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December 13, 2013

Mr. David Szymanski
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
270 Michigan Avenue – 3rd Floor
Buffalo, New York 14203

**RE: Fence Replacement Area Corrective Measure Confirmatory and Residential Sample Summary**
**Mineral Springs Road Former Manufactured Gas Plant Site**

Dear Mr. Szymanski:

Between November 4 and 15, 2013, National Fuel Gas (NFG) performed the field work described in the Corrective Measure Work Plan for the Fence Replacement Area (CMWP) dated September 26, 2013 and the related CMWP Addenda 1 and 2 dated November 1 and 6, 2013 respectively. The scope of work for the CMWP included collection and analysis of 21 confirmatory soil samples and four residential soil samples along with specified quality assurance samples. This letter provides the results of that sampling and analysis.

The purpose of the confirmatory samples was to characterize potential impacts from cyanide and other MGP residuals at the limits of excavation in the identified Areas of Concern along the Mineral Springs facility property line. The purpose of the residential samples was to characterize potential impacts on adjacent residential properties. As specified in the CMWP, six confirmatory samples collected near locations where dark staining was observed during excavation were also analyzed for organic compounds and additional inorganic chemicals.

The results of laboratory analysis for the samples collected are provided in Tables 1, 2, and 3. Sample locations are shown on Figures 1A and 1B. As the tables show, concentrations of cyanide and arsenic exceed soil cleanup objectives for residential use properties in a number of locations. As the tables indicate, sample/duplicate pairs CS-3/CS-53 and RS-1/RS-5 show significant differences in cyanide concentrations. These results have been discussed with the laboratory. After observing the samples, it is the laboratory's opinion that the differences are caused by the heterogeneity of the samples and presence of organic materials such as rootlets.

If you have comments or questions please call Brad Walker at 716-667-5559 or me at 978-905-2161. Once you and Scarlett McLaughlin have had a chance to look the data over, we would like to schedule a phone call to discuss how to proceed.

Sincerely yours,

Thomas P. Clark, P.E.
Senior Engineer

cc: B. Walker – NFG
T. Alexander – NFG
S. McLaughlin – NYSDOH
T. Raby, AECOM

# Tables

**Table 1**
**Confirmatory Soil Samples**
**Metals and Cyanide Analytical Results**
**National Fuel Gas Mineral Springs Former Manufactured Gas Plant**
**Fence Replacement Area Corrective Measure**
**November 2013**

| Location ID<br>Sample Date<br>Sample ID<br>SDG | CAS # | NYSDEC Restricted Use SCO - Residential | CS-1<br>11/7/2013<br>CS-1-20131107<br>480497511 | CS-2<br>11/7/2013<br>CS-2-20131107<br>480497511 | CS-3<br>11/7/2013<br>CS-3-20131107<br>480497511 | CS-3 DUP<br>11/7/2013<br>CS-53-20131107<br>480497511 | CS-4<br>11/7/2013<br>CS-4-20131107<br>480497511 | CS-5<br>11/7/2013<br>CS-5-20131107<br>480497511 | CS-6<br>11/8/2013<br>CS-6-20131108<br>480497511 | CS-7<br>11/7/2013<br>CS-7-20131107<br>480497511 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Metals (mg/Kg)** | | | | | | | | | | |
| ALUMINUM | 7429-90-5 | NL | NS | NS | 3570 | 4180 | 13000 | NS | 4160 | 7510 |
| ANTIMONY | 7440-36-0 | NL | NS | NS | 1.9 | 1.9 | 2.1 | NS | 2.6 | 3.5 |
| ARSENIC | 7440-38-2 | 16 | **32.1** | **55.1** | **19.7** | **22.2** | **31.7** | **50.4** | **26.1** | **23.8** |
| BARIUM | 7440-39-3 | 350 | NS | NS | 98.7 | 112 | 186 | NS | 105 | 204 |
| BERYLLIUM | 7440-41-7 | 14 | NS | NS | 0.38 | 0.46 | 1.1 | NS | 0.47 | 1.0 |
| CADMIUM | 7440-43-9 | 2.5 | NS | NS | 1.9 | 2.2 | 1.7 | NS | 2.0 | 4.5 |
| CALCIUM | 7440-70-2 | NL | NS | NS | 3640 | 4000 | 16500 | NS | 4530 | 15500 |
| CHROMIUM, HEXAVALENT | 18540-29-9 | 22 | NS | NS | 3.4 | < 6.2 | 2.8 | NS | < 7.0 | 4.0 |
| CHROMIUM, TOTAL | 7440-47-3 | NL | NS | NS | 10.1 | 11.8 | 16.7 | NS | 13.6 | 20.8 |
| COBALT | 7440-48-4 | NL | NS | NS | 3.9 | 5.3 | 6.9 | NS | 5.1 | 5.7 |
| COPPER | 7440-50-8 | 270 | NS | NS | 110 | 131 | 211 | NS | 139 | 127 |
| IRON | 7439-89-6 | NL | NS | NS | 19100 | 21200 | 28000 | NS | 25200 | 35000 |
| LEAD | 7439-92-1 | 400 | NS | NS | 299 | 331 | 406 | NS | 359 | 1510 |
| MAGNESIUM | 7439-95-4 | NL | NS | NS | 1110 | 1140 | 1470 | NS | 1090 | 3580 |
| MANGANESE | 7439-96-5 | 2000 | NS | NS | 149 | 230 | 391 | NS | 219 | 354 |
| MERCURY | 7439-97-6 | 0.81 | **0.32** | **0.42** | **0.22** | **0.33** | **0.30** | **0.32** | **0.17** | **0.30** |
| NICKEL | 7440-02-0 | 140 | NS | NS | 11.3 | 12.8 | 16.8 | NS | 17.3 | 17.7 |
| POTASSIUM | 7440-09-7 | NL | NS | NS | 506 | 556 | 1200 | NS | 547 | 816 |
| SELENIUM | 7782-49-2 | 36 | NS | NS | 0.67 | 1.3 | 1.1 | NS | 1.9 | 2.0 |
| SILVER | 7440-22-4 | 36 | NS | NS | 0.38 | 0.40 | 0.65 | NS | 0.58 | < 1.1 |
| SODIUM | 7440-23-5 | NL | NS | NS | 223 | 257 | 333 | NS | 398 | 406 |
| THALLIUM | 7440-28-0 | NL | NS | NS | < 8.7 | < 8.6 | < 10.1 | NS | < 10.6 | < 12.9 |
| VANADIUM | 7440-62-2 | NL | NS | NS | 11.1 | 12.3 | 24.8 | NS | 14.0 | 13.5 |
| ZINC | 7440-66-6 | 2200 | NS | NS | 439 | 481 | 302 | NS | 508 | 1390 |
| **Cyanide (mg/Kg)** | | | | | | | | | | |
| CYANIDE | 57-12-5 | 27 | **115** | **45.3** | **84.7** | **170** | **26.6** | **47.1** | **105** | **216** |

