jersey, 2008; Settlement Consent Order By and Between the Jersey City Entities and Honeywell International Inc.
- United States District Court, District of New Jersey, 2012; First Amended Consent Decree regarding the Remediation and Redevelopment of Study Area 6 North (SA-6 North Consent Decree).
- United States District Court, District of New Jersey, 2012; First Amended Consent Decree Regarding Remediation and Redevelopment between Honeywell, Hackensack Riverkeeper, Inc. and the City of Jersey City (SA-6 South Consent Decree).
- United States Environmental Protection Agency, 2001; Comprehensive Five-Year Review Guidance (OSWER Directive 9355.7-03B-P).

7.0 LIST OF ACRONYMS AND ABBREVIATIONS

ACO	Administrative Consent Order	LEL	Lower Explosive Limit
AOC	Area of Concern	LSRP	Licensed Site Remediation Professional
CEA	Classification Exception Area	LTMP	Long Term Monitoring Plan
CGI	Combustible Gas Indicator	µg/L	micrograms per liter
		mg/kg	milligrams per kilogram
DCBs	Design Change Bulletins	N.J.A.C.	New Jersey Administrative Code
FM	Force Main	NJDEP	New Jersey Department of Environmental Protection
FSPM	Field Sampling Procedures Manual		
ft msl	feet above mean sea level	OSDS	Open Space Design Standards
GWMP	Groundwater Monitoring Plan	OSWER	Office of Solid Waste & Emergency Response
GWQS	Groundwater Quality Standards	PSE&G	Public Service Electric & Gas
HASP	Health and Safety Plan		
IGWMR	Integrated Groundwater Monitoring Report	RAWP	Remedial Action Work Plan
ISRA	Industrial Site Recovery Act	RCRA	Resource Conservation and Recovery Act
		ROW	Right-Of-Way
JCDPW	Jersey City Department of Public Works	SA	Study Area
JCIA	Jersey City Incinerator Authority	SAP	Integrated Groundwater Sampling and Analysis Plan
JCMUA	Jersey City Municipal Authority	SGWMP	SA-6 South Development Area Shallow Groundwater Monitoring Plan

TA	Treatment Area
TRSR	Technical Requirements for Site Remediation
USEPA	United States Environmental Protection Agency

TABLES

FIGURES

APPENDICES

APPENDIX A

RELEVANT REGULATORY CORRESPONDENCE

- A-1: Design Change Bulletin Log**
- A-2: Record Drawings for Engineering Controls**
- A-3: Conservation Restrictions**
- A-4: Deed Notices**
- A-5: Classification Exception Area**
- A-6: Remedial Action Permits**

APPENDIX B

EXAMPLE FORMS

**B-1: Annual/Quarterly Inspection Form and Deed Notice
Checklist**

B-2: Subsurface Work Authorization Form/Dig Permit

B-3: Methane Monitoring Form

B-4: Groundwater Elevation Monitoring Form

APPENDIX C

**NJDEP REMEDIAL ACTION PROTECTIVENESS/BIENNIAL
CERTIFICATION FORM**

APPENDIX D

RELEVANT PREVIOUS REPORTS

D-1: Open Space Design Standards

D-2: Integrated Groundwater Sampling and Analysis Plan

D-3: L-Well Groundwater Monitoring Plan

D-4: In-Situ Treatment Monitoring Workplan

APPENDIX E

ENGINEERING CONTROL FIGURES FROM DEED NOTICES

TABLES

Table 1
LTMP Implementation
Study Areas 6 North & South

Consent Decree Task	Responsible Party	Frequency	LTMP Major Section	SA-6 North AOC 1 Open Space Consent Decree Reference/ Comment	SA-6 South Open Space AOC Consent Decree Reference/ Comment
CEA	Honeywell	One Time	4.2 Biennial Certification Reports	58g	69g
L Well GW Remedy	Honeywell	1 year after Chromium Remedy	3.1.9 Groundwater Sampling 3.2.4 L-Well Monitoring	N/A	72
Deed Notice	Honeywell and/or Title Owner	Completion Chromium Remedy	2.1.3 Administrative and Institutional Controls 3.1.13 Soil Sampling of In-Situ Injection Areas 3.2.1 Chromium Remedy Disturbance 4.1 Quarterly and Annual Reporting 4.2 Biennial Certification Reports	60c	74c
Implement, monitor, maintain, repair, replace Chromium Remedy	Honeywell	Implied Perpetuity	3.1 Inspections and Monitoring 3.2 Contingency Plan 4.4 Monitoring Plan Update and Procedures for Changes	61	75
LTMP	Honeywell	Annual Review	4.4 Monitoring Plan Update and Procedures for Changes	62-63	76-77

Table 1
LTMP Implementation
Study Areas 6 North & South

Consent Decree Task	Responsible Party	Frequency	LTMP Major Section	SA-6 North AOC 1 Open Space Consent Decree Reference/ Comment	SA-6 South Open Space AOC Consent Decree Reference/ Comment
Annual Reports of LTMP Activities to RK, Jersey City, SM, & NJDEP	Honeywell	Annual	4.1 Quarterly and Annual Reporting	64	78
Inspection Prohibited/ Permissible Uses/Stop Usage	Honeywell	Quarterly	2.1.3 Administrative and Institutional Controls 3.1.2 Chromium Remedy Visual Inspections	64 (a) i	78 (a) i
Inspect Grade and Slope for erosion/ remediate significant erosion	Honeywell	Quarterly	3.1.3 Surface Grade Visual Inspections 3.1.4 Differential Settlement Visual Inspections	64 (a) ii	78 (a) ii
Inspect Cap settlement/ subsidence; propose further investigation; remediate	Honeywell	Quarterly	3.1.3 Surface Grade Visual Inspections 3.1.4 Differential Settlement Visual Inspections	64 (a) iii	78 (a) iii
Baseline Topographic Survey	Honeywell	Baseline & three 5-year intervals	3.1.12 Topographic Survey	64 (a) iv	78 (a) iv
Inspect Capped area disturbance, exposure of warning layer or cap materials, and/or animal burrowing; construction or utility work; repair	Honeywell	Quarterly	3.1.3 Surface Grade Visual Inspections 3.1.4 Differential Settlement Visual Inspections 3.1.5 Disturbance Visual Inspections	64 (a) v & vi	78 (a) v & vi

Table 1
LTMP Implementation
Study Areas 6 North & South

Consent Decree Task	Responsible Party	Frequency	LTMP Major Section	SA-6 North AOC 1 Open Space Consent Decree Reference/ Comment	SA-6 South Open Space AOC Consent Decree Reference/ Comment
			3.1.6 Burrowing Animal Visual Inspections 3.1.7 Vegetative Cover Visual Inspection 3.2.7 Routine Maintenance and Repairs		
Inspect Vegetative Cover / Mowing	Honeywell	Quarterly/ Mowing As Needed	3.1.7 Vegetative Cover Visual Inspection 3.2.7 Routine Maintenance and Repairs	64 (a) vii	78 (a) vii
Groundwater Level Measurements	Honeywell	Quarterly	3.1.8 Groundwater Elevation Monitoring	64 (a) viii	78 (a) viii
Monitoring Gas Venting System & Vented Gases	Honeywell	Monthly – 1 st year; quarterly if stable	3.1.10 Gas Venting System and Vented Gases 3.2.6 Methane Monitoring	64 (a) ix	78 (a) ix
Contingency Plan (as part of LTMP)	Honeywell	Annually Updated	3.2 Contingency Plan 4.5 Contingency Plan And Notification Plan	64 (c)	78 c
Routine Maintenance	Title Owner of Open Space	Annual	3.2.7 Routine Maintenance and Repairs	Par. 64 d	78 d
Training Materials to Owner for Routine Maintenance	Honeywell	Reviewed Annually	3.2.7 Routine Maintenance and Repairs	Par. 64 d	78 d
Report Describing Training of Maintenance	Title Owner of Open Space	Annual	3.2.7 Routine Maintenance and Repairs	Par. 64 d	78 d

Table 1
LTMP Implementation
Study Areas 6 North & South

Consent Decree Task	Responsible Party	Frequency	LTMP Major Section	SA-6 North AOC 1 Open Space Consent Decree Reference/ Comment	SA-6 South Open Space AOC Consent Decree Reference/ Comment
Workers to Parties & SM			4.5 Contingency Plan And Notification Plan		
Written Logs of activities of LTMP	Honeywell	Quarterly	4.1 Quarterly and Annual Reporting	64 e	78 e
Monitoring and Reporting to RK and JC all submitted to NJDEP	Honeywell	Varies, Pursuant to LTMP Requirements	4.1 Quarterly and Annual Reporting 4.2 Biennial Certification Reports 4.5 Contingency Plan And Notification Plan	65	79
Annual Reports of LTMP Activities to Stakeholders	Honeywell	Annual	4.1 Quarterly and Annual Reporting 4.2 Biennial Certification Reports 4.5 Contingency Plan And Notification Plan	66	80

