



**HEALTH, SAFETY, ENVIRONMENT, PRODUCT STEWARDSHIP AND SUSTAINABILITY**  
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October 30, 2025

Honorable Robert G. Torricelli  
Office of the Special Master  
RGTspecialmaster@aol.com

Subject: **Updated, Revised 2025 Integrated Groundwater Sampling and Analysis Plan  
Study Areas 5, 6 & 7**

Dear Senator Torricelli:

Attached is a Revised 2025 Integrated Groundwater Sampling and Analysis Plan for Study Areas 5, 6 & 7 (SAP), dated October 30, 2025, as prepared by our hydrogeology consultant, Cornerstone. A memo prepared by WSP is also attached which explains the revisions made to the SAP.

Please contact me at 973-455-2877 should you have any questions or comments on this submittal.

Sincerely,

Eric Christodoulatos  
Senior Remediation Manager

Enclosures:

Revised 2025 Integrated Groundwater Sampling and Analysis Plan  
Study Areas 5, 6 & 7  
WSP Memo, Response to Plaintiffs' Comments on the  
2024 Integrated Sampling and Analysis Plan

cc: (electronic copy)  
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Dennis Nagg – WSP



## MEMO

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**Date:** October 30, 2025

**From:** Dennis Nagg

**To:** Eric Christodoulatos, Honeywell

**cc:** Jeremy Karpatkin – Arnold & Porter  
CJ Minchoff – GES  
George Pfeiffer – Honeywell  
John Giuliano – Tetra Tech  
Natalie Warner – WSP

**Subject:** Response to Plaintiffs' Comments on the 2024 Integrated Sampling and Analysis Plan

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WSP USA Inc. (WSP), on behalf of Honeywell, has prepared the following responses to the comments that were submitted by Plaintiffs regarding the 2024 Integrated Sampling and Analysis Plan in a letter dated August 25, 2025. Honeywell's hydrogeology consultant, Cornerstone, has revised the 2024 Integrated Sampling and Analysis Plan (SAP). Below, WSP has summarized the changes to pertinent portions of the text or tables based upon the comments received from Plaintiffs.

### RESPONSES TO COMMENTS FROM DR. BENJAMIN ROSS

#### DR. BENJAMIN ROSS COMMENT (BR-1):

*On page 9, in the third bullet under "Groundwater Quality Monitoring," replace "the western interior piezometers" with "piezometers where pumping is unable to consistently create an inward gradient"; and replace "Due to the low outboard heads along these western boundaries, the inboard piezometers PZ-10 and PZ-20R" with "At these piezometer pairs, the inboard piezometers (currently identified as PZ-2, PZ-10, and PZ-20R)". In the fourth bullet, replace "occurs based upon only the head difference criteria" with "consistently creates an inward gradient."*

#### WSP RESPONSE:

The requirement to annually sample the inboard piezometers PZ-10 and PZ-20R along the western boundaries of the SA-6 North and SA-6 South caps is unique due to the tidal influence on the outboard piezometers at these locations. Additionally, as indicated in Honeywell's September 2, 2025, response to comment memo sent to All Parties, Honeywell committed to sample PZ-2 in 2025 and to collect a groundwater sample from an interior piezometer when pumping for 30 days fails to reverse an outward gradient based on the monthly head difference at those locations. Therefore, Honeywell will retain the

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language in the third bullet on page 9 as is and will modify the fourth bullet as follows (shown below in redline/strikeout):

- Along the northern, eastern, and southern walls of the SA-6 Open Space Areas, Honeywell will conduct an annual sampling event for that year at interior piezometers when the associated piezometer pair exhibits an outward gradient based upon the 30-day monthly average and activation of the backup pumps does not reverse the gradient within 30 days. As long as If the activation of the contingent pumping system occurs based upon only the head difference criteria, reverses the gradient at those locations within 30 days, water quality sampling is not required.

**DR. BENJAMIN ROSS COMMENT (BR-2):**

*In Table A, change the frequency in the “regional” line to “annually, not before Sept. 1.”*

**WSP RESPONSE:**

The applicable portion of Table A has been changed to, “Annually, between Sept. 1 and Oct 31.”

**DR. BENJAMIN ROSS COMMENT (BR-3):**

*In Table A, change the frequency of manual water-level readings for SA-6 South and SA-6 North from annual to monthly. For SA-5 Sites 90 & 184, in the frequency column change “averaged monthly” to “averaged and calibrated against manual measurements”. Change all frequencies in Tables A-3 (except Wells 124-MW-10 and 124-MW-11) and A-4 to monthly and change footnotes to conform. Honeywell has in fact been calibrating the dataloggers monthly, and the rapid drift of the logger measurements after Honeywell stopped calibrating them in April 2024 shows the monthly recalibration to be necessary.*

**WSP RESPONSE:**

No changes to frequencies on the tables are required. For SA-6, the frequencies indicated on Tables A-3 and A-4 include the footnote, “Manual measurements annually, or more frequently at Honeywell’s discretion; logger data recorded every 6 hours and averaged monthly.” Thus, water levels can be collected more frequently at Honeywell’s discretion which is consistent with the SA-6 Long Term Monitoring Plan (LTMP). For SA-5, the frequency indicated on Table A is consistent with the SA-5 (NJCU) LTMP. Table A-5 has been edited to make the frequency consistent with the NJCU LTMP and now includes a footnote that water levels can be collected more frequently at Honeywell’s discretion.

**DR. BENJAMIN ROSS COMMENT (BR-4):**

*In Table A-1, remove the comment on Well 117-MW-14S. NJDEP has rejected abandonment of this well. In Tables A-1 and B-1, replace the destroyed Well 087-MW-136D with its replacement well. In Table A-8, remove the well that no longer exists.*

**WSP RESPONSE:**

The requested changes to Tables A-1, B-1, and A-8 have been made.

**DR. BENJAMIN ROSS COMMENT (BR-5):**

*Update all LTMP references in the tables to the currently applicable version.*

**WSP RESPONSE:**

All references to LTMPs have been updated on the tables.

**INTEGRATED GROUNDWATER SAMPLING  
AND ANALYSIS PLAN**

**STUDY AREAS 5, 6, AND 7  
JERSEY CITY, NEW JERSEY**

**Prepared for**

**HONEYWELL  
Morris Plains, New Jersey**

revised October 2025

Prepared by



100 Crystal Run Road, Suite 101  
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# 1 INTRODUCTION

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This document is a revision to the Integrated Groundwater Sampling and Analysis Plan (SAP) that was first issued November 5, 2013, and later revised April 29, 2014, October 21, 2019, and September 30, 2020 as a replacement to the Long-Term Monitoring Plan for the SA-7 deep overburden and bedrock groundwater remedy (SA-7 LTMP). By way of background, the SA-7 LTMP was originally developed in 2008 to address monitoring of groundwater conditions relative to the regional Groundwater Extraction and Treatment (GWET) system. Annual performance monitoring reports have been prepared since the startup of the GWET system in December 2008. In 2014, the LTMP was expanded to integrate groundwater monitoring requirements for the entire Project Area and was thus replaced by the SAP. The objective of this current update is to incorporate changes which have been agreed to by the Parties based on remedial actions completed at SA-5 and SA-6, and 15 years of monitoring data collected since 2008. Further, this updated plan incorporates provisions of the approved Long-Term Monitoring Plan for SA-6, dated February 2018 (SA-6 LTMP)<sup>1</sup>, the Long-Term Monitoring Plans applicable to the SA-5 sites, and the current Groundwater Permits issued by NJDEP, as referenced in tables herein. Remedial Action Groundwater Permit modifications were submitted to NJDEP in 2021. The modifications were approved by the NJDEP in February 2022 and May and June 2023, respectively. Therefore, the SAP is being updated to reflect the approved modifications.

The specific objectives of the plan are to characterize regional groundwater conditions and document compliance with area-specific remedial objectives. These monitoring activities generally consist of the collection of water level measurements and groundwater quality samples, and the reporting of these data in accordance with site-specific work plans. Because well locations and sampling frequencies vary from plan to plan and over time, there is a potential for duplication of efforts and inefficiency, both in the field, and in reporting. The specific objectives of the SAP and associated annual report are to:

- Improve consistency and efficiency in field procedures including sample collection and scheduling.
- Provide a central database for monitoring well specifications and status.
- Provide regional groundwater flow interpretations that consider the impact of features such as subsurface barrier walls, drains, caps, and drawdown from pumping.
- Provide localized groundwater flow maps consistent with the regional contour maps.

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<sup>1</sup> Honeywell updated the SA-6 LTMP in December 2020.

- Facilitate preparation of remedial action protectiveness biennial certifications pursuant to NJDEP Remedial Action Groundwater Permits and Classification Exception Area (CEA) requirements.

The contents of this SAP will be reviewed and re-issued on an as-needed basis to document such occurrences as:

- modifications to field procedures, equipment, or reporting that may be necessary due to changes in field conditions,
- changes in regulatory requirements or standards,
- changes in consent decrees, monitoring plans or remedial designs,
- changes in sampling frequency in response to accumulated monitoring data.

In the event that this plan omits monitoring activities required by an order, consent decree and/or a long-term monitoring plan, those activities will be carried out and reported in annual groundwater monitoring reports. If such inconsistencies are discovered, the plan will be corrected.

## 2 FIELD PROCEDURES

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### 2.1 Groundwater Level Measurements

Groundwater level measurements are required in the various monitoring plans listed in column B on Table A. The associated consent order or consent decree that requires these plans to be implemented is listed in column C on Table A. The individual wells associated with each plan are identified on Sub-tables A-1 through A-8 and a key to the appropriate Sub-table is provided in column F.

Monitoring well 124-MW-106T was replaced with 124-MW106TR at SA-6 South and 090-MW-09 was replaced with 090-MW-090R at NJCU. Both wells were replaced in October 2023 to a similar depth and screened interval as the original well. The casings in the original wells were crushed/bent and were unable to be sampled.

The most significant modification to the frequency of groundwater level monitoring is the approved change from quarterly to annual measurements for the GWET regional water level monitoring of the intermediate, deep, and bedrock groundwater zones. This change is based on the reduced number of available monitoring wells in the deeper zones and the consistency of the GWET capture zone that has been documented through more than 15 years of quarterly data. Monitoring of the shallow groundwater zone at SA-5, SA-6, and SA-7 includes quarterly monitoring of particular piezometers/monitoring wells as specified in the SA-5 and SA-6 LTMPs and per NJDEP permits.

Accuracy and consistency in water level measurements are critical considering the close tolerances in performance standards used to demonstrate capture zones, inward/outward gradients across barrier walls, and other performance metrics. As a result, groundwater level measurements will be conducted in accordance with the procedures provided below.

Field Procedures. Groundwater level measurements at the ten piezometer pairs around the perimeter of the SA-6 North and SA-6 South soil containment areas, the four piezometers within the interior pool of SA-7, the seven wells in SA-6 North and South along the SA-6/SA-7 boundary, and the four piezometer pairs located along the eastern barrier wall at NJCU are currently collected using automatic data loggers. For each well/piezometer equipped with an automatic data logger, the arithmetic mean of the recorded values will be calculated over a nominal one-month period as more fully described in Section 3.

For manual measurements, the depth to groundwater will be measured manually with an electronic water level meter. The sequence of manual water level measurements at a given well cluster will be pre-determined on the basis of existing groundwater quality data. Generally, the least contaminated well (in terms of hexavalent chromium concentration) will be measured first proceeding to progressively more contaminated wells based upon historic water quality data. The calibrated cable on the depth indicator will be checked against a surveyor's steel tape at the beginning of each quarterly event and replaced if more than 0.01 feet in error. The following procedures will be used for each manual water level measurement.

- The well cap will be removed and the well head allowed to vent for a short period of time.
- A new pair of latex gloves will be donned.
- The probe will be lowered into the well until the meter indicates water is reached.
- The probe will be raised above the water level and slowly lowered again until water is indicated.
- The cable will be held against the side of the inner well at the point designated for water level measurements and a depth reading taken.
- This procedure will be followed three times or until a consistent value is obtained.
- The value will be recorded to the nearest 0.01 feet in a field notebook.
- The time of the measurement and the reference point on the well head will be recorded in a field notebook.
- The probe will be raised to the surface and, together with the amount of cable that was wetted in the well, will be decontaminated as described in Appendix A.

Tidal Corrections. Groundwater levels in wells that are tidally influenced will rise and fall throughout the day in response to the rise and fall of the Hackensack River. The magnitude of this fluctuation relative to the magnitude of the tidal change defines the tidal efficiency of the well. The time delay between the river fluctuation and the associated groundwater fluctuation is the tidal lag.

In tidally influenced wells where head is not monitored by data loggers, tidal corrections are necessary to determine the average groundwater elevation. Wells affected by the tides are generally within 500 feet of the river and are screened below the Meadow Mat. A list of the wells where tidal corrections are necessary is provided in Table D. The tidal efficiency and tidal lag values shown on Table D were determined during prior tidal studies using pressure transducers. The tidal correction procedure for each well is as follows.

1. Hackensack river tidal fluctuations are plotted for a 10-day period centered on the date of the manual groundwater measurement. Tidal data are recorded in 6-minute intervals at the tide gauge on the SA-7 bulkhead.
2. A graph of the predicted groundwater fluctuations in the well of interest is then generated for this 10-day period based on the tidal lag and efficiency properties of the well as shown on Table D.
3. The date and time of the manual groundwater measurement is located on this chart and the correction amount is calculated as the difference between the manually-measured head and the average head for this well during the 10-day period.

4. The calculated head correction value is then added to, or subtracted from, the measured (raw) groundwater elevation to determine the corrected groundwater elevation for that well. For example, if the measurement was taken at time when groundwater levels in this well are predicted to be above the average, the correction value is subtracted from the manual reading and vice versa.
5. Average mean tide data for the previous 10 years (2015-2024) was obtained for the nearest USGS tide station (No. 01378570) on the Hackensack River, located approximately 12 miles upstream of the Site. This data was obtained from the United States Geologic Society (USGS) website. The average mean tide elevation was calculated to be 1.68 ft NGVD29 from the data measured at this station. The average mean tidal elevation will be evaluated and updated on a 10-year frequency, with the next update in 2034.