**Notes:**
<0.010 = Not detected above given laboratory reporting limit.
**Bold = Detected above reporting limit.**
Gray highlighted cells exceed NYSDEC Part 375-6.8 Restricted Residential SCO's
mg/Kg = Milligrams per kilogram
NL = No limit has been established for analyte
NS = Not Sampled for analyte
SCO = Soil Cleanup Objectives, 6NYCRR Part 375-6.8, Remedial Program Soil Cleanup Objectives, Restricted Use Soil Cleanup Objectives - Residential, Table 375-6.8b, December 2006.
SDG = Sample Delivery Group

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**Table 1**
**Confirmatory Soil Samples**
**Metals and Cyanide Analytical Results**
**National Fuel Gas Mineral Springs Former Manufactured Gas Plant**
**Fence Replacement Area Corrective Measure**
**November 2013**

| Location ID<br>Sample Date<br>Sample ID<br>SDG | CAS # | NYSDEC Restricted Use SCO - Residential | CS-8<br>11/8/2013<br>CS-8-20131108<br>480497511 | CS-9<br>11/8/2013<br>CS-9-20131108<br>480497511 | CS-10<br>11/7/2013<br>CS-10-20131107<br>480497511 | CS-11<br>11/7/2013<br>CS-11-20131107<br>480497511 | CS-12<br>11/7/2013<br>CS-12-20131107<br>480497511 | CS-13<br>11/7/2013<br>CS-13-20131107<br>480497511 | CS-14<br>11/7/2013<br>CS-14-20131107<br>480497511 |
|---|---|---|---|---|---|---|---|---|---|
| **Metals (mg/Kg)** | | | | | | | | | |
| ALUMINUM | 7429-90-5 | NL | 3820 | 6920 | NS | NS | NS | NS | NS |
| ANTIMONY | 7440-36-0 | NL | 8.1 | 3.1 | NS | NS | NS | NS | NS |
| ARSENIC | 7440-38-2 | 16 | **39.8** | **16.9** | **35.1** | **15.1** | **2.8** | **2.7** | **9.1** |
| BARIUM | 7440-39-3 | 350 | 195 | 150 | NS | NS | NS | NS | NS |
| BERYLLIUM | 7440-41-7 | 14 | 0.40 | 0.44 | NS | NS | NS | NS | NS |
| CADMIUM | 7440-43-9 | 2.5 | 2.3 | 5.6 | NS | NS | NS | NS | NS |
| CALCIUM | 7440-70-2 | NL | 10800 | 18000 | NS | NS | NS | NS | NS |
| CHROMIUM, HEXAVALENT | 18540-29-9 | 22 | < 5.6 | < 6.5 | NS | NS | NS | NS | NS |
| CHROMIUM, TOTAL | 7440-47-3 | NL | 13.6 | 18.0 | NS | NS | NS | NS | NS |
| COBALT | 7440-48-4 | NL | 6.4 | 6.3 | NS | NS | NS | NS | NS |
| COPPER | 7440-50-8 | 270 | 329 | 92.5 | NS | NS | NS | NS | NS |
| IRON | 7439-89-6 | NL | 35200 | 24800 | NS | NS | NS | NS | NS |
| LEAD | 7439-92-1 | 400 | 574 | 1110 | NS | NS | NS | NS | NS |
| MAGNESIUM | 7439-95-4 | NL | 1810 | 6130 | NS | NS | NS | NS | NS |
| MANGANESE | 7439-96-5 | 2000 | 311 | 342 | NS | NS | NS | NS | NS |
| MERCURY | 7439-97-6 | 0.81 | **0.26** | **0.13** | **0.42** | **0.11** | **0.031** | **0.017** | **0.038** |
| NICKEL | 7440-02-0 | 140 | 16.4 | 20.3 | NS | NS | NS | NS | NS |
| POTASSIUM | 7440-09-7 | NL | 488 | 998 | NS | NS | NS | NS | NS |
| SELENIUM | 7782-49-2 | 36 | 1.2 | 1.0 | NS | NS | NS | NS | NS |
| SILVER | 7440-22-4 | 36 | 1.1 | 0.41 | NS | NS | NS | NS | NS |
| SODIUM | 7440-23-5 | NL | 220 | 193 | NS | NS | NS | NS | NS |
| THALLIUM | 7440-28-0 | NL | < 8.0 | < 9.9 | NS | NS | NS | NS | NS |
| VANADIUM | 7440-62-2 | NL | 13.2 | 13.7 | NS | NS | NS | NS | NS |
| ZINC | 7440-66-6 | 2200 | 530 | 836 | NS | NS | NS | NS | NS |
| **Cyanide (mg/Kg)** | | | | | | | | | |
| CYANIDE | 57-12-5 | 27 | **30.4** | **29.7** | **33.5** | **17.6** | < 0.97 | < 0.99 | **1.8** |