Table 2
Contingency Plan Triggers Cross-References
Study Areas 6 North & South

Contingency Plan Section	Trigger Section
3.2.1 Chromium Remedy Disturbance	3.1.2 Chromium Remedy Visual Inspections 3.1.3 Surface Grade Inspections 3.1.4 Differential Settlement Visual Inspections 3.1.5 Disturbance Visual Inspections 3.1.6 Burrowing Animals Visual Inspection 3.2.1.1 Notification
3.2.2 Vegetative Cover Degradation	3.1.2 Chromium Remedy Visual Inspections 3.1.3 Surface Grade Inspection 3.1.4 Differential Settlement Visual Inspections 3.1.5 Disturbance Visual Inspections 3.1.6 Burrowing Animals Visual Inspection 3.1.7 Vegetative Cover Visual Inspection
3.2.3 Contingent Groundwater Extraction System	3.1.8 Groundwater Elevation Monitoring
3.2.4 SA-6 South L-Well Monitoring	3.1.9 Groundwater Sampling
3.2.5 SA-6 South Development AOC	3.1.9 Groundwater Sampling
3.2.6 Methane Monitoring	3.1.10 Gas Venting System & Vented Gases
3.2.7 Routine Maintenance and Repairs	3.1.1 Timing and Schedule of Inspections 3.1.2 Chromium Remedy Visual Inspections 3.1.3 Surface Grade Inspections 3.1.7 Vegetative Cover Visual Inspection 3.1.11 Sign Inspections 3.1.12 Topographic Survey 3.1.14 Other Inspections

Table 3
LTMP Inspection/Monitoring Timetable
Study Areas 6 North & South

Monitoring Plan Task	Frequency	SA-6 North AOC 1 Open Space Reference/Comment	SA-6 South Open Space AOC Reference/Comment
INSPECTIONS / MONITORING			
Prohibited/Permissible Uses	Quarterly	Consent Decree Par. 64 (a) i	Consent Decree Par. 78 (a) i
Grade and Slope for erosion	Quarterly	Consent Decree Par. 64 (a) ii	Consent Decree Par. 78 (a) ii
Cap settlement/ subsidence	Quarterly	Consent Decree Par. 64 (a) iii	Consent Decree Par. 78 (a) iii
Baseline Topographic Survey	Baseline & three 5-year intervals	Consent Decree Par. 64 (a) iv	Consent Decree Par. 78 (a) iv
Capped area disturbance, exposure of warning layer or cap materials, and/or animal burrowing; construction or utility work	Quarterly	Consent Decree Par. 64 (a) v & vi	Consent Decree Par. 78 (a) v & vi
Vegetative Cover / Mowing/removal of vegetation	Quarterly / As Needed	Consent Decree Par. 64 (a) vii	Consent Decree Par. 78 (a) vii
Groundwater Level Measurements	Quarterly	Consent Decree Par. 64 (a) viii	Consent Decree Par. 78 (a) viii
Perimeter Pools	Monthly	Integrated Groundwater Monitoring Plan	Integrated Groundwater Monitoring Plan
Gas Venting System & Vented Gases	Monthly – 1 st year; quarterly if stable	Consent Decree Par. 64 (a) ix	Consent Decree Par. 78 (a) ix
Groundwater Sampling Development AOC	Quarterly	Not Applicable	Consent Decree Par. 70 and 86
L-Wells	1 year after completion of Chromium Remedy	Not Applicable	Consent Decree Par. 72
Signs or displays	Quarterly	Consent Decree Par. 60 (l)	Consent Decree Par. 74 (l)
Disturbance to visible utility lines and manhole covers	Annually	LTMP, Section 3.1.14	
Road surface conditions	Every 5 Years	LTMP, Section 3.1.14	

Table 4
LTMP Reporting Timetable
Study Areas 6 North & South

Monitoring Plan Task	Responsible Party	Receiving Party	Frequency	SA-6 North AOC 1 Open Space Reference/Comment	SA-6 South Open Space AOC Reference/ Comment
REPORTING					
Annual Report of Alterations/Additions to development	Jersey City	Holders of Conservation Restriction; Honeywell; Riverkeeper	Annual	Consent Decree Par. 60 (j)	Consent Decree Par. 74 (j)
Biennial Certification Report- Soil	Honeywell	Parties; Hudson County Clerk; Jersey City and Regional Health Departments	Biennial	Consent Decree Par. 60 (c)	Consent Decree Par. 74 (c)
Inspection Monitoring Logs	Honeywell	Riverkeeper; Jersey City (For North)	Quarterly	Consent Decree Par. 64 (e)	Consent Decree Par. 78 (e)
Report of LTMP Activities Completed	Honeywell	Riverkeeper; Jersey City (for North); Special Master; NJDEP; Stakeholders	Annual	Consent Decree Par. 64 and 68	Consent Decree Par. 78 and 82
Contingency Plan Annual Update	Honeywell	NJDEP; Special Master; Parties	Annual	Consent Decree Par. 64 (c)	Consent Decree Par. 78 (c)
All documents submitted to NJDEP	Honeywell	Riverkeeper; Jersey City (for North)	As needed	Consent Decree Par. 65	Consent Decree Par. 79
Annual groundwater data and remedial system performance; Notification Prior to Groundwater Sampling	Honeywell	Riverkeeper; Jersey City; Special Master; NJDEP	Annual	Integrated Annual Groundwater Performance Report for SA-5, SA-6, and SA-7	Consent Decree Par. 70 and 86
Annual Worker Training Documentation	Owner	Honeywell	Annual	Consent Decree Par. 64 (d)	Consent Decree Par. 78 (d)
Documentation of Public Notice (below)	Honeywell	Riverkeeper; Jersey City (for North)	Annual	Consent Decree Par. 67	Consent Decree Par. 81
Deed Notice Disturbance Report/Post Work Documentation	Honeywell/Title Owner	NJDEP; Special Master; Parties	next biennial certification	LTMP Section 3.2.1.2/Section 3.2.1.3/Section 3.2.1.4/Section 4	LTMP Section 3.2.1.2/Section 3.2.1.3/Section 3.2.1.4/Section 4
PUBLIC NOTICE					
Notice of contamination, remedial actions, importance of Stakeholders to report activities that may impact engineering controls	Honeywell	Stakeholders	Annual & Deed/lease	Consent Decree Par. 66	Consent Decree Par. 80
Update website to inform the public about chromium remedies	Honeywell	Stakeholders	Annual	Consent Decree Par. 68	Consent Decree Par. 82

Notes:

Jersey City – City of Jersey City Entities

Parties – include Jersey City, Riverkeeper, Honeywell

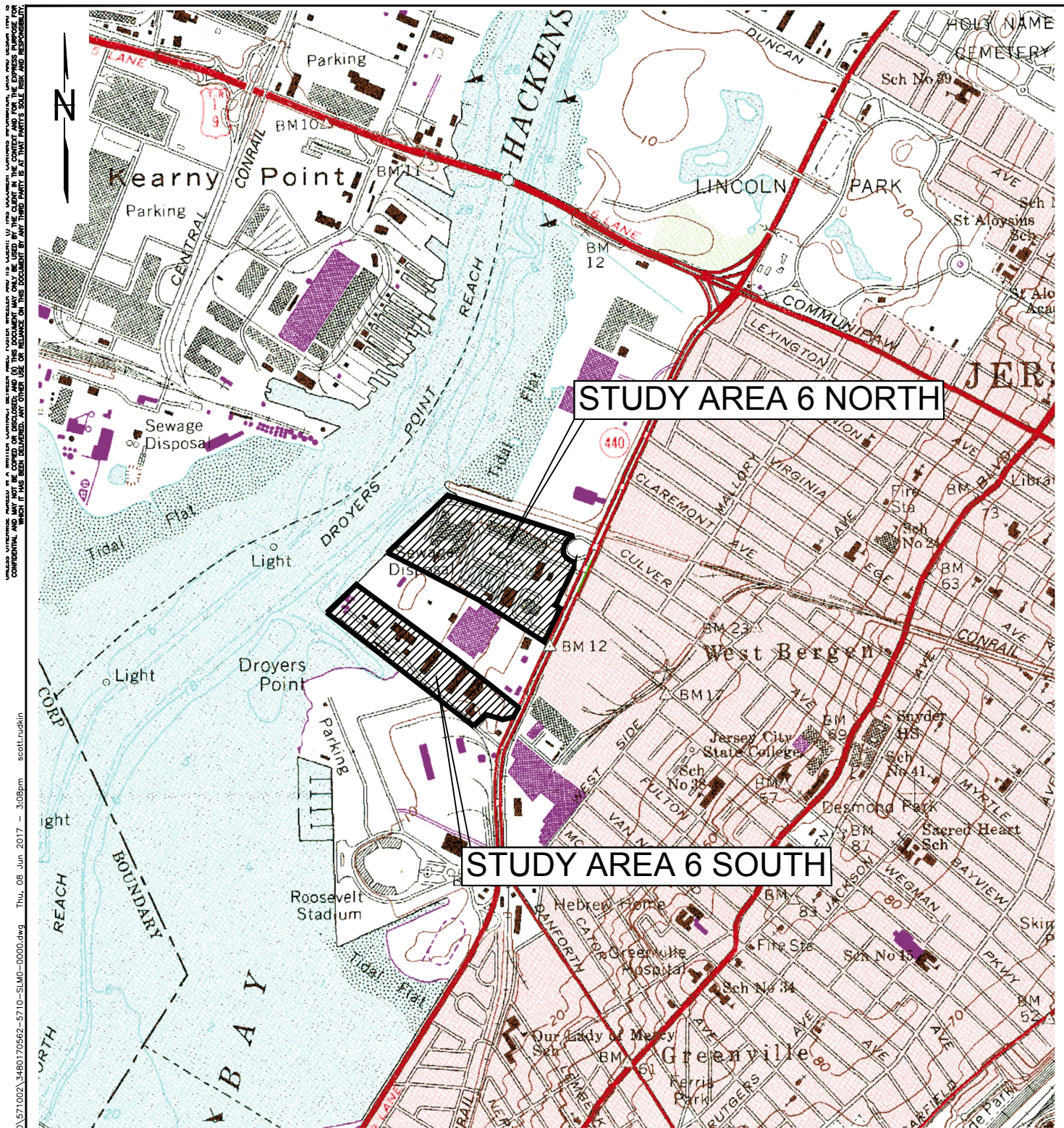
NJDEP – New Jersey Department of Environmental Protection

Stakeholders – residents and commercial tenants of SA-6 and SA-7

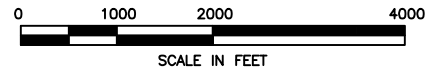
Table 5
LTMP Elements Applicability to Deferred Areas Other than Open Space Areas
Study Areas 6 North & South

Monitoring Plan Task	Frequency	DN #2	DN#3	DN#4	DN #6	DN#7	DN#9	DN#10	DN#14
INSPECTIONS / MONITORING									
Prohibited/Permissible Uses	Quarterly	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grade and Slope for erosion	Quarterly	NA	NA	NA	NA	NA	NA	NA	NA
Cap settlement/ subsidence	Quarterly	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Baseline Topographic Survey	Baseline & three 5-year intervals	NA	NA	NA	NA	NA	NA	NA	NA
Capped area disturbance, exposure of warning layer or cap materials, and/or animal burrowing; construction or utility work	Quarterly	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vegetative Cover Mowing as needed	Quarterly	NA, paved surface	NA, paved or stone surface	NA, paved or stone surface	Yes	NA, paved surface	NA, paved surface	NA, paved surface	NA, paved surface
Groundwater Level Measurements	Quarterly	NA	NA	NA	NA	NA	NA	NA	NA
Perimeter Pools	Monthly								
Gas Venting System & Vented Gases	Monthly – 1 st year; quarterly if stable	NA	NA	NA	NA	NA	NA	NA	NA
Groundwater Sampling Development AOC L-Wells	Quarterly 1 year after completion of Chromium Remedy	NA	NA	NA	NA	NA	NA	NA	NA
Signs or displays	Quarterly	NA	NA	NA	NA	NA	NA	NA	NA

FIGURES



SOURCE: USGS QUADRANGLE MAP, 7.5 MIN SERIES
JERSEY CITY, NJ-NY 1967, PHOTO REVISED 1981



Amec Foster Wheeler PROJECT No. 3480170562
DRAWING: 3480170562-5710-SLM0-0000

PREPARED/DATE:
STR 07/13/15

CHECKED/DATE:
DEN 07/13/15

amec foster wheeler

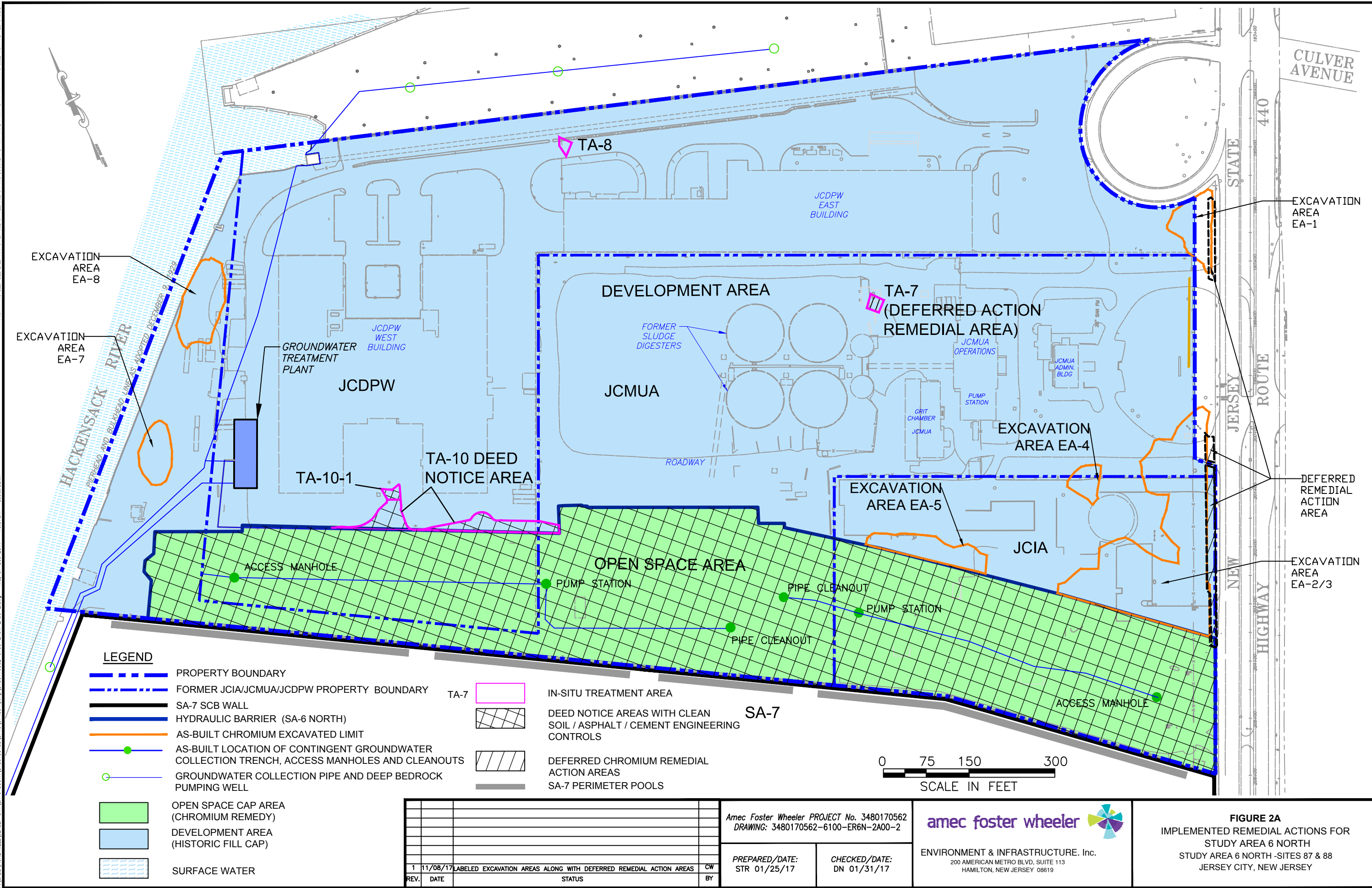


ENVIRONMENT & INFRASTRUCTURE, Inc.
200 AMERICAN METRO BLVD, SUITE 113
HAMILTON, NEW JERSEY 08619

FIGURE 1
SITE LOCATION MAP
STUDY AREA 6 NORTH - SITES 087 & 088
STUDY AREA 6 SOUTH -
SITES 073, 124, 125, 134, 140 & 163
JERSEY CITY, NEW JERSEY

UNLESS OTHERWISE AGREED IN A WRITTEN CONTRACT BETWEEN AMEC FOSTER WHEELER AND ITS CLIENT, (U) THIS DOCUMENT CONTAINS INFORMATION, DATA AND DESIGN THAT IS CONFIDENTIAL AND MAY NOT BE COPIED OR DISCLOSED, AND (U) THIS DOCUMENT MAY ONLY BE USED BY THE CLIENT IN THE CONTEXT AND FOR THE EXPRESS PURPOSE FOR WHICH IT HAS BEEN ELABORATED AND FOR NO OTHER USE OR RELIANCE ON THIS DOCUMENT BY ANY THIRD PARTY IS AT THAT PARTY'S SOLE RISK AND RESPONSIBILITY.