## 2.2 Groundwater Sample Collection

Groundwater sample collection for laboratory analysis is required in the various monitoring plans listed in Table B. The associated consent order or consent decree that requires these plans to be implemented is listed in column C in Table B. The individual wells associated with each plan are identified in Sub-tables B-1 through B-6 and a key to the appropriate Sub-table is provided in column F. The current frequency of sampling varies from quarterly at NJCU to every 5 years for the GWET deep monitoring wells.

Accuracy and consistency in groundwater sampling methods are critical and thus, groundwater sample collection will be conducted using a dedicated field team familiar with the nuances associated with the various well locations.

### **Field Procedures.**

- A well maintenance check that includes visual observations of the condition of the protective casing and surface seal will be performed. In addition, the well will be checked for other signs of damage or unauthorized entry.
- Plastic sheeting will be placed on the ground around the well (on the up-wind side of well) for a clean work area.
- The well cap will be removed and the well head allowed to vent for a short period of time before collecting a water level measurement.
- The static water level in each well/piezometer will be measured manually and recorded.
- Select groundwater sampling pump appropriate to the well depth and sample analysis.
- The pump or tubing will be placed in the well such that the intake is in the middle of the screened interval.
- The discharge tubing from the pump will be attached to the in-line flow cell fitted with the required probes to monitor the appropriate indicator parameters.

- The generator will be started/or pump connected to a battery and the controller used to set the pumping rate.
- The pump discharge rate will be measured and calculated using a graduated vessel and stop watch.
- The static water level in each well/piezometer will be measured manually and recorded.
- The discharge rate will be adjusted to minimize drawdown.
- Purging will continue until three consecutive readings have stabilized as follows:
  - pH (+/- 0.1 pH units)
  - Specific Conductivity (+/- 3%)
  - Temperature (+/- 3%)
  - ORP (+/- 10mv)
  - Dissolved Oxygen (+/- 10%)
  - Turbidity (+/- 10%)
- Upon stabilization, samples will be collected in appropriate containers in accordance with the analytical methods as provided in Table C. Each container will be filled to the appropriate volume required for analysis. VOC vials (if required for specific wells) will be filled to capacity, with no head space.

**Sample Labeling and Handling.** Samples destined for chemical analysis will be given sample designations. Sample designations will consist of the following information:

- Project name
- Sample identification
- Sample location
- Sample date and time
- Sample matrix
- Analyses to be performed
- Sample preservation, if appropriate.

The sample designation information will be printed on a waterproof label affixed to each sample container. Upon collection of each analytical sample, it will immediately be placed in a cooler. The contents of the cooler will be maintained at approximately 4°C with ice or cold packs. At the end of each day, the samples will be packed in the cooler(s) and prepared for pickup or dropped off to the laboratory. The appropriate chain-of-custody form will be completed, and the sampler's copies retained. The remaining copies will be placed inside a zip-lock bag and taped to the inside of the respective cooler lid. Sufficient ice/cold packs will be added to the cooler to maintain 4°C during delivery/shipment. The lid will then be closed and chain of custody seals added. Two signed and dated custody seals will be affixed across the seam of the cooler/lid (one on the front of the cooler and the other on the back).

**Field QA/QC Samples.** In addition to groundwater samples from the identified wells, one set of QA/QC samples will also be submitted for analysis for those events which consists of between five and twenty field samples (wells). If more than 20 field samples are collected, a

second set of QA/QC samples will be submitted for analyses and will be associated with this second “batch” of samples, and so on. Each batch of 20 (or fewer) samples will include the following QA/QC samples:

- One field duplicate
- One equipment rinsate blank
- One matrix spike and one matrix spike duplicate
- One trip blank per cooler containing samples for VOC analysis.

### 2.3 Laboratory Analysis and Reporting

The laboratory analyses of groundwater samples will be performed by SGS North America Inc. laboratories in Dayton, New Jersey. The analytical methods, containers, preservatives, and hold times are provided on Table C. Due to the relatively short hold time for hexavalent chromium, samples should be collected as late in the day as feasible and a pickup arranged as early in the day as feasible. Coordination between the laboratory and field staff on meeting hold times should be conducted by the project manager in advance of the sampling event. Special arrangements may be necessary when samples are collected on a Friday and need to be analyzed on the following Saturday. In general, sampling on Friday should be avoided.

Laboratory deliverables will include electronic transfer of data in both Excel spreadsheet and Access database formats, and on compact disc or in hardcopy (if requested). Case narratives describing observations made in the lab or the reasons for any “qualified” data will be provided in PDF format and in hardcopy. Standard turn-around time for this project is 2 weeks unless otherwise requested.

### 3 ANNUAL REPORTING

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Groundwater data collected as part of the SAP will be compiled and reported on an annual basis. More frequent reporting may be done through supplemental submissions as necessary. An outline of the current report format is provided as Attachment B. The primary section headings are:

#### General Conditions

This section will summarize factors that have influenced groundwater conditions during the year, such as the total annual precipitation, significant storm events, and subsurface site development activities. Changes to the monitoring well network will also be documented in this section. This may include wells that were permanently abandoned and wells that were added/replaced.

#### Groundwater Extraction

This section will document groundwater pumping history and rate for the regional GWET and the contingent pumping systems that may have been in operation at SA-6 North, SA-6 South, and NJCU. The data will be provided in tables and graphs as appropriate.

#### Hydraulic Monitoring

This section will include groundwater level data in tabular form and groundwater elevation contour maps of the intermediate, deep, and bedrock groundwater zones based on the annually collected data. Subsections may be provided to include various tables and charts illustrating the performance of the local hydraulic remedy. For the regional GWET system, this will include the area of depression of the downgradient extraction wells. For the Shallow groundwater zone, hydraulic gradients across the barrier walls will be compared with the performance criteria in individual LTMPs.

#### Hydraulic Gradients

For each piezometer equipped with an automatic data logger, the arithmetic mean of the recorded values will be calculated over a nominal one-month period and provided in both tabular form and as a 12-month hydrograph in the annual monitoring report. These data will also be used in comparative tables and plots to determine if the head gradients across the barrier walls meet the inward performance criteria defined in the respective LTMPs. For head comparisons across the Soil-Cement Barrier (SCB) wall between SA-6 and SA-7, data from each piezometer on SA-6 North and South will be compared to the nearest piezometer on the SA-7 side of the SCB.

The water-level data will be evaluated with respect to hydraulic gradients and requirements of remediation plans such as:

- Outward gradient from SA-7
- Inward gradient into containment cells on SA6 North and South
- Inward hydraulic gradients at the NJCU Commercial Area
- Plume capture by the regional GWET system.

### Groundwater Quality Monitoring

This section will include groundwater quality data from the following sampling programs:

- Regional GWET sampling rounds currently conducted every 5 years. Data will be provided in tabular form and on groundwater concentration maps for each of the four flow zones. Wells to be sampled are listed in Table B-1 in Appendix B.
- In-situ groundwater samples collected from beneath the Hackensack River riverbed deposits. Currently only one location (PW09-450) remains to be sampled every 5 years or until filtered total chromium concentrations are below 70 ppb.
- Gradient-dependent sampling of the western interior piezometers at SA-6 North and South as described in the draft SA-6 LTMP. Due to the low outboard heads along these western boundaries, the inboard piezometers PZ-10 and PZ-20R will be sampled annually unless the filtered total chromium concentration exceeds 70 ppb, at which time the sampling frequency shall be quarterly.
- Along the northern, eastern, and southern walls of the SA-6 Open Space Areas, Honeywell will conduct an annual sampling event for that year at interior piezometers when the associated piezometer pair exhibits an outward gradient based upon the 30-day monthly average and activation of the backup pumps does not reverse the gradient within 30 days. If the activation of the contingent pumping system reverses the gradient at those locations within 30 days, water quality sampling is not required.
- Gradient-dependent sampling of wells at NJCU as described in the Shallow Groundwater Monitoring and Extraction System Operations Plan (Appendix L of the NJCU LTMP). Wells to be sampled depend on groundwater quality results as provided in Table B-2 in Appendix B. The sampling frequency is quarterly if inward gradients are not fully maintained across the wall. Future sampling frequency of inboard wells may be reduced to semi-annual or annual, subject to agreement by the parties. Outboard wells are not currently being sampled. Changes to sampling frequency are subject to NJDEP remedial action permit modification prior to implementation.
- Sampling of monitoring wells on Sites 117 and 153 is conducted every 2 years (with the exception of 117-MW-I4S which is every 5 years) as specified in the NJDEP Groundwater Remedial Action Permits and will continue during the on-going negotiations between the Parties of the SA-5 Shallow Groundwater Remedy Order and the SA-5 LTMP. Once finalized, groundwater sampling will comply with these documents as required by the Consent Decree Regarding Remediation of the Study Area 5 Shallow Groundwater and the Site 79 Residential Properties. Wells to be sampled are listed in Table B-3 and B-4, respectively, in Appendix B.

In general, detections of chromium above the New Jersey Ground Water Quality Standard of 70 ppb in a well that previously met the standard, or a substantial increase in chromium concentrations, will require further evaluation. A detection of hexavalent chromium in a well where hexavalent chromium was not previously detected will also be evaluated. Cases in which the filtered total chromium result exceeded 70 ppb but the hexavalent chromium result did not will also be evaluated. Sampling rounds that collect 2 or more filtered samples with different filter pore sizes may be undertaken to assist in this evaluation.

### Conclusions and Recommendations

This section will summarize the performance of the various groundwater remedies and recommend modifications to the plan as appropriate. These recommendations may include:

- Addition or subtraction of wells within the monitoring network
- Changes to water level and/or water quality sampling frequency
- Changes to analytical parameters/methods
- Changes to pumping rates
- Changes to performance criteria
- Other recommendations

## TABLES

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**TABLE A**  
**GROUNDWATER LEVEL MONITORING REQUIREMENTS**  
**for Integrated Groundwater Sampling and Analysis Plan**

<u>A</u> <u>Location</u>	<u>B</u> <u>Monitoring Plan</u>	<u>C</u> <u>Consent Decree</u>	<u>D</u> <u>Depth</u>	<u>E</u> <u>Frequency</u>	<u>F</u> <u># Wells (ref table)</u>	<u>G</u> <u>Figure Ref. #</u>
Regional <sup>1</sup>	GWET Long Term Monitoring Plan June 10, 2008	Deep Overburden and Bedrock Groundwater Remedies Consent Order	All Zones	Annually, between Sept. 1 and Oct. 31	115 (A-1)	A-1a through A-1d
Study Area 7	SA-7 Perimeter Pools	Final Judgement, ICO v Honeywell	Shallow	Monthly	4 (A-2)	A-1a
Study Area 7 - Site 115	SA-6 Long Term Monitoring Plan (February 2018, revised December 2020)	Final Judgement	Shallow	Monthly manual readings; logger readings every 6 hours-averaged monthly	4 (A-2)	A-1a
SA-6 South <sup>4</sup>	SA-6 Long Term Monitoring Plan (February 2018, revised December 2020)	First Amended Consent Decree Regarding Remediation and Redevelopment of SA-6 South	Shallow	Annual manual readings; logger readings every 6 hours-averaged monthly	15 (A-3)	A-2
SA-6 North <sup>4</sup>	SA-6 Long Term Monitoring Plan (February 2018, revised December 2020)	First Amended Consent Decree Regarding Remediation and Redevelopment of Study Area 6 North	Shallow	Annual manual readings; logger readings every 6 hours-averaged monthly	14 (A-4)	A-3
SA-5 (NJCU) Sites 90 & 184 <sup>4</sup>	Long Term Monitoring Plan <sup>2A</sup> (May 2019)	Consent Decree Regarding Remediation of the New Jersey City University Redevelopment Area	Shallow	Quarterly manual readings; logger readings every 6 hours-averaged monthly	13 wells and 2 sumps (A-5)	A-4
SA-5: Site 079	Long Term Monitoring Plan for Sites 079 and 153 South (December 2019) <sup>2B</sup>	Consent Decree Regarding Remediation of the Study Area 5 Shallow Groundwater and the Site 79 Residential Properties	Shallow	Quarterly	3 (A-6)	A-4
SA-5: Site 153 <sup>4</sup>	Long Term Monitoring Plan for SA-5 Shallow GW <sup>3</sup>	Consent Decree Regarding Remediation of the Study Area 5 Shallow Groundwater and the Site 79 Residential Properties	Shallow	Quarterly	2 (A-7)	A-4
SA-5 Site 117 <sup>4</sup>	Long Term Monitoring Plan for SA-5 Shallow GW <sup>3</sup>	Consent Decree Regarding Remediation of the Study Area 5 Shallow Groundwater and the Site 79 Residential Properties	Shallow	Quarterly	5 (A-8)	A-4

<sup>1</sup> Includes available wells on SA-5, SA-6, SA-7, and surrounding areas historically considered part of the Deep Overburden Plume investigation..

<sup>2A</sup>SA-5 NJCU LTMP (November 2016; updated May 2019); Shallow Groundwater Monitoring and Extraction System Operation Plan (Appendix L of the LTMP).

<sup>2B</sup>SA-5 SITE 079 AND 153 SOUTH LTMP (April 2014; draft updated December 2019 [sent to Plaintiffs 12/12/19]).

<sup>3</sup>Draft LTMP for SA-5 Shallow Groundwater includes Sites 117 and 153 submitted to the Parties for review in 2018.

<sup>4</sup>Remedial Action Groundwater Permits were issued in 2018 for the Deep Overburden; Bedrock; and Shallow groundwater zones at SA-5 Sites 90/184, 117, 153, SA-6 North and South Open Space Cap Areas. Permit modification requests were approved in February 2022 for SA-5 and May and June 2023 for SA-6.

