

**Quality Assurance Project Plan (QAPP)
6th and Jackson Moscow, Idaho
Remediation Monitoring – Addendum I**

**Prepared for:
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September 30, 2015

Title and Approval Sheet .

Quality Assurance Project Plan Addendum for 6th and Jackson Moscow

Prepared by:

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Effective Date: September 30, 2015

Approved by:

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Acronyms and Abbreviations

ABCA	Analysis of Brownfields Cleanup Alternatives
Anatek	Anatek Labs, Inc.
AST	aboveground storage tank
City	City of Moscow
Coalition	Greater Moscow Area Coalition
COC	contaminant of concern
ESA	Environmental Site Assessment
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDTL	Initial Default Target Level
MCL	Maximum Contaminant Level
PID	photo-ionization detector
PQL	Project Quantitation Limit
QAPP	Quality Assurance Project Plan
RATL	Remedial Action Target Level
REC	recognized environmental condition
SM	Standard Method
TerraGraphics	TerraGraphics Environmental Engineering, Inc.
TKN	Total Kjeldahl Nitrogen
URA	Urban Renewal Agency
USEPA	US Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

Section 1.0 Introduction

The City of Moscow (City), through the Greater Moscow Area Coalition (the Coalition) Assessment Grant BF-00J24101 and on behalf of the Moscow Urban Renewal Agency (URA), engaged TerraGraphics Environmental Engineering, Inc. (TerraGraphics) to develop an Analysis of Brownfields Cleanup Alternatives (ABCA) and Work Plan for 217 and 317 W. 6th Street locations (6th and Jackson Street) (hereinafter referred to as the “Site”). In accordance with Idaho Administrative Procedures Act Idaho Land Remediation Rules (IDAPA 58.01.18), TerraGraphics developed an ABCA/Work Plan (TerraGraphics 2015b) that identified remediation standards which ensure that substantial present or probable future risk to human health or the environment is eliminated or reduced to protective levels based upon present and reasonably anticipated future uses of the Site (IDAPA 58.01.18(02)b).

The ABCA/Work Plan describes the evaluation methods used to determine the preferred remedial option to address contamination issues associated with the Site. Sampling and monitoring will support implementation of the preferred remedial alternative stated within the ABCA/Work Plan (TerraGraphics 2015b).

1.1 Purpose

Between 2008 and 2014, the Site had multiple assessments using approved Quality Assurance Project Plans (QAPPs) to characterize recognized environmental conditions (RECs) identified prior to redevelopment. Previous assessments identified bulk storage of agricultural chemicals on Site, a small heating oil underground storage tank (UST), and characterized pesticide concentrations in surface soil in the area of the aboveground storage tanks (ASTs). A Limited Phase II Environmental Site Assessment (ESA) completed by TerraGraphics (TerraGraphics 2015a) revealed elevated soil and groundwater concentrations of nitrate, ammonia, arsenic, and Total Kjeldahl Nitrogen (TKN). The ABCA/Work Plan describes the Site contaminants of concern (COCs), evaluates risk pathways, and discusses how both may be addressed to provide for redevelopment including analytical methods and monitoring.

1.2 Previous Approved Quality Assurance Project Plans for the 6th and Jackson Site

The following are references of the various QAPPs written and approved for the 6th and Jackson Site. Signature pages of the QAPPs listed below are attached to this report.

TerraGraphics Environmental Engineering, Inc. (TerraGraphics), 2011. Master Quality Assurance Project Plan for the City of Moscow Brownfields Phase II Environmental Site Assessments, Moscow, Idaho, October 31.

TerraGraphics and STRATA, 2012. Quality Assurance Project Plan 317 West 6th Street Moscow, Idaho Phase II Environmental Site Assessment. Prepared for the City of Moscow. February 21.

TerraGraphics, 2013. Quality Assurance Project Plan (QAPP) 6th and Jackson Moscow, Idaho Phase II Extension – Addendum I. Prepared for the City of Moscow. October 18.

