



**Table 2-5**  
**CCPW Metals Analytical Results in the Unsaturated Soil Zone Compared to DIGWSSL and IGWSRS-GAG**  
**Forrest Current-Use Remediation Areas, Garfield Avenue Group**  
**PPG, Jersey City, New Jersey**

Grid ID (G1)	Location ID (G2)	Location Elevation (ft NAVD88) (G3, G4)	As-built TEE (ft NAVD88) (G4, G6, G#a, G#b)	Sample ID (G5, G6)	Depth Interval (ft bgs) (G7)	Sample Start Elevation (ft NAVD88) (G4, G8)	Sample End Elevation (ft NAVD88) (G4, G9)	Lab ID (G10)	Lab SDG (G10)	Date Collected (G11)	Sample Status (G12, G13)	Sample Type (G14)	Validated (Y/N) (G15)	Groundwater Elevation (ft NAVD88) (G6)	Analyte CAS-RN Units DIGWSSL SSIGWSRS		ANTIMONY 7440-36-0 mg/kg N/A 62.7		CHROMIUM 7440-47-3 mg/kg N/A N/A		NICKEL 7440-02-0 mg/kg N/A 170		THALLIUM 7440-28-0 mg/kg 3 N/A		VANADIUM 7440-62-2 mg/kg N/A N/A		Specific Notes
															Result (G16, G17)	Qualifier (G18, G19)	Result (G16, G17)	Qualifier (G18, G19)	Result (G16, G17)	Qualifier (G18, G19)	Result (G16, G17)	Qualifier (G18, G19)	Result (G16, G17)	Qualifier (G18, G19)	Result (G16, G17)	Qualifier (G18, G19)	
EE16B	FS13	11.0		FS13-4.0-4.5	4.0 - 4.5	7.0	6.5	JB59311-4	JB59311	02/06/2014	remaining	N	Y	6.1	< 0.32	UJ	16.0		43.7		< 0.39	UJ	26.0		S3		
EE16B	FS24	11.1		FS24-0.0-0.5	0.0 - 0.5	11.1	10.6	JB96351-1A	JB96351A	06/05/2015	removed	N	Y	6.1	< 0.31	UJ	14.0		10.9		< 0.19	UJ	30.4		S3		
EE16B	FS24	11.1		FS24-2.0-2.5	2.0 - 2.5	9.1	8.6	JB96351-2A	JB96351A	06/05/2015	remaining	N	Y	6.1	1.5	J	168		42.2		< 0.25	UJ	67.3		S3		
EE16B	FSI8	10.4		FSI8-0.5-1.0	0.5 - 1.0	9.9	9.4	JB64326-1A	JB64326A	04/10/2014	remaining	N	Y	6.1	< 0.34	UJ	21.2	J	13.3		0.97	J	16.4		S5		
EE16B	FSI8	10.4		FSI8-1.0-1.5	1.0 - 1.5	9.4	8.9	JB64326-2A	JB64326A	04/10/2014	remaining	N	Y	6.1	< 0.33	UJ	18.7	J	15.1		0.78	J	19.9		S5		
EE16B	FSI8	10.4		FSI8-1.0-1.5X	1.0 - 1.5	9.4	8.9	JB64326-3A	JB64326A	04/10/2014	remaining	FD	Y	6.1	< 0.34	UJ	20.3	J	15.1		0.99	J	20.2		S5		
EE16B	FSI8	10.4		FSI8-1.5-2.0	1.5 - 2.0	8.9	8.4	JB64326-4A	JB64326A	04/10/2014	remaining	N	Y	6.1	< 0.32	UJ	21.7	J	16.6		0.51	J	25.3		S5		