**Table A-1**  
**Monitoring Wells for Groundwater Level Measurements**  
**Long-term Monitoring Plan**  
(refer to Figures A-1a through A-1d)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Comments</u>
Shallow	079-MW-01	
Shallow	079-MW-A2	
Shallow	079-MW-C6	
Shallow	087-PZ-1	
Shallow	087-PZ-2	
Shallow	087-PZ-3	
Shallow	087-PZ-4	
Shallow	087-PZ-5	
Shallow	087-PZ-6	
Shallow	087-PZ-7	
Shallow	087-PZ-8	
Shallow	087-PZ-9	
Shallow	087-PZ-10	
Shallow	090-PZ-05	
Shallow	090-PZ-06	
Shallow	115-E1A-SO	
Shallow	115-E2-SO	
Shallow	115-E3-SO	
Shallow	115-E4-SO	
Shallow	115-E5-SO	
Shallow	115-PZ-500	
Shallow	115-PZ-501	
Shallow	115-PZ-502	
Shallow	115-PZ-503	
Shallow	115-W1-SO	
Shallow	115-W3-SO	
Shallow	115-W5-SO	
Shallow	115-W6-SO	
Shallow	117-MW-A05	
Shallow	117-MW-A14	
Shallow	117-MW-A85	
Shallow	117-MW-A89	
Shallow	117-MW-A99	

**Table A-1**  
**Monitoring Wells for Groundwater Level Measurements**  
**Long-term Monitoring Plan**  
(refer to Figures A-1a through A-1d)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Comments</u>
Shallow	117-MW-I4S	
Shallow	124-MW-10	
Shallow	124-MW-11	
Shallow	124-PZ-11	
Shallow	124-PZ-12	
Shallow	124-PZ-13	
Shallow	124-PZ-14	
Shallow	124-PZ-15	
Shallow	124-PZ-16	
Shallow	124-PZ-17	
Shallow	124-PZ-18	
Shallow	124-PZ-19R	
Shallow	124-PZ-20R	
Shallow	153-MW-A13	
Shallow	153-MW-A15	
Shallow	154-MW-A06	
Shallow	184-MW-04	
Shallow	184-MW-05	
Shallow	184-MW-06	
Shallow	184-MW-101	
Shallow	184-MW-102	
Shallow	184-MW-103	
Shallow	184-MW-104	
Shallow	184-MW-105	
Shallow	184-MW-106R	
Shallow	184-MW-107	
Shallow	184-MW-108	
Shallow	Sump A	
Shallow	Sump B	

**Table A-1**  
**Monitoring Wells for Groundwater Level Measurements**  
**Long-term Monitoring Plan**  
(refer to Figures A-1a through A-1d)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Comments</u>
Intermediate	087-MW-13	
Intermediate	087-MW-136DR	
Intermediate	087-MW-W25D	
Intermediate	087-MW-A26D	
Intermediate	087-MW-O29D	
Intermediate	087-OBS-07	
Intermediate	087-OBS-1D	
Intermediate	087-OBS-2D	
Intermediate	087-OBS-5D	
Intermediate	087-PW-2	
Intermediate	087-PW-3	
Intermediate	088-MW-15R	
Intermediate	090-MW-07	
Intermediate	117-MW-I1	
Intermediate	117-MW-I2	
Intermediate	117-MW-I3	
Intermediate	117-MW-I5	
Intermediate	124-MW-G02D	
Intermediate	SA6-MW-AA1D	
Deep	087-MW-08	
Deep	087-MW-34	
Deep	087-MW-A26T	
Deep	087-MW-W25T	
Deep	087-OBS-1L	
Deep	087-OBS-1T	
Deep	087-OBS-3L	
Deep	087-OBS-4T	
Deep	087-OBS-5T	
Deep	087-PW-1	
Deep	088-MW-G19T	
Deep	090-MW-09R	
Deep	117-MW-D1	
Deep	117-MW-D2	
Deep	117-MW-D3	
Deep	117-MW-I4	
Deep	119-MW-01T	
Deep	119-MW-02T	
Deep	124-MW-106TR	
Deep	153-MW-13T	
Deep	SA6-MW-AAIT	

**Table A-1**  
**Monitoring Wells for Groundwater Level Measurements**  
**Long-term Monitoring Plan**  
(refer to Figures A-1a through A-1d)

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<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Comments</u>
Bedrock	073-MW-1BR	
Bedrock	079-MW-13BR	
Bedrock	090-MW-7BR	
Bedrock	115-MW-203BR	
Bedrock	115-MW-215BR	
Bedrock	117-MW-3BR	
Bedrock	117-MW-8BR	
Bedrock	119-MW-16BR	
Bedrock	119-MW-2BR	
Bedrock	124-MW-8BR	
Bedrock	SA6-MW-14BR	
Bedrock	SA6-MW-15BR	
Bedrock	SA6-MW-5BR	

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**Table A-2**  
**Monitoring Wells for Groundwater Level Measurements**  
**SA-7 Perimeter Pool and Interior Monitoring**  
(refer to Figure A-1a)

<u>Location</u>	<u>Pool / Well ID</u>	<u>Comments</u>	<u>Closest Monitoring Well(s) for Gradient Comparison</u>	<u>Comments</u>	<u>Frequency</u>
Perimeter Pool E-1	E-1 Standpipe	inside SA7 barrier wall	115-E3-SO	outside SA7 barrier wall	Monthly <sup>2</sup>
Perimeter Pool E-2	E-2 Standpipe	inside SA7 barrier wall	115-E2-SO	outside SA7 barrier wall	Monthly <sup>2</sup>
Site 115	115-PZ-500	inside SA7 barrier wall	115-W3-SO	outside SA7 barrier wall	Monthly <sup>1,3</sup>
Site 115	115-PZ-501	inside SA7 barrier wall	115-E1A-SO	outside SA7 barrier wall	Monthly <sup>1,3</sup>
			115-W5-SO	outside SA7 barrier wall	
Site 115	115-PZ-502	inside SA7 barrier wall	115-E4-SO	outside SA7 barrier wall	Monthly <sup>1,3</sup>
			115-E5-SO	outside SA7 barrier wall	
Site 115	115-PZ-503	inside SA7 barrier wall	115-W1-SO	outside SA7 barrier wall	Monthly <sup>1,3</sup>
			115-W6-SO	outside SA7 barrier wall	

<sup>1</sup>Manual measurements are currently collected monthly; logger data recorded every 6 hours and averaged monthly

<sup>2</sup>Additional monitoring as appropriate if construction could affect water levels in the perimeter pools

<sup>3</sup>Frequency to increase upon construction that could lower Site 115 water levels in accordance with Section 3.1.8 of the LTMP.

**Table A-3**  
**Monitoring Wells for Groundwater Level Measurements**  
**SA-6 South Groundwater Level Monitoring Plan**

(refer to Figure A-2)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Comments</u>	<u>Frequency</u>
Shallow	124-PZ-11	outside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	124-PZ-12	inside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	124-PZ-13	outside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	124-PZ-14	inside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	124-PZ-15	outside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	124-PZ-16	inside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	124-PZ-17	outside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	124-PZ-18	inside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	124-PZ-19R	outside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	124-PZ-20R	inside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	124-MW-10	outside SA-6S barrier wall	Annually <sup>2</sup>
Shallow	124-MW-11	outside SA-6S barrier wall	Annually <sup>2</sup>
Shallow	115-W3-SO	inside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	115-W5-SO	inside SA-6S barrier wall	Annually <sup>1</sup>
Shallow	115-E1A-SO	inside SA-6S barrier wall	Annually <sup>1</sup>

<sup>1</sup>Manual measurements annually, or more frequently at Honeywell's discretion; logger data recorded every 6 hours and averaged monthly

<sup>2</sup>Manual measurements only, no data logger installed

**Table A-4**  
**Monitoring Wells for Groundwater Level Measurements**  
**SA-6 North Groundwater Level Monitoring Plan**

(refer to Figure A-3)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Comments</u>	<u>Frequency</u>
Shallow	087-PZ-1	outside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	087-PZ-2	inside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	087-PZ-3	outside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	087-PZ-4	inside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	087-PZ-5	outside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	087-PZ-6	inside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	087-PZ-7	outside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	087-PZ-8	inside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	087-PZ-9	outside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	087-PZ-10	inside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	115-W6-SO	inside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	115-W1-SO	inside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	115-E4-SO	inside SA-6N barrier wall	Annually <sup>1</sup>
Shallow	115-E5-SO	inside SA-6N barrier wall	Annually <sup>1</sup>

<sup>1</sup>Manual measurements annually, or more frequently at Honeywell's discretion; logger data recorded every 6 hours and averaged monthly

**Table A-5**  
**Monitoring Wells for Groundwater Level Measurements**  
**SA-5 (NJCU) Sites 90 & 184 Long-term Monitoring Plan**

(refer to Figure A-4)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Comments</u>	<u>Frequency</u>
Shallow	090-PZ-05	Inside Barrier Wall	Quarterly
Shallow	090-PZ-06	Outside Barrier Wall	Quarterly
Shallow	184-MW-101	Outside Barrier Wall	Quarterly <sup>1</sup>
Shallow	184-MW-102	Inside Barrier Wall	Quarterly <sup>1</sup>
Shallow	184-MW-103	Outside Barrier Wall	Quarterly <sup>1</sup>
Shallow	184-MW-104	Outside Barrier Wall	Quarterly <sup>1</sup>
Shallow	184-MW-105	Inside Barrier Wall	Quarterly <sup>1</sup>
Shallow	184-MW-106R	Outside Barrier Wall	Quarterly <sup>1</sup>
Shallow	184-MW-107	Inside Barrier Wall	Quarterly <sup>1</sup>
Shallow	184-MW-108	Inside Barrier Wall	Quarterly <sup>1</sup>
Shallow	184-MW-04	Outside Barrier Wall	Quarterly
Shallow	184-MW-05 <sup>2</sup>	Outside Barrier Wall	Quarterly
Shallow	184-MW-06	Outside Barrier Wall	Quarterly
Shallow	Sump A	Inside Barrier Wall	Quarterly <sup>1</sup>
Shallow	Sump B	Inside Barrier Wall	Quarterly <sup>1</sup>

<sup>1</sup>Manual measurements quarterly, or more frequently at Honeywell's discretion; logger data recorded every 6 hours and averaged monthly

<sup>2</sup>This well is to be abandoned during site development

**Table A-6**  
**Monitoring Wells for Groundwater Level Measurements**  
**SA-5 Site 079 Long-term Monitoring Plan**  
(refer to Figure A-4)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Comments</u>
Shallow	079-MW-01	
Shallow	079-MW-A02	
Shallow	079-MW-C6	

**Table A-7**  
**Monitoring Wells for Groundwater Level Measurements**  
**SA-5 Site 153: Long Term Monitoring Plan for SA-5 Shallow Groundwater<sup>1</sup>**  
(refer to Figure A-4)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Comments</u>
Shallow	153-MW-A13	
Shallow	153-MW-A15	

<sup>1</sup> Draft LTMP for SA-5 Shallow Groundwater in progress.

**Table A-8**  
**Monitoring Wells for Groundwater Level Measurements**  
**SA-5 Site 117: Long-term Monitoring Plan for SA-5 Shallow Groundwater<sup>1</sup>**  
(refer to Figure A-4)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Comments</u>
Shallow	117-MW-A05	
Shallow	117-MW-A14	
Shallow	117-MW-A85	
Shallow	117-MW-A89	
Shallow	117-MW-A99	

<sup>1</sup> Draft LTMP for SA-5 Shallow Groundwater in progress.

**TABLE B  
GROUNDWATER QUALITY MONITORING REQUIREMENTS  
for Integrated Groundwater Sampling and Analysis Plan**

A <u>Location</u>	B <u>Monitoring Plan</u>	C <u>Consent Decree</u>	D <u>Depth</u>	E <u>Frequency</u>	F <u># Wells (ref table)</u>	G <u>Figure Ref. #</u>	H <u>Estimated Start Date</u>
Regional	Integrated Sampling and Analysis Plan; April 2014, revised October 2019	Deep Overburden and Bedrock Groundwater Remedies Consent Order	Intermediate Deep Bedrock Beneath River	Every 5 years <sup>5</sup> Every 5 years <sup>5</sup> Every 5 years <sup>5</sup> Every 5 years	6 (B-1) 10 (B-1) 9 (B-1) 1	B-1a B-1b B-1c	On-going future events TBD
SA-5 (NJCU) Sites 90 & 184	Long Term Monitoring Plan / Shallow Groundwater Monitoring Document <sup>1</sup>	Consent Decree Regarding Remediation of the New Jersey City University Redevelopment Area	Shallow	Quarterly	8 (B-2)	B-2	On-going
SA-5 Site 117	Long Term Monitoring Plan for SA-5 Shallow GW <sup>2</sup>	Consent Decree Regarding Remediation of the Study Area 5 Shallow Groundwater and the Site 79 Residential Properties	Shallow	Biennial <sup>2</sup>	6 (B-3)	B-2	On-going
SA-5: Site153	Long Term Monitoring Plan for SA-5 Shallow GW <sup>2</sup>	Consent Decree Regarding Remediation of the Study Area 5 Shallow Groundwater and the Site 79 Residential Properties	Shallow	Biennial <sup>2</sup>	2 (B-4)	B-2	On-going
SA-6 South	SA-6 LTMP (February 2018) <sup>3</sup>	First Amended Consent Decree Regarding Remediation and Redevelopment of SA-6 South	Shallow	As required by inward gradients across wall	5(B-5)	B-3	On-going
SA-6 North	SA-6 LTMP (February 2018) <sup>3</sup>	First Amended Consent Decree Regarding Remediation and Redevelopment of SA-6 North	Shallow	As required by inward gradients across wall	5(B-6)	B-4	On-going

Biennial = every two years

<sup>1</sup>SA-5 NJCU LTMP (November 2016, updated May 2019); Shallow Groundwater Monitoring and Extraction System Operation Plan (Appendix L of the LTMP).