TerraGraphics, 2014. Sampling Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) for 217 & 317 West 6th Street Moscow, Idaho, Phase II Environmental Site Assessment. Prepared for the City of Moscow. November 17, Revision 3.

1.3 Scope

The scope of the monitoring described in the QAPP includes supporting sampling for the following remedial activities:

- Removal of nutrient rich soils.
- Injection of a remedial amendment to stimulate the denitrification within the ground water.
- Installation of a pump and treat system that captures ground water and directs it to the City’s sanitary sewer for treatment at the Moscow Wastewater Treatment Plant.

1.4 Monitoring

During soil excavation of identified nutrient-rich soils, field crews will collect four samples from each excavated pit (one from each sidewall) and analyze for ammonia, nitrate, dieldrin, and DDT, similar to the sampling previously completed. During the excavation of soils within the historic tunnel excavation location, field crews will screen soils using a field photo-ionization detector (PID) to determine the presence of volatile organic compounds (VOCs). Up to three samples will be collected based upon olfactory, visual, and PID screening results, from the sidewalls and bottom of the excavation pit. Anatek Labs, Inc. (Anatek) will analyze the samples for naphthalene by US Environmental Protection Agency (USEPA) Method 8260B (USEPA 1996), ammonia by Standard Method (SM) 4500-NH₃ (SM 1997), nitrate by USEPA Method 300.0, and dieldrin and DDT by USEPA 8081B (USEPA 2007). Prior samples taken in December 2014 noted naphthalene above the Idaho Initial Default Target Level (IDTL; IDEQ 2004) in the vicinity of MW-5 and the historic tunnel location.

The selected contractor will conduct groundwater monitoring from the well network to demonstrate remediation effectiveness and demonstrate compliance with cleanup levels (established in the ABCA/Work Plan [TerraGraphics 2015b]). Monthly sampling will begin following the substrate injections. During the initial sampling event, groundwater samples will be collected from each of the wells (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, and extraction wells). The selected contractor will prepare and deliver a brief memorandum summarizing the results of each monitoring event 4 weeks following each sampling event to the Idaho Department of Environmental Quality (IDEQ). Tables 1 and 2 summarize COCs and analytical methods.

Table 1. Analytical Reporting Limits and Cleanup Levels for COCs in GW (mg/L)

Analyte	Analytical Laboratory	Analytical Method	PQL ^a	Cleanup Level (MCL ^b or RATL-1 ^c)
Nitrate	Anatek	USEPA 300.0	1.0	10 ^b

Table 1. Analytical Reporting Limits and Cleanup Levels for COCs in GW (mg/L)

Analyte	Analytical Laboratory	Analytical Method	PQL ^a	Cleanup Level (MCL ^b or RATL-1 ^c)
Ammonia	Anatek	SM 4500-NH ₃	0.5	3.83 ^c

Notes:

- a. Project Quantitation Limit (PQL) - The substance-specific level that the listed laboratory must be able to routinely and reliably detect in specific sample matrices.
- b. Maximum Contaminant Level (MCL) - IDAPA 58.01.08. Idaho Rules for Public Drinking Water Systems.
- c. Remedial Action Target Levels (RATLs)-1 for the child residential receptor developed using site-specific data and calculated with the IDEQ REM (2004) as presented in Appendix B of this ABCA/Work Plan.

Table 2. Analytical Reporting Limits and Cleanup Levels for COCs in Soil (mg/kg)

Analyte	Analytical Laboratory	Analytical Method	PQL ^a	Cleanup Level (IDTL ^b or RATL-1 ^c)
Ammonia	Anatek	SM 4500-NH ₃	2.5	0.377 ^c
Naphthalene	Anatek	USEPA 8260	0.0050	0.104 ^c
DDT	Anatek	USEPA 8081B	0.01	3.34 ^c
Dieldrin	Anatek	USEPA 8081B	0.01	0.0826 ^c
Nitrate	Anatek	USEPA 300.0	5	18.4 ^b

Notes:

- a. Project Quantitation Limit (PQL) - The substance-specific level that the listed laboratory must be able to routinely and reliably detect in specific sample matrices.
- b. IDEQ REM Initial Default Target Levels (IDTLs).
- c. Remedial Action Target Levels (RATLs)-1 for the child residential receptor developed using site-specific data and calculated with the IDEQ REM (2004) as presented in Appendix B of this ABCA/Work Plan.