**Notes:**
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mg/Kg = Milligrams per kilogram
NL = No limit has been established for analyte
NS = Not Sampled for analyte
SCO = Soil Cleanup Objectives, 6NYCRR Part 375-6.8, Remedial Program Soil Cleanup Objectives, Restricted Use Soil Cleanup Objectives - Residential, Table 375-6.8b, December 2006.
SDG = Sample Delivery Group

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**Table 1**
**Confirmatory Soil Samples**
**Metals and Cyanide Analytical Results**
**National Fuel Gas Mineral Springs Former Manufactured Gas Plant**
**Fence Replacement Area Corrective Measure**
**November 2013**

| Location ID<br>Sample Date<br>Sample ID<br>SDG | CAS # | NYSDEC Restricted Use SCO - Residential | CS-15<br>11/7/2013<br>CS-15-20131107<br>480497511 | CS-16<br>11/7/2013<br>CS-16-20131107<br>480497511 | CS-17<br>11/7/2013<br>CS-17-20131107<br>480497511 | CS-18<br>11/7/2013<br>CS-18-20131107<br>480497511 | CS-19<br>11/7/2013<br>CS-19-20131107<br>480497511 | CS-20<br>11/7/2013<br>CS-20-20131107<br>480497511 | CS-21<br>11/7/2013<br>CS-21-20131107<br>480497511 |
|---|---|---|---|---|---|---|---|---|---|
| **Metals (mg/Kg)** | | | | | | | | | |
| ALUMINUM | 7429-90-5 | NL | NS | NS | NS | NS | NS | NS | NS |
| ANTIMONY | 7440-36-0 | NL | NS | NS | NS | NS | NS | NS | NS |
| ARSENIC | 7440-38-2 | 16 | **16.3** | **13.0** | **6.1** | **11.8** | **46** | **8.7** | **11.5** |
| BARIUM | 7440-39-3 | 350 | NS | NS | NS | NS | NS | NS | NS |
| BERYLLIUM | 7440-41-7 | 14 | NS | NS | NS | NS | NS | NS | NS |
| CADMIUM | 7440-43-9 | 2.5 | NS | NS | NS | NS | NS | NS | NS |
| CALCIUM | 7440-70-2 | NL | NS | NS | NS | NS | NS | NS | NS |
| CHROMIUM, HEXAVALENT | 18540-29-9 | 22 | NS | NS | NS | NS | NS | NS | NS |
| CHROMIUM, TOTAL | 7440-47-3 | NL | NS | NS | NS | NS | NS | NS | NS |
| COBALT | 7440-48-4 | NL | NS | NS | NS | NS | NS | NS | NS |
| COPPER | 7440-50-8 | 270 | NS | NS | NS | NS | NS | NS | NS |
| IRON | 7439-89-6 | NL | NS | NS | NS | NS | NS | NS | NS |
| LEAD | 7439-92-1 | 400 | NS | NS | NS | NS | NS | NS | NS |
| MAGNESIUM | 7439-95-4 | NL | NS | NS | NS | NS | NS | NS | NS |
| MANGANESE | 7439-96-5 | 2000 | NS | NS | NS | NS | NS | NS | NS |
| MERCURY | 7439-97-6 | 0.81 | **0.44** | **0.31** | **0.059** | **0.062** | **0.087** | **0.095** | **0.013** |
| NICKEL | 7440-02-0 | 140 | NS | NS | NS | NS | NS | NS | NS |
| POTASSIUM | 7440-09-7 | NL | NS | NS | NS | NS | NS | NS | NS |
| SELENIUM | 7782-49-2 | 36 | NS | NS | NS | NS | NS | NS | NS |
| SILVER | 7440-22-4 | 36 | NS | NS | NS | NS | NS | NS | NS |
| SODIUM | 7440-23-5 | NL | NS | NS | NS | NS | NS | NS | NS |
| THALLIUM | 7440-28-0 | NL | NS | NS | NS | NS | NS | NS | NS |
| VANADIUM | 7440-62-2 | NL | NS | NS | NS | NS | NS | NS | NS |
| ZINC | 7440-66-6 | 2200 | NS | NS | NS | NS | NS | NS | NS |
| **Cyanide (mg/Kg)** | | | | | | | | | |
| CYANIDE | 57-12-5 | 27 | **0.97** | **12.4** | **0.69** | **1.9** | **60** | **13.0** | **9.8** |