P:\CADD\JERSEY\JERSEY_CITY\SA_6_SOUTH\3480170562-6100-ER6N-2A00-2.dwg Thu, 07 Dec 2017 10:07:00m scott.madden



REV.	DATE	STATUS	BY
1	11/08/17	LABELED EXCAVATION AREAS ALONG WITH DEFERRED REMEDIAL ACTION AREAS	CW

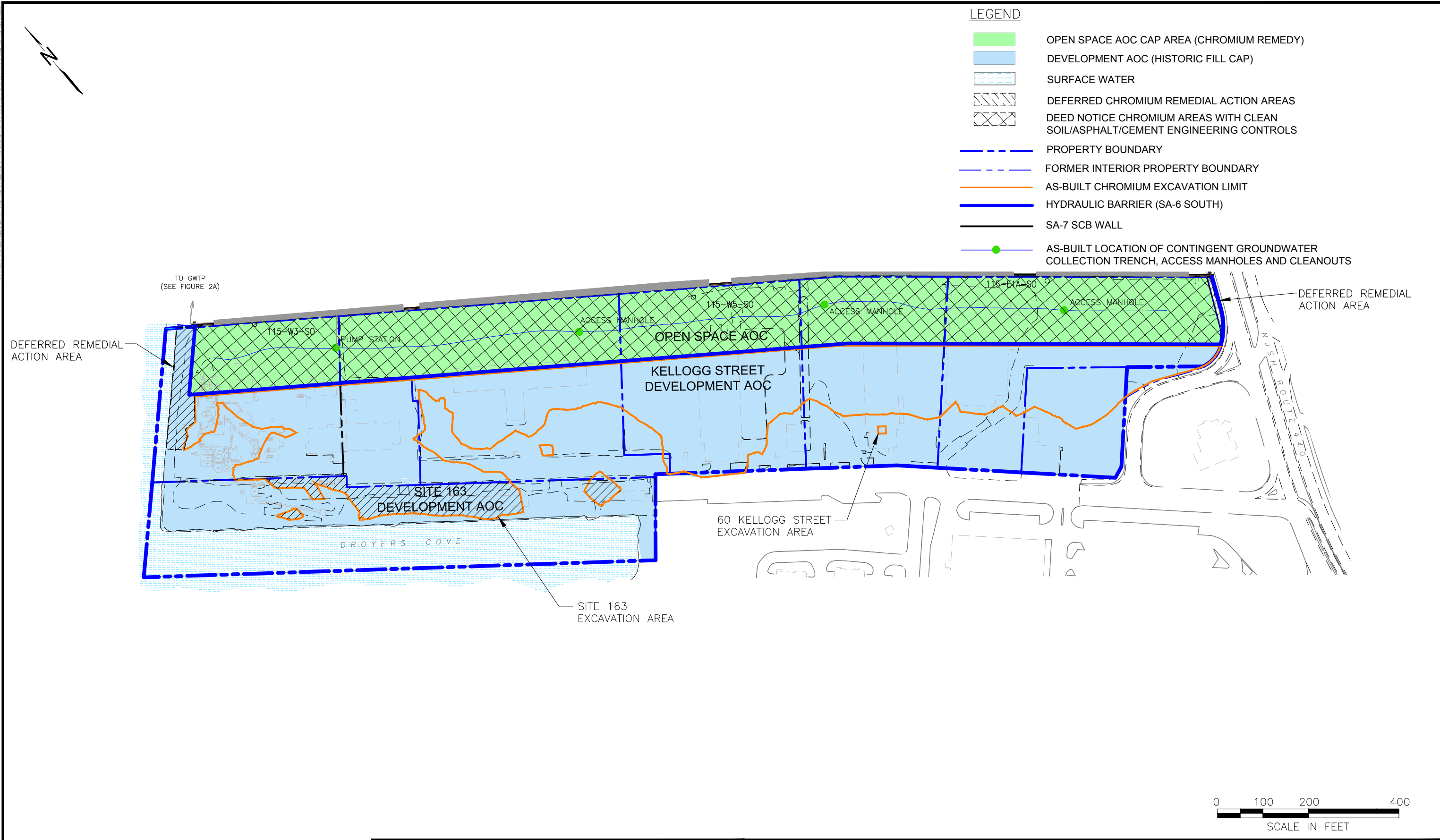
Amec Foster Wheeler PROJECT No. 3480170562 DRAWING: 3480170562-6100-ER6N-2A00-2	
PREPARED/DATE: STR 01/25/17	CHECKED/DATE: DN 01/31/17

amec foster wheeler
ENVIRONMENT & INFRASTRUCTURE, Inc. 200 AMERICAN METRO BLVD, SUITE 113 HAMILTON, NEW JERSEY 08619

FIGURE 2A IMPLEMENTED REMEDIAL ACTIONS FOR STUDY AREA 6 NORTH STUDY AREA 6 NORTH - SITES 87 & 88 JERSEY CITY, NEW JERSEY
--

IS CONFIDENTIAL AND MAY NOT BE COPIED OR DISCLOSED, AND (D) THIS DOCUMENT MAY ONLY BE USED BY THE CLIENT IN THE CONTEXT AND FOR THE EXPRESS PURPOSE FOR WHICH IT HAS BEEN DELIVERED. ANY OTHER USE OR RELIANCE ON THIS DOCUMENT BY ANY THIRD PARTY IS AT THAT PARTY'S SOLE RISK AND RESPONSIBILITY.

E:\CADD\NEW JERSEY\JERSEY CITY\SA 6 SOUTH\3480170562\5710\571004A.dwg Thu, 16 Nov 2017 - 11:10am chris.willigfield Layout: SITE



SOURCE:
BASEMAP TOPOGRAPHIC SURVEY COMPLETED BY MASER CONSULTING, P.A. 331 NEWMAN SPRINGS ROAD, SUITE 203, RED BANK, NEW JERSEY.
JOB NO. 10000292A, DATED DECEMBER 17, 2010.

1	11/08/17	LEGEND UPDATE	CW	NW	
REV.	DATE	STATUS	PRPD BY	CHKD BY	

Amec Foster Wheeler PROJECT No. 3480170562 DRAWING: 3480170562-5710-ERA0-6S02	
PREPARED/DATE: CW 11/08/17	CHECKED/DATE: NW 11/08/17