EE16B	FSI8	10.4		FSI8-2.0-2.5	2.0 - 2.5	8.4	7.9	JB64326-5A	JB64326A	04/10/2014	remaining	N	Y	6.1	< 0.32	UJ	17.0	J	13.8		0.60	J	21.5		S5		
EE16B	FSI8	10.4		FSI8-2.5-3.0	2.5 - 3.0	7.9	7.4	JB64326-6A	JB64326A	04/10/2014	remaining	N	Y	6.1	< 0.37	UJ	30.9	J	17.4		< 0.55	UJ	20.0		S5		
EE16B	FSI8	10.4		FSI8-3.0-3.5	3.0 - 3.5	7.4	6.9	JB64326-7A	JB64326A	04/10/2014	remaining	N	Y	6.1	< 0.35	UJ	16.7	J	15.8		0.62	J	20.0		S5		
EE16B	FSI8	10.4		FSI8-3.5-4.0	3.5 - 4.0	6.9	6.4	JB64326-8A	JB64326A	04/10/2014	remaining	N	Y	6.1	0.34	J	20.4	J	15.2		< 0.52	UJ	19.7		S5		
FF12B	FSI9	16.5		FSI9-0.4-0.9	0.4 - 0.9	16.1	15.6	JB63992-1A	JB63992A	04/07/2014	remaining	N	Y	6.1	< 0.30	UJ	10.4		4.7		< 0.45	UJ	10.9		S8		
FF12B	FSI9	16.5		FSI9-1.5-2.0	1.5 - 2.0	15.0	14.5	JB63992-10A	JB63992A	04/07/2014	remaining	N	Y	6.1	0.61	J	136		18.2		< 0.44	UJ	41.8		S8		
FF12B	FSI9	16.5		FSI9-5.0-5.5	5.0 - 5.5	11.5	11.0	JB63992-2A	JB63992A	04/07/2014	remaining	N	Y	6.1	< 0.32	UJ	28.8		14.7		< 0.48	UJ	19.3		S8		
FF12B	FSI9	16.5		FSI9-7.0-7.5	7.0 - 7.5	9.5	9.0	JB63992-3A	JB63992A	04/07/2014	remaining	N	Y	6.1	< 0.34	UJ	18.0		15.5		< 0.52	UJ	25.5		S8		
FF12B	FSI9	16.5		FSI9-8.0-8.5	8.0 - 8.5	8.5	8.0	JB63992-11A	JB63992A	04/07/2014	remaining	N	Y	6.1	< 0.34	UJ	16.8		14.4		< 0.51	UJ	21.6		S8		
FF13B	FSI10	20.6		FSI10-0.0-0.5	0.0 - 0.5	20.6	20.1	JB96351-6A	JB96351A	06/05/2015	remaining	N	Y	6.1	< 0.36	UJ	8.6		9.2		< 0.22	UJ	14.7		S8		
FF13B	FSI10	20.6		FSI10-1.0-1.5	1.0 - 1.5	19.6	19.1	JB96351-7A	JB96351A	06/05/2015	remaining	N	Y	6.1	< 0.34	UJ	28.6		15.9		0.21	J	34.1		S8		
FF13B	FSI10	20.6		FSI10-1.0-1.5X	1.0 - 1.5	19.6	19.1	JB96351-8A	JB96351A	06/05/2015	remaining	FD	Y	6.1	0.48	J	32.0		13.0		< 0.19	UJ	34.2		S8		
FF13B	FSI10	20.6		FSI10-3.0-3.5	3.0 - 3.5	17.6	17.1	JB96351-9A	JB96351A	06/05/2015	remaining	N	Y	6.1	< 0.35	UJ	22.0		15.1		< 0.22	UJ	20.4		S8		
FF13B	FSI10	20.6		FSI10-5.0-5.5	5.0 - 5.5	15.6	15.1	JB96351-10A	JB96351A	06/05/2015	remaining	N	Y	6.1	< 0.38	UJ	33.2		22.4		0.77	J	27.6		S8		
FF13B	FSI10	20.6		FSI10-10.0-10.5	10.0 - 10.5	10.6	10.1	JB96351-11A	JB96351A	06/05/2015	remaining	N	Y	6.1	0.54	J	29.4		12.5		< 0.22	UJ	14.0		S8		
FF13B	FSI10	20.6		FSI10-11.0-11.5	11.0 - 11.5	9.6	9.1	JB96351-12A	JB96351A	06/05/2015	remaining	N	Y	6.1	< 0.39	UJ	15.1		13.3		< 0.24	UJ	21.7		S8		
FF13B	FSI10	20.6		FSI10-13.0-13.5	13.0 - 13.5	7.6	7.1	JB96351-13A	JB96351A	06/05/2015	remaining	N	Y	6.1	< 0.44	UJ	15.8		16.9		< 0.27	UJ	21.1		S8		
FF14B	FSI7	10.5		FSI7-0.5-1.0	0.5 - 1.0	10.0	9.5	JB64510-1A	JB64510A	04/11/2014	remaining	N	Y	6.1	< 0.35	UJ	16.2		14.1		< 0.52	UJ	20.3		S5		
FF14B	FSI7	10.5		FSI7-2.0-2.5	2.0 - 2.5	8.5	8.0	JB64510-2A	JB64510A	04/11/2014	remaining	N	Y	6.1	< 0.34	UJ	15.7		16.3		< 0.52	UJ	20.7		S5		
GG14B	ICO-23	10.2		ICO-23-0.3	0.3 - 0.8	9.9	9.4	460-36375-1	460363751	02/01/2012	remaining	N	Y	6.1	3.4		298		23.6		0.27		35.6		S9		
GG14B	ICO-23	10.2		ICO-23-2.0	2.0 - 2.5	8.2	7.7	460-36375-2	460363751	02/01/2012	remaining	N	Y	6.1	1.1		74.9		13.8		< 0.22	UJ	16.7		S9		
W14B	FS25	18.4	7.6	FS25-10.0-10.5	10.0 - 10.5	8.4	7.9	JB97048-10A	JB97048A	06/15/2015	remaining	N	Y	6.1	< 0.37	UJ	28.9		8.4		< 0.23	UJ	19.8		S10		
X12B	EF-05	10.6		EF-B05-2.5	2.5 - 3.0	8.1	7.6	460-25190-11	460251901	04/11/2011	remaining	N	Y	6.1	< 1.0	UJ	759		19.4		< 1.1	UJ	11.6		S1		
X13B	FS18	11.6		FS18-2.0-2.5	2.0 - 2.5	9.6	9.1	JB62136-2A	JB62136A	03/17/2014	remaining	N	Y	6.1	0.43	J	4800	J	366		2.6	J	363		S10, S11		
X13B	FS18	11.6		FS18-4.0-4.5	4.0 - 4.5	7.6	7.1	JB62136-3A	JB62136A	03/17/2014	remaining	N	Y	6.1	< 0.28	UJ	402	J	17.1		0.53	J	24.7		S10		
X13B	FS18	11.6		FS18-4.0-4.5X	4.0 - 4.5	7.6	7.1	JB62136-4A	JB62136A	03/17/2014	remaining	FD	Y	6.1	< 0.31	UJ	410	J	16.7		0.63	J	27.0		S10		
Y11B	FS16	10.1	8	FS16-3.0-3.5	3.0 - 3.5	7.1	6.6	JB63591-3A	JB63591A	04/02/2014	remaining	N	Y	6.3	< 0.34	UJ	59.0		17.0		< 0.52	UJ	24.5		S1		
Y12B	P4-FOR-Y12B	10.5		P4-FOR-Y12B-0.5-1.0	0.5 - 1.0	9.9	9.4	JC22855-17A	JC22855A	06/23/2016	remaining	N	Y	6.3	0.44	J	1090		92.1		0.83	J	129		S12		
Y12B	P4-FOR-Y12B	10.5		P4-FOR-Y12B-2.0-2.5	2.0 - 2.5	8.4	7.9	JC22855-18A	JC22855A	06/23/2016	remaining	N	Y	6.3	0.83	J	422		51.3		< 0.93	UJ	31.7		S12		
Y12B	P4-FOR-Y12BR	10.5		P4-FOR-Y12BR-0.5-1.0	0.5 - 1.0	9.9	9.4	JC23104-12A	JC23104A	06/28/2016	remaining	N	Y	6.3	0.96	J	564		53.2		< 0.48	UJ	84.6		S12		

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**Forrest Current-Use Remediation Areas, Garfield Avenue Group**  
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**ABBREVIATIONS:**

ACO - Administrative Consent Order

bgs - below ground surface

CAS RN - Chemical Abstracts Service Registry Number

CCPW - Chromate Chemical Production Waste

DIGWSSL - Default Impact to Ground Water Soil Screening Level

EI. - elevation

FD - field duplicate sample type

ft - feet

IGW - Impact to Ground Water

IGWSRS-GAG - Site Specific Impact to Groundwater Soil Remediation Standard – Garfield Avenue Group (alternative remediation standard as proposed in the *Supplemental Soil Remedial Investigation Report, Final (Revision 1)*, dated August 30, 2018 and approved by NJDEP on October 22, 2018)

JCO - Judicial Consent Order

mg/kg - milligrams per kilogram

N - normal sample type

NAVD88 - North American Vertical Datum of 1988

N/A - not applicable

NJDEP - New Jersey Department of Environmental Protection

SDG - sample delivery group

**QUALIFIERS:**

J - The result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

RA - The result was rejected due to deficiencies but is considered usable for decision-making purposes.

U - The analyte was not detected above the sample reporting limit shown.

UJ - The analyte was not detected above the sample reporting limit shown and the reporting limit was approximate.

**GENERAL NOTES:**

G1. "Grid ID" refers to an area, typically 30 ft by 30 ft, identified as Grid Row W through HH (extending west to east) and Grid Column 10B through 17B (extending from south to north).

G2. "Location ID" refers to the location name where samples were collected.

G3. "Location Elevation" refers to the pre-remediation surface elevation for samples collected from the pit bottom, and the surface elevation of the sample location when the sample was collected via boring or test pit.

G4. Elevation vertical datum is NAVD88, in U.S. survey ft.

G5. "Sample ID" refers to the name of a sample collected at a given location and is unique to the depth of the sample collected. The depth listed in the Sample ID may not necessarily correspond to the actual sample depth interval due to corrections made as a result of post-field work review of surveyed surface elevations and/or boring logs. In some cases, the "Sample ID" in the table is a variant of the sample ID in the laboratory report and/or data validation report. In these cases, the "Lab ID" associates the sample results to the laboratory report and/or data validation report.

G6. This table compares sample results from the unsaturated zone to the DIGWSSL or the IGWSRS-GAG. The groundwater elevations (above which is the unsaturated zone) on Forrest Street Properties was estimated as the 50th percentile groundwater elevation from ten monitoring wells located on or adjacent to Forrest Street Properties gauged between February 2007 and December 2016. The groundwater elevation (above which is the unsaturated zone) on Forrest Street was estimated as the 50th percentile groundwater elevation from seven monitoring wells located on or adjacent to Forrest Street gauged between December 2003 and December 2016. The monitoring well locations and data are included in Appendix D. The estimated groundwater elevation for Forrest Street Properties is EI. 6.1 ft NAVD88, and the estimated groundwater elevation for Forrest Street is EI. 6.3 ft NAVD88.

G7. "Depth Interval" is based on the "Location Elevation."

G8. "Sample Start Elevation" refers to the start of the sample interval. There may be up to 0.1 ft variation between the listed Sample Start Elevation and the elevation calculated using the Location Elevation and Depth Interval due to rounding of the numbers.

G9. "Sample End Elevation" refers to the end of the sample interval. There may be up to 0.1 ft variation between the listed Sample End Elevation and the elevation calculated using the Location Elevation and Depth Interval due to rounding of the numbers.

G10. "Lab ID" refers to the identification number assigned to the sample by the analytical laboratory performing the sample analysis. "Lab SDG" refers to the delivery group number assigned to the sample by the analytical laboratory.

G11. "Date Collected" refers to the date the soil sample was collected.

G12. "Sample Status" indicates whether a sample is remaining or removed:

- "Remaining" indicates the soil in that interval is outside the excavation footprint, and remains in-place at that location; and

- "Removed" indicates the sample was removed during excavation.

G13. The 1-ft post-excavation contours representing the as-built terminal excavation elevations are provided on Figure 4-1 through Figure 4-9.

G14. "Sample Type" indicates whether the sample type is normal (N) or a field duplicate (FD).

G15. "Y" indicates that a sample underwent data validation and "N" indicates that data validation was not conducted.

G16. "Result" refers to the analytical result which is reported in mg/kg.

G17. Bold text indicates that the result exceeds the DIGWSSL or the IGWSRS-GAG. Non-bold text indicates that the result does not exceed the DIGWSSL or the IGWSRS-GAG.

G18. "Qualifier" refers to the data qualifier assigned by the data validation team reviewing the data from the laboratory for validated data. For unvalidated data, it refers to the qualifier assigned by the laboratory.

G19. Non-detect results are shown on this table using the Method Detection Limit, if available; otherwise they are shown at the Reporting Limit.

**SPECIFIC NOTES:**

S1. This sample is remaining in place within the Forrest Street Utility Offset.

S2. This sample is remaining in place within the 98/100 Forrest Street Building Footprint.

S3. This sample is remaining in place with the 90 Forrest Street Alleyway.

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S4. The nickel result for this sample is greater than the IGWSRS-GAG and is remaining in place within the Forrest Street Alleyway. For the current-use remediation, this sample is being addressed via engineering controls (90 Forrest Street Alleyway Asphalt Cap) and institutional controls (deed notice). For the future residential-use, this sample will be removed via future remedial excavation per the *Conceptual Future Residential-Use Remedial Excavation Plan*, provided in Appendix M.

S5. This sample is remaining in place within the 86/90 Forrest Street Building Footprint.

S6. In Grid EE15B, the nickel result for sample NFS-PDI-EE15B-2.0-2.5 is greater than the IGWSRS-GAG. The elevated nickel concentration at this location is not attributable to Site 114 operations (i.e., is not emanating from Site 114) because 1) samples from multiple boring locations (FSI4A, NFS-PDI-CC12BR, FSI3, FS10, FS8, FS9, FSTP1-WaterLine1, NFS-PDI-CC14B, and FS11) with nickel concentrations less than the IGWSRS-GAG were collected between Site 114 and this location; 2) this sample was not co-located with concentrations of Cr<sup>+6</sup> greater than the CrSCC or other concentrations of other CCPW-related metals greater than the DIGWSSL and IGWSRS-GAG; and 3) these samples are not commingled with CCPW. As this exceedance is not emanating from Site 114, it does not fall under purview of the ACO and JCO and is the responsibility of the property owner.

S7. In Grid DD16B, the nickel result for sample FS12-2.0-2.5 is greater than the IGWSRS-GAG. The elevated nickel concentration at this location is not attributable to Site 114 operations (i.e., is not emanating from Site 114) per the *Supplemental Soil Remedial Investigation Report Final (Revision 1)*, dated August 30, 2018 and approved by NJDEP on October 22, 2018. As this exceedance is not emanating from Site 114, it does not fall under purview of the ACO and JCO and is the responsibility of the property owner.

S8. This sample is remaining in place within the 84 Forrest Street Building Footprint and Loading Dock.

S9. This sample is located outside of the current-use remediation area boundaries, but is located within the property boundary of 86/90 Forrest Street and is therefore included herein for completeness.

S10. This sample is remaining in place with the 100 Forrest Street Offset.

S11. In Grid X13B, the nickel concentration in sample FS18-2.0-2.5 (El. 9.6 to 9.1 ft NAVD88) is 366 mg/kg. This concentration is greater than the IGWSRS-GAG of 170 mg/kg. Compliance with the nickel IGWSRS-GAG is demonstrated through spatial averaging. The calculations are included in the Technical Memorandum *Forrest Street Properties (Block 21501, Lot 15), Compliance Averaging for Nickel in Soil*, AECOM, January 2019 (see Appendix I of the *Remedial Action Report, Forrest Street Properties (AOC FSP-1A, AOC FSP-1B, AOC FSP-2A, and AOC FSP-2B) Soil*, AECOM, January 2019). The spatially weighted average nickel concentration is 136 mg/kg, which is compliant with the 170 mg/kg IGWSRS-GAG.

S12. This sample is remaining in place within the 100 Forrest Street Loading Dock Driveway.