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SDG = Sample Delivery Group

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**Table 2**
**Confirmatory Soil Samples**
**Organic Compounds Analytical Results**
**National Fuel Gas Mineral Springs Former Manufactured Gas Plant**
**Fence Replacement Area Corrective Measure**
**November 2013**

| Location ID<br>Sample Date<br>Sample ID<br>SDG | CAS # | NYSDEC Restricted Use SCO - Residential | CS-3<br>11/7/2013<br>CS-3-20131107<br>480497511 | CS-3 DUP<br>11/7/2013<br>CS-53-20131107<br>480497511 | CS-4<br>11/7/2013<br>CS-4-20131107<br>480497511 | CS-6<br>11/8/2013<br>CS-6-20131108<br>480497511 | CS-7<br>11/7/2013<br>CS-7-20131107<br>480497511 | CS-8<br>11/8/2013<br>CS-8-20131108<br>480497511 | CS-9<br>11/8/2013<br>CS-9-20131108<br>480497511 |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds (mg/Kg)** | | | | | | | | | |
| 1,1,1-TRICHLOROETHANE | 71-55-6 | 100 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,1,2,2-TETRACHLOROETHANE | 79-34-5 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE | 76-13-1 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,1,2-TRICHLOROETHANE | 79-00-5 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,1-DICHLOROETHANE | 75-34-3 | 19 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,1-DICHLOROETHENE | 75-35-4 | 100 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,2,4-TRICHLOROBENZENE | 120-82-1 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,2,4-TRIMETHYLBENZENE | 95-63-6 | 47 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,2-DIBROMO-3-CHLOROPROPANE | 96-12-8 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE) | 106-93-4 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,2-DICHLOROBENZENE | 95-50-1 | 100 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,2-DICHLOROETHANE | 107-06-2 | 2.3 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,2-DICHLOROPROPANE | 78-87-5 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,3,5-TRIMETHYLBENZENE (MESITYLENE) | 108-67-8 | 47 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,3-DICHLOROBENZENE | 541-73-1 | 17 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,4-DICHLOROBENZENE | 106-46-7 | 9.8 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| 1,4-DIOXANE (P-DIOXANE) | 123-91-1 | 9.8 | < 0.26 | < 0.27 | < 0.31 | < 0.37 | < 0.47 | < 0.26 | < 0.32 |
| 2-HEXANONE | 591-78-6 | NL | < 0.032 | < 0.034 | < 0.039 | < 0.046 | < 0.058 | < 0.032 | < 0.04 |
| ACETONE | 67-64-1 | 100 | < 0.032 | < 0.034 | < 0.039 | < 0.046 | < 0.058 | < 0.032 | < 0.04 |
| BENZENE | 71-43-2 | 2.9 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| BROMODICHLOROMETHANE | 75-27-4 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| BROMOFORM | 75-25-2 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| BROMOMETHANE | 74-83-9 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| CARBON DISULFIDE | 75-15-0 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| CARBON TETRACHLORIDE | 56-23-5 | 1.4 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| CHLOROBENZENE | 108-90-7 | 100 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| CHLOROETHANE | 75-00-3 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| CHLOROFORM | 67-66-3 | 10 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| CHLOROMETHANE | 74-87-3 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| CIS-1,2-DICHLOROETHYLENE | 156-59-2 | 59 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| CIS-1,3-DICHLOROPROPENE | 10061-01-5 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| CYCLOHEXANE | 110-82-7 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| DIBROMOCHLOROMETHANE | 124-48-1 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| DICHLORODIFLUOROMETHANE | 75-71-8 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| ETHYLBENZENE | 100-41-4 | 30 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| ISOPROPYLBENZENE (CUMENE) | 98-82-8 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| METHYL ACETATE | 79-20-9 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| METHYL ETHYL KETONE (2-BUTANONE) | 78-93-3 | 100 | < 0.032 | < 0.034 | < 0.039 | < 0.046 | < 0.058 | < 0.032 | < 0.04 |

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**Table 2**
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**Organic Compounds Analytical Results**
**National Fuel Gas Mineral Springs Former Manufactured Gas Plant**
**Fence Replacement Area Corrective Measure**
**November 2013**