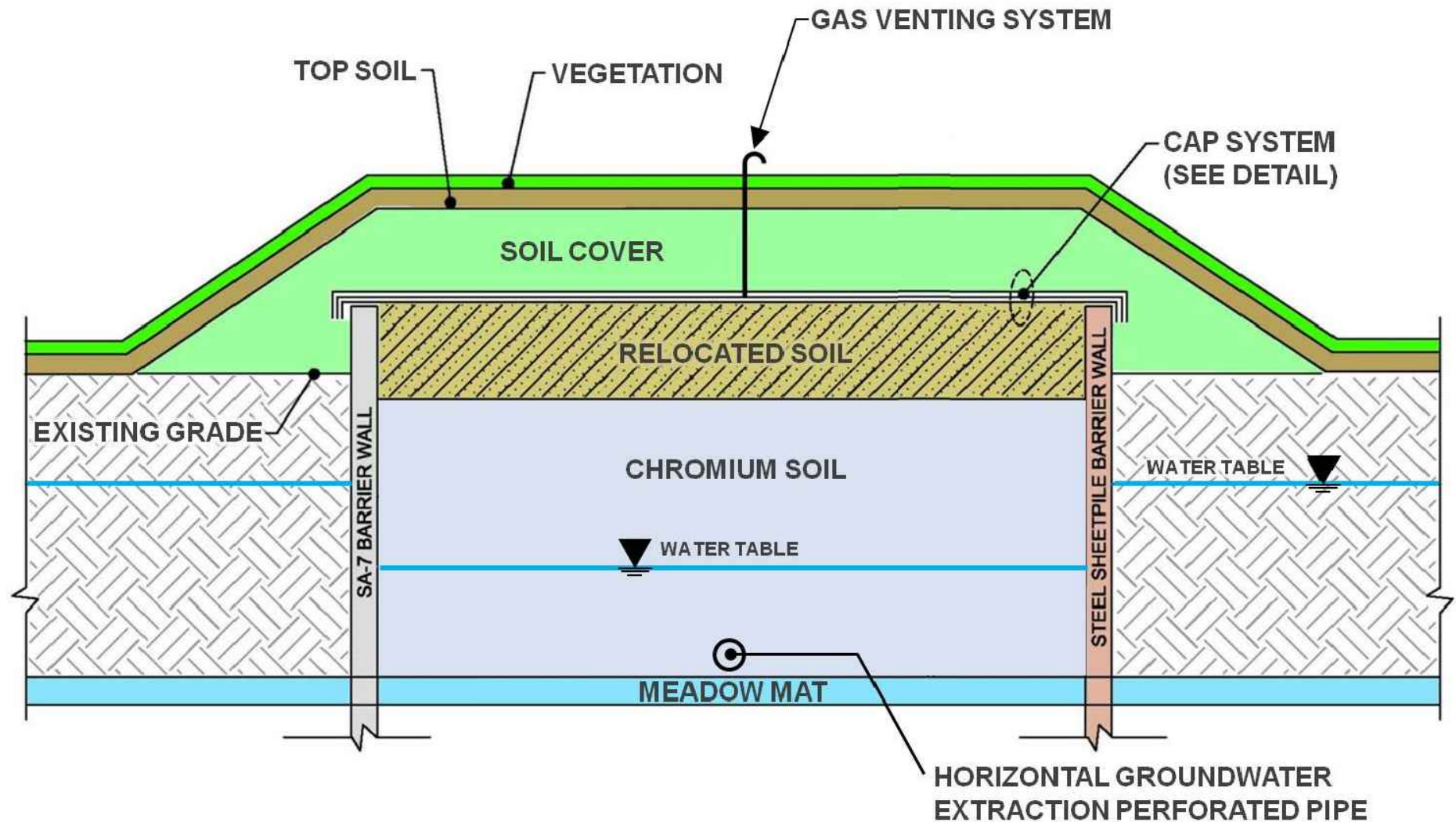
**amec foster wheeler**

ENVIRONMENT & INFRASTRUCTURE, Inc.
200 AMERICAN METRO BLVD, SUITE 113
HAMILTON, NEW JERSEY 08619

FIGURE 2B
IMPLEMENTED REMEDIAL ACTIONS
FOR STUDY AREA 6 SOUTH
STUDY AREA 6 SOUTH
SITES 073, 124, 125, 134, 140 & 163
JERSEY CITY, NEW JERSEY

UNLESS OTHERWISE NOTED IN A WRITTEN CONTRACT BETWEEN AMEC FOSTER WHEELER AND ITS CLIENT, (i) THE DOCUMENT CONTAINS INFORMATION, DATA AND DESIGN THAT IS THE PROPERTY OF AMEC FOSTER WHEELER AND (ii) NO PART OF THIS DOCUMENT IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF AMEC FOSTER WHEELER. ANY OTHER USE OR RELIANCE ON THIS DOCUMENT BY ANY THIRD PARTY IS AT THAT PARTY'S SOLE RISK AND RESPONSIBILITY.

P:\CADD\HONEYWELL\JERSEY CITY\SA 6\3480150438\5710\571002\3480170562-5710-CPCS-0000.dwg Thu 08 Jun 2017 - 3:13pm



CHROMIUM REMEDY COMPONENTS

NTS

REV.	DATE	STATUS	DRFT BY	CHKD BY

Amec Foster Wheeler PROJECT No. 3480170562
DRAWING: 3480170562-5710-CPCS-0000

PREPARED/DATE: STR 07/20/15
CHECKED/DATE: DEN 07/20/15

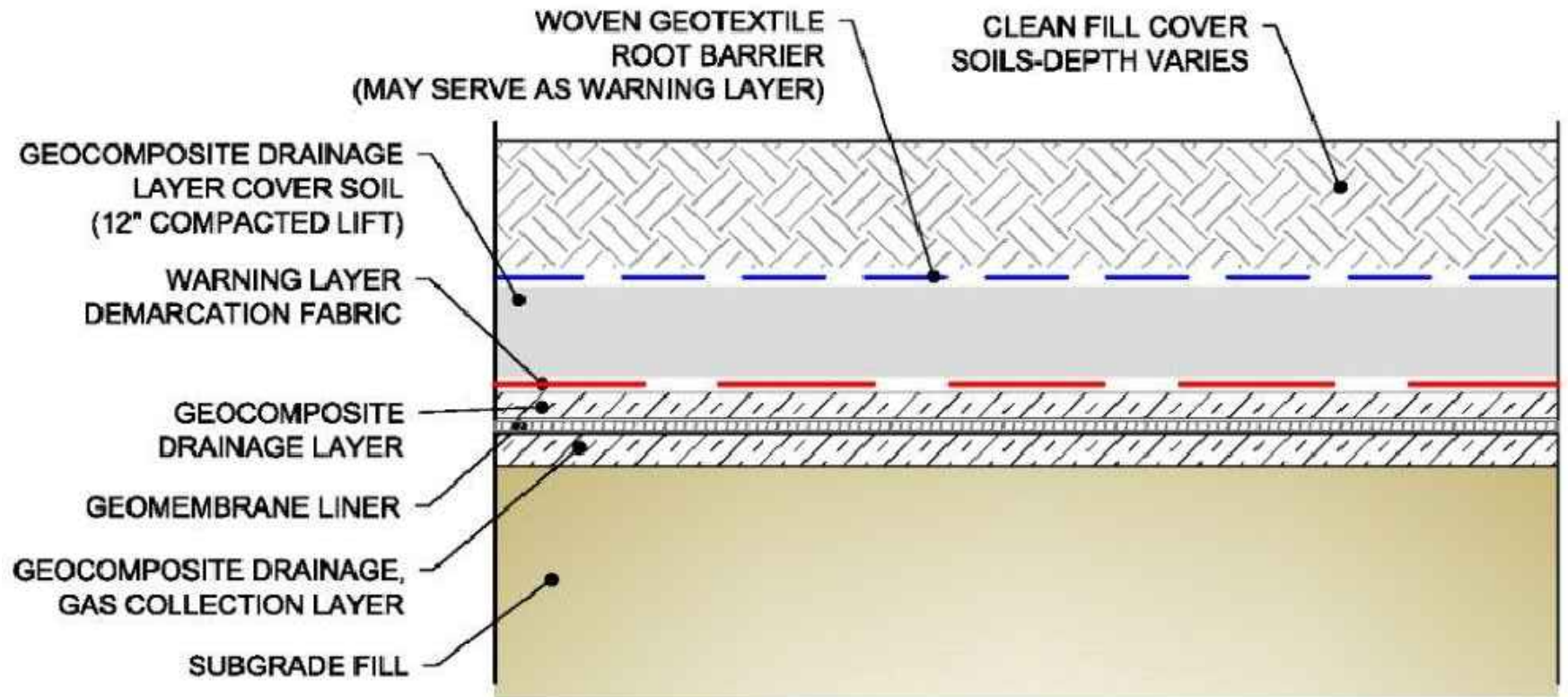
amec foster wheeler

ENVIRONMENT & INFRASTRUCTURE, Inc.
200 AMERICAN METRO BLVD, SUITE 113
HAMILTON, NEW JERSEY 08619

FIGURE 3A
CAP-CROSS SECTION
STUDY AREA 6 NORTH - SITES 87 & 88
STUDY AREA 6 SOUTH -
SITE 073, 124, 125, 134, 140 & 163
JERSEY CITY, NEW JERSEY

UNLESS OTHERWISE AGREED IN A WRITTEN CONTRACT BETWEEN AMEC FOSTER WHEELER AND ITS CLIENT, (i) THIS DOCUMENT CONTAINS INFORMATION, DATA AND DESIGN THAT IS CONFIDENTIAL AND NOT TO BE DISCLOSED OR REPRODUCED IN ANY MANNER WITHOUT THE WRITTEN CONSENT OF AMEC FOSTER WHEELER, (ii) THIS DOCUMENT IS THE PROPERTY OF AMEC FOSTER WHEELER AND IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED IN THIS DOCUMENT, AND (iii) ANY REUSE OR MODIFICATION OF THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF AMEC FOSTER WHEELER IS PROHIBITED.