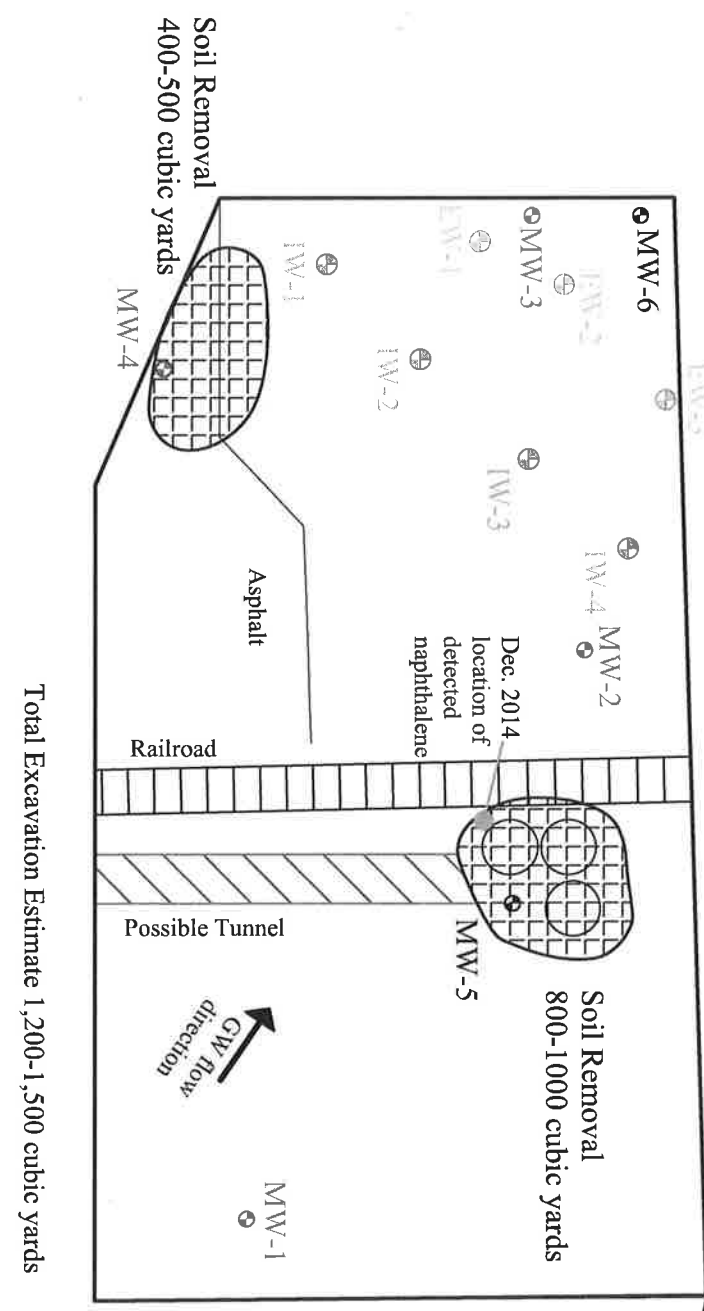
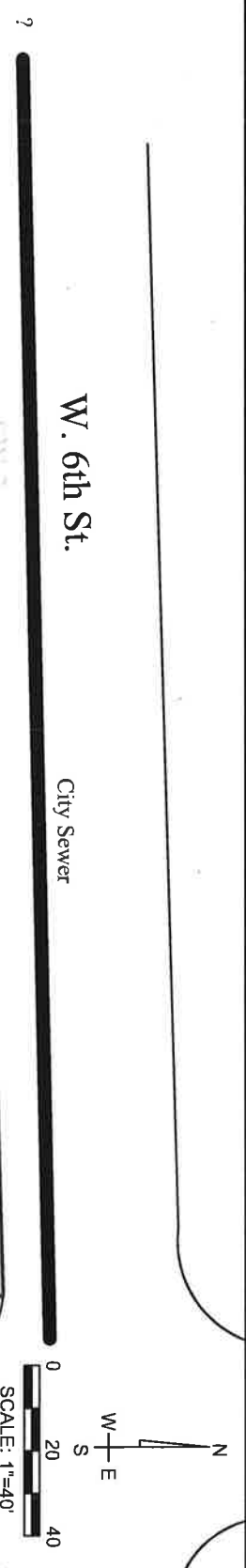
Section 2.0 Project Timetable