<sup>2</sup>Draft LTMP for SA-5 Shallow Groundwater includes Sites 117 and 153 submitted to the Parties for review in 2018.

<sup>3</sup>The SA-6 LTMP was updated in December 2020.

<sup>4</sup>Remedial Action Groundwater Permits were issued in 2018 for the Deep Overburden; Bedrock; and Shallow groundwater zones at SA-5 Sites 90/184, 117, 153, SA-6 North and South Open Space Cap Areas. Permit modification requests were approved in May 2023.

<sup>5</sup>The frequency in the Remedial Action Groundwater Permits issued in 2018 for the Deep Overburden; Bedrock; and Shallow groundwater zones is every 2 years, thus a reduced frequency to every 5 years is subject to NJDEP approval via RA GW permit modification which was received in 2023.

**Table B-1**  
**Monitoring Wells for Groundwater Quality Sampling**  
**GWET Long-term Monitoring Plan**  
(refer to Figures B-1a through B-1c)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Analytical Parameters</u>	<u>Analytical Methods</u>
Shallow	None*	NA	NA
Intermediate	087-MW-136DR	Note 1	Note 2
Intermediate	087-MW-W25D	Note 1	Note 2
Intermediate	087-MW-A26D	Note 1	Note 2
Intermediate	117-MW-I1	Note 1	Note 2
Intermediate	117-MW-I5	Note 1	Note 2
Intermediate	SA6-MW-AA1D	Note 1	Note 2
Deep	087-MW-W25T	Note 1	Note 2
Deep	087-MW-A26T	Note 1	Note 2
Deep	090-MW-09R	Note 1	Note 2
Deep	117-MW-D3	Note 1	Note 2
Deep	117-MW-I4	Note 1	Note 2
Deep	117-MW-D2	Note 1	Note 2
Deep	119-MW-01T	Note 1	Note 2
Deep	119-MW-02T	Note 1	Note 2
Deep	124-MW-106TR	Note 1	Note 2
Deep	SA6-MW-AA1T	Note 1	Note 2
Bedrock	079-MW-13BR	Note 1	Note 2
Bedrock	090-MW-7BR	Note 1	Note 2
Bedrock	115-MW-203BR	Note 1	Note 2
Bedrock	117-MW-8BR	Note 1	Note 2
Bedrock	119-MW-2BR-1	Note 1	Note 2
Bedrock	119-MW-16BR-1	Note 1	Note 2
Bedrock	124-MW-8BR	Note 1	Note 2
Bedrock	SA6-MW-14BR	Note 1	Note 2
Bedrock	SA6-MW-15BR	Note 1	Note 2
Riverbed Porewater	PW09-450	Note 1	Note 2

\* Shallow groundwater is not considered part of the Deep Overburden Groundwater Plume.  
**Note 1: Total Cr (filtered and unfiltered), Hex Cr. (filtered and unfiltered)**  
**Note 2: Total Cr method EPA 200.7; hex Cr method SW846-7199**

**Table B-2**  
**Monitoring Wells for Groundwater Quality Sampling**  
**SA-5 (NJCU) Sites 090 and 184 Long Term Monitoring Plan**  
(refer to Figure B-2)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Analytical Parameters</u>	<u>Analytical Methods</u>
Shallow	184-MW-102	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	184-MW-105	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	184-MW-107	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	184-MW-108	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199

Future sampling of wells may be reduced to semi-annual or annual, subject to agreement by the parties and NJDEP remedial action permit modification.

**Table B-3**  
**Monitoring Wells for Groundwater Quality Sampling**  
**SA-5 Site 117: Long-term Monitoring Plan for SA-5 Shallow Groundwater<sup>1</sup>**  
(refer to Figure B-2)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Analytical Parameters</u>	<u>Analytical Methods</u>
Shallow	117-MW-A05	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	117-MW-A14	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	117-MW-A85	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	117-MW-A89	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	117-MW-A99	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	117-MW-I4S <sup>2</sup>	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199

<sup>1</sup> Draft LTMP for SA-5 Shallow Groundwater in progress.

<sup>2</sup>Groundwater quality sampling at 117-MW-I4S is on a 5 year sampling frequency per May 2023 Remedial Action permit modification. Other wells on a 2 year sampling frequency.

**Table B-4**  
**Monitoring Wells for Groundwater Quality Sampling**  
**SA-5 Site 153: Long-term Monitoring Plan for SA-5 Shallow Groundwater<sup>1</sup>**  
(refer to Figure B-2)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Analytical Parameters</u>	<u>Analytical Methods</u>
Shallow	153-MW-A13	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	153-MW-A15	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199

<sup>1</sup> Draft LTMP for SA-5 Shallow Groundwater in progress.

**Table B-5**  
**Monitoring Wells for Groundwater Quality Sampling**  
**SA-6 South Site 124 : Long-term Monitoring Plan for SA-6 South Shallow Groundwater**  
(refer to Figure B-3)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Analytical Parameters</u>	<u>Analytical Methods</u>
Shallow	124-PZ-12	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	124-PZ-14	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	124-PZ-16	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	124-PZ-18	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	124-PZ-20R	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199

Wells sampled only as required by monitoring plan if lack of inward gradient across barrier wall

**Table B-6**  
**Monitoring Wells for Groundwater Quality Sampling**  
**SA-6 North Site 087: Long-term Monitoring Plan for SA-6 North Shallow Groundwater**  
(refer to Figure B-4)

<u>Monitoring Zone</u>	<u>Well ID</u>	<u>Analytical Parameters</u>	<u>Analytical Methods</u>
Shallow	087-PZ-2	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	087-PZ-4	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	087-PZ-6	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	087-PZ-8	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199
Shallow	087-PZ-10	Total and Hexavalent Chromium	EPA 200.7 and SW846-7199

Wells sampled only as required by monitoring plan if lack of inward gradient across barrier wall  
See LTMP for details

**Table C**  
**Analytical Methods, Containers, Preservation, and Hold Times**

<u>Analytical Parameter</u>	<u>Method</u>	<u>Container</u>	<u>Preservation</u>	<u>Hold Time</u>
Total Chromium	EPA 200.7	500 ml poly	cool 4 <sup>o</sup> C*	6 months
Hexavalent Chromium	SW846-7199	500 ml poly	cool 4 <sup>o</sup> C*	24 hours
Iron	EPA 200.7	500 ml poly	cool 4 <sup>o</sup> C*	6 months
Sulfate	EPA 300/SW846 9056A	500 ml poly	cool 4 <sup>o</sup> C	6 months
Calcium	EPA 200.9	500 ml poly	cool 4 <sup>o</sup> C*	6 months
VOC	EPA 624	40 ml glass (3)	cool 4 <sup>o</sup> C	14 days

\* Nitric acid to pH < 2 for dissolved (filtered) samples.

**Table D**  
**Summary of Tidal Lag and Tidal Efficiency**

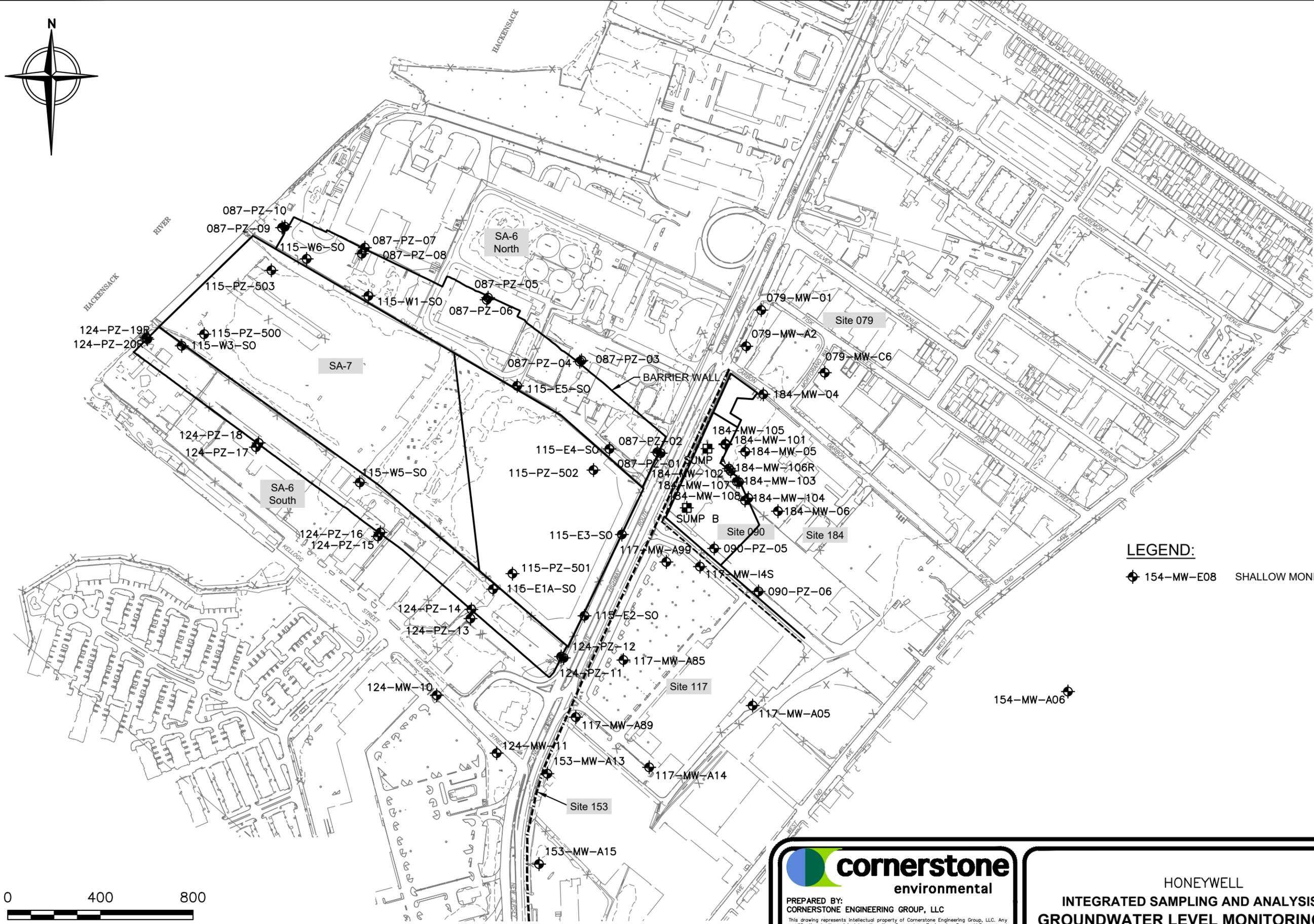
<u>Well ID</u>	<u>Screened Zone</u>	<u>Tidal Efficiency (%)</u>	<u>Tidal Lag (minutes)</u>
087-MW-13	Intermediate	61.50%	18
087-MW-O29D	Intermediate	15.40%	107
087-MW-W25D	Intermediate	40.00%	22
087-OBS-1D	Intermediate	62.20%	25.5
087-OBS-2D	Intermediate	29.00%	19
087-OBS-5D	Intermediate	30.00%	20
SA6-MW-AA1D	Intermediate	44.10%	10
087-MW-08	Deep	45.70%	3.5
087-MW-34	Deep	29.10%	19
087-MW-W25T	Deep	33.00%	40
087-OBS-1L	Deep	62.20%	25.5
087-OBS-1T	Deep	48.40%	18
087-OBS-3L	Deep	45.00%	18
087-OBS-4T	Deep	18.50%	56.2
087-OBS-5T	Deep	30.00%	20
SA6-MW-AA1T	Deep	34.20%	4
073-MW-1BR	Bedrock	38.90%	32.8
115-MW-203BR	Bedrock	38.70%	25
115-MW-215BR	Bedrock	40.50%	14
119-MW-2BR	Bedrock	43.80%	16.4
SA6-MW-5BR	Bedrock	13.50%	53.7
SA6-MW-14BR	Bedrock	3.90%	183.7
SA6-MW-15BR	Bedrock	18.70%	187.1

## FIGURES

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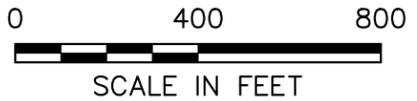


File: X:\PROJECTS\HONEYWELL\130109 - SA7\PROJECT DRAWINGS\2025 October Integrated SAP\H15WSF-S-SITE-A-1A.dwg Layout: FIGURE 4-1A User: john.guliano Oct 29, 2025 - 9:36am