P:\CADD\HONOLULU\JERSEY CITY\SA 6\3480150438\5710\571002\3480170562-5710-CSD0-0000.dwg Thu, 08 Jun 2017 3:11pm



CAP SYSTEM DETAIL
NTS

REV.	DATE	STATUS	DRFT BY	CHKD BY

Amec Foster Wheeler PROJECT No. 3480170562
DRAWING: 3480170562-5710-CSD0-0000

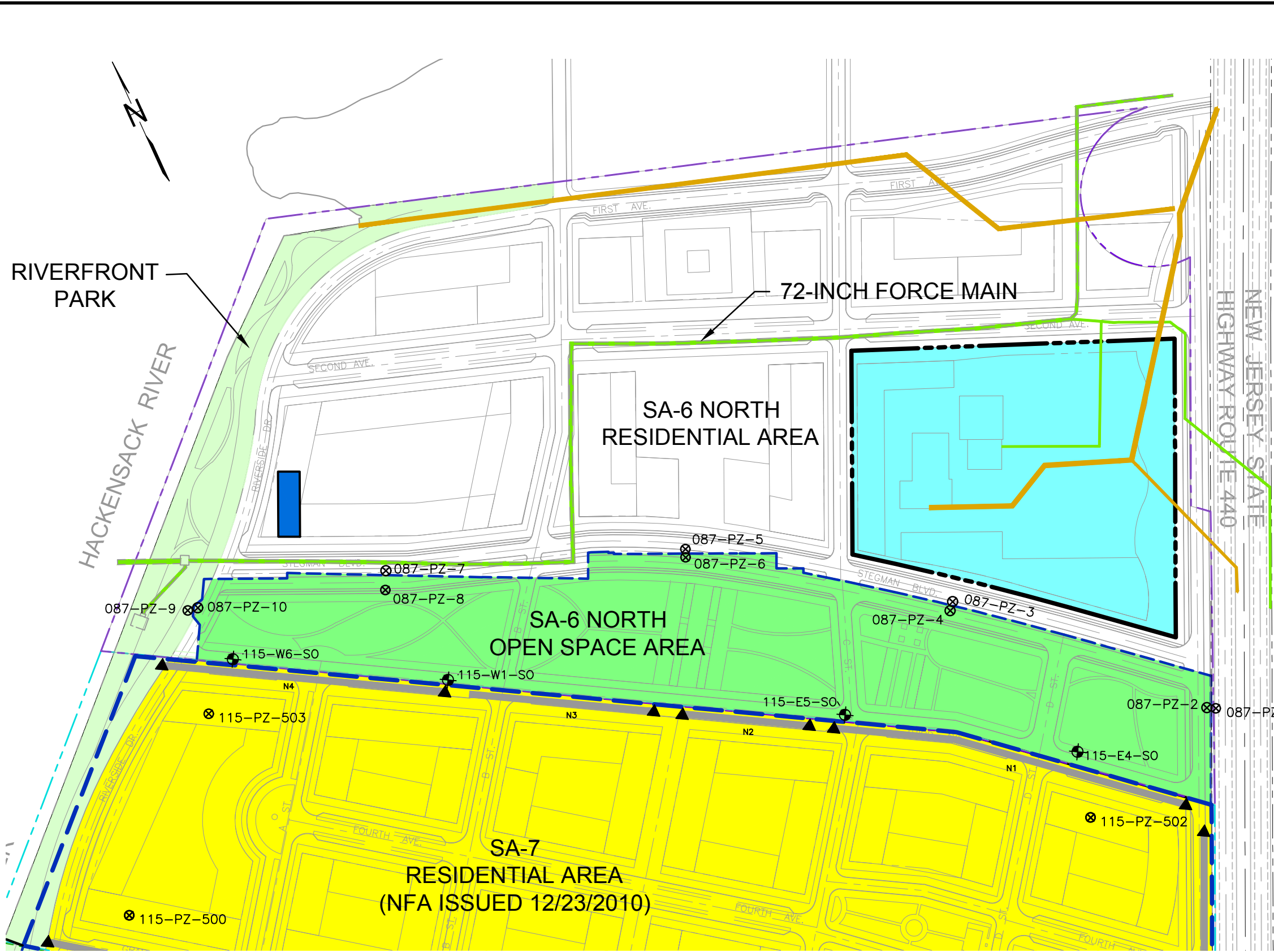
PREPARED/DATE: STR 07/20/15
CHECKED/DATE: DEN 07/20/15

amec foster wheeler 
ENVIRONMENT & INFRASTRUCTURE, Inc.
200 AMERICAN METRO BLVD, SUITE 113
HAMILTON, NEW JERSEY 08619

FIGURE 3B
CAP SYSTEM DETAIL
STUDY AREA 6 NORTH - SITES 87 & 88
STUDY AREA 6 SOUTH -
SITE 073, 124, 125, 134, 140 & 163
JERSEY CITY, NEW JERSEY

UNLESS OTHERWISE SPECIFIED IN A WRITTEN CONTRACT, AMEC FOSTER WHEELER AND ITS CLIENTS, IF ANY, SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED HEREIN. THIS DOCUMENT IS THE PROPERTY OF AMEC FOSTER WHEELER AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF AMEC FOSTER WHEELER. THE INFORMATION CONTAINED HEREIN IS FOR THE EXCLUSIVE USE OF THE CLIENT AND IS NOT TO BE USED FOR ANY OTHER PURPOSE. THE CLIENT'S USE OF THIS DOCUMENT IS AT THE CLIENT'S SOLE RISK AND RESPONSIBILITY. AMEC FOSTER WHEELER AND ITS CLIENTS, IF ANY, SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED HEREIN.

P:\CADD\HONOLULU\JERSEY CITY\SA 6 SOUTH\3480170562-6100-BF6N-F400.dwg P:\CADD\HONOLULU\JERSEY CITY\SA 6 SOUTH\3480170562-6100-BF6N-F400.dwg P:\CADD\HONOLULU\JERSEY CITY\SA 6 SOUTH\3480170562-6100-BF6N-F400.dwg P:\CADD\HONOLULU\JERSEY CITY\SA 6 SOUTH\3480170562-6100-BF6N-F400.dwg P:\CADD\HONOLULU\JERSEY CITY\SA 6 SOUTH\3480170562-6100-BF6N-F400.dwg P:\CADD\HONOLULU\JERSEY CITY\SA 6 SOUTH\3480170562-6100-BF6N-F400.dwg P:\CADD\HONOLULU\JERSEY CITY\SA 6 SOUTH\3480170562-6100-BF6N-F400.dwg P:\CADD\HONOLULU\JERSEY CITY\SA 6 SOUTH\3480170562-6100-BF6N-F400.dwg P:\CADD\HONOLULU\JERSEY CITY\SA 6 SOUTH\3480170562-6100-BF6N-F400.dwg P:\CADD\HONOLULU\JERSEY CITY\SA 6 SOUTH\3480170562-6100-BF6N-F400.dwg



LEGEND

- EXISTING SHALLOW MONITORING WELL LOCATION
- PIEZOMETER
- SA-7 PERIMETER POOL STANDPIPES
- FUTURE BLOCK / LOT DESIGNATION
- PROPERTY LINE SA-7
- PROPERTY LINE SA-6 NORTH
- 72-INCH FORCE MAIN
- STORMWATER / 96-INCH CSO
- SA-7 SOIL/CEMENT BENTONITE BARRIER
- SA-6 NORTH VERTICAL HYDRAULIC BARRIER (STEEL SHEETPILE)
- BLOCK 6 JCMUA PROPERTY
- GROUNDWATER TREATMENT PLANT
- PERIMETER POOL AND DESIGNATION

- NOTES:**
- NFA = NO FURTHER ACTION
 - SA-6 NORTH SHALLOW GROUNDWATER IS SUBJECT TO A CLASSIFICATION EXCEPTION AREA (CEA) FOR BOTH CHROMIUM & NON-CHROMIUM CONTAMINANTS
 - SEE FIGURE 5 FOR DEED NOTICE AREAS.



REV.	DATE	STATUS	PRPD BY	CHKD BY

Amec Foster Wheeler PROJECT No. 3480170562
DRAWING: 3480170562-6100-BF6N-F400

PREPARED/DATE:
STR 01/25/17

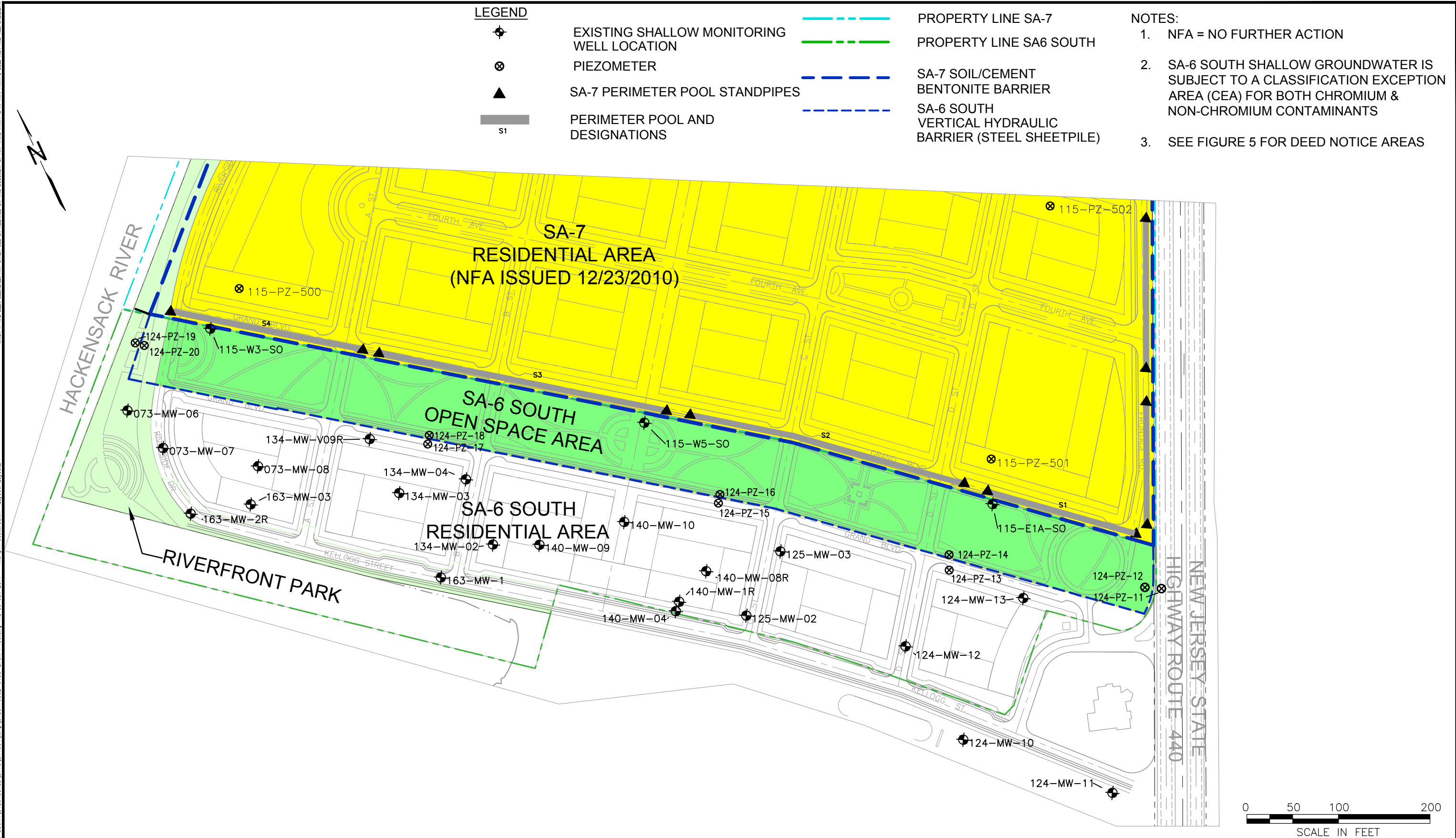
CHECKED/DATE:
DEN 01/31/17

amec foster wheeler

ENVIRONMENT & INFRASTRUCTURE, Inc.
200 AMERICAN METRO BLVD, SUITE 113
HAMILTON, NEW JERSEY 08619

FIGURE 4A
SHALLOW GROUNDWATER MONITORING WELL LOCATION MAP FOR
STUDY AREA 6 NORTH
STUDY AREA 6 NORTH - SITES 87 & 88
JERSEY CITY, NEW JERSEY

UNLESS OTHERWISE SPECIFIED IN A WRITTEN CONTRACT, AMEC FOSTER WHEELER AND ITS CLIENTS, US, HAS ASSUMED LIABILITY FOR THE PREPARATION, REVIEW, AND USE OF THIS DOCUMENT. THE CLIENT AND USER OF THIS DOCUMENT SHALL BE RESPONSIBLE FOR THE ACCURACY, COMPLETENESS, AND RELIABILITY OF THE INFORMATION PROVIDED. THE CLIENT AND USER OF THIS DOCUMENT SHALL BE RESPONSIBLE FOR THE ACCURACY, COMPLETENESS, AND RELIABILITY OF THE INFORMATION PROVIDED. THE CLIENT AND USER OF THIS DOCUMENT SHALL BE RESPONSIBLE FOR THE ACCURACY, COMPLETENESS, AND RELIABILITY OF THE INFORMATION PROVIDED.



- NOTES:
- NFA = NO FURTHER ACTION
 - SA-6 SOUTH SHALLOW GROUNDWATER IS SUBJECT TO A CLASSIFICATION EXCEPTION AREA (CEA) FOR BOTH CHROMIUM & NON-CHROMIUM CONTAMINANTS
 - SEE FIGURE 5 FOR DEED NOTICE AREAS

REV.	DATE	STATUS	PRPD BY	CHKD BY

Amec Foster Wheeler PROJECT No. 3480170562
DRAWING: 3480170562-6100-BF6N-F400

PREPARED/DATE:
STR 01/25/17

CHECKED/DATE:
DEN 01/31/17

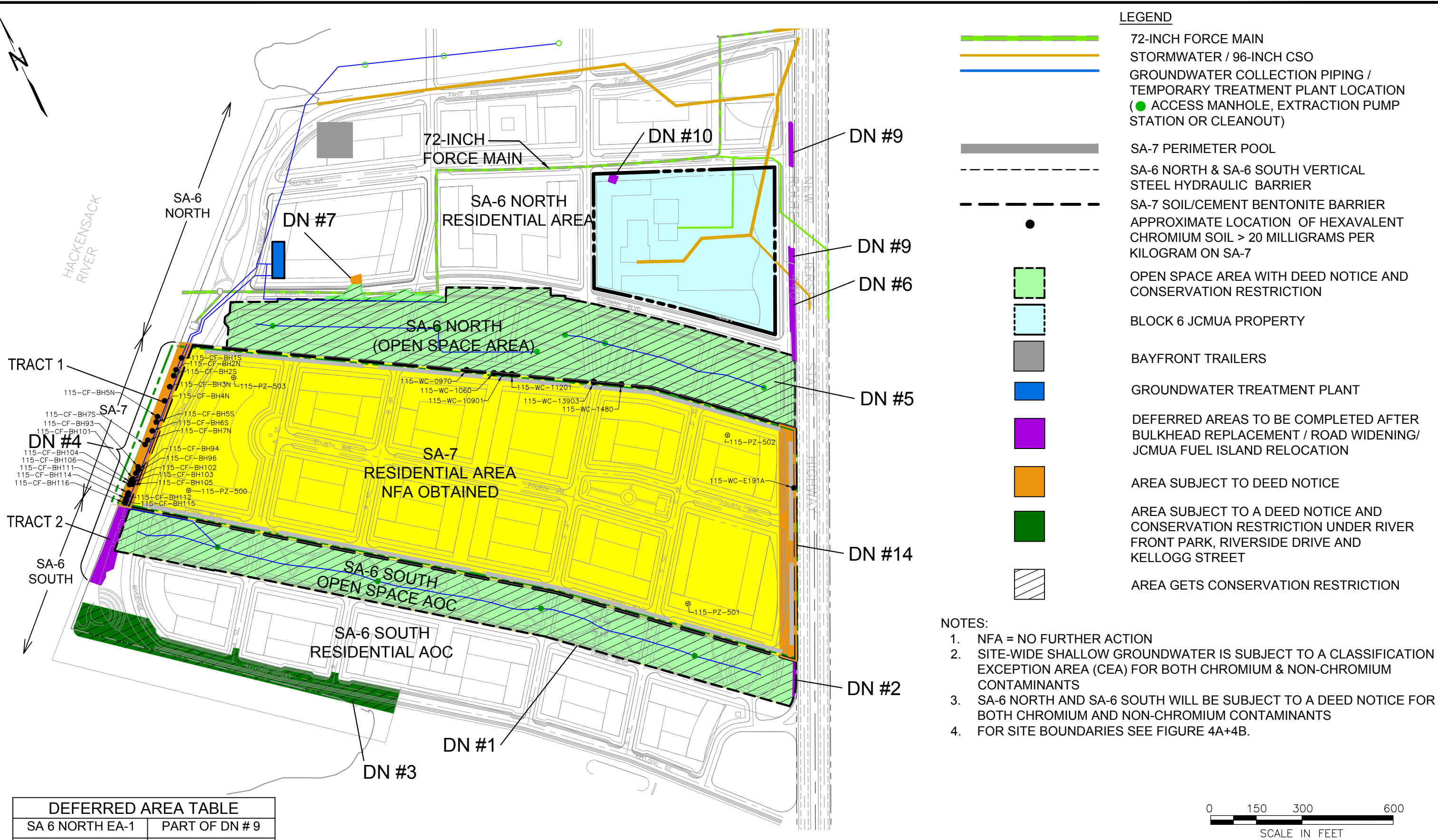
amec foster wheeler

ENVIRONMENT & INFRASTRUCTURE, Inc.
200 AMERICAN METRO BLVD, SUITE 113
HAMILTON, NEW JERSEY 08619

FIGURE 4B
SHALLOW GROUNDWATER MONITORING
WELL LOCATION MAP FOR
STUDY AREA 6 SOUTH
STUDY AREA 6 SOUTH -
SITES 073, 124, 125, 134, 140 & 163
JERSEY CITY, NEW JERSEY

UNLESS OTHERWISE SPECIFIED IN A WRITTEN CONTRACT, AMEC FOSTER WHEELER AND ITS CLIENTS, US, HAS ASSUMED LIABILITY FOR THE PREPARATION, REVIEW, AND USE OF THIS DOCUMENT. THE CLIENT AND THE USER OF THIS DOCUMENT SHALL BE RESPONSIBLE FOR THE ACCURACY, COMPLETENESS, AND TIMELINESS OF THE INFORMATION PROVIDED TO AMEC FOSTER WHEELER AND ITS CLIENTS, US. THIS DOCUMENT IS THE PROPERTY OF AMEC FOSTER WHEELER AND SHALL BE KEPT IN CONFIDENTIALITY AND NOT BE COPIED OR DISCLOSED TO ANY OTHER PARTY WITHOUT THE WRITTEN CONSENT OF AMEC FOSTER WHEELER. ANY OTHER USE OR RELIANCE ON THIS DOCUMENT BY ANY THIRD PARTY IS AT THAT PARTY'S SOLE RISK AND RESPONSIBILITY. WHICH IT HAS BEEN DELIVERED.

P:\CADD\HONOLULU\JERSEY CITY\SA 6 SOUTH\3480170562-6100-DRA0-0003.dwg Thu, 09 Nov 2017 9:10am scott.rudkin Layout: Layout1



DEFERRED AREA TABLE	
SA 6 NORTH EA-1	PART OF DN # 9
SA 6 NORTH EA-2/3	PART OF DN # 6 & 9
SA 6 NORTH TA 7	PART OF DN # 10
SA 6 SOUTH RT 440	PART OF DN # 2
SA 6 SOUTH BULKHEAD	PART OF DN # 4

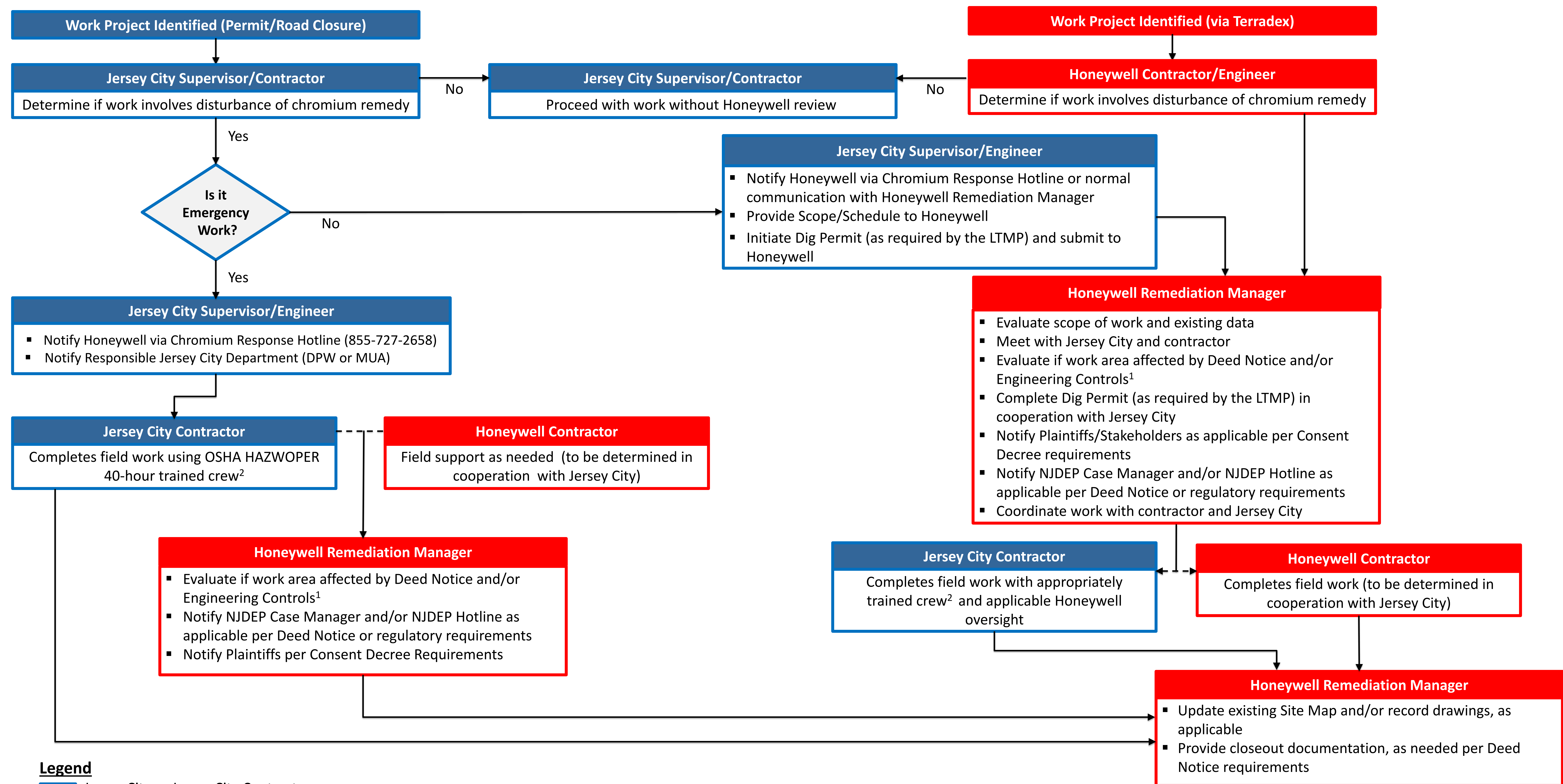
REV.	DATE	STATUS	PRPD BY	CHKD BY

Amec Foster Wheeler PROJECT No. 3480170562 DRAWING: 3480170562-6100-DRA0-0003	
PREPARED/DATE: STR 10/12/17	CHECKED/DATE: DEN 10/12/17

amec foster wheeler
ENVIRONMENT & INFRASTRUCTURE, Inc. 200 AMERICAN METRO BLVD, SUITE 113 HAMILTON, NEW JERSEY 08619

FIGURE 5 CHROMIUM DEED NOTICE AND CONSERVATION RESTRICTION AREAS STUDY AREAS 6 NORTH, 6 SOUTH & 7 JERSEY CITY, NEW JERSEY

Figure 6: Notification and Response Flow Chart – SA-6 Open Space or Chromium Deed Restricted Area



¹ See Deed Notice For Notification/Reporting Requirements

² Refer to LTMP for details on coordination and requirements for health and safety, excavation and disposal of chromium soils, backfill, and site restoration.

³ The new form of Deed Notice requires disturbances to be reported in the biennial certification.

Points Of Contact:
Chromium Response Hotline: 855-727-2658 (24/7 answering service)
Honeywell Remediation Manager: Maria Kaouris 973-455-3302 (office); 862-579-8453 (cell)
Jersey City Facilities Department: *To Be Determined*