- QAPP preparation and approval: September/October 2015
- Coordination with Analytical Laboratory: September/October 2015
- Field work: October 2015
- Laboratory Analysis: October/November 2015
- Data Review: November/December 2015
- Data Summary Memo Preparation: November/December 2015

- Issue Draft Data Summary Memo: November/December 2015
- Memo Finalization: November/December 2015

Section 3.0 References and Resources Used

- Idaho Administrative Procedures Act (IDAPA), 1997. IDAPA 58.01.18. Idaho Land Remediation Rules. March.
- IDAPA, 2013. IDAPA 58.01.08. Idaho Rules for Public Drinking Water Systems. Last amended April.
- Idaho Department of Environmental Quality (IDEQ), 2004. Idaho Risk Evaluation Manual. 1410 North Hilton, Boise, Idaho 83706, April.
- Standard Method (SM). 1997. Method 4500-NH₃: Standard Methods for the Examination of Water and Wastewater. Section D. Ammonia-Selective Electrode Method.
- TerraGraphics Environmental Engineering, Inc. (TerraGraphics), 2011. Master Quality Assurance Project Plan for the City of Moscow Brownfields Phase II Environmental Site Assessments, Moscow, Idaho, October 31.
- TerraGraphics and STRATA, 2012. Quality Assurance Project Plan 317 West 6th Street Moscow, Idaho Phase II Environmental Site Assessment. Prepared for the City of Moscow. February 21.
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- TerraGraphics, 2014. Sampling Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) for 217 & 317 West 6th Street Moscow, Idaho, Phase II Environmental Site Assessment. Prepared for the City of Moscow. November 17, Revision 3.
- TerraGraphics, 2015a. Phase II Environmental Assessment Report for 217 & 317 East 6th Street Moscow, Idaho Final. Prepared for the City of Moscow. April 2.
- TerraGraphics, 2015b. Final Analysis of Brownfields Cleanup Alternatives and Remediation Work Plan for 217 & 317 W. 6th Street Moscow, Idaho. Prepared for the City of Moscow and the Moscow Urban Renewal Agency Idaho. September.
- U.S. Environmental Protection Agency (USEPA), 1993. Method 300.0. Determination of Inorganic Anions by Ion Chromatography. Revision 2.1. August.
- USEPA, 1996. Method 8260B: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS). Revision 2, December.
- USEPA, 2001. EPA Requirements for Quality Assurance Project Plans. EPA QA-R5. March.
- USEPA, 2007. Method 8081B; Organochlorine Pesticides by Gas Chromatography. February: Revision 2.



Total Excavation Estimate 1,200-1,500 cubic yards

LEGEND

- Approximate Property Boundary
- Historic Bulk Storage Tanks
- TeraTech Monitoring Well Locations (May 2013)
- Historic Railroad Spur Location
- Possible Tunnel Location
- TeraGraphics Monitoring Well Location (Dec 2014)
- Injection Well
- Extraction Well
- Soil Removal Area

<p>TerraGraphics Environmental Engineering, Inc. www.TerraGraphics.com</p>	PRINT DATE: Sept. 23, 2015	PROJECTION: UTM NAD 83, Zone 11N	PROJECT NAME: City of Moscow Brownfields 6th and Jackson	FIGURE # Estimated Soil Removal Locations
	PROJECT NUMBER: 13068	PROJECT MANAGER: R. Nimmer	CARTOGRAPHER: M. Snider	