| Location ID<br>Sample Date<br>Sample ID<br>SDG | CAS # | NYSDEC Restricted Use SCO - Residential | CS-3<br>11/7/2013<br>CS-3-20131107<br>480497511 | CS-3 DUP<br>11/7/2013<br>CS-53-20131107<br>480497511 | CS-4<br>11/7/2013<br>CS-4-20131107<br>480497511 | CS-6<br>11/8/2013<br>CS-6-20131108<br>480497511 | CS-7<br>11/7/2013<br>CS-7-20131107<br>480497511 | CS-8<br>11/8/2013<br>CS-8-20131108<br>480497511 | CS-9<br>11/8/2013<br>CS-9-20131108<br>480497511 |
|---|---|---|---|---|---|---|---|---|---|
| METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE) | 108-10-1 | NL | < 0.032 | < 0.034 | < 0.039 | < 0.046 | < 0.058 | < 0.032 | < 0.04 |
| METHYLCYCLOHEXANE | 108-87-2 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| METHYLENE CHLORIDE | 75-09-2 | 51 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| N-BUTYLBENZENE | 104-51-8 | 100 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| N-PROPYLBENZENE | 103-65-1 | 100 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| SEC-BUTYLBENZENE | 135-98-8 | 100 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| STYRENE | 100-42-5 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| T-BUTYLBENZENE | 98-06-6 | 100 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| TERT-BUTYL METHYL ETHER | 1634-04-4 | 62 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| TETRACHLOROETHYLENE(PCE) | 127-18-4 | 5.5 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| TOLUENE | 108-88-3 | 100 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| TRANS-1,2-DICHLOROETHENE | 156-60-5 | 100 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| TRANS-1,3-DICHLOROPROPENE | 10061-02-6 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| TRICHLOROETHYLENE (TCE) | 79-01-6 | 10 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| TRICHLOROFLUOROMETHANE | 75-69-4 | NL | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| VINYL CHLORIDE | 75-01-4 | 0.21 | < 0.0064 | < 0.0068 | < 0.0077 | < 0.0092 | < 0.012 | < 0.0065 | < 0.0080 |
| XYLENES, TOTAL | XYLENES | NL | < 0.013 | < 0.014 | < 0.015 | < 0.018 | < 0.023 | < 0.013 | < 0.016 |
| **Polycyclic Aromatic Hydrocarbons (mg/Kg)** | | | | | | | | | |
| 2-METHYLNAPHTHALENE | 91-57-6 | NL | < 1.2 | **0.016** | **0.032** | **0.078** | < 3.3 | **0.19** | **0.022** |
| ACENAPHTHENE | 83-32-9 | 100 | < 1.2 | < 0.26 | **0.0075** | < 0.59 | < 3.3 | **0.014** | **0.015** |
| ACENAPHTHYLENE | 208-96-8 | 100 | < 1.2 | **0.04** | **0.09** | **0.24** | < 3.3 | **0.61** | **0.053** |
| ANTHRACENE | 120-12-7 | 100 | **0.072** | **0.023** | **0.048** | **0.16** | < 3.3 | **0.35** | **0.064** |
| BENZO(A)ANTHRACENE | 56-55-3 | 1 | **0.38** | **0.17** | **0.33** | **1.1** | **0.92** | **3.3** | **0.4** |
| BENZO(A)PYRENE | 50-32-8 | 1 | **0.3** | **0.16** | **0.31** | **1.2** | **0.91** | **3.9** | **0.42** |
| BENZO(B)FLUORANTHENE | 205-99-2 | 1 | **0.62** | **0.33** | **0.54** | **2.8** | **1.8** | **7.6** | **0.59** |
| BENZO(G,H,I)PERYLENE | 191-24-2 | 100 | **0.086** | **0.062** | **0.12** | **0.44** | **0.42** | **1.3** | **0.14** |
| BENZO(K)FLUORANTHENE | 207-08-9 | 1 | **0.19** | **0.13** | **0.21** | **0.84** | **0.71** | **2.5** | **0.23** |
| CHRYSENE | 218-01-9 | 1 | **0.37** | **0.2** | **0.35** | **1.3** | **0.98** | **3.6** | **0.43** |
| DIBENZ(A,H)ANTHRACENE | 53-70-3 | 0.33 | < 1.2 | **0.02** | **0.04** | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| FLUORANTHENE | 206-44-0 | 100 | **0.54** | **0.25** | **0.44** | **1.4** | **0.92** | **3.5** | **0.67** |
| FLUORENE | 86-73-7 | 100 | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | **0.022** |
| INDENO(1,2,3-C,D)PYRENE | 193-39-5 | 0.5 | **0.087** | **0.058** | **0.11** | **0.41** | **0.29** | **1.2** | **0.13** |
| NAPHTHALENE | 91-20-3 | 100 | < 1.2 | < 0.26 | **0.029** | < 0.59 | < 3.3 | **0.21** | **0.029** |
| PHENANTHRENE | 85-01-8 | 100 | **0.32** | **0.092** | **0.19** | **0.55** | **0.27** | **1** | **0.3** |
| PYRENE | 129-00-0 | 100 | **0.49** | **0.21** | **0.45** | **1.2** | **0.86** | **5** | **0.6** |
| **Semi-Volatile Organic Compounds (mg/Kg)** | | | | | | | | | |
| 2,4,5-TRICHLOROPHENOL | 95-95-4 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 2,4,6-TRICHLOROPHENOL | 88-06-2 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 2,4-DICHLOROPHENOL | 120-83-2 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 2,4-DIMETHYLPHENOL | 105-67-9 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 2,4-DINITROPHENOL | 51-28-5 | NL | < 2.3 | < 0.51 | < 0.54 | < 1.1 | < 6.4 | < 2.3 | < 0.52 |
| 2,4-DINITROTOLUENE | 121-14-2 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 2,6-DINITROTOLUENE | 606-20-2 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 2-CHLORONAPHTHALENE | 91-58-7 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 2-CHLOROPHENOL | 95-57-8 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 2-METHYLPHENOL (O-CRESOL) | 95-48-7 | 100 | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 2-NITROANILINE | 88-74-4 | NL | < 2.3 | < 0.51 | < 0.54 | < 1.1 | < 6.4 | < 2.3 | < 0.52 |
| 2-NITROPHENOL | 88-75-5 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 3,3'-DICHLOROBENZIDINE | 91-94-1 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |

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**Table 2**
**Confirmatory Soil Samples**
**Organic Compounds Analytical Results**
**National Fuel Gas Mineral Springs Former Manufactured Gas Plant**
**Fence Replacement Area Corrective Measure**
**November 2013**

| Location ID<br>Sample Date<br>Sample ID<br>SDG | CAS # | NYSDEC Restricted Use SCO - Residential | CS-3<br>11/7/2013<br>CS-3-20131107<br>480497511 | CS-3 DUP<br>11/7/2013<br>CS-53-20131107<br>480497511 | CS-4<br>11/7/2013<br>CS-4-20131107<br>480497511 | CS-6<br>11/8/2013<br>CS-6-20131108<br>480497511 | CS-7<br>11/7/2013<br>CS-7-20131107<br>480497511 | CS-8<br>11/8/2013<br>CS-8-20131108<br>480497511 | CS-9<br>11/8/2013<br>CS-9-20131108<br>480497511 |
|---|---|---|---|---|---|---|---|---|---|
| 3-NITROANILINE | 99-09-2 | NL | < 2.3 | < 0.51 | < 0.54 | < 1.1 | < 6.4 | < 2.3 | < 0.52 |
| 4,6-DINITRO-2-METHYLPHENOL | 534-52-1 | NL | < 2.3 | < 0.51 | < 0.54 | < 1.1 | < 6.4 | < 2.3 | < 0.52 |
| 4-BROMOPHENYL PHENYL ETHER | 101-55-3 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 4-CHLORO-3-METHYLPHENOL | 59-50-7 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 4-CHLOROANILINE | 106-47-8 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 4-CHLOROPHENYL PHENYL ETHER | 7005-72-3 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| 4-METHYLPHENOL (P-CRESOL) | 106-44-5 | 34 | < 2.3 | < 0.51 | < 0.54 | < 1.1 | < 6.4 | < 2.3 | < 0.52 |
| 4-NITROANILINE | 100-01-6 | NL | < 2.3 | < 0.51 | < 0.54 | < 1.1 | < 6.4 | < 2.3 | < 0.52 |
| 4-NITROPHENOL | 100-02-7 | NL | < 2.3 | < 0.51 | < 0.54 | < 1.1 | < 6.4 | < 2.3 | < 0.52 |
| ACETOPHENONE | 98-86-2 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| ATRAZINE | 1912-24-9 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| BENZALDEHYDE | 100-52-7 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| BENZYL BUTYL PHTHALATE | 85-68-7 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| BIPHENYL (DIPHENYL) | 92-52-4 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| BIS(2-CHLOROETHOXY) METHANE | 111-91-1 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER) | 111-44-4 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| BIS(2-CHLOROISOPROPYL) ETHER | 108-60-1 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| BIS(2-ETHYLHEXYL) PHTHALATE | 117-81-7 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | **1.3** | < 1.2 | < 0.27 |
| CAPROLACTAM | 105-60-2 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| CARBAZOLE | 86-74-8 | NL | < 1.2 | **0.015** | **0.025** | **0.088** | < 3.3 | **0.098** | **0.038** |
| DIBENZOFURAN | 132-64-9 | 14 | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | **0.069** | < 0.27 |
| DIETHYL PHTHALATE | 84-66-2 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| DIMETHYL PHTHALATE | 131-11-3 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| DI-N-BUTYL PHTHALATE | 84-74-2 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| DI-N-OCTYLPHTHALATE | 117-84-0 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| **SVOCs (mg/Kg) (cont)** | | | | | | | | | |
| HEXACHLOROBENZENE | 118-74-1 | 0.33 | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| HEXACHLOROBUTADIENE | 87-68-3 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| HEXACHLOROCYCLOPENTADIENE | 77-47-4 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| HEXACHLOROETHANE | 67-72-1 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| ISOPHORONE | 78-59-1 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| NITROBENZENE | 98-95-3 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| N-NITROSODI-N-PROPYLAMINE | 621-64-7 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| N-NITROSODIPHENYLAMINE | 86-30-6 | NL | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |
| PENTACHLOROPHENOL | 87-86-5 | 2.4 | < 2.3 | < 0.51 | < 0.54 | < 1.1 | < 6.4 | < 2.3 | < 0.52 |
| PHENOL | 108-95-2 | 100 | < 1.2 | < 0.26 | < 0.28 | < 0.59 | < 3.3 | < 1.2 | < 0.27 |

**Notes:**
<0.010 = Not detected above given laboratory reporting limit.
**Bold = Detected above reporting limit.**
Gray highlighted cells exceed NYSDEC Part 375-6.8 Restricted Residential SCO's
NL = No limit has been established for analyte
SCO = Soil Cleanup Objectives, 6NYCRR Part 375-6.8, Remedial Program Soil Cleanup Objectives, Restricted Use Soil Cleanup Objectives - Residential, Table 375-6.8b, December 2006.
SDG - Sample Delivery Group

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**Table 3**
**Residential Soil Samples**
**Metals and Cyanide Analytical Results**
**National Fuel Gas Mineral Springs Former Manufactured Gas Plant**
**Fence Replacement Area Corrective Measure**
**November 2013**

| Location ID<br>Sample Date<br>Sample ID<br>SDG | CAS # | NYSDEC Restricted Use SCO - Residential | RS-1<br>11/7/2013<br>RS-1-20131107<br>480497511 | RS-1 DUP<br>11/7/2013<br>RS-5-20131107<br>480497511 | RS-2<br>11/7/2013<br>RS-2-20131107<br>480497511 | RS-3<br>11/7/2013<br>RS-3-20131107<br>480497511 | RS-4<br>11/7/2013<br>RS-4-20131107<br>480497511 |
|---|---|---|---|---|---|---|---|
| **Metals (mg/Kg)** | | | | | | | |
| ARSENIC | 7440-38-2 | 16 | 10.3 | 8.4 | 10.7 | 8.6 | 6.7 |
| MERCURY | 7439-97-6 | 0.81 | 0.40 | 0.35 | 0.34 | 0.13 | 0.086 |
| **Cyanide (mg/Kg)** | | | | | | | |
| CYANIDE | 57-12-5 | 27 | 15.4 | 67.2 | 12.2 | 28.2 | 1.9 |