**LEGEND:**

◆ 154-MW-E08 SHALLOW MONITORING WELL



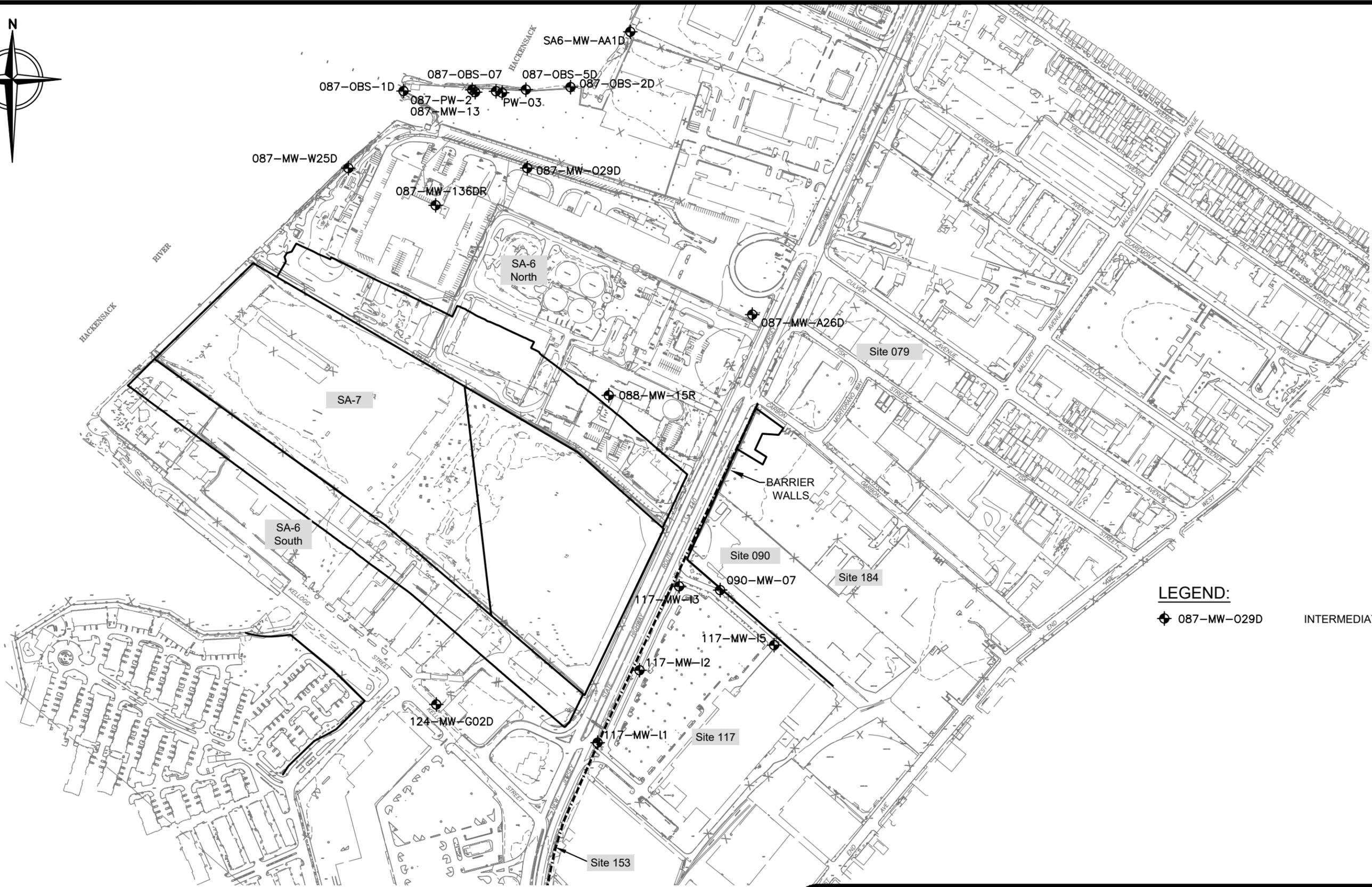
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environmental

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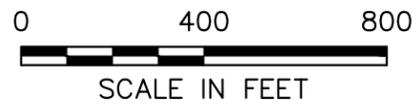
HONEYWELL  
**INTEGRATED SAMPLING AND ANALYSIS PLAN**  
**GROUNDWATER LEVEL MONITORING WELLS**  
**SHALLOW ZONE**

FIGURE NO.  
**A-1a**  
PROJECT NO.  
4243390



**LEGEND:**

◆ 087-MW-029D INTERMEDIATE ZONE MONITORING WELL



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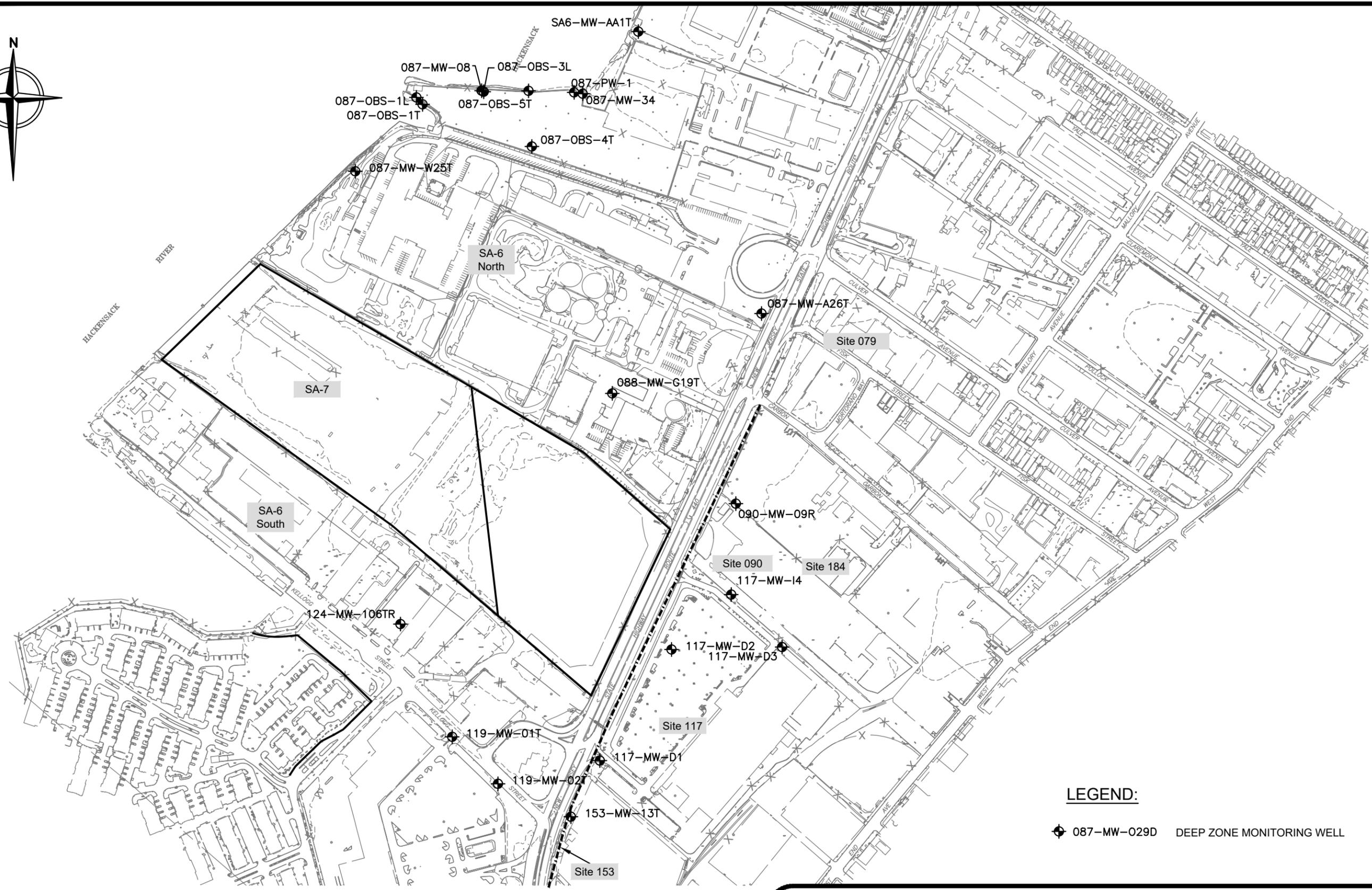


HONEYWELL  
**INTEGRATED SAMPLING AND ANALYSIS PLAN  
GROUNDWATER LEVEL MONITORING WELLS  
INTERMEDIATE ZONE**

FIGURE NO.  
**A-1b**  
PROJECT NO.  
120538

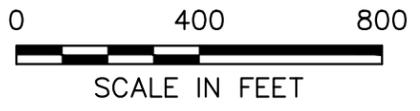
File: X:\PROJECTS\HONEYWELL\30109 - SA7\PROJECT DRAWINGS\2025 October Integrated SAP\H15WSF-S-SITE-A-1B.dwg Layout: A-1B User: johngiuliano Oct 29, 2025 - 9:41am

File: X:\PROJECTS\HONEYWELL\130109 - SKY\PROJECT DRAWINGS\2024 March Integrated SAP\H15WSF-S-SITE-A-1C.dwg Layout: FIGURE 4-3 User: john.guiliano Mar 20, 2024 - 8:51am



**LEGEND:**

◆ 087-MW-029D DEEP ZONE MONITORING WELL

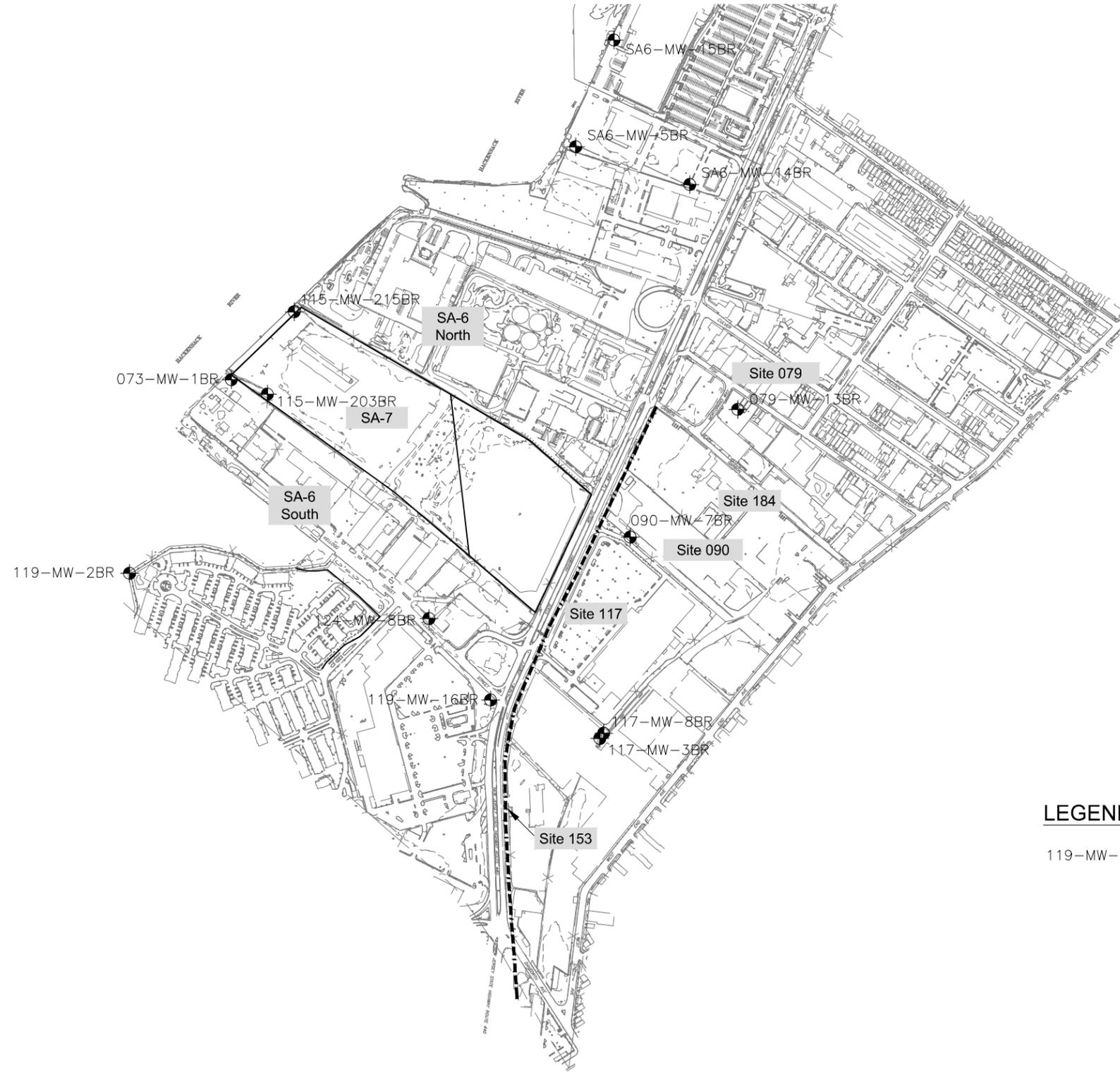
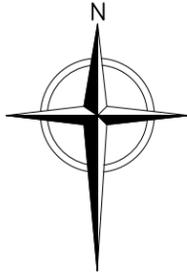


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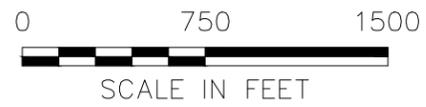
HONEYWELL  
**INTEGRATED SAMPLING AND ANALYSIS PLAN  
GROUNDWATER LEVEL MONITORING WELLS  
DEEP ZONE**

FIGURE NO.  
**A-1c**  
PROJECT NO.  
120538



**LEGEND:**

119-MW-11BR  BEDROCK ZONE MONITORING WELL



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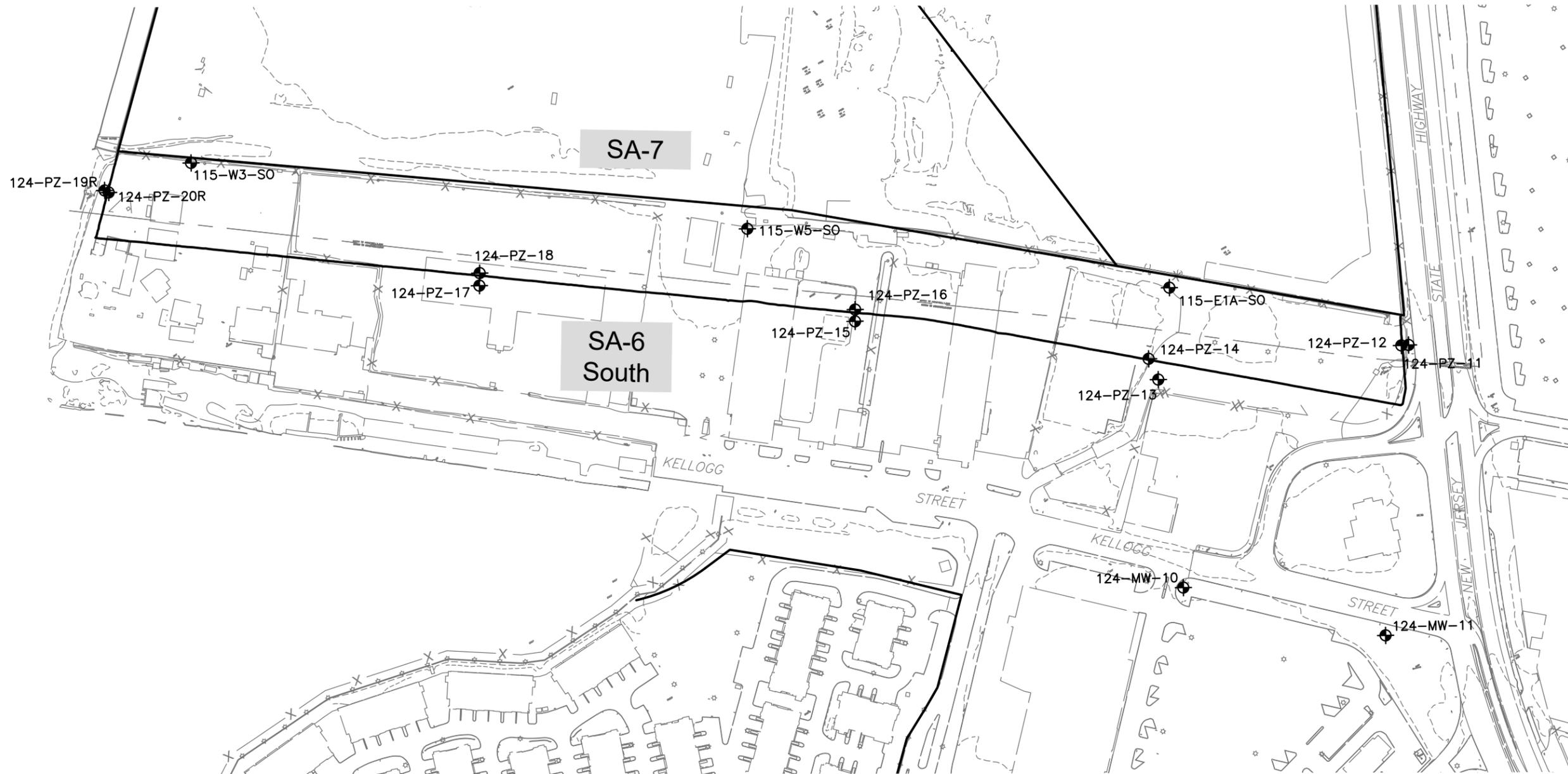
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HONEYWELL  
**INTEGRATED SAMPLING AND ANALYSIS PLAN**  
**GROUNDWATER LEVEL MONITORING WELLS**  
**BEDROCK ZONE**

FIGURE NO.  
**A-1d**  
 PROJECT NO.  
 120538

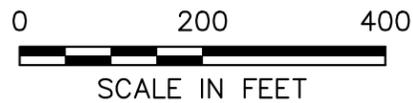


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**LEGEND:**

◆ 154-MW-E08 SHALLOW MONITORING WELL



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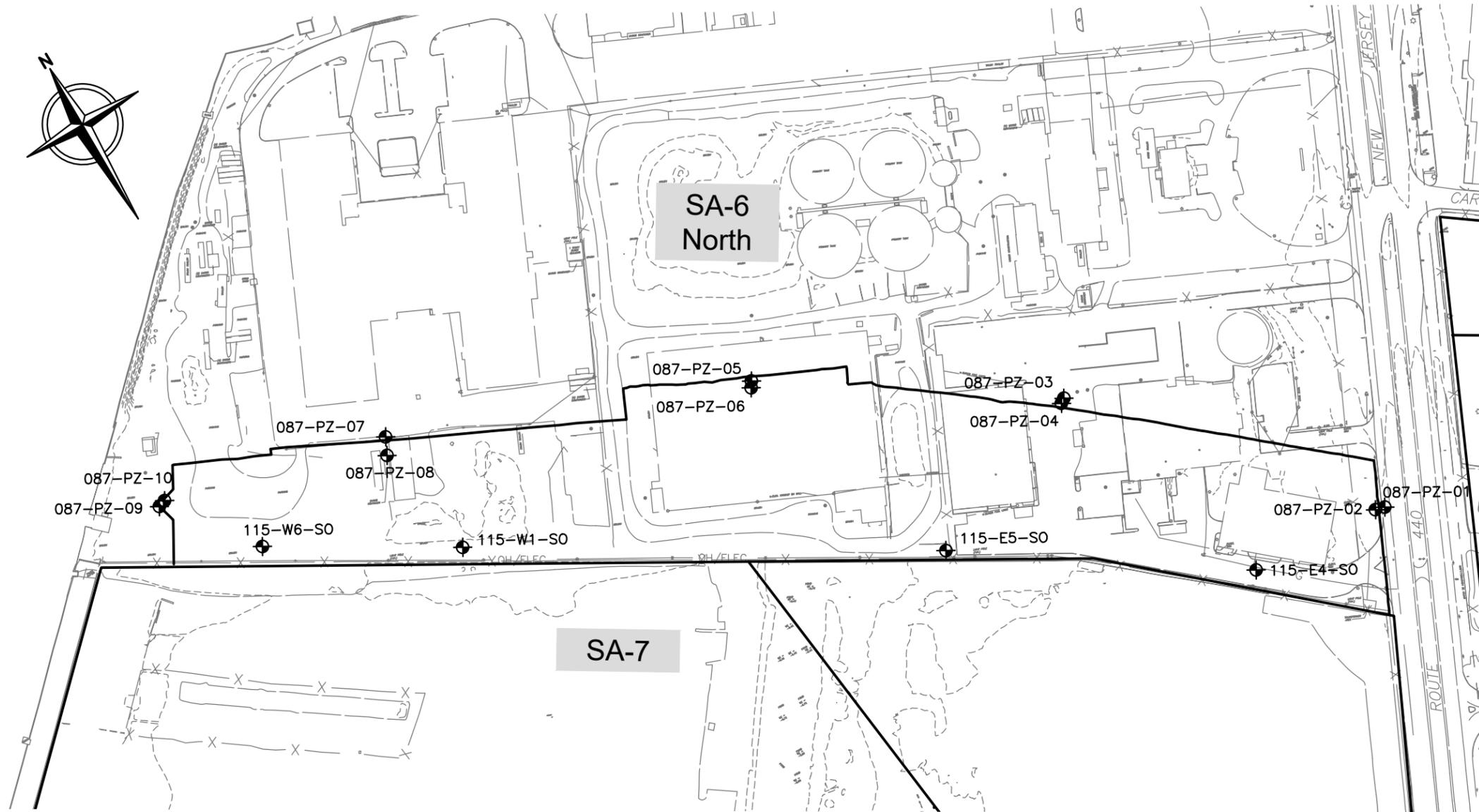
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HONEYWELL  
**INTEGRATED SAMPLING AND ANALYSIS PLAN**  
**GROUNDWATER LEVEL MONITORING WELLS**  
**SA6-SOUTH**

FIGURE NO.

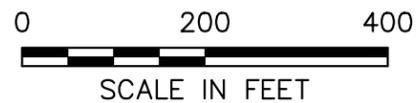
**A-2**

PROJECT NO.  
120538



**LEGEND:**

◆ 154-MW-E08 SHALLOW MONITORING WELL



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HONEYWELL  
INTEGRATED SAMPLING AND ANALYSIS PLAN  
GROUNDWATER LEVEL MONITORING WELLS  
SA6-NORTH

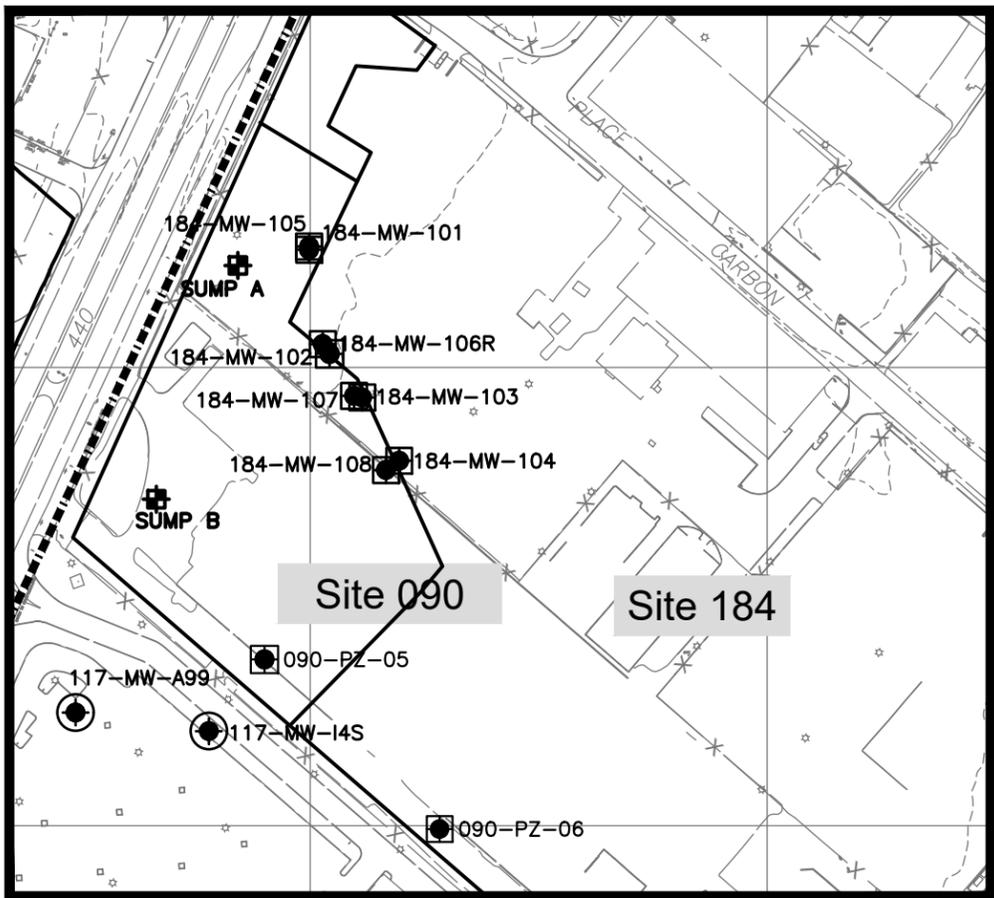
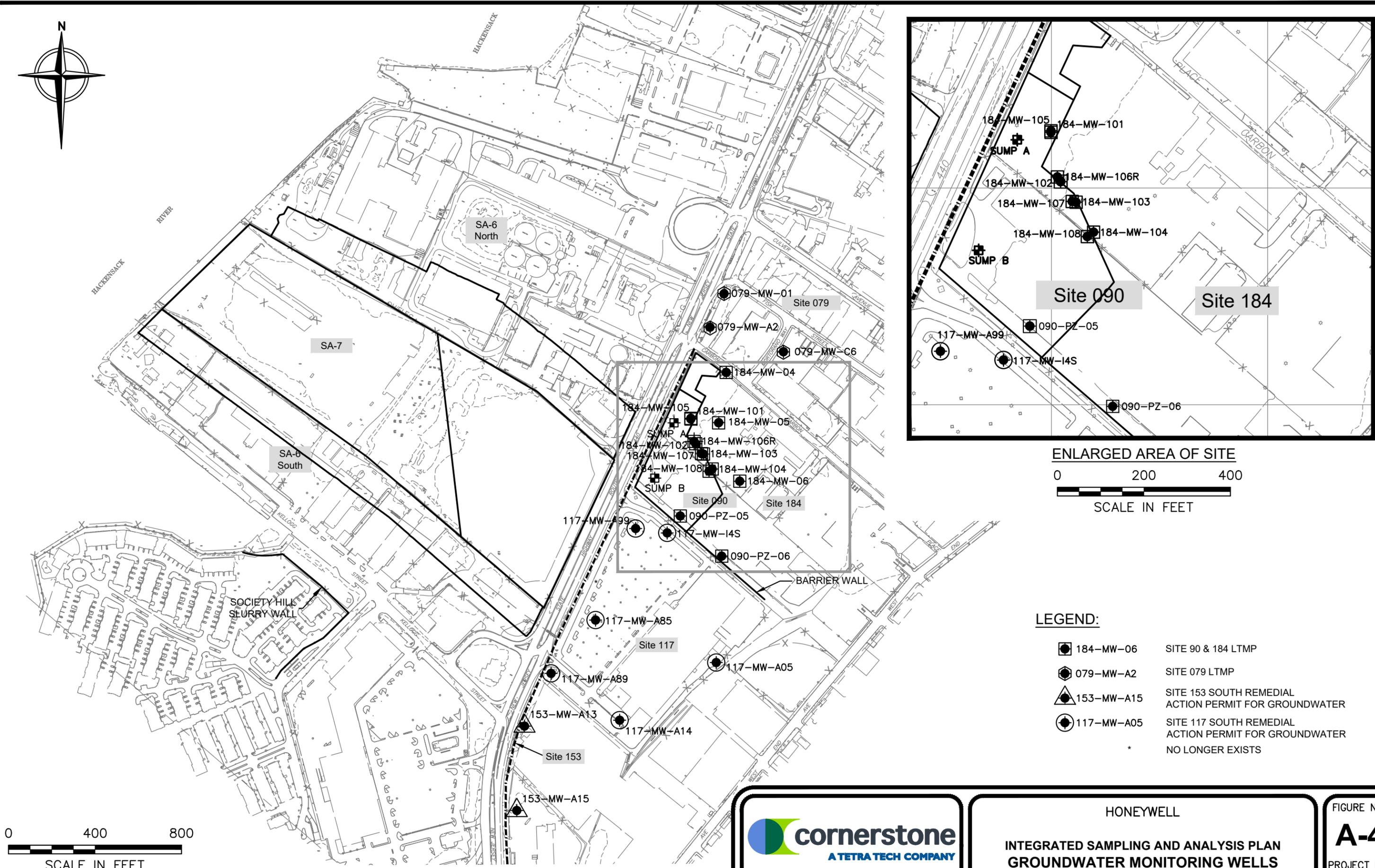
FIGURE NO.

**A-3**

PROJECT NO.  
120538



File: X:\PROJECTS\HONEYWELL\190185 - SA7\PROJECT DRAWINGS\2018-4Q ANNUAL FIGURES\H15WSF-S-SITE-A-4.dwg Layout: FIGURE A-4 User: johnguiliano Mar 20, 2024 - 10:07am



ENLARGED AREA OF SITE  
0 200 400  
SCALE IN FEET

- LEGEND:**
-  184-MW-06 SITE 90 & 184 LTMP
  -  079-MW-A2 SITE 079 LTMP
  -  153-MW-A15 SITE 153 SOUTH REMEDIAL ACTION PERMIT FOR GROUNDWATER
  -  117-MW-A05 SITE 117 SOUTH REMEDIAL ACTION PERMIT FOR GROUNDWATER
  - \* NO LONGER EXISTS

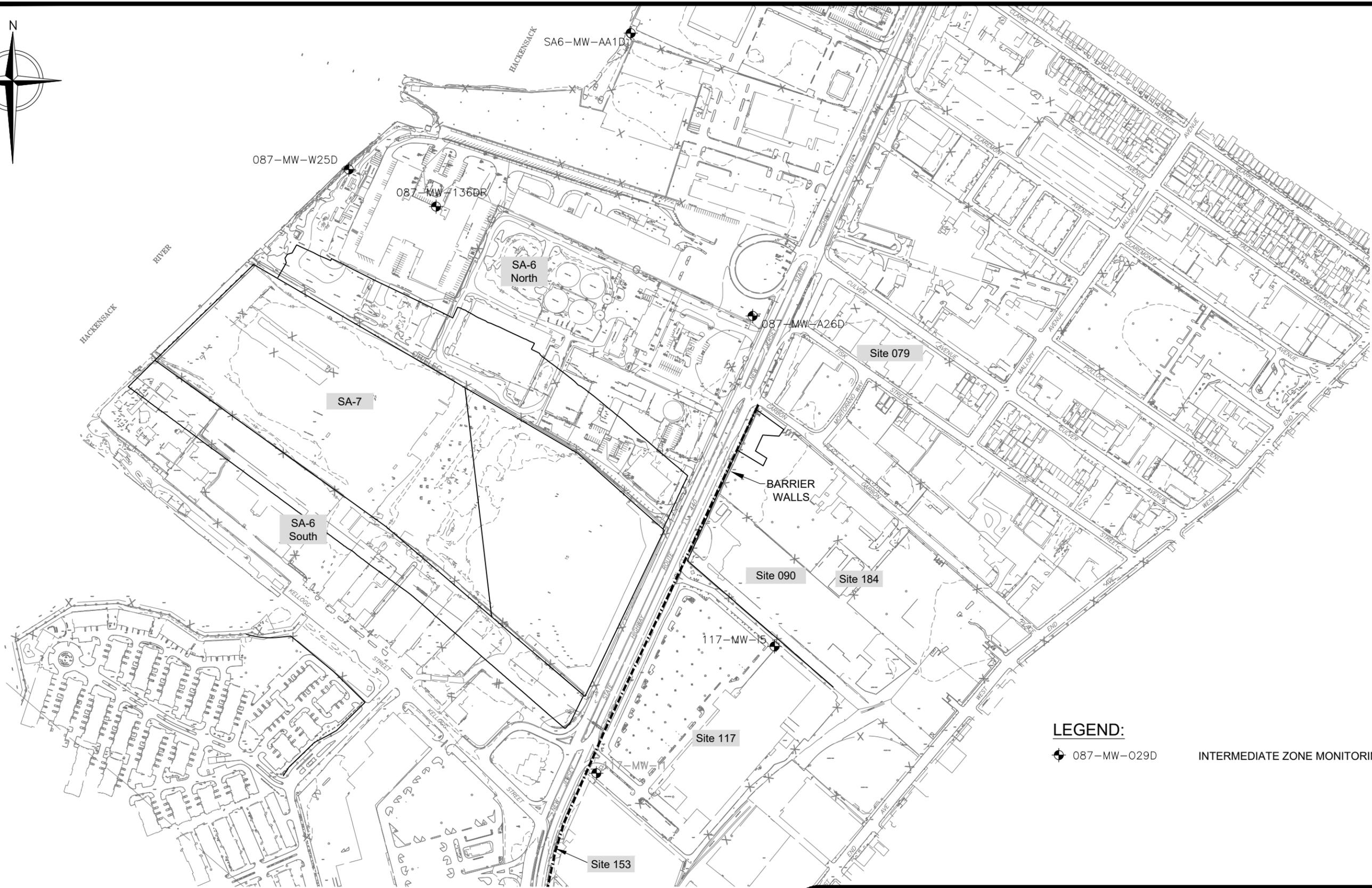
0 400 800  
SCALE IN FEET

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HONEYWELL  
INTEGRATED SAMPLING AND ANALYSIS PLAN  
GROUNDWATER MONITORING WELLS  
SA5 SHALLOW ZONE LOCATIONS

FIGURE NO.  
**A-4**  
PROJECT NO.  
190185



**LEGEND:**

-  087-MW-029D INTERMEDIATE ZONE MONITORING WELL

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HONEYWELL

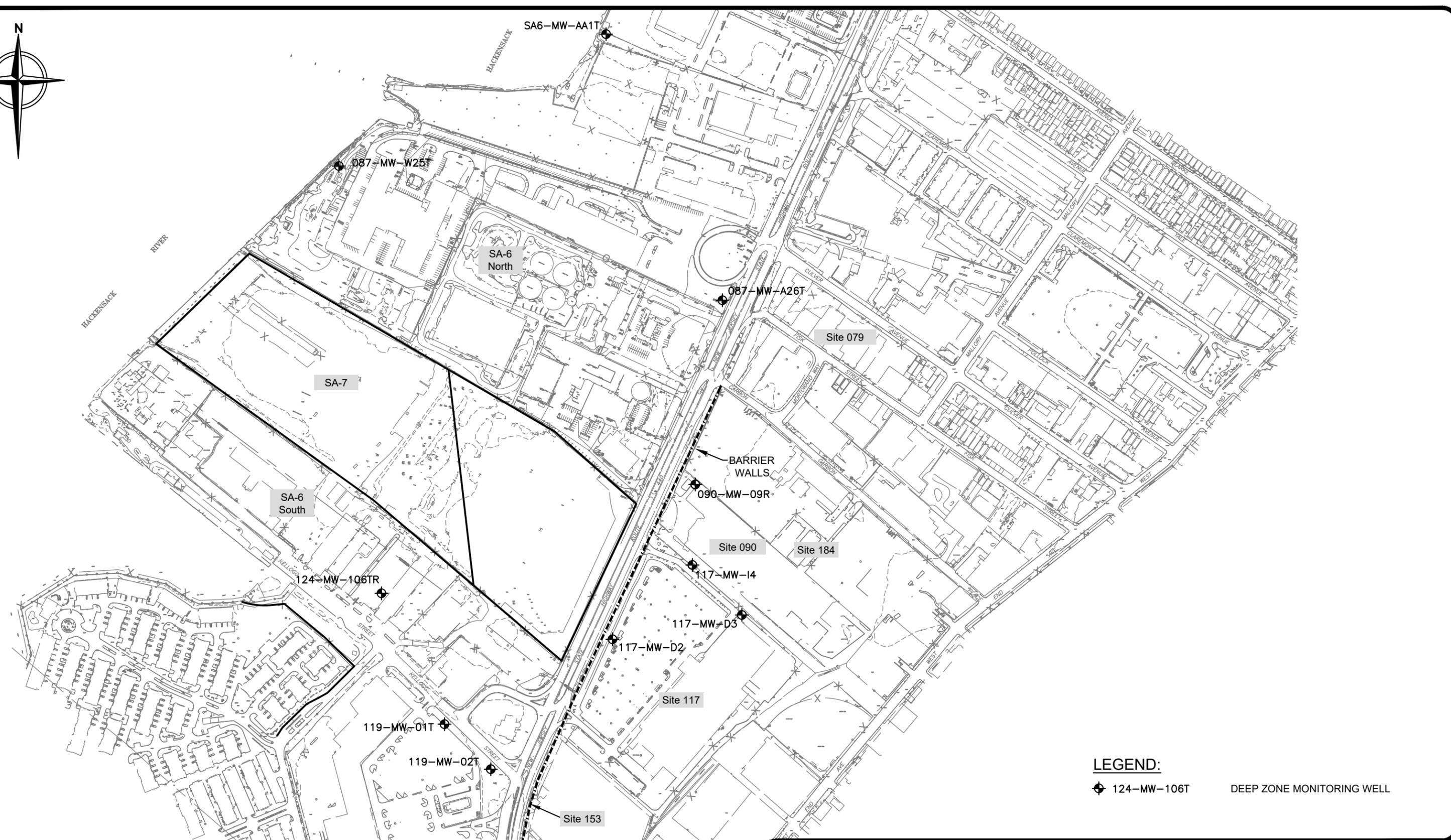
**INTEGRATED SAMPLING AND ANALYSIS PLAN  
GROUNDWATER QUALITY MONITORING WELLS  
INTERMEDIATE ZONE**

FIGURE NO.  
**B-1a**

PROJECT NO.  
120538

File: X:\PROJECTS\HONEYWELL\130109 - SA7\PROJECT DRAWINGS\2025 October\Integrated SAP\H15WSF-S-SITE-B-1A.dwg Layout: FIGURE B-1A User: john.guiliano Oct 29, 2025 - 9:42am

File: X:\PROJECTS\HONEYWELL\130109 - S&T\PROJECT DRAWINGS\2024 March Integrated SAP\H15WSF-S-SITE-B-1B.dwg Layout: FIGURE B-1B User: john.giuffano Mar 20, 2024 - 10:07am



**LEGEND:**  
 124-MW-106T DEEP ZONE MONITORING WELL



HONEYWELL  
**INTEGRATED SAMPLING AND ANALYSIS PLAN**  
**GROUNDWATER QUALITY MONITORING WELLS**  
**DEEP ZONE**

FIGURE NO.  
**B-1b**  
PROJECT NO.  
120538

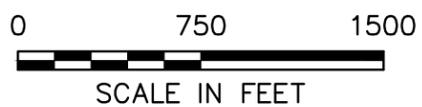
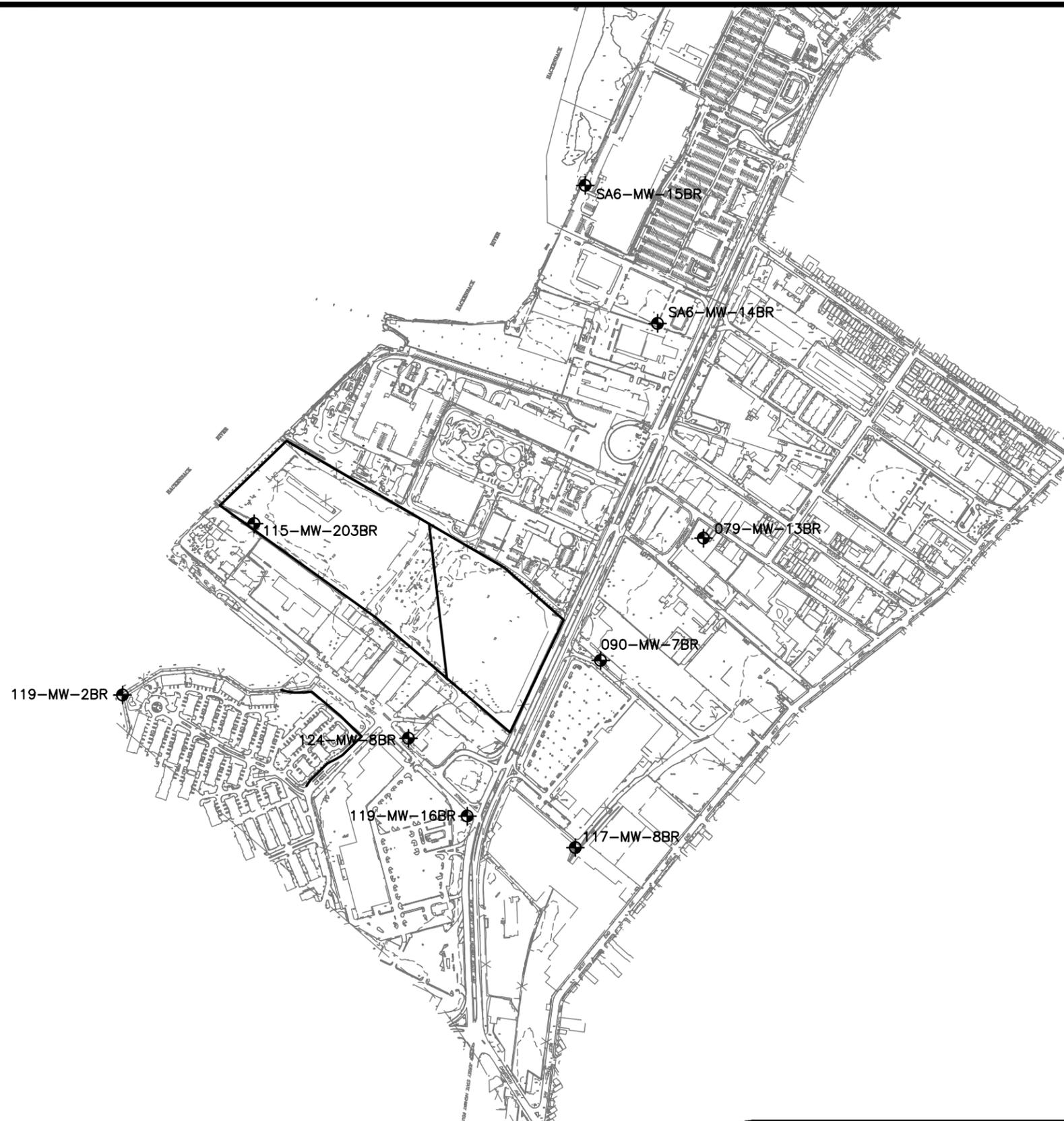
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**LEGEND:**

◆ 119-MW-2BR BEDROCK ZONE MONITORING WELL



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HONEYWELL

**INTEGRATED SAMPLING AND ANALYSIS PLAN**

**GROUNDWATER QUALITY MONITORING WELLS**

**BEDROCK ZONE**

FIGURE NO.

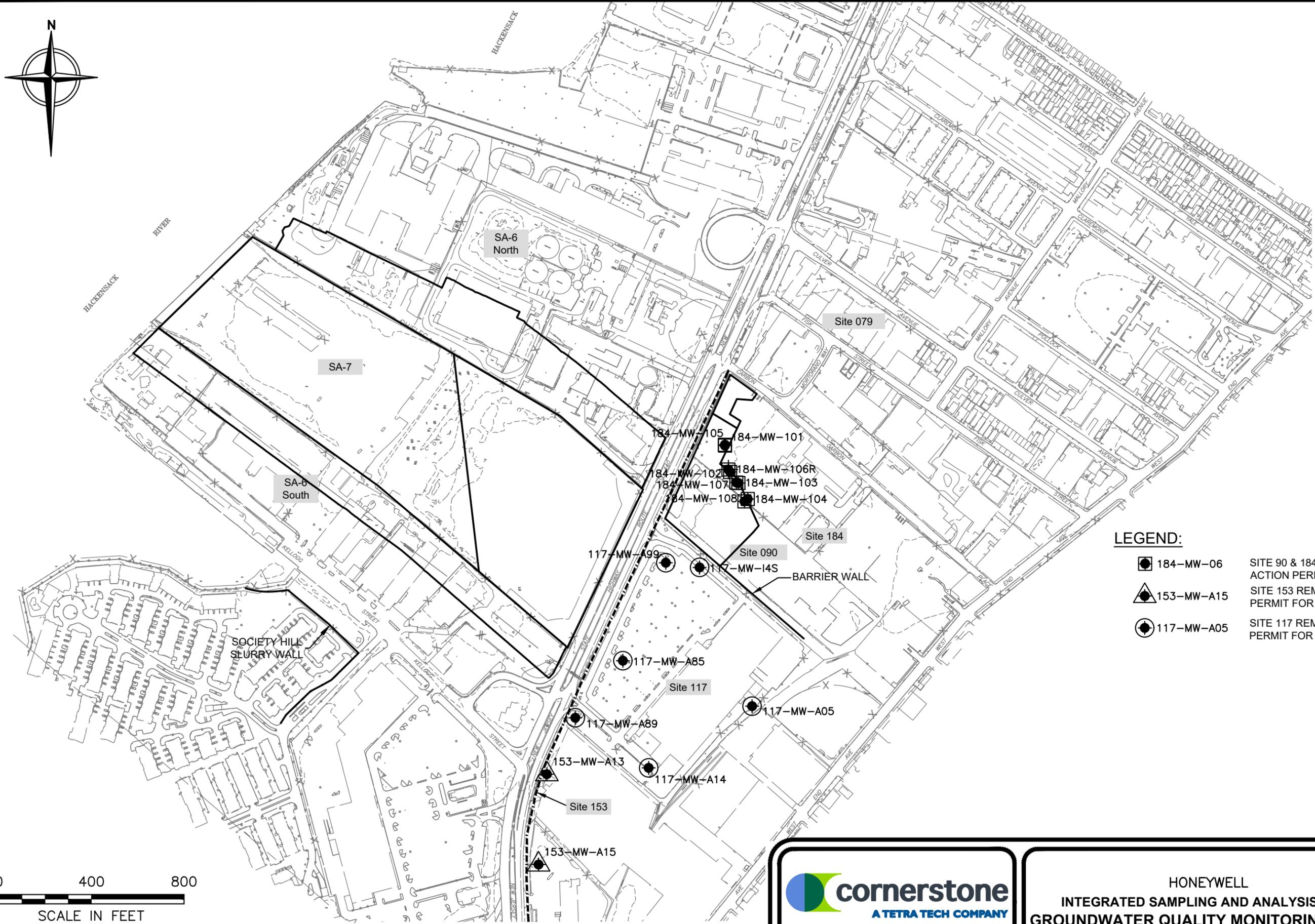
**B-1c**

PROJECT NO.

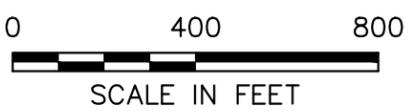
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File: X:\PROJECTS\HONEYWELL\130109 - SA5\PROJECT DRAWINGS\2024 March Integrated SAP\H1SWSF-S-SITE-B-2.dwg Layout: FIGURE B-2 User: john.guliano Mar 20, 2024 - 9:17am



- LEGEND:**
-  184-MW-06 SITE 90 & 184 LTMP AND REMEDIAL ACTION PERMIT FOR GROUNDWATER
  -  153-MW-A15 SITE 153 REMEDIAL ACTION PERMIT FOR GROUNDWATER
  -  117-MW-A05 SITE 117 REMEDIAL ACTION PERMIT FOR GROUNDWATER



HONEYWELL  
 INTEGRATED SAMPLING AND ANALYSIS PLAN  
 GROUNDWATER QUALITY MONITORING WELLS  
 SA5 SHALLOW ZONE

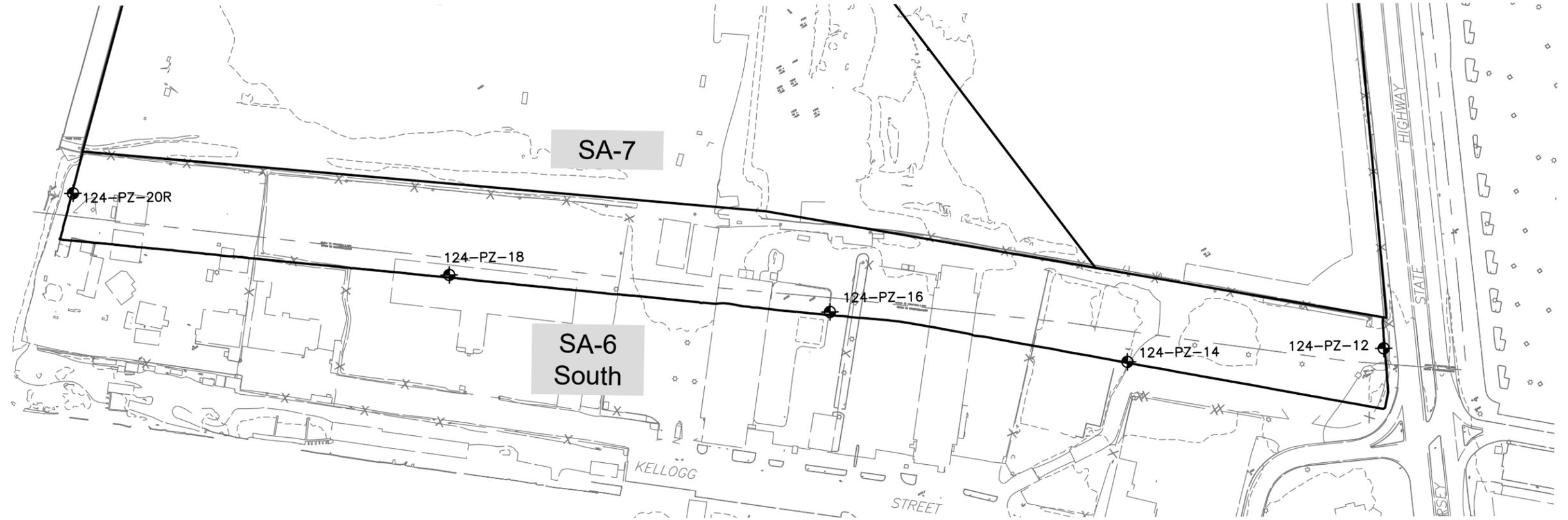
FIGURE NO.  
**B-2**  
 PROJECT NO.  
 120538

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**LEGEND:**

◆ 124-PZ-18 SHALLOW MONITORING WELL

NOTE: SAMPLE MONITORING WELL ONLY IN ACCORDANCE WITH SA-6 LTMP.



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HONEYWELL  
INTEGRATED SAMPLING AND ANALYSIS PLAN  
GROUNDWATER QUALITY MONITORING WELLS  
SA6-SOUTH

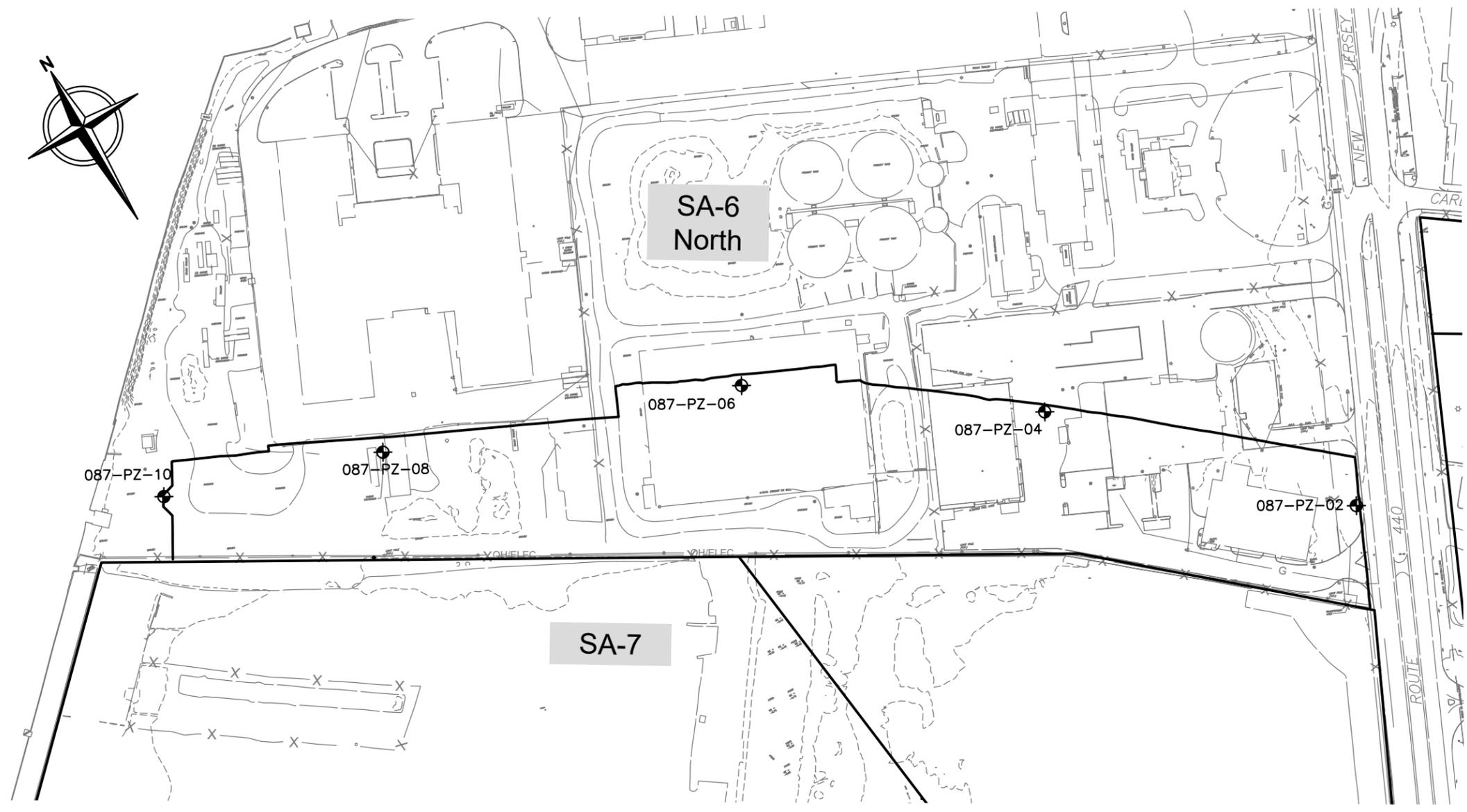
FIGURE NO.

**B-3**

PROJECT NO.

120538

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**LEGEND:**

◆ 087-PZ-10 SHALLOW MONITORING WELL

NOTE: SAMPLE MONITORING WELL ONLY IN ACCORDANCE WITH SA-6 LTMP.



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HONEYWELL  
INTEGRATED SAMPLING AND ANALYSIS PLAN  
GROUNDWATER QUALITY MONITORING WELLS  
SA6-NORTH

FIGURE NO.  
**B-4**  
PROJECT NO.  
120538

## APPENDIX A

### DECONTAMINATION PROCEDURES

---

An important aspect of quality control is the decontamination of field equipment. Improperly cleaned equipment can lead to cross-contamination and inaccurate data. The decontamination procedures used in this project are outlined in the following paragraphs.

#### **Water Level Indicators and Water Quality Probes**

Upon completion of the measurement, the probe will be decontaminated with the following procedure:

- Wipe with Nitric Acid (only if coated with non-Cr petroleum contaminants)
- Wash in potable water and non-phosphate detergent
- Rinse with potable water
- Rinse with deionized water

#### **Redi-flow 2 Sampling Pump and Other Non-dedicated Sampling Equipment**

Non-dedicated equipment used for the collection of samples will be decontaminated between each use by the following procedure.

- Submerge the pump in a clean bucket containing non-phosphate detergent and potable water and pump this mixture through the pump and flow-through cell.
- Pump deionized water through the pump and flow-through cell
- Replace tubing prior to sampling next well.
- Air dry
- Wrap in foil unless used immediately.

## APPENDIX B

### ANNUAL INTEGRATED GROUNDWATER MONITORING REPORT OUTLINE

---

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\* only provided in years with regional plume and/or other monitoring events