**Notes:**
Gray highlighted cells exceed NYSDEC Part 375-6.8 Restricted Residential SCO's
mg/Kg = Milligrams per kilogram
SCO = Soil Cleanup Objectives, 6NYCRR Part 375-6.8, Remedial Program Soil Cleanup Objectives, Restricted Use Soil Cleanup Objectives - Residential, Table 375-6.8b, December 2006.
SDG = Sample Delivery Group

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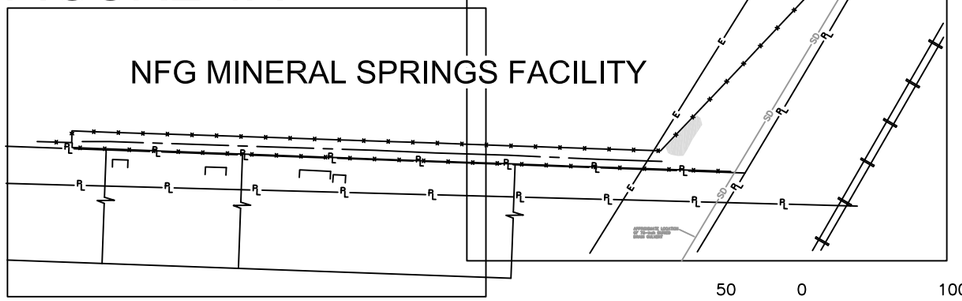
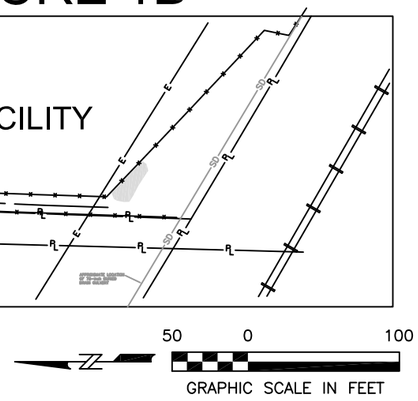
# Figures

File: J:\Rem_Eng\Project Files\National Fuel Gas\Mineral Springs 04870 NFG\CADD\2013-AsBuilt\60250836-AsBuilt_2013-12-12.dwg Layout: NORTH-1 User: vershonb Plotted: Dec 12, 2013 - 3:46pm Xref's:

# FIGURE 1A

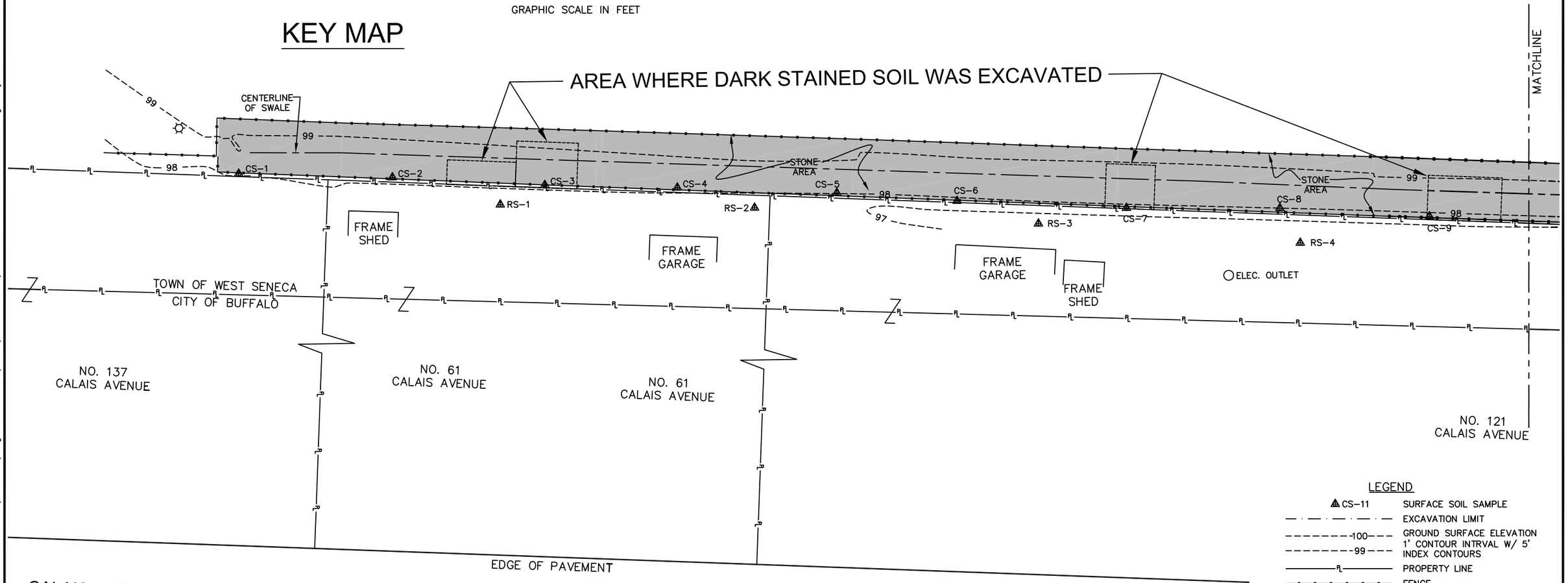



# FIGURE 1B




MINERAL SPRINGS FACILITY

## KEY MAP




LEGEND

| | |
|---|---|
| CS-11 | SURFACE SOIL SAMPLE |
| | EXCAVATION LIMIT |
| 100 | GROUND SURFACE ELEVATION 1' CONTOUR INTRVAL W/ 5' INDEX CONTOURS |
| 99 | |
| RL | PROPERTY LINE |
| | FENCE |
| SD | STORM DRAIN |
| E | UNDERGROUND ELECTRIC UTILITY |
| | STONE COVER AREA |

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AECOM

10 0 20
GRAPHIC SCALE IN FEET

NATIONAL FUEL GAS
MINERAL SPRINGS ROAD
FORMER MANUFACTURED GAS PLANT

**FENCE REPLACEMENT AREA**
**CORRECTIVE MEASURES**
**SAMPLING LOCATIONS**

| DATE: 12/12/13 | DRWN: BcV | 60250836.400.2.1 | **FIGURE 1A** |
|---|---|---|---|

# FIGURE 1A

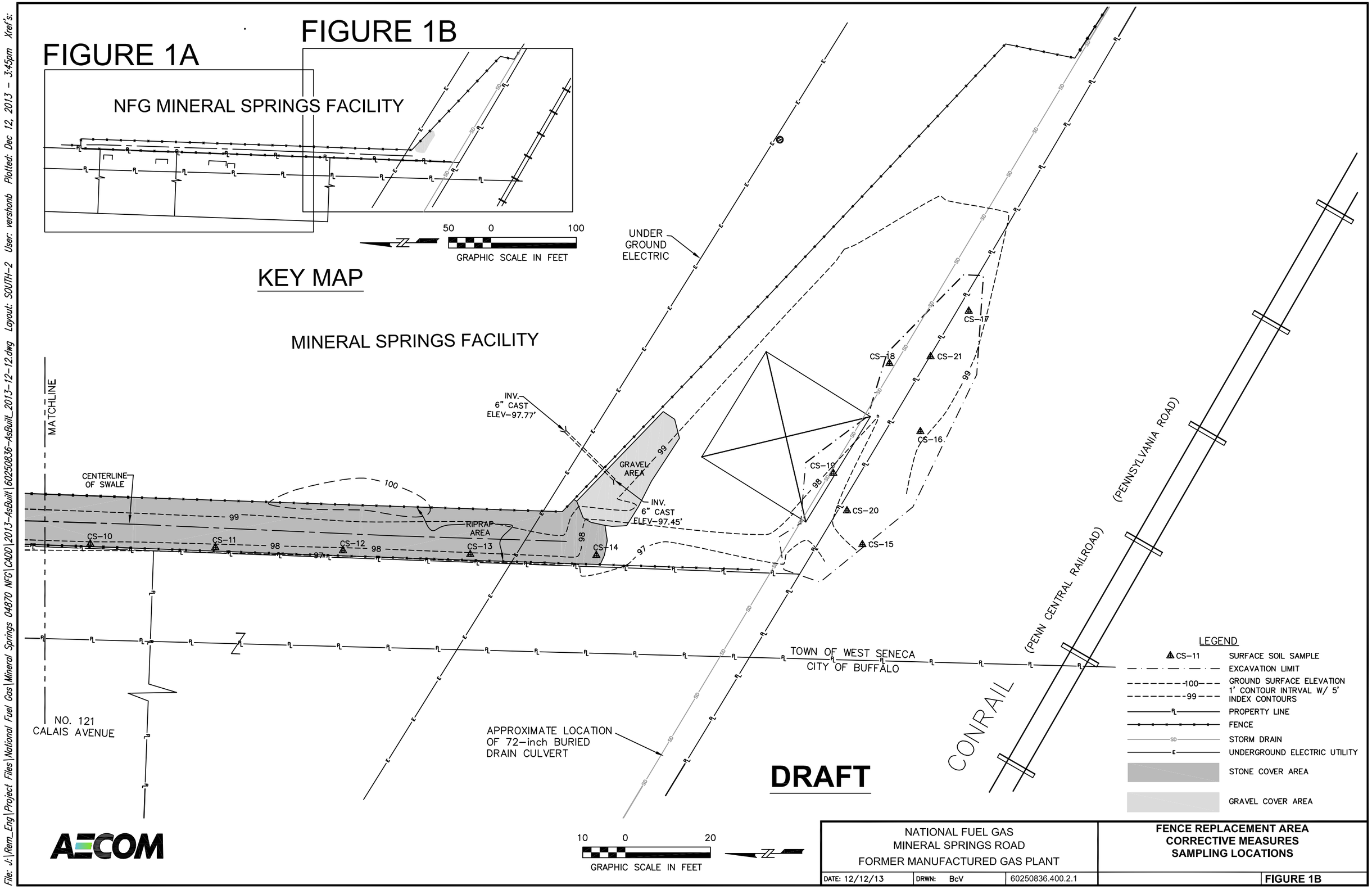



# FIGURE 1B




## KEY MAP

MINERAL SPRINGS FACILITY

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10 0 20

GRAPHIC SCALE IN FEET

AECOM

NATIONAL FUEL GAS
MINERAL SPRINGS ROAD
FORMER MANUFACTURED GAS PLANT

**FENCE REPLACEMENT AREA
CORRECTIVE MEASURES
SAMPLING LOCATIONS**

| DATE: 12/12/13 | DRWN: BcV | 60250836.400.2.1 | FIGURE 1B |
|---|---|---|---|

File: J:\Rem_Eng\Project Files\National Fuel Gas\Mineral Springs 04870 NFG\CADD\2013-AsBuilt\60250836-AsBuilt_2013-12-12.dwg Layout: SOUTH-2 User: vershonb Plotted: Dec 12, 2013 - 3:45pm Xref's: