DEPARTMENT OF THE ARMY

89th Regional Readiness Command

Final

Remedial Design/Remedial Action Work Plan for the Final Remedial Action for the Groundwater Operable Unit

FORMER WELDON SPRING ORDNANCE WORKS

WELDON SPRING, MISSOURI

OPERABLE UNIT 2: GROUNDWATER

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Prepared for: 89th Regional Readiness Command

Phase I – Monitored Natural Attenuation: Performance Monitoring

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CONTENTS

1.0 Introduction ... 1
1.1. Purpose and Scope ... 1
1.2. Background ... 1
1.3. Document Organization ... 2
2.0 Monitored Natural Attenuation ... 3
2.1. Monitoring Strategy ... 3
2.1.1. Nature and Extent of Contamination ... 5
2.1.2. Performance Goals ... 7
2.2. Monitoring Parameters ... 7
2.3. Monitoring Locations ... 7
2.3.1. Groundwater and Spring Monitoring Locations ... 10
2.4. Monitoring Frequencies ... 14
2.5. Data Analysis and Interpretation ... 14
2.5.1. Performance Monitoring (Objective 1 locations) ... 22
2.5.2. Detection Monitoring (Objective 2, 3, and 4 Locations) ... 23
2.5.3. Hydrologic Monitoring (Objective 4 Locations) ... 23
2.6. Actions ... 24
3.0 Construction Activities ... 30
4.0 Project Schedule ... 31
5.0 Summary of Project Costs ... 32
6.0 Quality Plans ... 33
6.1. Quality Assurance Project Plan ... 33
6.2. Quality Control Plan ... 33
6.3. Contractor Quality Control Plan ... 34
7.0 Emergency Preparedness Plan ... 35
7.1. Purpose ... 35
7.2. Description ... 35
7.3. Implementation ... 35
8.0 Document Submittal ... 37
8.1. Documents ... 37
9.0 References ... 38

CONTENTS

FIGURES

Figure 2-1: General Site Information
Figure 2-2: Monitoring Well and Spring Locations (presented as a set of figures)
Figure 2-2:A – Spring Recharge Basins SP-6301 and SP-6301/6303
Figure 2-2:B – Spring Recharge Basin SP-6303/6304
Figure 2-2:C – Spring Recharge Basin SP-6501
Figure 2-2:D – Spring Recharge Basin SP-5601/5603/5605
Figure 2-2:E – Spring Recharge Basin SP-5602
Figure 2-2:F – Spring Recharge Basin SP-5304
Figure 2-3: Validation and Statistical Evaluation Scheme
Figure 2-4: Decision Tree for Objective 1 Data
Figure 2-5: Decision Tree for Objective 2 (and 4) Data
Figure 2-6: Decision Tree for Objective 3 Data
Figure 3-1: Proposed Location of MWD34

TABLES

Table 1-1: Remediation Standards for the OU2 Groundwater (as Presented in Table 2.8.1 of the Record of Decision)
Table 2-1: Monitoring Points with Mean Concentrations Exceeding Remediation Standards for the OU2 Groundwater of WSOW
Table 2-2: Monitoring Parameters for MNA Locations
Table 2-3: Summary of Locations Retained for MNA Performance Monitoring
Table 2-4: Proposed/Tentative Sampling Schedule Through 2010
Table 2-5: Criteria (μg/L) for the Performance and Detection Monitoring Programs

CONTENTS

NOTATION

The following is a list of the acronyms, abbreviations, and a definition of terminology used in this document:

ACRONYMS, ABBREVIATIONS, and DEFINITIONS

General

ARARs	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COCs	contaminants of concern
CPA	Chemical Plant Area
DNB	dinitrobenzene
DNT	dinitrotoluene
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
Ft	feet
GMAR	Groundwater Monitoring Assessment Report
IC	Institutional Control
MDNR	Missouri Department of Natural Resources
MNA	monitored natural attenuation
μg/L	micrograms per liter
mg/L	milligrams per liter
NB	nitrobenzene
NCP	National (Oil and Hazardous Substances Pollution) Contingency Plan
NT	nitrotoluene
OU	operable unit
OU1	Operable Unit 1: Soils and Process Pipelines
OU2	Operable Unit 2: Groundwater
PRG	preliminary remediation goal
RAO	remedial action objective
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act (to CERCLA)
TNT	trinitrotoluene
USACE	U.S. Army Corps of Engineers
WSOW	Weldon Spring Ordnance Works
WSTA	Weldon Spring Training Area
WSS	Weldon Spring Site
WSSRAP	Weldon Spring Site Remedial Action Project

CONTENTS

Definitions

Semi-annual	A frequency of twice per year
Bi-annual	A frequency of one per two years

Chemicals

1,3-DNB	1,3-dinitrobenzene
2,4-DNT	2,4-dinitrotoluene
2,6-DNT	2,6-dinitrotoluene
DNT	dinitrotoluene (refers to both 2,4-DNT and 2,6-DNT)
NB	nitrobenzene
NT	nitrotoluenes (refers to 2-NT, 3-NT, and 4-NT)
TNT	2,4,6-trinitrotoluene

1.0 INTRODUCTION

Operable Unit 2 (OU2) is the second of two operable units established for the Former Weldon Spring Ordnance Works (WSOW). The first operable unit, OU1, addressed contaminated soil and pipeline at the WSOW. OU2 addresses contaminated groundwater and springs in the WSOW. The selected remedy for the groundwater and springs at the WSOW constitutes the final component of the phased cleanup process implemented at the WSOW.

1.1. PURPOSE AND SCOPE

This Remedial Design / Remedial Action Work Plan (*Work Plan)* is intended to fulfill the requirements for both the remedial design and the remedial action work plans for the implementation of the *Record of Decision for the Final Remedial Action for Operable Unit 2, Groundwater, at the Former Weldon Spring Ordnance Works* (ROD). This *Work Plan* will define the design and implementation of the selected final remedial action for OU2 in two phases. This *Work Plan* provides the following:

- The design strategy for the selected remedy,
- The design strategy for the Institutional Controls (detailed in Phase II),
- The implementation approach for Phase I,
- The overall schedule under which the remedial design and remedial action activities are projected to be conducted, and
- General cost estimates for the selected remedy.

The *Work Plan* is presented in two phases. Phase I of the *Work Plan* covers the performance monitoring of the selected remedy, monitored natural attenuation, including the monitoring strategy, performance goals, data analysis and evaluation, and associated actions. Phase II of the *Work Plan* covers institutional controls and will be provided under separate cover subsequent to Phase I which is provided under this cover.

1.2. BACKGROUND

The ROD presents the selected final remedial action for OU2. The action was selected following the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The selected remedy for OU2 is monitored natural attenuation (MNA). This remedy also includes institutional controls (ICs) to aid in ensuring that use of the groundwater and springwater is restricted during the restoration period. Remediation Goals were also specified. Standards for Contaminants of Concern associated with the Remediation Goals are presented in Table 1-1-1.

Restoration of the aquifer is estimated to take 160 years. Information presented in the *Remedial Investigation*, *Feasibility Study*, *Baseline Risk Assessment*, *Groundwater Monitoring Assessment Report*, *Supplemental Feasibility Study*, and *Proposed Plan* prepared for OU2 was used to develop the selected action.

Table 1-1: Remediation Standards for the OU2 Groundwater
(as Presented in Table 2.8.1 of the Record of Decision)

Contaminant of Concern	Standard (µg/L)	Basis of Standard
2,4-DNT	0.11	Missouri Water Quality Standards, 10 CSR 20-7.031
1,3-DNB	1.0	Missouri Water Quality Standards, 10 CSR 20-7.031
NB	17	Missouri Water Quality Standards, 10 CSR 20-7.031
2,6-DNT	1.3	Risk based concentration eqivalent to 10^{-5} resident scenerio
2,4,6-TNT	2.8	Risk based concentration eqivalent to 10^{-6} resident scenerio
o-NT	37	Risk based concentration based upon Hazard Index of 1 residential scenerio
m-NT	37	Risk based concentration based upon Hazard Index of 1 residential scenerio
p-NT	37	Risk based concentration based upon Hazard Index of 1 residential scenerio

*The remedial goal for 2,6-DNT was selected on the basis of site specific factors, including technical limitations in achieving cleanup levels greater than a 10^{-5} risk level.

1.3. DOCUMENT ORGANIZATION

The remaining sections of the document are:

- Section 2, Monitored Natural Attenuation: Discusses the design criteria for the groundwater monitoring program.
- Section 3, Construction Activities
- Section 4, Project Schedule: Provides an overall schedule for the design and implementation of the different activities discussed in this plan.
- Section 5, Summary of Project Costs: Summarizes the costs for designing and constructing the selected remedy, as well as operations and maintenance (O&M) costs.
- Section 6, Quality Assurance Plan: Provides a brief abstract of the project quality assurance plan.
- Section 7, Health and Safety Plan: Provides a brief abstract of the project health and safety plan.
- Section 8, Documents: Summarizes the documents that will be prepared for the remedial design and remedial action phases of OU2.
- Section 9, References: Lists the reference documents used for preparation of this plan.

2.0 MONITORED NATURAL ATTENUATION

The selected remedy provides for monitored natural attenuation (MNA). Institutional Controls (ICs) are added to limit groundwater use. This remedial action is being performed to comply with the *ROD*. The remedial action objective (RAO) is:

> To minimize the potential for exposure either by ingestion, dermal contact, or inhalation of contaminated groundwater until concentrations are reduced to cleanup standards specified in the Table 2.8-1 in the *ROD* (see Table 1-1).

The aquifer is not likely to be used as a drinking water source due to low aquifer yield and the availability of municipal drinking water sources in the area. Nevertheless, cleanup standards are based on Applicable or Relevant and Appropriate Requirements (ARARs) and levels deemed to be protective for residential drinking water.

As stated in the ROD, the major components of the selected remedy include:

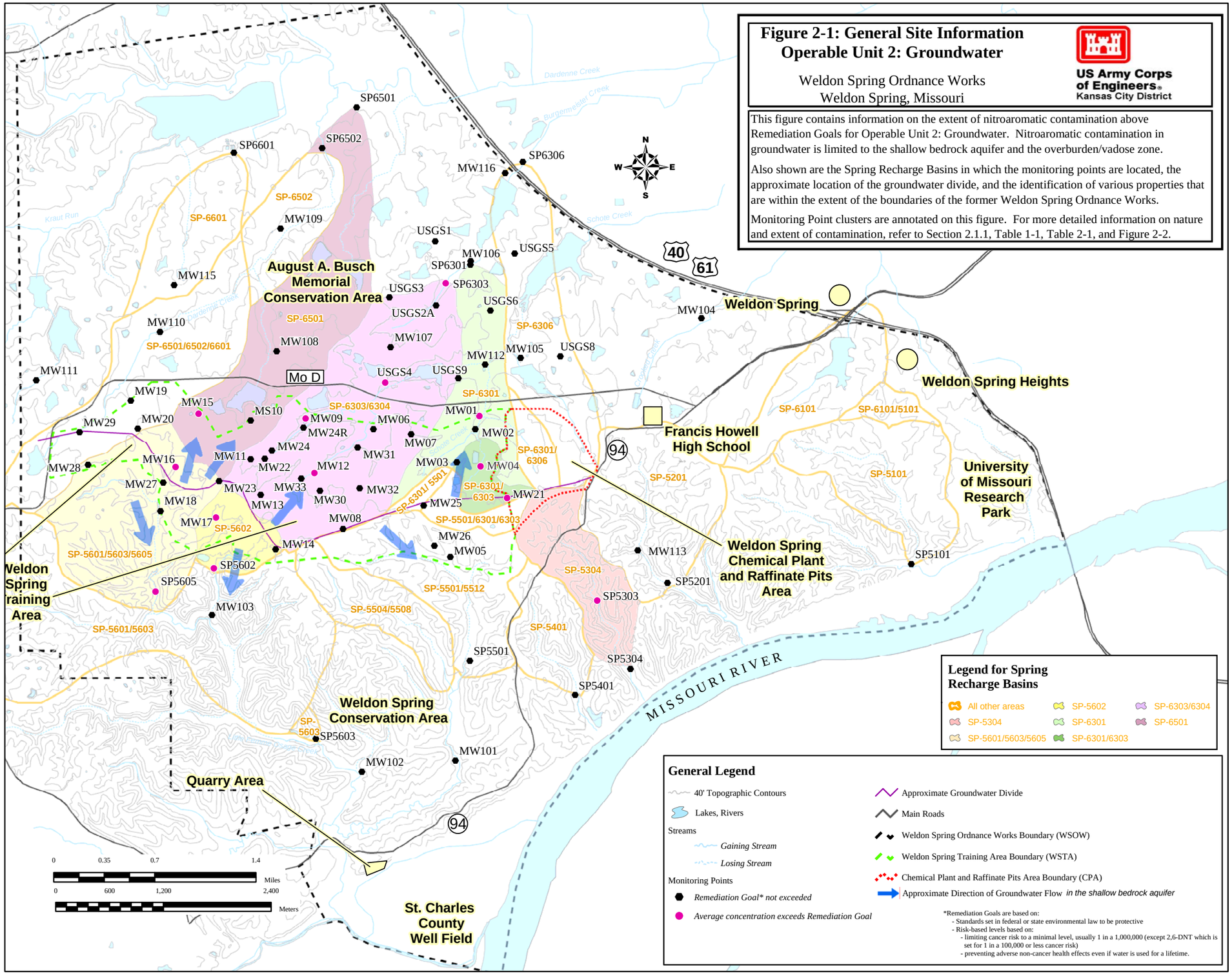
- Collection of monitoring data to verify the effectiveness of naturally occurring processes to reduce contaminant concentrations.
- Use of select wells from the existing groundwater monitoring network to collect groundwater data. Use of select springs at the site for additional monitoring data. The initial monitoring network will be presented during remedial design. This network will be modified over time, if necessary, to aid in evaluation of progress toward the RAO. This modification may include installation of new monitoring wells.
- Institutional controls in areas which exceed remediation goals designed to limit ingestion or dermal exposure to groundwater and prevent use of groundwater contaminated above ARARs or health based remediation goals as a potable water source. The institutional controls would also restrict activities that may negatively impact the remediation of contamination or result in creation of a potential for downward migration of contamination.

This section outlines the following components of the groundwater monitoring program:

- Monitoring strategy,
- Monitoring parameters,
- Monitoring locations,
- Monitoring frequencies,
- Data analysis and interpretation, and
- Actions to be performed as a result of monitoring.

2.1. MONITORING STRATEGY

Groundwater at the WSOW is contaminated with nitroaromatic compounds (Figure 2-1). Groundwater contamination originated from various sources which were reduced and/or eliminated as part of OU1. Surface water and precipitation mobilized nitroaromatic contamination into the uppermost water-bearing unit at the WSOW. Contamination is limited to the shallow bedrock aquifer (Burlington-Keokuk) and the springs at the WSOW. Contamination is neither impacting the deeper aquifer nor the sand and gravel alluvial aquifer of the Missouri River. The weathered Burlington-Keokuk Limestone is the uppermost unit within the shallow bedrock aquifer. An east-west trending groundwater divide results in two flow systems in the shallow aquifer beneath the WSOW. Contaminated groundwater has been observed north and south of this divide. To aid in developing a monitoring strategy, contaminated wells and springs have been evaluated based on impacted spring recharge basin areas (See Figure 2-1) as defined by the dye-trace study data collected by the Missouri Department of Natural Resources



Final

OU2 RD/RA Work Plan – Phase I
Former Weldon Spring Ordnance Works

(MDNR) Division of Geology and Land Survey. The monitoring strategy has been developed considering the nature and extent of contamination and the performance goals identified in the ROD.

2.1.1. Nature and Extent of Contamination

Of the 13 monitoring points at the WSOW (See Figure 2-1) with concentrations of nitroaromatics exceeding the Remediation Goals (RGs), provided in the Record of Decision, eight are located on the Weldon Spring Training Area (WSTA). Of the five other monitoring points with exceedances of RGs, two points are located north of the WSTA within the same spring recharge basin and have concentrations of the same order of magnitude as the RGs (See Table 2-1) RGs). These two points are located in the SP-6303/6304 spring recharge basin, within the boundaries of the WSOW.

The remaining three monitoring points are located to the south and southeast of the WSTA (also within the boundaries of the WSOW). The monitoring points are springs located at a distance of 0.5 to 1.5 miles from the nearest road access across rugged terrain. Concentrations of contaminants of concern (COCs) in these springs range from 1 to 2 orders of magnitude over the RGs (See Table 2-1). However, as the springs represent the only existing complete pathway for exposure to contaminated water, a recreational exposure scenario has been developed (Baseline Risk Assessment, DOE and DOD 1997) to identify the potential risk to current users of the conservation property near the impacted springs. The concentrations observed at the springs are lower than the concentrations established as protective under the recreational exposure scenario. However, to ensure that both current and potential future uses of the springs are protective, the RGs are based the residential exposure scenario and ARARs.

Table 2-1 provides details on the specific monitoring points with mean concentrations exceeding RGs. For each monitoring point with an exceedance of RGs, there is at least one downgradient monitoring point within the WSOW that is at or below the RGs. In most cases, the most downgradient monitoring point within the boundaries of the WSOW is non-detect for all nitroaromatics.

Off-site migration occurs laterally through solution-enlarged conduits and bedding planes in the weathered Burlington-Keokuk Limestone. The expectation is that the concentration of contaminants will be reduced during transport as a result of dispersion along existing flow paths and become more dilute with natural recharge from precipitation and lateral flow. Adsorption of contaminants in the overburden and similar effects due to micropores and microfractures in the bedrock limit the rate of mass transfer from the overburden and bedrock system to the larger fractures and features responsible for the transmission of groundwater through the overburden and bedrock system. Physical destruction of nitroaromatics (biotic, abiotic, and photolytic processes) also serves to reduce the mass of contamination but is generally limited in effect when compared to the dominant processes of dilution and dispersion. Over time, concentrations in the areas of highest impact will decrease, but because of dispersion, concentrations in some downgradient locations may exhibit temporary increases.

Recent activities associated with the Operable Unit 1 (specifically T-13, which is upgradient of monitoring well cluster 16) may result in temporary concentration increases in the downgradient sampling locations. The OU1 remediation effort significantly reduced and/or eliminated known sources of explosives contamination to groundwater. As a result, groundwater quality should continue to improve. The overall area of contamination should not become significantly larger than it currently is. The distribution of contaminants is controlled by the structure of the bedrock, which controls the groundwater flow direction in the shallow aquifer beneath the WSOW. Data collected to date provides

support that the most downgradient monitoring points within the WSOW are non-detect for all nitroaromatics. This trend is not expected to change. Further, potentiometric data and structural features of the upper weathered unit support the premise that contamination should not migrate to greater depths or would be limited enough in migration to have insignificant impact.

Table 2-1: Monitoring Points with Mean Concentrations Exceeding Remediation Standards for the OU2 Groundwater of WSOW

Area	Well ID	Analytical Parameter	Remediation Goal (µg/L)	Number of samples	Mean* (µg/L)
SP-5304	SP5303	2,4,6-TNT	2.8	6	21.20
SP-5601/5603/5605	MWS16	2,4,6-TNT	2.8	14	3.00
	SP5605	2,4,6-TNT	2.8	12	25.28
SP-5602	MWS17	2,4-DNT	0.11	14	0.13
	SP5602	2,4-DNT	0.11	13	0.18
		2,6-DNT	1.3	12	1.56
SP-6301	MWV01	2,4-DNT	0.11	5	0.21
SP-6301/6303	MWS04	2,4-DNT	0.11	13	0.19
	MWS21	2,4-DNT	0.11	13	0.23
SP-6303/6304	MWV09	2,4,6-TNT	2.8	14	24.49
		2,4-DNT	0.11	14	37.37
		2,6-DNT	1.3	13	4.39
	MWS12	2,4-DNT	0.11	13	79.85
		2,6-DNT	1.3	12	59.92
		1,3-DNB	1	12	2.98
		o-NT	37	13	280.39
		p-NT	37	12	143.17
	USGS4	2,4-DNT	0.11	14	0.12
		2,6-DNT	1.3	12	2.65
	SP6303	2,4-DNT	0.11	5	0.12
SP-6501	MWS15	2,4-DNT	0.11	14	0.28

*Period of evaluation is Round 22 through Round 35 (October 1999 to August 2003)

While potentiometric data presented in Table B-3-1 (See Appendix A of this report) of the *Groundwater Monitoring Assessment Report* (GMAR) (USACE, 2004) indicates several areas where concentrations exceed remediation goals and a slight downward gradient (a recharge area) is also present, the contamination has been limited to the shallow bedrock aquifer in these areas. This is likely due to the preferential horizontal flow component of groundwater. Vertical movement of groundwater is limited by structural controls of bedding planes and abundant horizontal fractures, relative to vertical fractures, found in the upper weathered unit. Concentrations exceeding remediation goals (one to two orders of magnitude above the remediation goals) occur in areas where the potentiometric surface is above the bedrock surface (i.e. WSTA portion of the SP-6303/6304 Spring Recharge Basin). While the effect would be the potential for discharge conditions, localized glacial deposits (i.e. drift) may impede this upward mobility.

Groundwater at the WSOW has also been impacted by contamination sourced on the adjacent former Chemical Plant Area (CPA) which is under management by the U.S. Department of Energy

(DOE) as part of the Weldon Spring Site Remedial Action Project. DOE will monitor for nitroaromatic compounds at locations on both the CPA and WSOW that are or could be impacted by migration from source areas that have been remediated at the CPA. The Army will address groundwater impact associated with previously impacted soils near Production Line #4, which is along the southeast boundary of the WSTA, adjacent to the CPA.

2.1.2. Performance Goals

The performance goals for the monitoring program, as identified in the ROD, are as follows:

1) Contaminants will attenuate at a rate sufficient to meet cleanup goals in a reasonable time (currently estimated at approximately 160 years);
2) Contaminant migration will remain confined to the currently impacted groundwater system; and
3) Contaminant levels at potential exposure points (i.e., springs) will not pose unacceptable risks to receptors and will decline over time.

2.2. MONITORING PARAMETERS

The contaminants of concern identified in the groundwater at the WSOW are 2,4,6-Trinitrotolune (TNT), 2,4-Dinitrotoluene (2,4-DNT), 2,6-Dinitrotoluene (2,6-DNT), o-Nitrotoluene (o-NT), m-Nitrotoluene (m-NT), p-Nitrotoluene (p-NT) and the Photolytic Degradation Products 1,3-Dinitrobenzene (DNB) and Nitrobenzene (NB). All nitroaromatic compounds reported by the standard U.S. Environmental Protection Agency (EPA) method 8330 will be obtained (as relevant to the WSOW). Only those that are identified as contaminants of concern will be evaluated. Further, the contaminants of concern currently exceeding RGs (Table 2-1) varies by monitoring location. Table 2-2 provides a listing of constituents by monitoring location based upon current conditions at the WSOW. However, results for COCs included in the standard EPA method 8330 will be compared to Table 2-1 to determine whether or not any changes in conditions have resulted in a verifiable increase above concentrations listed in Table 2-1 for a COC at a monitoring location not previously impacted by that COC.

2.3. MONITORING LOCATIONS

The evaluation of monitoring data as well as the geologic and hydrogeologic conditions at the WSOW presented in the Groundwater Monitoring Assessment Report (USACE 2004) formed the basis for the determination of monitoring locations. The Executive Summary of the Groundwater Monitoring Assessment Report (GMAR) and relevant tables and figures from the GMAR are provided in Appendix B. Discussion of monitoring locations specific to each basin as related to the objectives presented below is provided in Section 2.3.1.

The data evaluation completed as part of the GMAR utilized the Preliminary Remediation Goals (PRGs) to identify any statistically verified exceedances[1]. To facilitate the evaluation, the data was organized based on impacted spring recharge basins. This approach was continued during development of the Supplemental Feasibility Study, Proposed Plan, Record of Decision, and this Remedial Design. Further, the GMAR provided an evaluation of natural attenuation. Each subsequent document (listed above) was developed using the GMAR data evaluation and presentation. As a result, the conclusions

[1] Due to the fact that the PRGs were used to determine the Remediation Goals (RGs) and that the concentrations were not decreased when selecting the RGs, the evaluation completed as part of the GMAR provided a conservative framework for initiating development of a monitoring network.

provided in the GMAR are still valid. It was determined that the existing network is adequate for the continued monitoring of contamination both laterally and at depth (one new well, MWD34 to be installed at a deeper interval between MWS12 and MWS31). Further, the existing monitoring network met the requirements for a sentinel network. Select wells and springs from within the existing network will be used. With the exception of MWD34, no additional well installation is required. However, select wells installed by DOE will also be used to monitor conditions deeper within the Burlington-Keokuk.

TABLE 2-2 Monitoring Parameters[a] for MNA Locations

Group ID	Spring Basin ID	Location	TNT	2,4-DNT	2,6-DNT	NT[b]	DNB	NB
A	SP-6301, SP-6301/6303	**MWV-01**		**OB-1**[c]				
		MWS-01		OB-4				
		MWS-04		**OB-1**				
		MWS-21		**OB-1**				
		MW-4007		OB-4				
B	SP-6303/6304	**MWV-09**	**OB-1**	**OB-1**	**OB-1**			
		MWD-09	OB-4	OB-4	OB-4			
		MWS-12	**OB-1**	**OB-1**	**OB-1**	**OB-1**	**OB-1**	**OB-1**
		MWD-34	OB-4	OB-4	OB-4	OB-4	OB-4	OB-4
		MWS-31	OB-2N[d]	OB-2N	OB-2N	OB-2N	OB-2N	OB-2N
		USG4	OB-2N	**OB-1**	**OB-1**	OB-2N	OB-2N	OB-2N
A,B[e]	SP-6301, SP-6301/6303 and SP-6303/6304	MWS-106	OB-2F[d]	OB-2F	OB-2F	OB-2F	OB-2F	OB-2F
		SP6303	OB-2F	OB-N	OB-2F	OB-2F	OB-2F	OB-2F
		SP6301	OB-2F	OB-2F	OB-2F	OB-2F	OB-2F	OB-2F
		MWS-116	OB-2F	OB-2F	OB-2F	OB-2F	OB-2F	OB-2F
C	SP-6501	**MWS-15**		**OB-1**				
		MWD-15		OB-4				
		MWS-110		OB-2F				
B,C	SP-6303/6304, SP-6501	MWS-108	OB-2F	OB-2F	OB-2F	OB-2F	OB-2F	OB-2F
		SP6502	OB-2F	OB-2F	OB-2F	OB-2F	OB-2F	OB-2F
D	SP-5601/5603/5605	**MWS-16**	**OB-1**					
		SP5605	**OB-3**					
E	SP-5602	**MWS-17**		**OB-1**				
		SP5602		**OB-3**	**OB-3**			
D, E	SP-5601/5603/5605, SP-5602	MWS-103	OB-2N	OB-2N	OB-2N			
		SP5603	OB-2F	OB-2F	OB-2F			
F	SP-5304	**SP5303**	**OB-3**					
		SP5304	OB-2F					

[a] Monitoring is based on current mean exceedance of the well for Objective 1 and 3 and on the upgradient contaminant for Objective 2 and Objective 4 monitoring points

[b] Level is for each of o-NT, p-NT, and m-NT individually

[b] The identifier "OB-#" means Objective 1, 2, 3, or 4 as indicated by the "#". OB-1 and OB-3 are shown in bold.

[d] The designation OB-2N is for a "near" Objective 2 monitoring point. OB-2F is for a "far" Objective 2 monitoring point.

[e] The listing of multiple Group IDs indicates that the points provide Objective 2 monitoring for upgradient points that are located in different basins. These points were selected both on location within the Spring Recharge Basin and potential upgradient monitoring points.

Monitoring points have been reevaluted in this remedial design based on objectives that will assure the performance goals of the ROD and this design are being achieved. Two documents, in addition to the GMAR, were used in development of the performance monitoring scheme and in identification of monitoring points that would be used to satisfy the objectives of that scheme:

- *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites* (OSWER 9200.4-17P);
- and the Technical Report (USACE EL-99-7, March 1999) *Monitored Natural Attenuation of Explosives in Groundwater – Environmental Security Technology Certification Program Completion Report.*

These guidance documents were utilized in developing the appropriate monitoring strategy for this site given the site specific contaminants and conditions. The strategy is presented below:

Objective 1

Objective 1 is to verify that contaminant concentrations are declining with time at a rate and in a manner so that cleanup standards will be met in approximately 160 years. This objective will be met by using wells at the locations with the highest concentrations of contaminants within the individual spring recharge basin areas. If several monitoring points within the same recharge basin are identified as having elevated concentration and it is evident that the downgradient contamination is likely the result of one or two wells exhibiting higher concentrations, then only those wells with the higher concentrations would be monitored as part of meeting this objective. Long-term trend analysis will be performed to confirm downward trends in contaminant concentration over time. Performance will be gauged against long-term trends. It is anticipated that some locations could show temporary upward trends as a result of recent source control remediation, ongoing dispersion, analytical variability, or other factors. However, concentrations are not expected to exceed historical maximums (post OU1).

Objective 2

Objective 2 is to ensure that the lateral migration does not significantly extend beyond the current area of impact. Contaminants are expected to continue to disperse within known preferential flow paths associated with solution-enlarged conduits and bedding planes in the upper Burlington-Keokuk Limestone and become more dilute over time. This objective will be met by monitoring various downgradient locations that are either not impacted or are minimally impacted. Contaminant impacts in these locations are expected to remain minimal or nonexistent.

Objective 3

Objective 3 is to monitor contaminant levels at the impacted springs, which are the only potential points of exposure under current land use conditions. The springs discharge groundwater that includes contaminated groundwater originating from the WSTA and CPA. Current contaminant concentrations at these locations are protective of human health and the environment under current recreational land uses. Continued improvement of water quality in these affected springs is expected.

Objective 4

Objective 4 is to monitor hydrologic conditions at the site over time in order to identify any changes in groundwater flow that might affect the protectiveness of the selected remedy. This objective will also provide continued support of the premise that vertical migration of contamination will be

limited as a result of upward vertical gradients, the nature of the potentiometric surface of the shallow aquifer being above the bedrock surface, and the prevailing hydrologic and geologic conditions at the site that define the mechanism for contaminant transport. While these conditions are prevalent at the site at a macro level, potentiometric data collected to date indicate occasional areas where a downward vertical gradient is present. As contamination is present in these areas, periodic monitoring of deeper intervals in the shallow aquifer is also included in this objective to provide analytic verification that contamination continues to be limited in vertical distribution at depth. The static groundwater monitoring network will be measured to establish that groundwater flow is not changing significantly and resulting in changes in contaminant migration. This objective is separate from the potentiometric data collected for the entire site as part of general hydrologic monitoring.

Because the WSTA is located on a groundwater divide and the contaminants of concern at the site are unique to the WSTA and the adjacent CPA, upgradient monitoring is not required. Further, the nature of the hydrology at the WSTA and surrounding WSOW results in localized discharge conditions (where the potentiometric surface of the aquifer is above the bedrock surface or, in some cases, above the ground surface). While this indicates the potential for discharge conditions, localized glacial deposits (i.e. drift) may impede this upward mobility. In these areas, groundwater (and contamination) is more likely to flow through the weathered bedrock and/or the overburden (or discharge as springs) rather than travel deeper through the unweathered bedrock. However, analytic monitoring at depth will be provided as part of this objective in addition to continued monitoring of water levels in select wells to verify the continued nature of these conditions that limit the potential for downgradient migration of contamination.

2.3.1. Groundwater and Spring Monitoring Locations

Monitoring points were initially evaluated on the basis of whether the data from the wells exceeded the cleanup standards. These wells and springs are identified in Table 2-1. Those locations that slightly exceeded or did not exceed cleanup standards were evaluated as detection monitoring locations. Springs exceeding cleanup standards are also evaluated as detection monitoring locations. Each of the existing monitoring wells and springs on the WSOW was evaluated to determine which objectives the wells or springs would best satisfy.

The final monitoring network from which samples will be collected consists of 15 wells and 8 springs (Objectives 1, 2, and 3). An additional 5 wells are included to provide analytic confirmation of Objective 4. Other Objective 4 wells (Table 2-3) are included for collection of water level data only.

The locations from which samples will be collected and the objectives they satisfy are summarized in Table 2-2 and Table 2-3 and are depicted on Figure 2-2. Each location is discussed in more detail in the following subsections.

The remainder of the existing wells will be retained only for contingency sampling. These wells will be maintained until abandonment is required as a result of deterioration, damage, or other circumstances but will not be sampled. Certain wells may be selected for early abandonment if they are clearly not within the established flow path or are no longer required for any objective. Once monitored natural attenuation (MNA) establishes a consistent downward trend within the areas of impact, the need to retain contingency wells will be reevaluated. These wells will be used as hydrologic monitoring locations until their abandonment or incorporation into the monitoring program.

TABLE 2-3 Summary of Locations Retained for MNA Performance Monitoring

	Objective 1	Objective 2[a]	Objective 3	Objective 4
Locations	MWV-01	MWS-31	SP5303	MWS-01[b]
	MWS-04	MWS-103	SP5602	MWS-06
	MWV-09	MWS-106	SP5605	MWV-09[b,c]
	MWS-12	MWS-108		MWS-09
	MWS-15	MWS-110		MWD-09[b]
	MWS-16	MWS-116		MWS-15[b,c]
	MWS-17	SP5304		MWD-15[b]
	MWS-21	SP5603		MWS-31[b,d]
	USG4	SP6301		MWD-34[b]
		SP6303		MW-4007[b]
		SP6502		MWS-107
		USGS4[c]		MWS-108[b,d]
				MWS-110[b,d]
				USGS2A
Number of Unique Locations	9	11	3	9

[a] Monitoring locations are, contaminant specific, either near or far Objective 2 monitoring points. Refer to Table 2-2 for
[b] Periodic analytic sampling will be executed at this Objective 4 monitoring point.
[c] Location is also an Objective 1 location
[d] Location is also an Objective 2 location

The following subsections summarize the basin-specific evaluation of monitoring point selection. Table 2.5-1 of the ROD (Table 2-1 of this document) presented "Monitoring Points with Mean Concentrations Exceeding Remediation Standards for the OU2 Groundwater of WSOW." The previous evaluations completed as part of the Groundwater Monitoring Assessment Report, Supplemental Feasibility Study, and Proposed Plan provide the support for this table. These points are the Objective 1 and Objective 3 points. The Objective 2 points are selected based on site conditions and the locations of the Objective 1 and Objective 3 points. Objective 2 monitoring points are identified as either "near" or "far" depending on the location of the point with respect to existing contamination and whether the monitoring point is an intermediate point or is the most downgradient point within a Spring Recharge Basin.

A "near" Objective 2 monitoring point is only "near" for those contaminants exceeding Remediation Goals for the upgradient Objective 1 and/or Objective 3 points. For all other contaminants monitored, the Objective 2 monitoring point would be classified as "far". The classification of "near" versus "far" is conceptual and is more related to the overall position and previous data for the monitoring point than relative location to the Objective 1 point. Due to the widely varied hydraulic transport rates at the WSOW, the classification of the Objective 2 monitoring points is largely based on past performance and rationale for inclusion in previous networks (ie, wells and/or springs previously

impacted above the "far" criteria would not be identified as a "far" point for that contaminant provided that a downgradient point can be identified as "far"; the most downgradient monitoring point in a basin, and points monitoring contamination associated with Objective 4, are always "far" monitoring points.) Further, all data not collected for the purposes of Objective 1 or Objective 3 will be screened against the Objective 2 performance criteria (ie, SP5303 is an Objective 3 point for 2,4,6-trinitrotoluene only). Concentration for all contaminants of concern (as reported by EPA Standard Method 8330) would be compared against the "far" Objective 2 criteria which is set at the Remediation Goals of the OU2 ROD.

Spring Recharge Basins SP-6301 and SP-6301/6303

MWV01, MWS04, and MWS21 had a mean concentration for 2,4-DNT that exceeded the RG of 0.11 μg/L. Therefore, each point is an Objective 1 location for 2,4-DNT. SP6301, MWS106, and MWS116 are identified as "far" Objective 2 monitoring points for this basin. Because Objective 4 data for the WSTA portion of this basin indicates a slight downward vertical gradient and the area is also within a zone where the potentiometric surface of the shallow aquifer is below the top of bedrock (a recharge area), analytical data will also be collected, periodically, to supplement the Objective 4 potentiometric data. MW-4007 (installed by the U.S. Department of Energy) and MWS01 will be sampled for this purpose. Data collected from these points will be evaluated against the same criteria as a "far" Objective 2 point. Refer to Table 2-2 and Figure 2-2:A for more information.

Spring Recharge Basins SP-6303/6304

Of the basins impacted, this basin has the most monitoring points exhibiting an exceedance of the RGs, some of the highest concentrations of the contaminants of concern, and the widest variety of contaminants of concern with an exceedance of the RGs. As a result, this basin will be discussed in a different manner than the other basins. Refer to Table 2-2 and Figure 2-2:B for more information.

Monitoring Points with:

- TNT RG exceedance (RG of 2.8 μg/L): MWV09
- 2,4-DNT RG exceedance (RG of 0.11 μg/L): MWV09, MWS12, USGS4, SP6303
- 2,6-DNT RG exceedance (RG of 1.3 μg/L): MWV09, MWS12, USGS4
- 1,3-dinitrobenze (DNB) RG exceedance (RG of 1 μg/L): MWS12
- ortho-nitrotoluene (o-NT) RG exceedance (RG of 37 μg/L): MWS12
- para-nitrotoluene (p-NT) RG exceedance (RG of 37 μg/L): MWS12

With the exception of SP6303, these monitoring points are Objective 1 or Objective 3 monitoring points for the contaminants listed. Because of the location of SP6303 and mean concentration of 2,4-DNT (0.12 μg/L) at SP6303 relative to the RG of 0.11 μg/L, SP6303 is selected as an Objective 2 monitoring point (see below for more discussion).

Objective 2 monitoring points and associated rationale:

- MWS31: Serves as a "near" Objective 2 location for the Objective 1 contaminants of MWS12
- USGS4: Although USGS4 is an Objective 1 location for 2,4-DNT and 2,6-DNT, it is also a "near" Objective 2 monitoring point for TNT, DNB, o-NT, p-NT, and NB as a result of its proximity to MWS12 and MWV09.

- SP6303: Serves as a "near" Objective 2 location for 2,4-DNT (based on past indication of impact) and a "far" Objective 2 location for all other contaminants of concern within this basin (TNT, 2,6-DNT, DNB, o-NT, p-NT).
- SP6301: Serves as a "far" Objective 2 location for all contaminants of concern within this basin (TNT, 2,6-DNT, 2,4-DNT, DNB, o-NT, p-NT).
- MWS106: Serves as a "far" Objective 2 location for all contaminants of concern within this basin (TNT, 2,6-DNT, 2,4-DNT, DNB, o-NT, p-NT).
- MWS116: Serves as a "far" Objective 2 location for all contaminants of concern within this basin (TNT, 2,6-DNT, 2,4-DNT, DNB, o-NT, p-NT).
- MWS108: While not within this basin, the potentiometric surface of the shallow-bedrock aquifer indicates the potential for groundwater to flow toward MWS108. As a result, MWS108 is included as a "far" Objective 2 location for all contaminants of concern within the SP-6303/6304 Spring Recharge Basin.
- SP6502: The rationale for inclusion of SP6502 as a "far" Objective 2 location is the same as for MWS108.

Objective 4, analytic confirmation:

- MWS09: Due to the concentrations of COCs observed at MWV09 for TNT, 2,4-DNT, and 2,6-DNT, MWS09 will be periodically sampled to confirm the vertical gradient (which is up from bedrock to overburden at this location which indicates a discharge rather than recharge zone) and confirm that contamination is not migrating deeper within the shallow bedrock aquifer. The data collected at this location will be compared against the "far" Objective 2 monitoring point criteria.
- MWD34: This well is to be installed and periodically sampled to confirm that contamination is not migrating deeper within the shallow bedrock aquifer in the area of MWS12 in support of Objective 4. The goal of this well is to provide a monitoring point at depth that is within the shallow bedrock aquifer but is not currently impacted with contamination. If installed accordingly, the data collected at this location will be compared against the "far" Objective 2 monitoring point criteria.

Spring Recharge Basins SP-6501

MWS15 had a mean concentration for 2,4-DNT that exceeded the RG of 0.11 μg/L. MWS110, MWS108, and SP5602 are identified as "far" Objective 2 monitoring point for MWS15. MWD15 is also included for periodic monitoring to provide analytic confirmation of Objective 4. Refer to Table 2-2 and Figure 2-2:C for more information.

Spring Recharge Basin SP-5601/5603/5605

Both MWS16 and SP5605 had a mean concentration for TNT that exceeded the RG of 2.8 μg/L. Therefore, these points are Objective 1 and Objective 3 points, respectively. MWS103 and SP5603 are identified as the Objective 2 monitoring points for this basin. MWS103 is categorized as "near" and SP5603 is categorized as "far". Refer to Table 2-2 and Figure 2-2:D for more information.

Spring Recharge Basin SP-5602

Both MWS17 and SP5602 had a mean concentration for 2,4-dinitrotoluene (2,4-DNT) that exceeded the RG of 0.11 μg/L. SP5602 also had a mean concentration exceedance for 2,6-DNT (RG of 1.3 μg/L). Therefore, these points are Objective 1 and Objective 3 points, respectively (MWS17 for 2,4-

DNT and SP5603 for 2,4-DNT and 2,6-DNT). MWS103 and SP5603 are identified as the Objective 2 monitoring points for this basin. MWS103 is categorized as "near" and SP5603 is categorized as "far". Refer to Table 2-2 and Figure 2-2:E for more information.

Spring Recharge Basin SP-5304

SP5303 had a mean concentration for 2,4,6-trinitrotoluene (TNT) that exceeded the Remediation Goal (RG) of 2.8 μg/L. SP5304 is identified as the Objective 2 monitoring point for SP5303. Further, SP5304 is a "far" Objective 2 monitoring point as it is the most downgradient monitoring point from SP5303. Refer to Table 2-2 and Figure 2-2:F for more information.

2.4. Monitoring Frequencies

The frequency of monitoring should be adequate to detect, in a timely manner, the potential changes in site conditions. Flexibility for adjusting the monitoring frequency over the life of the remedy is also necessary. It may be appropriate to decrease monitoring frequency at some point in time, once it has been determined that natural attenuation is progressing as expected. In contrast, the monitoring frequency may need to be increased if unexpected conditions are observed. A tentative schedule is provided in Table 2-4.

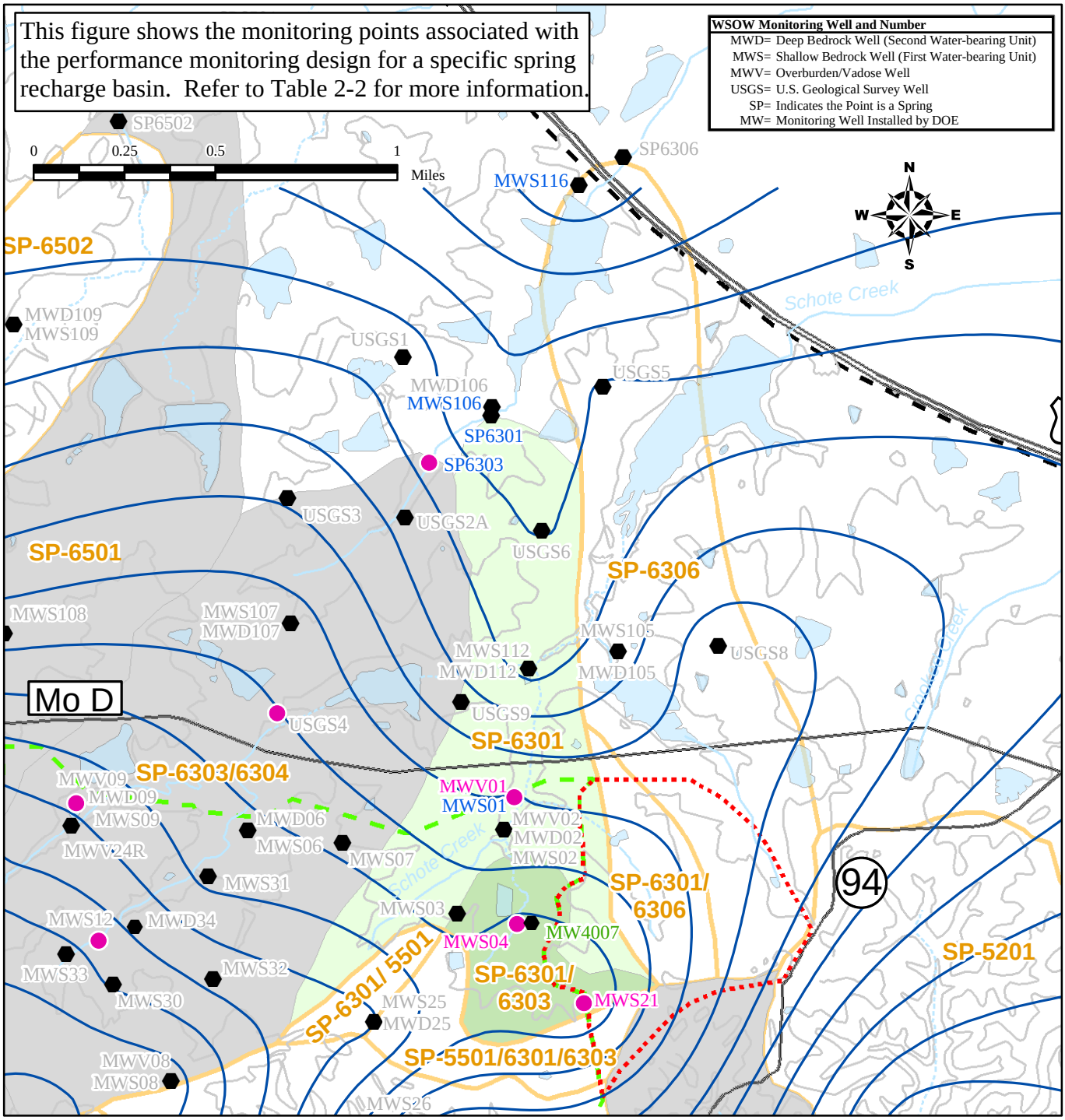
Sampling frequencies initially will be semi-annual at all locations (except Objective 4 locations which will be bi-annual). At the end of two years of semi-annual sampling (including baseline sampling at MWD34), the frequency will be adjusted to annual (Objective 4 locations continue at bi-annual). After 3 years of annual monitoring, an evaluation of the performance monitoring (monitoring network and frequency) will be completed.

Changes in sampling frequency are generally described in the decision flowsheets. Annual reports will present any changes in monitoring frequency. Any changes in frequency that require execution prior distribution of the annual report will be annotated in a memo. EPA and MDNR will be included as part of the distribution of the memo so as to facilitate discussion on the identified changes. The memo will also be included in the annual report.

2.5. Data Analysis and Interpretation

This monitoring network is designed to collect data that demonstrates the effectiveness of the remedy or to initiate the implementation of other actions if natural attenuation process is not occurring as predicted (e.g., unexpected expansion of the impacted area or sustained increases in concentrations within the area of impact). The data analysis and interpretation will ensure the following:

- Performance monitoring locations (Objective 1) indicate that concentrations within the area of impact are decreasing as expected.
- Detection monitoring locations (Objectives 2, 3, and analytic Objective 4) indicate when a performance criterion has been exceeded (i.e. no significant expansion of current contamination).
- Hydrologic conditions (Objective 4) continue to support the existing processes for natural attenuation.



Legend

Monitoring Well ID (Color label Legend)

MWV01	Objective 1 or 3 Monitoring Point
MWV01	Objective 2 Monitoring Point
MWV01	Objective 4 Monitoring Point (analytic)
MWV01	Other Monitoring Points

Legend for Spring Recharge Basins

- SP-6301
- SP-6301/6303
- Other Basins of Interest
- All other areas

Monitoring Points

- *Remediation Goal* not exceeded*
- *Average concentration exceeds Remediation Goal*
- Main Roads
- Weldon Spring Ordnance Works Boundary (WSOW)
- 40' Topographic Contours
- Weldon Spring Training Area Boundary (WSTA)
- Chemical Plant and Raffinate Pits Area Boundary (CPA)

Burlington-Keokuk: Potentiometric Surface

Round 35 (August 2003)

- Potentiometric Surface *Feet AMSL*
- Inferred Potentiometric Surface *Feet AMSL*

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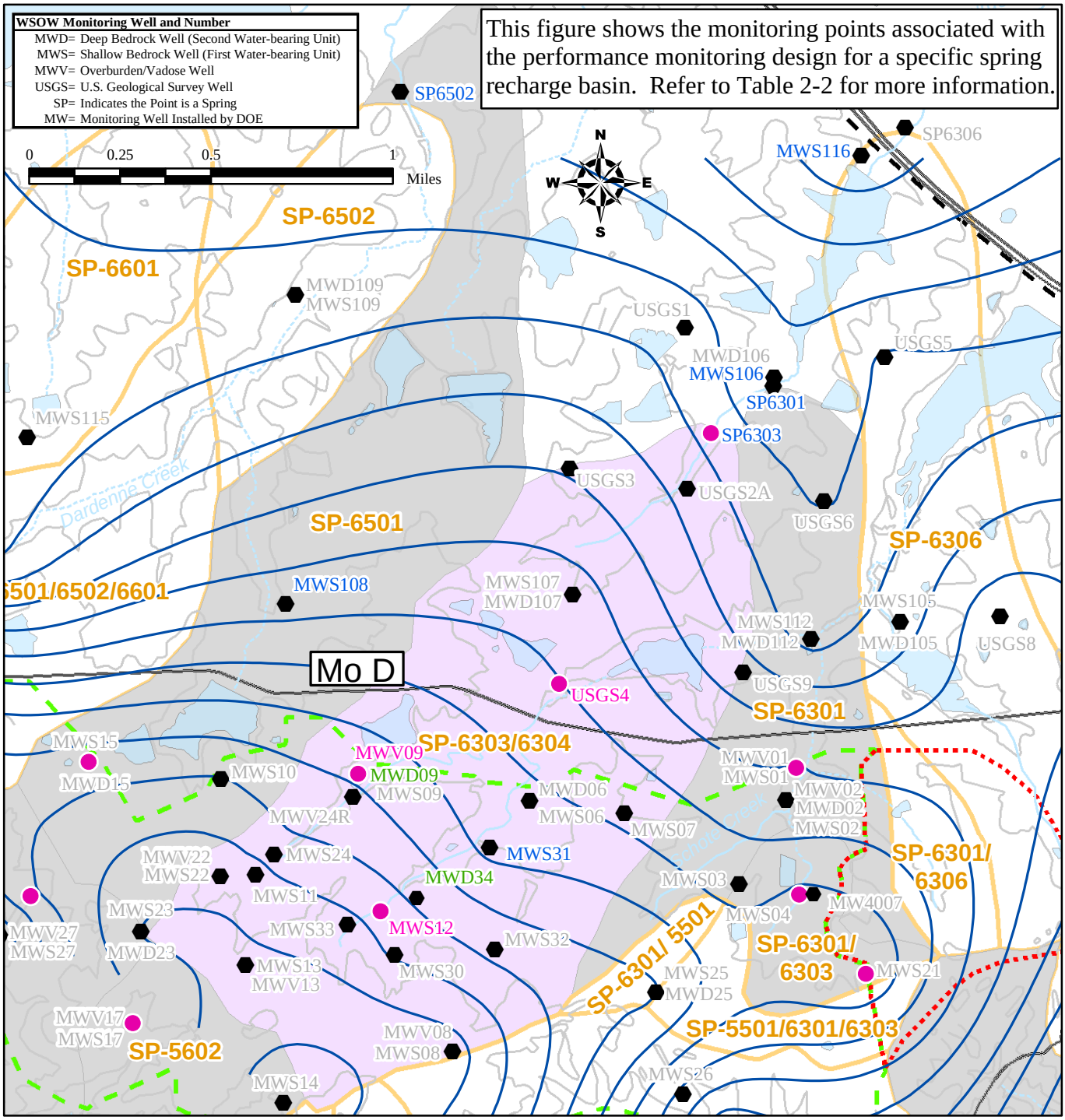
Figure 2-2:A Spring Recharge Basins SP-6301 and SP-6301/6303



Legend

Monitoring Well ID (Color label Legend)

MWV01	Objective 1 or 3 Monitoring Point
MWV01	Objective 2 Monitoring Point
MWV01	Objective 4 Monitoring Point (analytic)
MWV01	Other Monitoring Points

Legend for Spring Recharge Basins

- SP-6303/6304
- Other Basins of Interest
- All other areas

Monitoring Points

- *Remediation Goal* not exceeded*
- *Average concentration exceeds Remediation Goal*
- Main Roads
- Weldon Spring Ordnance Works Boundary (WSOW)
- 40' Topographic Contours
- Weldon Spring Training Area Boundary (WSTA)
- Chemical Plant and Raffinate Pits Area Boundary (CPA)

Burlington-Keokuk: Potentiometric Surface

Round 35 (August 2003)

- Potentiometric Surface *Feet AMSL*
- Inferred Potentiometric Surface *Feet AMSL*

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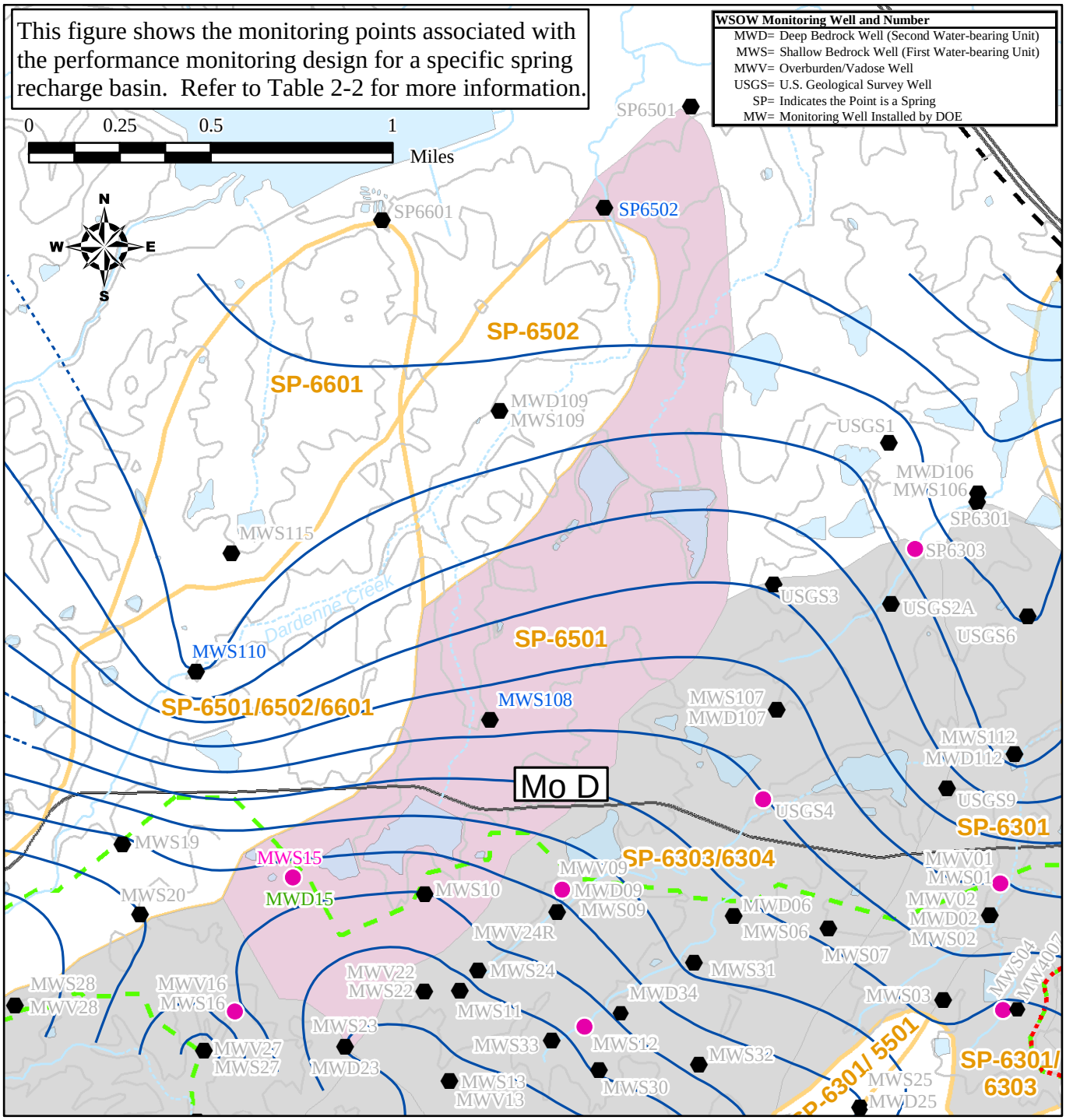
Figure 2-2:B Spring Recharge Basin SP-6303/6304



Legend

Monitoring Well ID (Color label Legend)

MWV01	Objective 1 or 3 Monitoring Point
MWV01	Objective 2 Monitoring Point
MWV01	Objective 4 Monitoring Point (analytic)
MWV01	Other Monitoring Points

Legend for Spring Recharge Basins

- SP-6501
- Other Basins of Interest
- All other areas

Monitoring Points

- *Remediation Goal* not exceeded*
- *Average concentration exceeds Remediation Goal*
- Main Roads
- Weldon Spring Ordnance Works Boundary (WSOW)
- 40' Topographic Contours
- Weldon Spring Training Area Boundary (WSTA)
- Chemical Plant and Raffinate Pits Area Boundary (CPA)

Burlington-Keokuk: Potentiometric Surface

Round 35 (August 2003)

- Potentiometric Surface *Feet AMSL*
- Inferred Potentiometric Surface *Feet AMSL*

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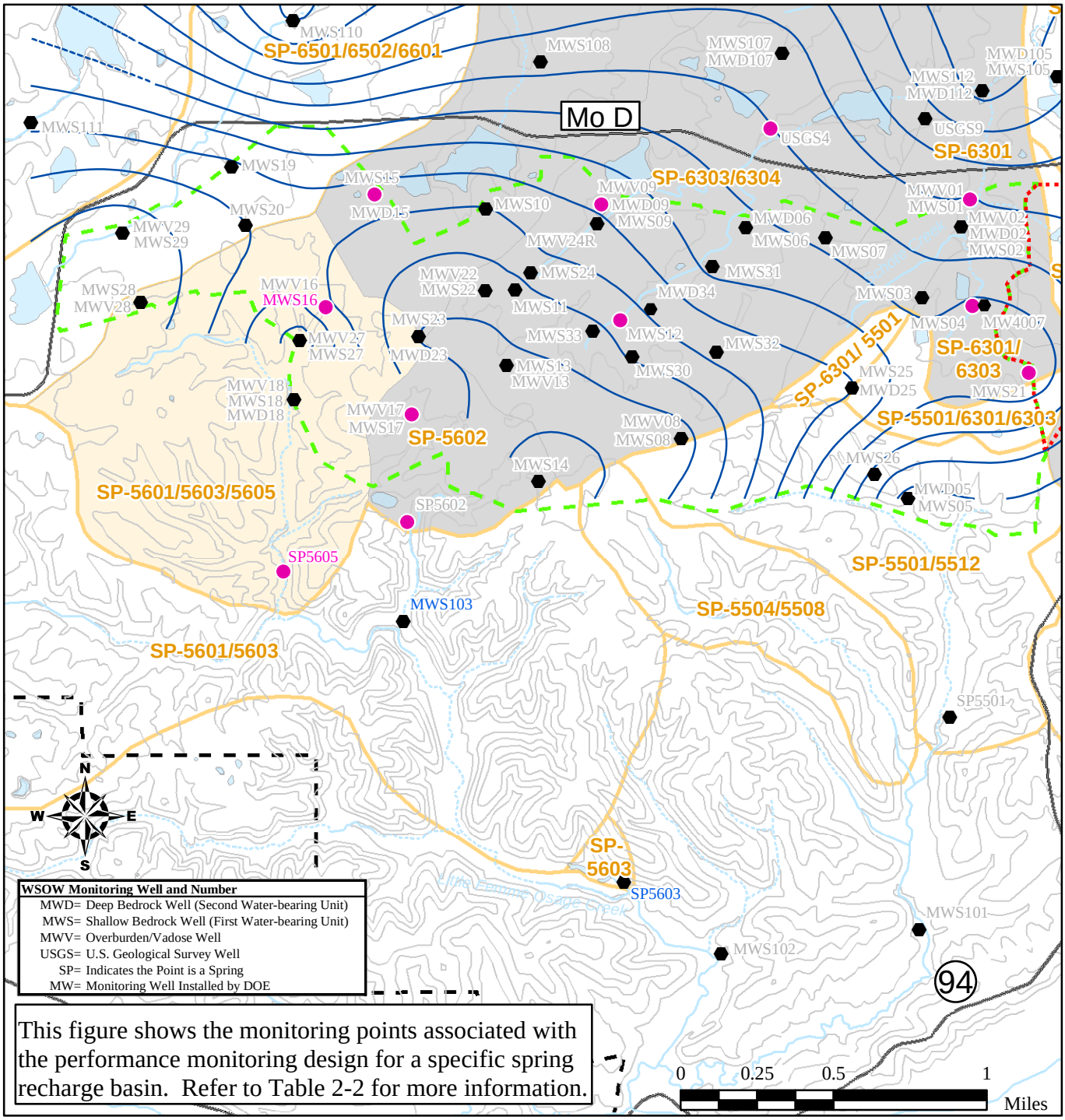
Figure 2-2:C Spring Recharge Basin SP-6501



This figure shows the monitoring points associated with the performance monitoring design for a specific spring recharge basin. Refer to Table 2-2 for more information.

Legend

Monitoring Well ID (Color label Legend)

MWV01	Objective 1 or 3 Monitoring Point
MWV01	Objective 2 Monitoring Point
MWV01	Objective 4 Monitoring Point (analytic)
MWV01	Other Monitoring Points

Legend for Spring Recharge Basins

- SP-5601/5603/5605
- All other areas
- Other Basins of Interest

Monitoring Points

- *Remediation Goal* not exceeded*
- *Average concentration exceeds Remediation Goal*
- Main Roads
- Weldon Spring Ordnance Works Boundary (WSOW)
- 40' Topographic Contours
- Weldon Spring Training Area Boundary (WSTA)
- Chemical Plant and Raffinate Pits Area Boundary (CPA)

Burlington-Keokuk: Potentiometric Surface

Round 35 (August 2003)

- Potentiometric Surface *Feet AMSL*
- Inferred Potentiometric Surface *Feet AMSL*

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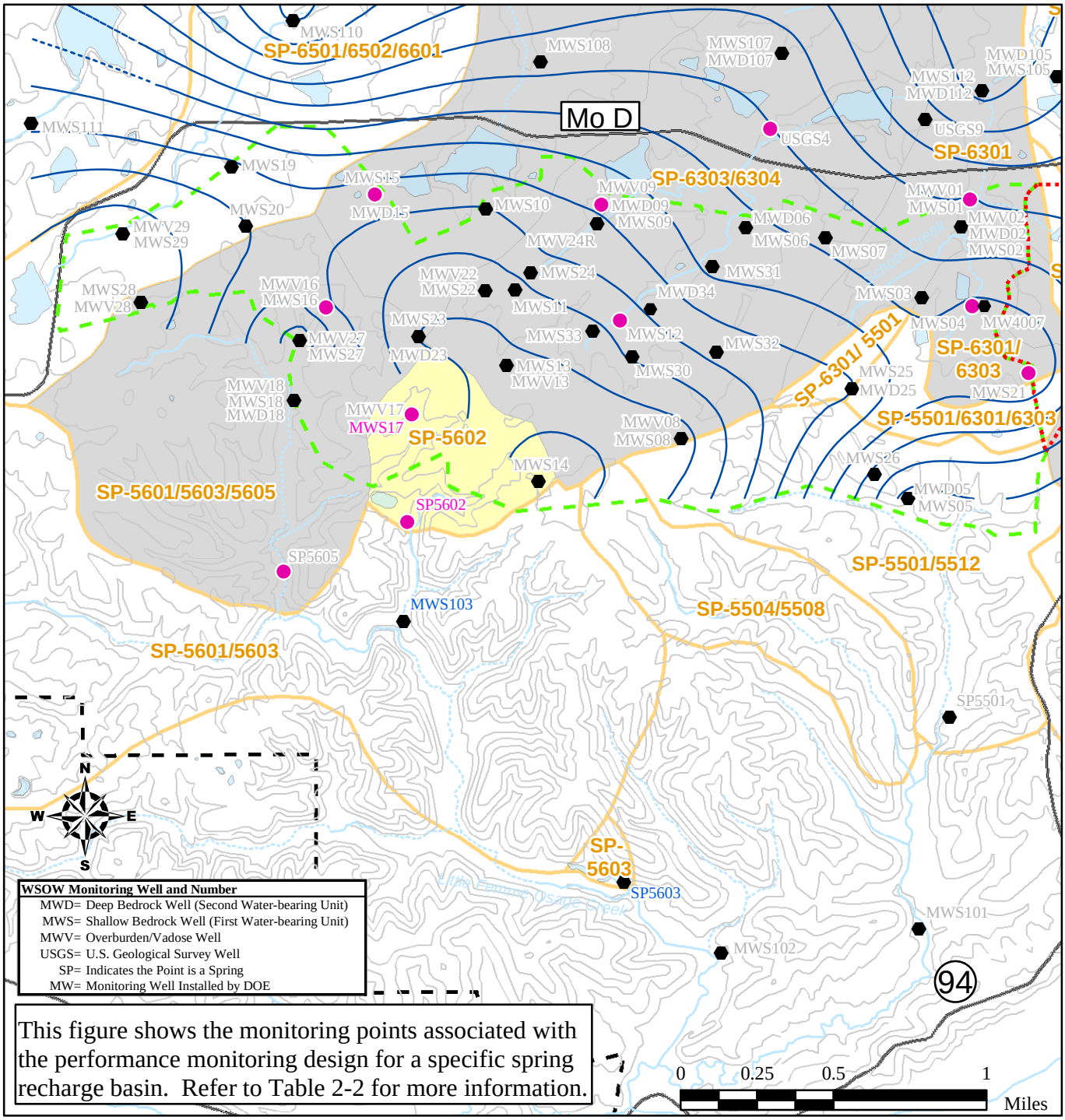
Figure 2-2:D Spring Recharge Basin SP-5601/5603/5605



This figure shows the monitoring points associated with the performance monitoring design for a specific spring recharge basin. Refer to Table 2-2 for more information.

Legend

Monitoring Well ID (Color label Legend)

MWV01	Objective 1 or 3 Monitoring Point
MWV01	Objective 2 Monitoring Point
MWV01	Objective 4 Monitoring Point (analytic)
MWV01	Other Monitoring Points

Legend for Spring Recharge Basins

- SP-5602
- All other areas
- Other Basins of Interest

Monitoring Points

- *Remediation Goal* not exceeded*
- *Average concentration exceeds Remediation Goal*
- Main Roads
- Weldon Spring Ordnance Works Boundary (WSOW)
- 40' Topographic Contours
- Weldon Spring Training Area Boundary (WSTA)
- Chemical Plant and Raffinate Pits Area Boundary (CPA)

Burlington-Keokuk: Potentiometric Surface

Round 35 (August 2003)

- Potentiometric Surface *Feet AMSL*
- Inferred Potentiometric Surface *Feet AMSL*

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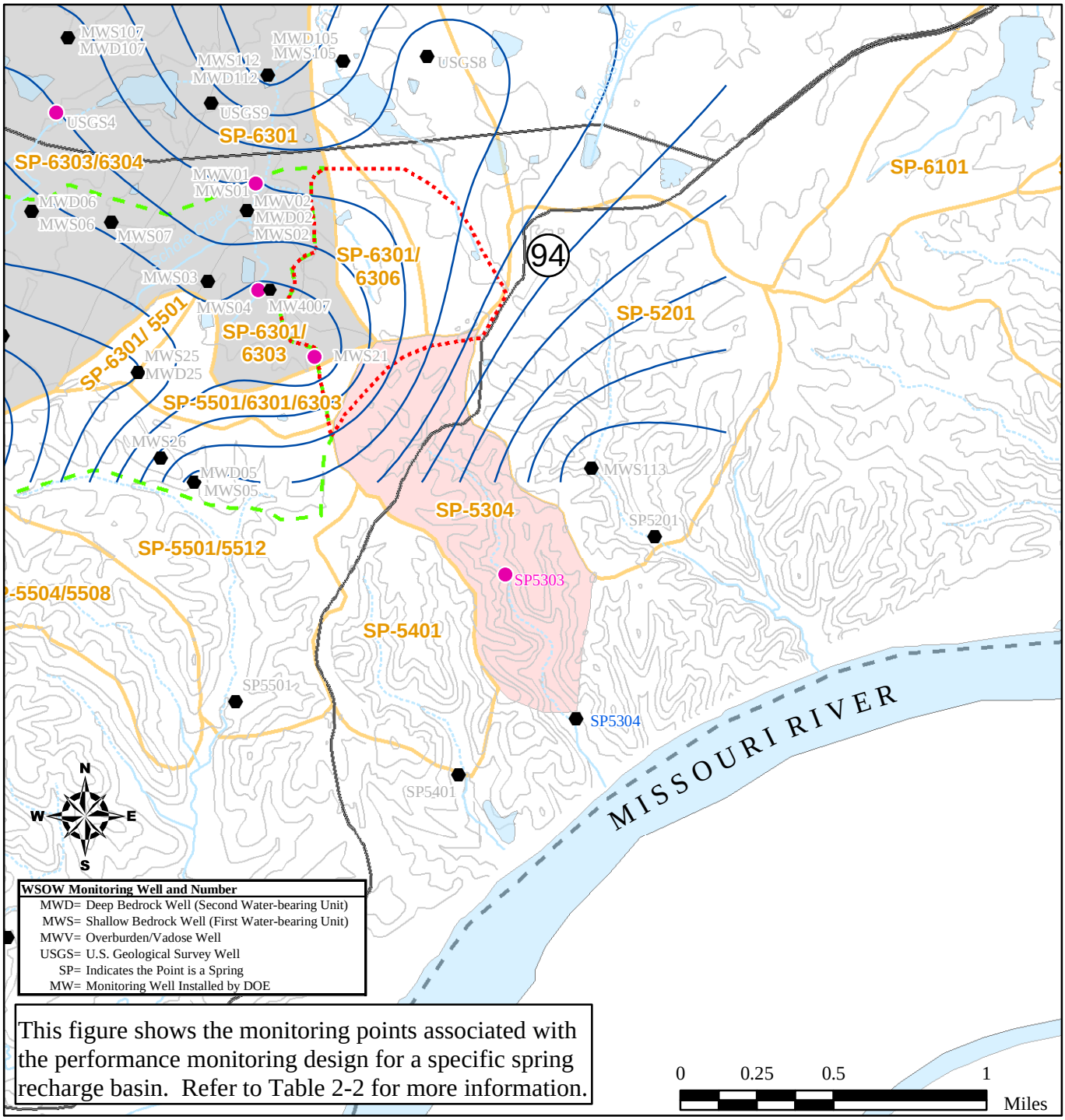
Figure 2-2:E Spring Recharge Basin SP-5602



This figure shows the monitoring points associated with the performance monitoring design for a specific spring recharge basin. Refer to Table 2-2 for more information.

Legend

Monitoring Well ID (Color label Legend)

MWV01	Objective 1 or 3 Monitoring Point
MWV01	Objective 2 Monitoring Point
MWV01	Objective 4 Monitoring Point (analytic)
MWV01	Other Monitoring Points

Legend for Spring Recharge Basins

- SP-5304
- All other areas
- Other Basins of Interest

Monitoring Points

- *Remediation Goal* not exceeded*
- *Average concentration exceeds Remediation Goal*
- Main Roads
- Weldon Spring Ordnance Works Boundary (WSOW)
- 40' Topographic Contours
- Weldon Spring Training Area Boundary (WSTA)
- Chemical Plant and Raffinate Pits Area Boundary (CPA)

Burlington-Keokuk: Potentiometric Surface

Round 35 (August 2003)

- Potentiometric Surface *Feet AMSL*
- Inferred Potentiometric Surface *Feet AMSL*

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Figure 2-2:F Spring Recharge Basin SP-5304

Two documents – *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites* (OSWER 9200.4-17P) and the Technical Report (USACE EL-99-7, March 1999) *Monitored Natural Attenuation of Explosives in Groundwater – Environmental Security Technology Certification Program Completion Report* – were used during the development of this monitoring program. Efforts completed by DOE in development of a Remedial Design and Remedial Action (RD/RA) Work Plan were also taken into consideration when developing this RD/RA Work Plan.

TABLE 2-4 Proposed/Tentative Sampling Schedule Through 2010*

Location	Aug-05	May-06	Aug-06	May-07	May-08	May-09	May-10
MWV-01**	X	X	X	X	X	X	X
MWS-01							
MWS-04	X	X	X	X	X	X	X
MWV-09	X	X	X	X	X	X	X
MWS-09	X			X		X	
MWS-12	X	X	X	X	X	X	X
MWS-15	X	X	X	X	X	X	X
MWD-15	X			X		X	
MWS-16	X	X	X	X	X	X	X
MWS-17	X	X	X	X	X	X	X
MWS-21	X	X	X	X	X	X	X
MWS-31	X	X	X	X	X	X	X
MWD-34	X	X	X	X		X	
MW-4007	X			X		X	
MWS-103	X	X	X	X	X	X	X
MWS-106	X	X	X	X	X	X	X
MWS-108	X	X	X	X	X	X	X
MWS-110	X	X	X	X	X	X	X
MWS-116	X	X	X	X	X	X	X
USG4	X	X	X	X	X	X	X
SP5303	X	X	X	X	X	X	X
SP5304	X	X	X	X	X	X	X
SP5602	X	X	X	X	X	X	X
SP5603	X	X	X	X	X	X	X
SP5605	X	X	X	X	X	X	X
SP6301	X	X	X	X	X	X	X
SP6303	X	X	X	X	X	X	X
SP6502	X	X	X	X	X	X	X
TOTAL	27	24	24	27	23	27	23

*This frequency is based on the initial schedule as detailed in Section 2.4. However, this frequency may change according to the requirements of the decision flow sheets provided in Section 2.6. It is anticipated that sampling will be required beyond 2010. Actual schedules for sampling events will be provided in advance of the event.

**If MWV-01 is dry, MWS-01 will be sampled. As MWV-01 is periodically dry, replacement sampling with MWS-01 should be sufficient for analytic confirmation of Objective 4 at this location.

2.5.1. Performance Monitoring (Objective 1 locations)

Concentrations of contaminants of concern are expected to decrease to cleanup standards within a reasonable timeframe (i.e., approximately 160 years). Estimates for predictive timeframes were presented in the *Groundwater Monitoring Assessment Report* (USACE 2004) for OU2. These calculations assumed that natural attenuation processes at the WSOW involve dilution and dispersion with an unquantified and lesser benefit from other attenuation processes (such as adsorption, biodegradation, and photolysis). Predictive timeframes were based on observable trends in contaminant concentrations over time. Performance will be gauged against long-term trends. It is anticipated that localized and temporary upward trends resulting from recent source control remediation, ongoing dispersion, analytical variability, or other factors may be observed. However, concentrations are not expected to exceed historical maximums (as identified in the GMAR which is based on data collected subsequent to initiation of active remediation of OU1). A similar methodology will be followed to recalculate MNA timeframes when needed to support the performance monitoring program. The timeframes will be evaluated to determine if contaminants are continuing to attenuate at a rate sufficient to meet remediation goals in a reasonable time. At a minimum (unless otherwise specified in the monitoring reports), the statistical rate calculations will be conducted every 5 years for the contaminants of concern for the Objective 1 and Objective 3 monitoring points (refer to Table 2-2).

In the interim and as the first step in overall trend analysis, a trend method using the non-parametric Mann-Kendall test will be employed. *EPA Guidance for Data Quality Assessment – Practical Methods of Data Analysis* (EPA/600/R-96-084, July 2000) provides more detail on the Mann-Kendall test. For the WSOW, the Mann-Kendall test will provide a consistent mechanism for evaluating data to determine the extent to which an upward or downward trend is likely. The Mann-Kendall test can be performed as frequently as needed for each Objective 1 (and 3) location for contaminants exceeding remediation goals. The test can therefore be an indicator for trend changes (i.e. from no statistically significant trend in either direction to a statistically significant upward or downward trend (or any combination)). The Mann-Kendall test will be conducted if an increase in concentration of a contaminant of concern is observed in two consecutive sampling rounds for the specific monitoring point and contaminant exhibiting the increase. The test will be useful in gaining frequent evaluations of trends without the need to go through complex statistical analysis. However, the Mann-Kendall trend analysis has some limitations and will therefore be supplemented by other regression based analysis, as previously used, when needed to support the performance monitoring program. If a third consecutive increase is observed, the criteria described in the first paragraph of this subsection is met (i.e. 5 years), or the flow charts (Figures 2-3 to 2-6) dictate the need, the statistical analysis (as performed for the GMAR) will also be completed.

Long-term monitoring within a given spring recharge basin will be concluded whenever all contaminants of concern have been less than the respective cleanup level for four consecutive sampling periods spanning a minimum of two years. This evaluation is based on all monitoring locations in a given spring recharge basin that are sampled as part of the performance monitoring scheme. However, as some Objective 2 locations may be located in an adjacent basin, the purpose of each Objective 2 location in relation to the Objective 1 (and/or 3) locations will also be evaluated prior to termination of monitoring. This issue is pertinent to the spring basins north of the groundwater divide. All spring recharge basins will be evaluated separately.

Performance criteria levels will be set for the monitoring (Objective 1) locations in the event unexpected increases occur within the area of impact. The first criteria will be a statistically significant increase in contaminant concentrations outside those that have been measured for the most recent 8 data points. Concentrations that exceed the mean plus 3 standard deviations for that location will be considered to show a statistically significant increase. The second criteria was set based on the historical maximums (post OU1), the upper limit of the 99% confidence interval as presented in the GMAR (see Appendix A of this *Work Plan* for relevant tables), and/or the basis for the RGs as presented in the ROD. This criteria will be unique to the spring basin recharge area as each basin has different contaminants of concern at varied magnitudes of concern. An exceedance of this criteria (Table 2-5) will invoke a more vigorous response. Actions associated with the performance criteria are discussed in Section 2.6.

2.5.2. Detection Monitoring (Objective 2, 3, and 4 Locations)

Concentrations of contaminants of concern are expected to decrease to cleanup standards within a reasonable timeframe (i.e., approximately 160 years). This objective will be met by monitoring various downgradient and perimeter locations that are either not impacted or are minimally impacted. This monitoring also includes analytic confirmation of several monitoring points included as Objective 4 locations.

The springs discharge groundwater that includes contaminated groundwater originating from the WSTA and CPA. Current contaminant concentrations at these locations are protective of human health and the environment under current recreational land uses. Continued improvement of the water quality in these affected springs is expected. Trend analysis (Section 2.5.1) will be performed at the springs (Objective 3) to evaluate if downward trends are occurring.

Performance criteria will be set for each contaminant for the detection monitoring locations and the springs. These criteria are summarized in Table 2-5. Actions (Section 2.6) will be initiated if concentrations exceed established performance criteria.

2.5.3. Hydrologic Monitoring (Objective 4 Locations)

Hydrologic conditions at the site over time will be monitored in all remaining WSOW wells in order to identify any changes in groundwater flow that might affect the protectiveness of the selected remedy. A set of wells has been selected as the minimum required to adequately evaluate the hydrologic conditions in the impacted areas. Additionally, these wells will aid in verification of a continued upward gradient and/or discharge conditions that will limit the extent of vertical migration of contamination into the deeper bedrock units at the WSOW.

Static groundwater elevation of the wells within the existing well network will be measured to establish that groundwater flow is not changing significantly and not resulting in changes in contaminant migration. Groundwater quality samples will not be collected from Objective 4 wells unless the wells are also required as part of another objective or are specifically listed in Table 2-2.

Groundwater elevation maps will be created and evaluated to verify that the groundwater flow directions and rates are sufficient to support the attenuation of the contaminants in the predicted timeframes. Also, groundwater flow directions will be evaluated against the IC boundary to verify that the IC area is adequate.

The Army will coordinate with the U.S. Department of Energy (DOE) site for joint collection of groundwater data information as feasible. This periodic sharing of hydrologic data will aid in providing a better resolution of the groundwater potentiometric surface in the vicinity of the Weldon Spring Site managed by DOE.

TABLE 2-5 Criteria[a] (μg/L) for the Performance and Detection Monitoring Programs

	TNT	2,4-DNT	2,6-DNT	NT[c]	DNB	NB
Objective 1[b]						
A[d]		1.3				
B	100	1000	500	1500	50	34
C		1.3				
D	4.75					
E		1.3	1.3			
Objective 2						
A,B,C,D,E,F (near)	5.6	0.55	2.6	74	2	34
A,B,C,D,E,F (far)	2.8	0.11	1.3	37	1	17
Objective 3[b]						
B		1.3	11			
D	75					
E		2.6	11			
F	100					

[a] If a compound is not listed, then it has not been a concern for the basin. As such, any exceedance of the Remediaion Goals would result in execution of the validation and statistical evaluation scheme
[b] This table lists the second of two criteria for Objective 1and Objective 3 locations. The first criteria is a statistically significant increase in contaminant concentrations outside those that have been measured for the most recent 8 events. Concentrations that exceed the mean plus 3 standard deviations for that location will be considered to show a statistically significant increase. (See Section 2.5.1)
[c] Level is for each of o-NT, p-NT, and m-NT individually
[d] Identifiers are related to the spring recharge basins; A: SP-6301, SP-6301/6303; B: SP-6303/6304; C: SP-6501; D: SP-5601/5603/5605; E: SP-5602; F: SP-5304

2.6. ACTIONS

Although evaluations completed to date indicate the occurrence of the following are unlikely, the monitoring program has also been developed to recognize any of the following observations:

- A sustained upward trend in contaminant concentrations in groundwater or springwater, indicating that undiscovered sources may be present;
- Trends in contaminant concentrations that are inconsistent with meeting the cleanup goals within a reasonable timeframe; or
- Significant increases in the area or vertical extent of contamination, resulting in new significant impacts to adjacent, unimpacted groundwater systems.

Performance criteria concentrations have been assigned at appropriate locations as indicators of changed conditions having potential for impact outside those areas where migration is expected to occur (i.e., solution-enlarged conduits and bedding planes in the weathered Burlington-Keokuk Limestone). Responses will range from data verification and increased monitoring to reevaluation of time required to reach remediation goals by MNA. Decision trees have been developed for each monitoring program (Figures 2-3 to 2-6) that outline courses of action for exceeding the performance criteria. In the event

that recalculation of the MNA timeframes is required, the methodology used in the *Groundwater Monitoring Assessment Report* (USACE 2004) will be used.

The remedial action was chosen in accordance with CERCLA as amended by the Superfund Amendments and Reauthorization Act (SARA) and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Army will fulfill its responsibility and obligation under CERCLA and the NCP as it implements, maintains, and when necessary, reviews the selected remedy.

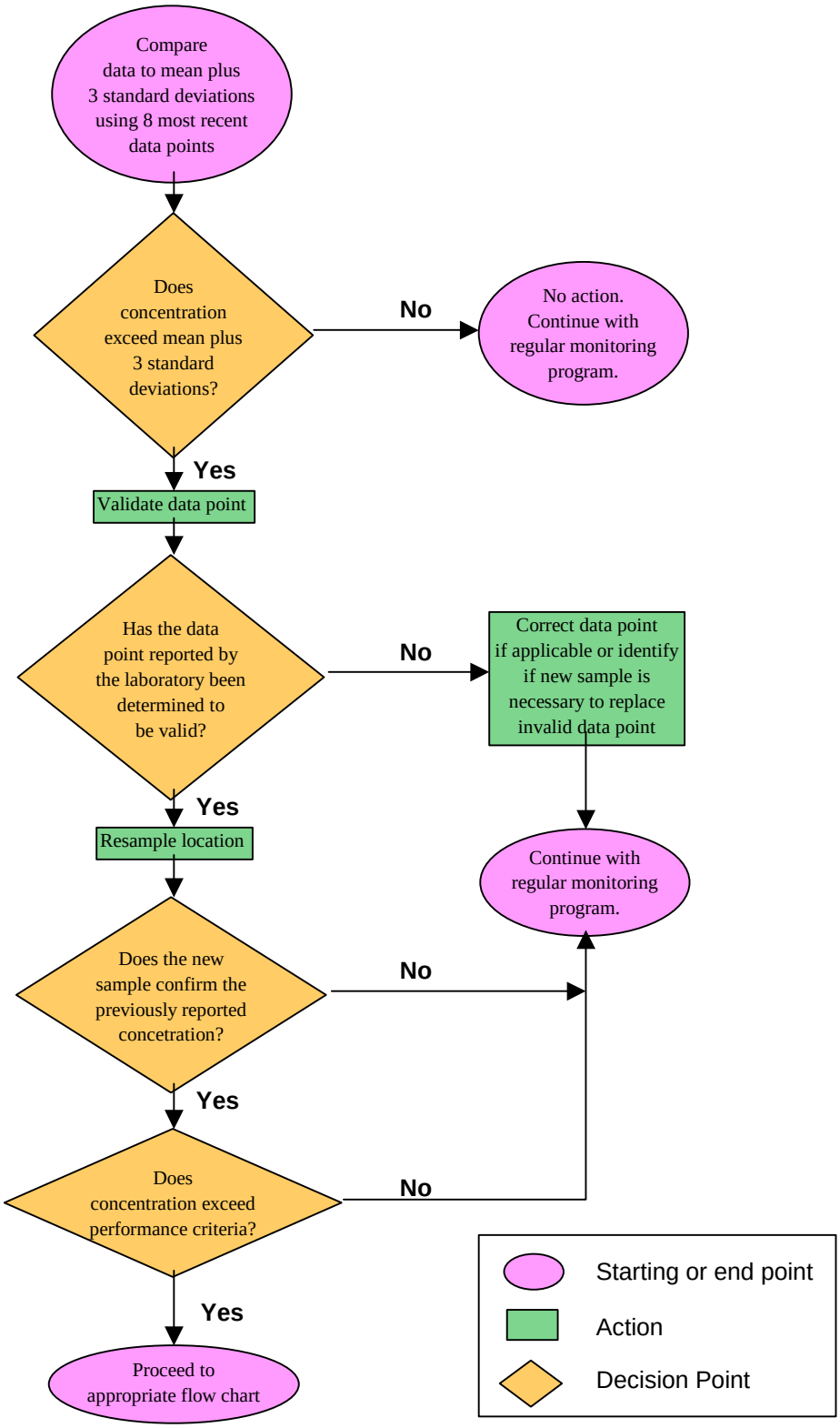

Figure 2-3 Validation and Statistical Evaluation Scheme

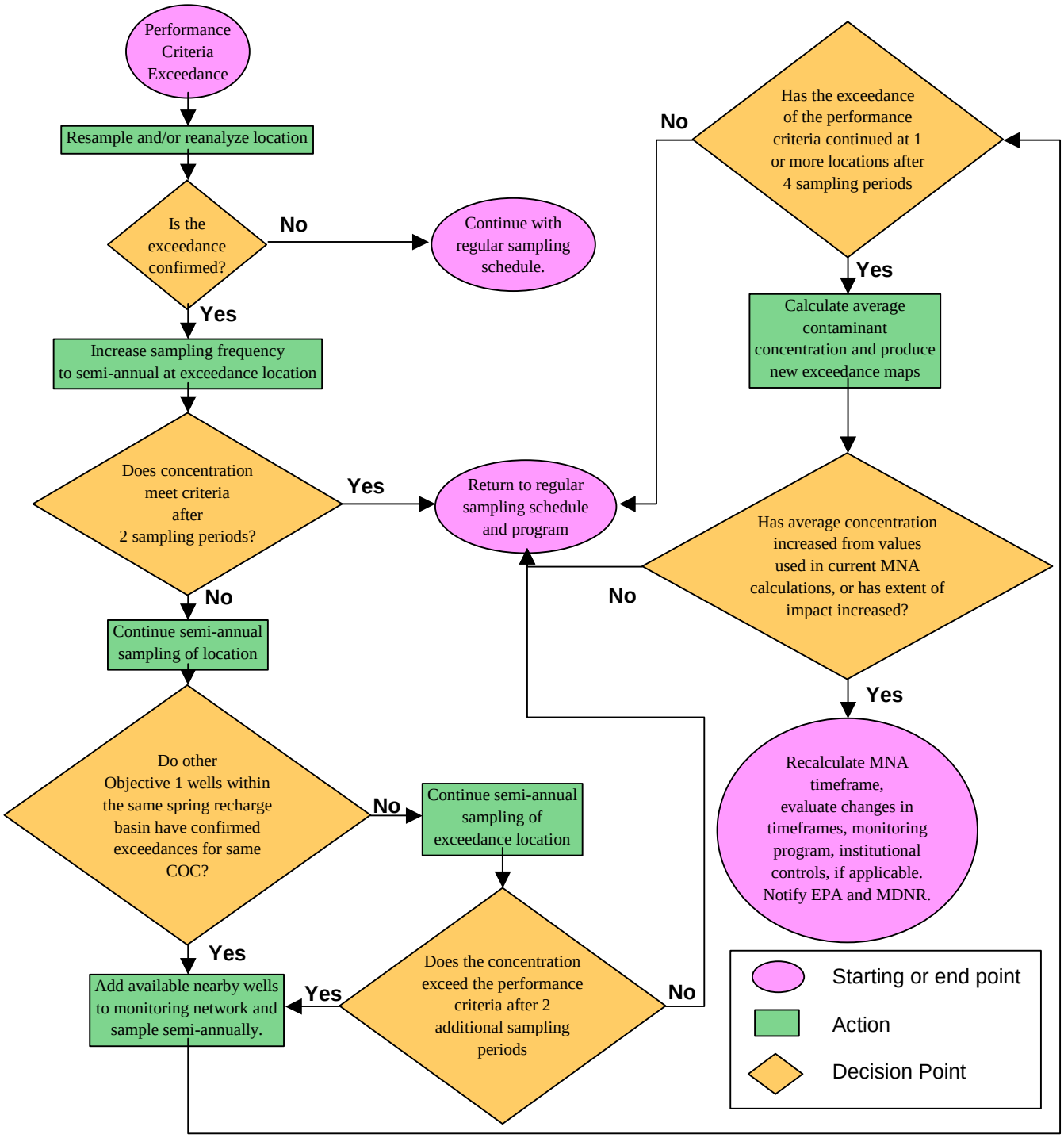

Figure 2-4 Decision Tree for Objective 1 Data

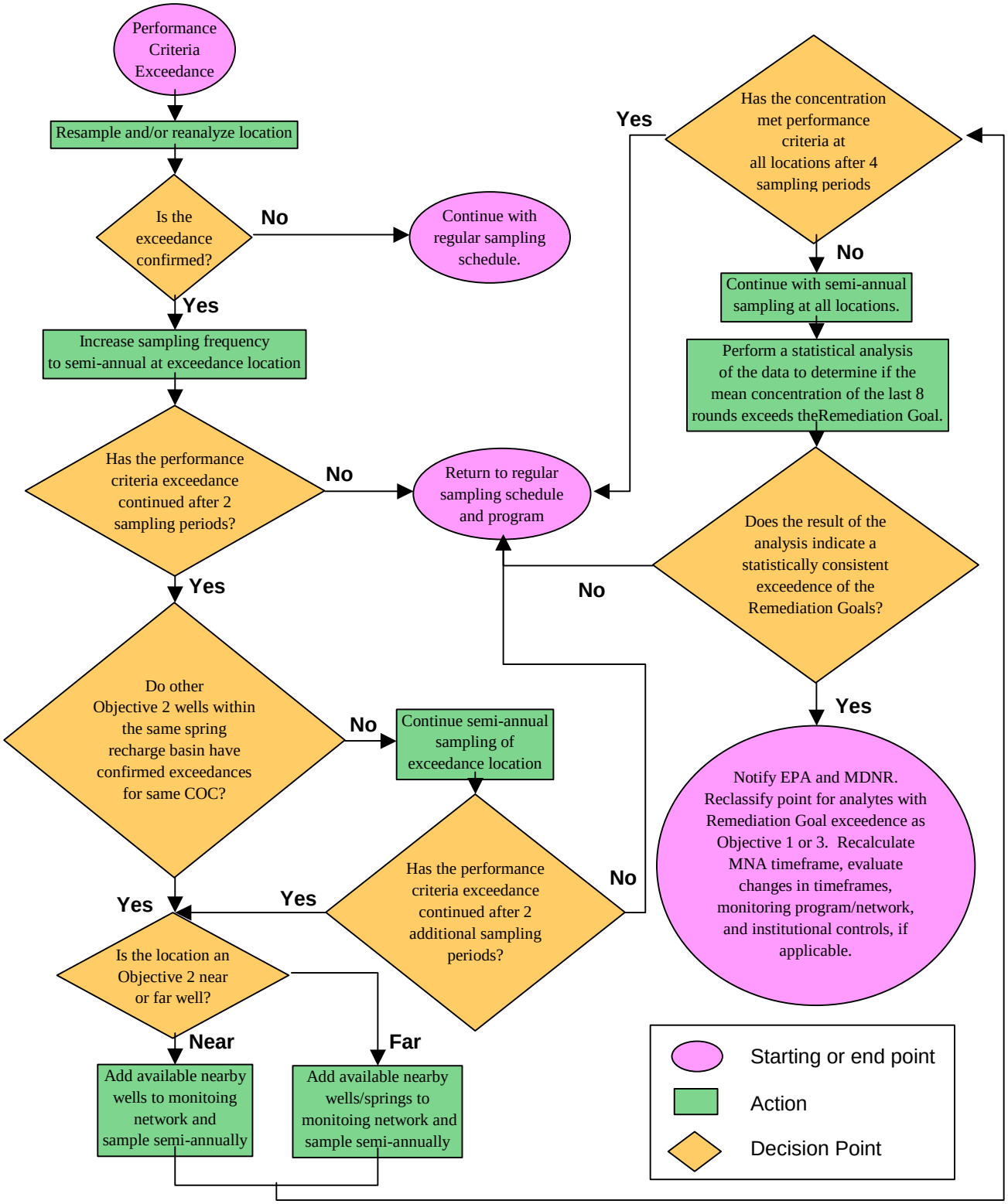

Figure 2-5 Decision Tree for Objective 2 (and 4) Data

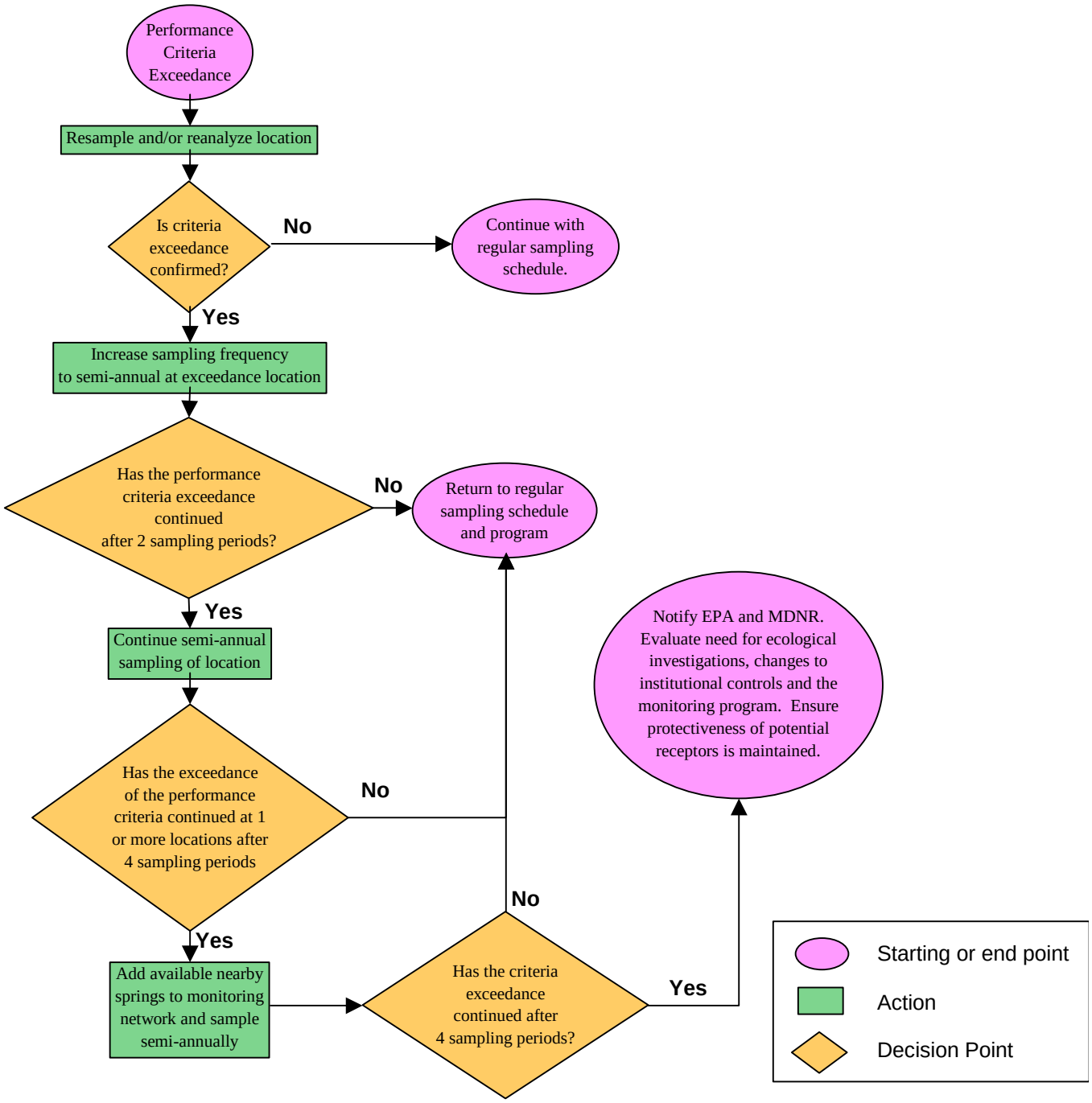

Figure 2-6 Decision Tree for Objective 3 Data

3.0 CONSTRUCTION ACTIVITIES

Careful consideration has been given to the monitoring network during the investigation period. As a result, limited construction is required to implement this *Work Plan*. MWD34 will be installed downgradient of MWS12 as an Objective 4 monitoring point. This well, MW-4007 (a DOE installed monitoring well), and a subset of the existing DA monitoring network will be monitored. This select network meets the needs of the design as identified in Chapter 2. The integrity of all wells naturally deteriorates over time. As a result, wells not required as part of the existing network and not likely to be utilized as a supplemental point (per the decision flow sheets) may be abandoned in the future. Any activities associated with abandonment, replacement, or addition of monitoring wells will be performed in accordance with the regulations (10 CSR 23, Missouri Well Construction Rules) as appropriate. Monitoring well construction is considered to be a minor punch-list item and is not considered to be remedy construction for this site. However, it is field activities for the monitoring well installation are currently scheduled to begin approximately 10 days following the finalization of this *Work Plan*.

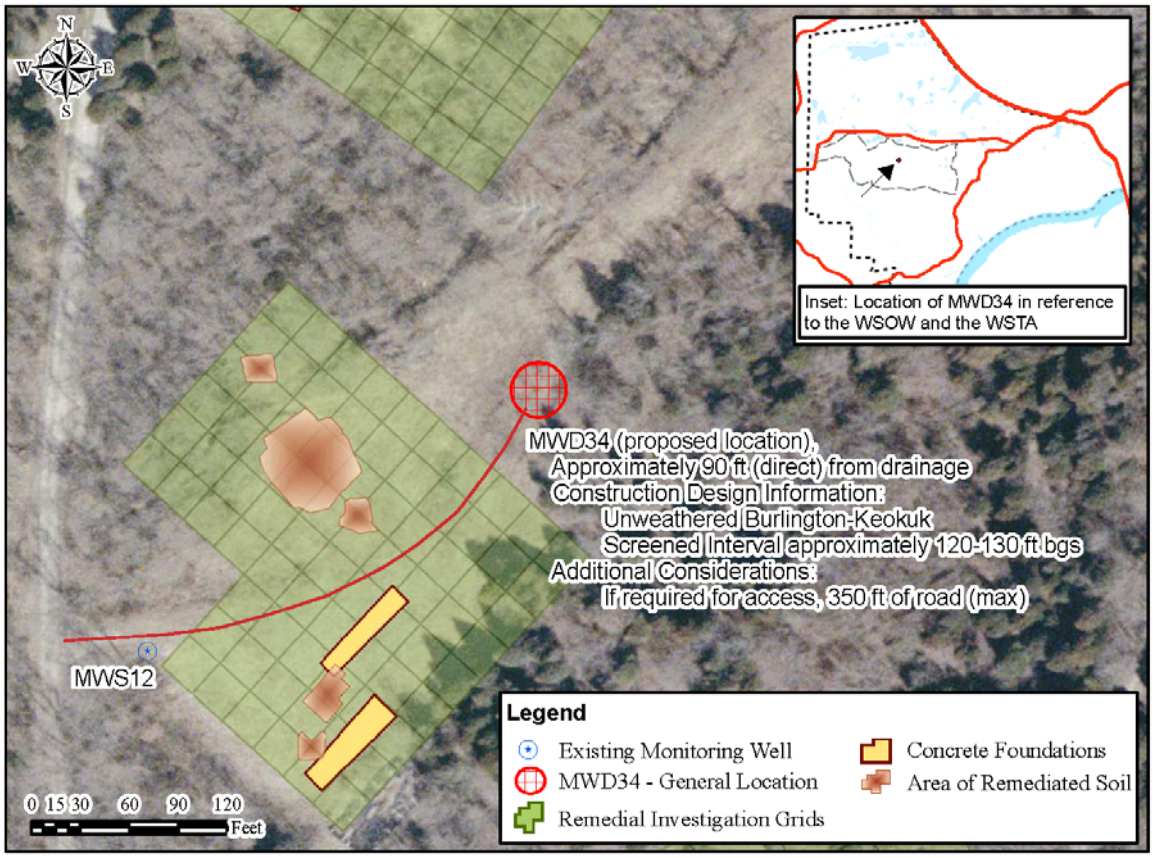

Figure 3-1: Proposed Location of MWD34

4.0 PROJECT SCHEDULE

The milestones associated with the implementation of this *Work Plan (includes Phase I only)* are as follows:

Initiated coordination with affected landowners	February 2005
Begin update to existing Work Plan for Groundwater Monitoring	July 2005
Initiate MNA monitoring (Round RA-001)	August 2005
Submit 1st Quality Control Summary Report	September 2005
Submit 1st Monitoring Report (Draft)	February 2006
Update and extend schedule (included as part of Monitoring Report)	April 2006
MNA monitoring (Round RA-002)	May 2006

5.0 SUMMARY OF PROJECT COSTS

Current projections for duration of the remedial action are approximately 160 years. Costs for performance monitoring of the selected remedy and associated actions are provided below. One well will be installed but the cost for this installation is not included in the estimate provided. Well maintenance is included. However, cost for abandonment of wells is not currently included in this design. The actual determination of wells to be abandoned and the abandonment process will be carried out at a currently undetermined future date. Costs are broken out by Year of Remedial Action (i.e. Costs for Year 1 cover actions associated with Phase I subsequent to the approval of Phase I for 1 year).

Current cost estimates for Phase I:

- Year 1 – $110,000
  - Includes (2) sampling events, (1) Groundwater Monitoring Report, Well Maintenance, and (2) Public Meetings and Coordination
- Year 2 – $112,000
  - Includes (2) sampling events, (1) Groundwater Monitoring Report, Well Maintenance, and (2) Public Meetings and Coordination
- Year 3 – $84,000
  - Includes (1) sampling event, (1) Groundwater Monitoring Report, Well Maintenance, 2 Public Meetings and Coordination
- Year 4 – $76,000
  - Includes (1) sampling event, (1) Groundwater Monitoring Report, Well Maintenance, (1) Public Meeting and Coordination
- Year 5 – $118,000
  - Includes (1) sampling event, (1) Groundwater Monitoring Report, 5-year Review, Well Maintenance, (1) Public Meeting and Coordination

Costs will be updated and presented for both Phase I and Phase II as part of Phase II. O&M costs do not currently include implementation of additional actions (Section 2.6).

6.0 QUALITY PLANS

The existing Quality Control Plan (QCP) will be modified to reflect changes in the project team and deliverables associated with the program for MNA. A new Quality Assurance Project Plan (QAPP) will be developed to define the processes for sample analysis by the contracted laboratory. In addition, a Contractor Quality Control Plan (CQCP) will be required for any contracted activities (such as groundwater monitoring, spring monitoring, and well installation/abandonment). Kansas City District Business Quality Procedure 5.5.04 will be used in development/revision of these quality plans.

6.1. QUALITY ASSURANCE PROJECT PLAN

The QAPP presents in specific terms the policies, organization, functions, and Quality Assurance/Quality Control (QA/QC) requirement designed to achieve the data quality goals described in the Sampling and Analysis Plan for this project. The detailed QAPP:

- Will be prepared for use by contractors who perform environmental services to ensure the data are scientifically valid and defensible, and
- Establishes the analytical protocols and documentation requirements to ensure data are collected, reviewed, validated, and analyzed in a consistent manner.

6.2. QUALITY CONTROL PLAN

The Quality Control Plan outlines the procedures, organization, objectives, and functional activities as well as quality assurance (QA) and quality control (QC) activities to be performed. These activities are the planning and performance of groundwater sampling events for Operable Unit 2 of the WSOW. The QCP further describes the preparation of work plans, groundwater monitoring reports, and quality control summary reports. The purpose of the QCP is to:

- Establish a quality framework for sampling activities
- Provide a framework for the development of project requirements and implementation guidelines and procedures

The components of the QCP will include:

- Identification of required end products
- Identification of critical stages of development for which quality must be controlled to produce desired end products
- Definition of acceptability criteria for each process, procedure, and product employed to accomplish the critical stages of development
- Methods for determining if acceptability criteria have been satisfied
- Corrective action processes where acceptability criteria have not been satisfied (explanation of consequences of failure to implement quality control)
- Documentation to ensure that quality control has been accomplished

Quality performance is expected in every process and is inherent to the operations by DA. Quality control provides confidence that quality performance has been accomplished. Use of this plan will ensure that the performance of groundwater sampling and the preparation and review of reports and plans meet the quality criteria.

6.3. CONTRACTOR QUALITY CONTROL PLAN

If the execution of sampling and/or report preparation and work plan modification will be completed through the use of a contract, a CQCP will be developed to cover the procedures under which the contractor will execute the required work. The requirements will be similar to that of the QCP and will add contract administration and other appropriate features to ensure that the contractor meets the quality criteria.

7.0 EMERGENCY PREPAREDNESS PLAN

7.1. PURPOSE

The WSOW *Site Safety and Health Plan for Groundwater Sampling* (SSHP) establishes the planning, preparedness, and response concepts for emergencies at the WSOW. The emergency response measures established in the SSHP are intended to afford protection for the health and safety of on-site personnel and the public during operations. The plan is implemented whenever an emergency situation is declared or conditions exist that constitute, or could result in, an operational emergency at the WSOW during remedial action. The SSHP also defines the health and safety requirements for the work performed as part of the remedial action.

7.2. DESCRIPTION

The SSHP is designed to address the health and safety aspects of the operations conducted at the WSOW in association with the remedial action. The scope and extent of the planning is appropriate for the hazards currently present at the WSOW associated with activities during remedial action.

The SSHP addresses the following topics:

- Scope and applicability of the plan
- Site description and hazards
- Project organization and responsibilities
- Training
- Personal protective equipment
- Decontamination procedures
- Medical surveillance
- Illumination
- Site control and work zones
- Heat stress
- Cold stress
- Hazard communication program
- General site rules
- Emergency procedures
- Task specific procedures and equipment handling/operation based on job safety analysis
- Safety procedures for operation in areas of the WSTA under safety protocols instituted by the DA and/or Army Reserves associated with training operations conducted at the WSTA
- Safety procedures for operation and/or restriction from operation during various hunting seasons.
- Routes for reaching and/or contacting nearby medical facilities with emergency response capabilities

7.3. IMPLEMENTATION

It is the policy of DA to conduct operations in a responsible manner so as to be protective of human health and the environment. The primary focus of site management is the prevention of accidents, emergency situations, and other incidents, which could adversely affect on-site personnel, the public, property, or the environment. These objectives are attained through the implementation of effective

planning and preparedness for emergencies during the initial stages of site activities. Also, the use of protective actions and training encourages personnel to maintain an awareness of potential emergencies and of the appropriate responses required for prevention or mitigation of problems that could occur. Specific provisions for responding to emergencies that are unique to the individual tasks within the remedial action activities are incorporated into the SSHP.

8.0 DOCUMENT SUBMITTAL

This section outlines the documents that will be prepared to support the design and implementation of the selected remedy for Operable Unit 2: Groundwater. The schedule for the documents being prepared in support of the remedial activities will be provided within 45-days of finalization of the *Work Plan*.

8.1. DOCUMENTS

Existing and/or updated workplans will be used if construction activities (such as well installation, rehabilitation, or abandonment) are required in the future. At this time, the only anticipated activities are the eventual abandonment of monitoring wells and rehabilitation of existing wells as necessary. One new monitoring well (MWD34) will be installed. No design submittals are anticipated at this time.

The existing workplan (which includes the Field Sampling Plan and Quality Assurance Project Plan) for groundwater monitoring (USACE, 2002) will be updated to be consistent with the requirements for the remedial action and this RD/RA workplan.

The annual groundwater monitoring reports will provide a mechanism for identifying the need for changes based on statistical evaluation of data and the decision trees contained in this RD/RA workplan. The report will also discuss the status of the ICs.

In addition, Quality Control Summary Reports and components of the annual groundwater monitoring report that involve presentation of data (such as data tables, groundwater elevation maps, etc.) may be provided. Depending on the scope of the annual monitoring report, these documents may be finalized in advance of the annual report. This will permit distribution of data in a timely fashion if the scope of the annual monitoring report requires an extended production and review cycle.

9.0 REFERENCES

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Mugel, D., 1997, *Geohydrology of the Weldon Spring Ordnance Works, St. Charles County, Missouri*, USGS Water-Resources Investigation Report 96-4171, prepared by the U.S. Geological Survey, Rolla, MO, in cooperation with the U.S. Army Corps of Engineers, Kansas City District, Kansas City, MO.

U.S. Army Corps of Engineers and U.S. Department of Energy, 1997a, *Baseline Risk Assessment for the Groundwater Operable Units at the Chemical Plant Area and the Ordnance Works Area, Weldon Spring, Missouri*, DOE/OR/21548-569, prepared by Argonne National Laboratory, Argonne, IL, for U.S. Department of Energy, Weldon Spring Site Remedial Action Project, Weldon Spring, MO, and U.S. Department of the Army, Corps of Engineers, Kansas City District, Kansas City, MO, July.

U.S. Army Corps of Engineers and U.S. Department of Energy, 1997b, *Remedial Investigation for the Groundwater Operable Units at the Chemical Plant Area and the Ordnance Works Area, Weldon Spring Site, Weldon Spring, Missouri*, DOE/OR/21548-571, Final, prepared by MK-Ferguson Company and Jacobs Engineering Group, Inc., Weldon Spring, MO., and Argonne National Laboratory, Argonne, IL For U.S. Department of Energy, Weldon Spring Site Remedial Action Project, Weldon Spring, MO, and U.S. Department of Army, Corps of Engineers, Kansas City District, Kansas City, MO, July.

U.S. Army Corps of Engineers and U.S. Department of Energy, 1998, *Feasibility Study for Remedial Action for the Groundwater Operable Units at the Chemical Plant Area and the Ordnance Works Area, Weldon Spring, Missouri*, DOE/OR/21548-569, Final, prepared by Argonne National Laboratory, Argonne, IL For U.S. Department of Energy, Weldon Spring Site Remedial Action Project, Weldon Spring, MO, and U.S. Department of Army, Corps of Engineers, Kansas City District, Kansas City, MO, December.

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U.S. Army Corps of Engineers, 2004, *Record of Decision for the Final Remedial Action for Operable Unit 2: Groundwater at the Weldon Spring Ordnance Works Site, Weldon Spring, Missouri*, Final, prepared by the U.S. Department of Army, Corps of Engineers, Kansas City District, Kansas City, MO, September.

Appendix A

Extracted Figures, Tables, and Text from
Supporting Documents to the Record of Decision

Appendix A to this *Work Plan* for the Weldon Spring Ordnance Works (WSOW), Operable Unit 2: Groundwater, includes various tables, figures, and text that have been extracted from supporting documents to the Record of Decision. Appendix A includes this reference information to facilitate easier review of pertinent information as related to the identification of monitoring locations, parameters, frequency, and performance criteria in the *Work Plan*.

The extracted items include:

Groundwater Monitoring Assessment Report* (GMAR)

Executive Summary – Provides a summary of the analysis and evaluation of groundwater data collected at the WSOW from October 1999 through August 2003. The analysis and evaluations presented in the GMAR were used as a starting point in development of the Performance Monitoring Scheme as presented in this *Work Plan*.

Table 2 – "Summary of Exceedances of Screening Levels Based on Maximum Value Observed Between Rounds 22 and 35"

Table 3 – "Summary of Nitroaromatic Data Statistical Analysis: Wells and Springs with an Upper Confidence Interval that Exceeds a PRG"

Table 4 – "Summary of Upper Limit of 99% Confidence Intervals Presented in Table 3"

Table 5 – "Results of Nitroaromatic Trend Analysis for Select Wells and Springs"

Tables B-4-1 to B-4-7 – Nitroaromatic Concentrations in Wells and Springs at the WSOW.

Supplemental Feasibility Study* (SFS)

Table 2-3 – "Results of Nitroaromatic Trend Analysis for Select Wells and Springs" – This table is an update to Table 5 of the GMAR. The "Estimated Time to Reach PRG in Years" column has been updated based on the PRGs presented in the SFS.

Figure 2-5 – "Potentiometric Contour Map of Groundwater in the Burlington-Keokuk Formation at the Weldon Spring Ordnance Works"

Figure 2-9 – "Exceedance of [2,4-DNT, 2,6-DNT, 2,4,6-TNT] PRG: Based on Mean Concentration in Wells and Springs"

* The Preliminary Remediation Goals (PRG) presented in the *Supplemental Feasibility Study* were carried forward as Remediation Goals (RGs) in the *Record of Decision* (ROD). The PRGs of the SFS and RGs of the ROD are the same as the GMAR screening levels with the exception of 2,6-DNT. The PRG/RG for 2,6-DNT was 1.3 ug/L (initial screening level from the GMAR was 0.13 ug/L).

Executive Summary

The Weldon Spring Ordnance Works Area (WSOW) is a former explosives production facility which manufactured trinitrotoluene (TNT) and dinitrotoluene (DNT) for use during World War II. It has been approximately 60 years since the former WSOW was used as a production facility for TNT and DNT. During the course of Remedial Investigations (RI), contaminated soil and pipelines were found to pose sufficient risk to require Remedial Action (RA). Remediation of the soils and pipeline was executed as Operable Unit 1 (OU1).

Prior to initiation of the RA for OU1, an RI and Baseline Risk Assessment was completed for the groundwater operable unit (OU2). Some areas on the WSOW were identified as having contaminant concentrations that exceeded federal and state levels for groundwater and/or surface water. PRGs for OU2 were then proposed in a Feasibility Study. Groundwater is not deemed to pose a recreational or ecological risk. However, the PRGs for groundwater are based on the federal and state levels and a residential exposure scenario.

A secondary benefit of the OU1 RA was the elimination of known sources of groundwater contamination. Given the already limited extent of contamination in groundwater (primarily on the Weldon Spring Training Area (WSTA) with a few springs and wells on the WSOW) and the foreseeable benefits of a removal of known sources of groundwater contamination, a monitoring program was proposed to identify whether or not natural processes could sufficiently attenuate the remaining groundwater contamination. Monitoring points are shown in Figure ES-1.

The objectives of this report:

1. Supplement previous evaluations of the fate and transport as well as a determination of nature and extent of groundwater contamination at the WSOW.
2. Determine trends of nitroaromatic and nitrate concentrations in the groundwater following the removal of contaminated soil and pipelines completed as part of Operable Unit 1 (OU1).
3. Provide rationale for development of a supplemental Feasibility Study that will add

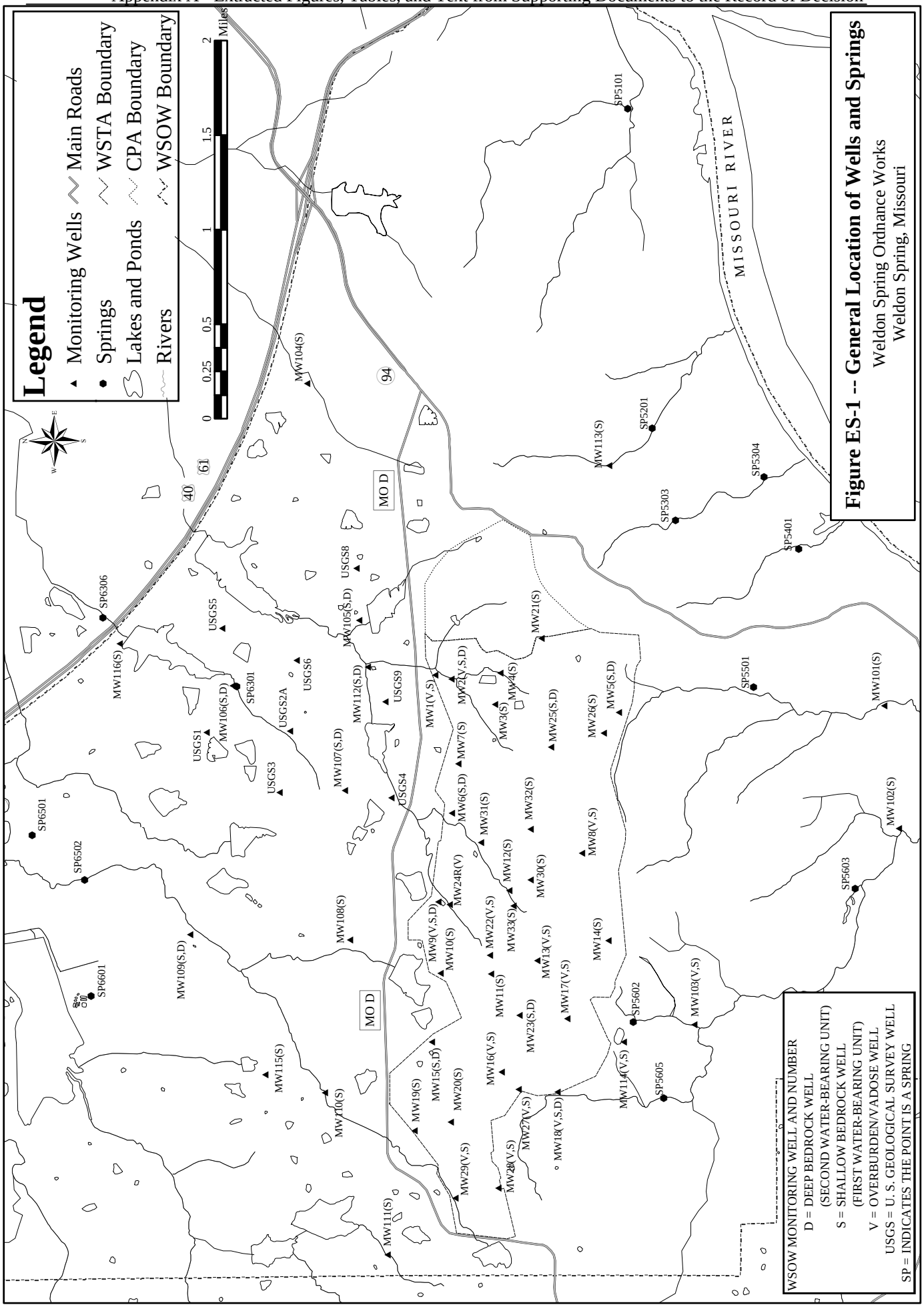

Figure ES-1 -- General Location of Wells and Springs

Weldon Spring Ordnance Works
Weldon Spring, Missouri

Monitored Natural Attenuation as a potential groundwater remedy to the remedies proposed in the 1998 Feasibility Study (DOE and DA, 1998).

Each of these objectives has been achieved:

1. Additional monitoring wells were installed at the Site that resulted in a more confident and comprehensive determination that groundwater contamination is not migrating off Site and any further increase in the area of impact of groundwater contamination is not expected. Previous reports were reviewed for information to supplement current data. Studies completed by the U.S. Army Corps of Engineers (USACE), U.S. Department of Energy (DOE), U.S. Geological Survey (USGS), and the Missouri Department of Natural Resources (MDNR) aided in evaluation of the Site for lateral and vertical contaminant migration potential
    a. Previously identified data gaps have been filled through the installation of new monitoring wells and an expanded analytical suite.
    b. The potentiometric surface in this Spring Basin recharge area is generally positive or lies above the bedrock contract (Mugel, 1996). This data is supported by the monitoring wells in this area, which typically exhibit upward vertical gradients indicating discharge of groundwater and ultimately restrict the vertical movement of contaminants into deeper units.
    c. Of the 54 wells on the WSTA that are sampled, 36 had mean concentrations at or below all nitroaromatic screening levels. Conversely, 18 wells on the WSTA had mean concentrations above at least one nitroaromatic screening level.
    d. Of the 28 wells sampled beyond the boundary of the WSTA (but still on the WSOW), 27 had mean concentrations at or below all nitroaromatic screening levels. Conversely, 1 well (USGS4) had mean concentrations above screening levels (0.12 μg/L versus 0.11 μg/L for 2,4-DNT and 2.65 μg/L versus 0.13 μg/L for 2,6-DNT)
    e. Of the 13 springs that are representative of the spring recharge basins, 10 had mean concentrations at or below all nitroaromatic screening levels. Conversely, 3 springs had mean concentrations above at least one nitroaromatic screening level.

2. Groundwater contamination was evaluated by dividing the WSOW (Site) into areas based on spring recharge basins. A statistical analysis was completed to determine which wells and springs within each basin exceeded screening levels. The data was then evaluated for trends in concentration over time. Screening levels used in this evaluation are:

TNT	2.8 μg/L	m-NT	37 μg/L
2,4-DNT	0.11 μg/L	TNB	1100 μg/L
2,6-DNT	0.13μg/L	DNB	1.0 μg/L
o-NT	37 μg/L	NB	17.0 μg/L
p-NT	37 μg/L		

a. SP-6303/6304 Recharge Area: MWS12 and MWV09 are the two areas within this recharge area with the highest concentrations of nitroaromatics. Seasonally variable and increasing contaminant levels in monitoring wells MWS12 (with occasional downgradient detections at USGS4) and the seasonally variable and decreasing concentrations at MWV09 have not resulted in mean concentrations exceeding screening levels downgradient of USGS4, the closest downgradient point to MWV09. Favorable conditions for degradation are present at both locations and the nitroaromatic data collected verifies the occurrence of degradation of TNT and DNT. Further, the hydrogeologic and geologic conditions at these locations are attenuating the rate of transport of contamination through the aquifer system.

b. SP-6501 Recharge Area: None of the impacted monitoring points lie beyond the boundary of the WSTA. Three wells (MWS10, MWS15, and MWD15) have been identified within this recharge area as having concentrations of nitroaromatics that exceed screening levels (for 2,4-DNT and/or 2,6-DNT). Current natural processes (dilution, dispersion, degradation, and sorption) are sufficiently attenuating the contamination in this area.

c. SP-5602 Recharge Area: Three monitoring points have been identified for this area (MWS17, MWV17, and SP5602) as having mean concentrations of nitroaromatics that exceed screening levels. Only SP5602 is located beyond the boundary of the WSTA. Dilution, dispersion, and biodegradation are applicable natural attenuation processes for the wells. Dilution and photolysis are applicable natural attenuation processes for the spring. These natural attenuation mechanisms are sufficiently

attenuating the groundwater contamination in this area.

d. SP-5601/5603/5605 Recharge Area: MWS16 and SP5605 have been identified as having mean concentrations of 2,6-DNT and TNT exceeding screening levels. With the exception of 2,6-DNT in MWS16, the trends in concentration of nitroaromatics indicate a decrease in concentration over time. A source of nitroaromatic contamination at T-13, upgradient of MWS16, is potentially the source of contamination at MWS16. The remediation at T-13 is in the final stages of execution. Based upon the amount of contaminated soil remediated, a significant downgradient decrease in groundwater contaminant concentration is expected. However, benefits from this source removal have not yet been identified for the groundwater. Dilution, dispersion, and biodegradation are applicable natural attenuation processes for the well. Dilution and photolysis are potential natural attenuation processes for the spring.

e. SP-5304 Recharge Area: The concentration of TNT samples collected from SP5303 is seasonally variable, higher than screening levels, and is potentially increasing over time. The concentration of the next downgradient spring, SP5304, is approximately two orders of magnitude less than SP5303 and is below screening levels by an order of magnitude. However, when the data is evaluated over an extended period of time (16 years of data collected by the U.S. Department of Energy), the trend in concentration is decreasing, not increasing. Further, the mean (average) concentration of the detections (23 data points over the same 16 year period) at the downgradient spring, SP5304, is 0.79 μg/L. This concentration is below the screening level of 2.8 μg/L for TNT. The increasing trend observed from October 1999 to August 2003 is more likely the result of seasonal impact than an actual increasing trend. The use of the longer time period reduces the impact of seasonality on evaluation and is, therefore, the more likely trend at this location. With the supporting data for the downgradient spring, SP5304, resulting in consistent data below the screening level such that the average is also below the screening level, the calculated increasing trend for TNT in SP5303 does not significantly change the

potential for natural attenuation at this location. With the extended time frame of evaluation, it is apparent that dilution and photolysis are attenuating the contamination in this area.

f. SP-6301/6303 and SP6301 Recharge Areas: A combination of source removals and natural attenuation processes have resulted in a decline in concentration over time for all points within this area except the overburden well MWV01 (for 2,6-DNT). Given the declining concentrations of 2,6-DNT in the bedrock well at this location, MWS01, and the relationship of increases in concentration of 2,6-DNT at MWV01 to precipitation events, dilution and dispersion are the dominant natural processes for the area monitored by this cluster of wells. During periods of low precipitation, the contamination is partitioned between the organic material in the overburden and the water in the unsaturated zone of the overburden material. During a precipitation event, the infiltrating rainwater dilutes and flushes the contamination partitioned in the aqueous phase with fresh rainwater. The infiltrating rainwater also picks up some of the sorbed contamination as it passes through the overburden material.

3. Geochemical parameters were added to the analysis to aid in determining the oxidative/reductive potential of the aquifer in discrete zones. Additional breakdown products of TNT and DNT were added to the existing nitroaromatic analytical method to further define the extent of natural attenuation at the site with respect to actual degradation of TNT and DNT. Geologic and hydrogeologic conditions at the Site were also reevaluated with respect to the potential for facilitation of natural attenuation processes such as adsorption, dilution, and dispersion.
   a. Evaluation of existing groundwater monitoring data presents strong evidence of intrinsic natural mechanisms attenuating the nitroaromatic contamination.
   b. The current limited extent of contamination at this Site result in strong support for the feasibility of natural attenuation.

In addition to the analysis provided for the nitroaromatics, an analysis was completed for nitrate and various metals with lead as the focus of the metals evaluation. Nitrate was included in the

sampling scheme as both an indicator of the potential for natural attenuation and as a contaminant of concern. Only one location in the entire network of monitoring points that have been part of the WSOW sampling plan exhibited levels of nitrate that consistently exceeded PRGs. This well monitors groundwater that has been impacted by upgradient nitrate contamination that originates on the CPA and is being addressed by DOE. Monitoring of nitrate is recommended for identification of natural attenuation potential and it is recommended that nitrate no longer be considered a contaminant of concern for the WSOW groundwater operable unit. Monitoring for lead was conducted to verify that the OU1 RA had not impacted groundwater. Metals were not considered a contaminant of concern for groundwater prior to OU1 RA and based upon the evaluation of data, are still not a contaminant of concern. Monitoring for metals has been discontinued.

It is not necessary to continue monitoring wells or springs that have shown no historical exceedance of screening levels as sufficient data has been collected to show that no exceedance of screening levels is expected in the foreseeable future (although these points may be included as sentinel points). The existing network is adequate for the needs of continued monitoring of the extent of contamination both laterally and at depth. The existing monitoring network was designed to meet the need for the sentinel network. An effective monitoring network includes sentinel points to verify the extent of the contamination. Wells or springs that are currently at or below screening levels have the potential to add benefit to the monitoring program as further verification of contamination extent. Several wells and springs have been previously identified as sentinel points and could continue to provide this role in future sampling events. Duplication of sentinel monitoring is not required.

Similarly, if several monitoring points within the same recharge basin are identified as having concentrations exceeding screening levels and it is evident that downgradient contamination is likely a result of one or two wells exhibiting higher concentrations of nitroaromatics, only those wells with higher concentrations would need to be monitored as part of a continued evaluation of natural attenuation. Observed trends indicate that a sampling frequency of no more than semi-

annual is appropriate. Development of future sampling networks should be based on the impacted recharge basins as described in this report and on the considerations provided in the rationale for installing additional monitoring wells (previous investigations and work plans for monitoring well installation and sampling).

On the basis of the evaluation of data presented in this report and review of the site history, geology, and hydrogeology, preparation of a Supplemental Feasibility Study including Monitored Natural Attenuation as one of the evaluated remedies is recommended. The intrinsic natural mechanisms at the Site provide strong support for the feasibility of natural attenuation of groundwater contamination. Adsorption of contaminants in the overburden and reduced transmissivity within certain portions of the underlying bedrock limit the rate of migration of contamination in the groundwater. Photolytic breakdown of nitroaromatics is evident in the springs. Analytic data obtained supports the potential for biodegradation of TNT and DNT at this site but quantification of the impact of biodegradation is difficult given the current understanding of the mechanisms and the available technology for tracking the degradation products. Analyzing for the photolytic breakdown products at the springs and the breakdown products of DNT at MWS12 would supplement future evaluations of the ongoing natural attenuation of groundwater contamination at the Site. Because Dilution and Dispersion are the dominant attenuation processes at the Site, the continued evaluation of the breakdown products is not required, but may provide supporting documentation of natural attenuation in key locations at the site.

Table 2 -- Summary of Exceedances of Screening Levels Based on Maximum Value Observed Between Rounds 22 and 35

	No Exceedances of Screening Levels	Exceeds for 2,4,6-TNT	Exceeds for 2,4-DNT	Exceeds for 2,6-DNT	Exceeds for 1,3-DNB	Exceeds for NT (o-, m-, and/or p-)
Screening Level ▶	**NA**	**2.8 µg/L**	**0.11 µg/L**	**0.13 µg/L**	**1.0 µg/L**	**37/37/37 µg/L**
WSTA/WSOW Overburden Wells						
MWV01			0.52	0.74		
MWV02	X					
MWV08	X					
MWV09		35	55	7.6		
MWV13	X					
MWV16		3.56		0.53		
MWV17				0.66		
MWV18	X					
MWV22				0.16		
MWV24R			0.2	0.95		
MWV27				0.68		
MWV28	X					
MWV29	X					
MWV103	X					

"X" indicates no nitroaromatic exceedances.
Exceedances may represent isoloated events.
See Tables 3 and 4 for further evaluation of data.

Table 2 -- Summary of Exceedances of Screening Levels Based on Maximum Value Observed Between Rounds 22 and 35

	No Exceedances of Screening Levels	Exceeds for 2,4,6-TNT	Exceeds for 2,4-DNT	Exceeds for 2,6-DNT	Exceeds for 1,3-DNB	Exceeds for NT (o-, m-, and/or p-)
Screening Level ▶	**NA**	**2.8 µg/L**	**0.11 µg/L**	**0.13 µg/L**	**1.0 µg/L**	**37/37/37 µg/L**
WSTA Weathered Burlington-Keokuk Bedrock Wells						
MWS01				0.28		
MWS02	X					
MWS04		12.8	1.32	2.15	1.54	
MWS07			0.2	0.69		
MWS08	X					
MWS09	X					
MWS10				1.5		
MWS11				0.62		
MWS12		12	520	220	20	960/72/620
MWS13	X					
MWS14	X					
MWS15		4.03	1.7	2.2		
MWD15				0.64		
MWS16		3.9		1		
MWS19	X					
MWS20	X					
MWS21			0.36	0.21		
MWS22				0.26		
MWS23	X					
MWS24	*					
MWS25	X					
MWS26	*					
MWS27	X					
MWS28	X					
MWS29	X					
MWS30	X					
MWS31				0.36		
MWS32				0.2		
MWS33	X					

"X" indicates no nitroaromatic exceedances.
Exceedances may represent isoloated events.
See Tables 3 and 4 for further evaluation of data.

Table 2 -- Summary of Exceedances of Screening Levels Based on Maximum Value Observed Between Rounds 22 and 35

	No Exceedances of Screening Levels	Exceeds for 2,4,6-TNT	Exceeds for 2,4-DNT	Exceeds for 2,6-DNT	Exceeds for 1,3-DNB	Exceeds for NT (o-, m-, and/or p-)
Screening Level ▶	**NA**	**2.8 µg/L**	**0.11 µg/L**	**0.13 µg/L**	**1.0 µg/L**	**37/37/37 µg/L**
WSTA Unweathered Burlington-Keokuk Bedrock Wells						
MWD02	X					
MWS03	X					
MWS05	X					
MWS06				0.94		
MWD06	X					
MWD09	X					
MWS17			0.47	1.4		
MWD23	X					
MWD25	X					
WSTA Other Wells						
MWD05	X					
MWS18	X					
MWD18	X					
WSOW Weathered Burlington-Keokuk Bedrock Wells						
MWS104	X					
MWS107				0.46		
MWS110				0.23		
MWS111	X					
MWS112	X					
MWS113	X					
MWS115	X					
MWS116	X					
USGS2A	X					
USGS3	X					
USGS4			0.4	4.2	1.31	
USGS5	X					
USGS8	X					
USGS9			0.63			

"X" indicates no nitroaromatic exceedances.
Exceedances may represent isoloated events.
See Tables 3 and 4 for further evaluation of data.

Table 2 -- Summary of Exceedances of Screening Levels Based on Maximum Value Observed Between Rounds 22 and 35

	No Exceedances of Screening Levels	Exceeds for 2,4,6-TNT	Exceeds for 2,4-DNT	Exceeds for 2,6-DNT	Exceeds for 1,3-DNB	Exceeds for NT (o-, m-, and/or p-)
Screening Level ▶	**NA**	**2.8 µg/L**	**0.11 µg/L**	**0.13 µg/L**	**1.0 µg/L**	**37/37/37 µg/L**
WSOW Unweathered Burlington-Keokuk Bedrock Wells						
MWD105	X					
MWS105	X					
MWD106	X					
MWS106	X					
MWD107	X					
MWS108	X					
MWD109	X					
MWS109	X					
MWD112	X					
USGS1	X					
USGS6	X					
WSOW Other Wells						
MWS101	X					
MWS102	X					
MWS103	X					

"X" indicates no nitroaromatic exceedances.
Exceedances may represent isoloated events.
See Tables 3 and 4 for further evaluation of data.

Table 2 -- Summary of Exceedances of Screening Levels Based on Maximum Value Observed Between Rounds 22 and 35

	No Exceedances of Screening Levels	Exceeds for 2,4,6-TNT	Exceeds for 2,4-DNT	Exceeds for 2,6-DNT	Exceeds for 1,3-DNB	Exceeds for NT (o-, m-, and/or p-)
Screening Level ▶	**NA**	**2.8 µg/L**	**0.11 µg/L**	**0.13 µg/L**	**1.0 µg/L**	**37/37/37 µg/L**
Springs						
SP5101	X					
SP5201		3.38		0.28		
SP5303		59		0.36		
SP5304	X					
SP5401	X					
SP5501				0.18		
SP5602		4.31	1.1	4.5		
SP5603	X					
SP5605		49	0.25	1.4		
SP6301				0.23		
SP6303			0.39	1.5		
SP6306	X					
SP6501	X					
SP6502		3.28				
SP6601	X					

"X" indicates no nitroaromatic exceedances.
Exceedances may represent isoloated events.
See Tables 3 and 4 for further evaluation of data.

Table 3 -- Summary of Nitroaromatic Data Statistical Analysis:
Wells and Springs with an Upper Limit Confidence Interval that Exceeds a PRG

Well ID	Analytical Parameter	n	Mean, x_{mean}	Standard Deviation, S	$t_{(0.99,n-1)}$ t	99% Confidence Interval, $I = t * S / (n)^{0.5}$	Upper Limit of 99% Confidence Interval, $x_{mean} + I$	PRG
			µg/L	µg/L		µg/L	µg/L	µg/L
WSTA and WSOW Overburden Wells								
MWV01	***2,4,6-TNT***	5	*1.62*	2.64	3.365	3.98E+00	5.59	2.8
	2,4-DNT	5	0.21	0.18	3.365	2.75E-01	0.49	0.11
	2,6-DNT	5	0.30	0.27	3.365	4.02E-01	0.70	0.13
MWV09	**2,4,6-TNT**	14	24.49	7.52	2.624	5.27E+00	29.77	2.8
	2,4-DNT	14	37.37	12.73	2.624	8.93E+00	46.30	0.11
	2,6-DNT	13	4.39	2.40	2.650	1.76E+00	6.15	0.13
MWV16	***2,6-DNT***	14	*0.11*	0.14	2.624	9.51E-02	0.20	0.13
MWV17	**2,6-DNT**	4	0.23	0.29	3.747	5.46E-01	0.78	0.13
MWV22	***2,6-DNT***	8	*0.09*	0.06	2.896	5.66E-02	0.15	0.13
MWV24R	**2,6-DNT**	13	0.67	0.14	2.650	1.05E-01	0.78	0.13
WSTA Weathered Burlington-Keokuk Bedrock Wells								
MWS01	**2,6-DNT**	14	0.15	0.10	2.624	6.76E-02	0.21	0.13
MWS04	***2,4,6-TNT***	13	1.50	3.41	2.650	2.50E+00	4.01	2.8
	2,4-DNT	13	0.19	0.34	2.650	2.52E-01	0.44	0.11
	2,6-DNT	13	1.11	0.35	2.650	2.56E-01	1.36	0.13
MWS07	**2,6-DNT**	14	0.50	0.17	2.624	1.18E-01	0.62	0.13
MWS10	**2,6-DNT**	12	0.97	0.48	2.681	3.75E-01	1.34	0.13
MWS11	**2,6-DNT**	12	0.35	0.20	2.681	1.55E-01	0.51	0.13
MWS12	**1,3-DNB**	12	2.98	5.53	2.681	4.28E+00	7.25	1
	2,4,6-TNT	13	*1.94*	3.57	2.650	2.62E+00	4.57	2.8
	2,4-DNT	13	79.85	137.12	2.650	1.01E+02	180.62	0.11
	2,6-DNT	12	59.92	52.81	2.681	4.09E+01	100.79	0.13
	o-NT	13	280.39	250.83	2.650	1.84E+02	464.74	37
	p-NT	12	143.17	162.14	2.681	1.25E+02	268.65	37
MWS15	**2,4-DNT**	14	0.28	0.45	2.624	3.12E-01	0.59	0.11
	2,6-DNT	12	0.64	0.70	2.681	5.40E-01	1.18	0.13
MWD15	**2,6-DNT**	11	0.43	0.16	2.718	1.27E-01	0.56	0.13
MWS16	**2,4,6-TNT**	14	3.00	0.58	2.624	4.05E-01	3.41	2.8
	2,6-DNT	14	0.83	0.10	2.624	7.12E-02	0.90	0.13
MWS21	**2,4-DNT**	13	0.23	0.11	2.650	7.72E-02	0.30	0.11
MWS22	***2,6-DNT***	8	0.10	0.08	2.896	7.78E-02	0.17	0.13

Table 3 -- Summary of Nitroaromatic Data Statistical Analysis:
Wells and Springs with an Upper Limit Confidence Interval that Exceeds a PRG

Well ID	Analytical Parameter	n	Mean, x_{mean}	Standard Deviation, S	$t_{(0.99,n-1)}$ t	99% Confidence Interval, $I = t * S / (n)^{0.5}$	Upper Limit of 99% Confidence Interval, $x_{mean} + I$	PRG
			µg/L	µg/L		µg/L	µg/L	µg/L
WSTA Unweathered Burlington-Keokuk Bedrock Wells								
MWD09	***2,6-DNT***	13	0.13	0.10	2.650	7.54E-02	0.20	0.13
MWS06	**2,6-DNT**	9	0.15	0.30	2.821	2.77E-01	0.43	0.13
MWS17	**2,4-DNT**	14	0.13	0.14	2.624	9.59E-02	0.23	0.11
	2,6-DNT	14	0.67	0.37	2.624	2.62E-01	0.93	0.13
WSTA Other Wells (Screened in a formation other than the Burlington-Keokuk)								
NONE								
WSOW Weathered Burlington-Keokuk Bedrock Wells								
MWS107	**2,6-DNT**	13	0.23	0.14	2.650	1.05E-01	0.33	0.13
MWS110	**2,6-DNT**	13	0.09	0.06	2.650	4.76E-02	0.14	0.13
USGS4	**2,4-DNT**	14	0.12	0.09	2.624	6.60E-02	0.19	0.11
	2,6-DNT	12	2.65	0.61	2.681	4.75E-01	3.13	0.13
USGS9	***2,4-DNT***	14	0.10	0.15	2.624	1.08E-01	0.21	0.11
WSOW Unweathered Burlington-Keokuk Bedrock Wells								
NONE								
WSOW Other Wells (Screened in a formation other than the Burlington-Keokuk)								
NONE								
Springs								
SP5201	***2,6-DNT***	14	*0.11*	0.08	2.624	5.91E-02	0.17	0.13
SP5303	**2,4,6-TNT**	6	21.20	24.44	3.143	3.14E+01	52.56	2.8
	2,6-DNT	5	*0.11*	0.14	3.365	2.09E-01	0.32	0.13
SP5602	***2,4,6-TNT***	13	*2.41*	1.34	2.650	9.84E-01	3.39	2.8
	2,4-DNT	13	0.18	0.29	2.650	2.13E-01	0.39	0.11
	2,6-DNT	12	1.56	1.35	2.681	1.05E+00	2.61	0.13
SP5605	**2,4,6-TNT**	12	25.28	15.08	2.681	1.17E+01	36.95	2.8
	2,4-DNT	12	*0.10*	0.06	2.681	4.98E-02	0.14	0.11
	2,6-DNT	12	0.70	0.46	2.681	3.53E-01	1.05	0.13
SP6301	***2,6-DNT***	12	*0.11*	0.07	2.681	5.46E-02	0.16	0.13
SP6303	**2,4-DNT**	5	0.12	0.15	3.365	2.29E-01	0.35	0.11
	2,6-DNT	4	0.45	0.70	3.747	1.32E+00	1.77	0.13

Italics indicate that the mean concentration was below the PRG.
U Coded data replaced with a value no less than half the detection limit (0.05 µg/L)
R Coded data was not used in calculations
"n" is the number of data points used in the calculation
See Appendix B for comprehensive listing of calculations

Table 4 -- Summary of Upper Limit 99% Confidence Intervals Presented in Table 3

Analyte	1,3-DNB	2,4,6-TNT	2,4-DNT	2,6-DNT	o-NT	p-NT
PRG	**1**	**2.8**	**0.11**	**0.13**	**37**	**37**
WSTA and WSOW Overburden Wells						
MWV01		*5.59*	0.49	0.70		
MWV09		29.77	46.30	6.15		
MWV16				*0.20*		
MWV17				0.78		
MWV22				*0.15*		
MWV24R				0.78		
WSTA Weathered Burlington-Keokuk Bedrock Wells						
MWS01				0.21		
MWS04		*4.01*	0.44	1.36		
MWS07				0.62		
MWS10				1.34		
MWS11				0.51		
MWS12	7.25	*4.57*	180.62	100.79	464.74	268.65
MWS15			0.59	1.18		
MWD15				0.56		
MWS16		3.41		0.90		
MWS21			0.30			
MWS22				*0.17*		
WSTA Unweathered Burlington-Keokuk Bedrock Wells						
MWD09				*0.20*		
MWS06				0.43		
MWS17			0.23	0.93		
WSTA Other Wells (Screened in a formation other than the Burlington-Keokuk): NONE						
WSOW Weathered Burlington-Keokuk Bedrock Wells						
MWS107				0.33		
MWS110				0.14		
USGS4			0.19	3.13		
USGS9			0.21			
WSOW Unweathered Burlington-Keokuk Bedrock Wells : NONE						
WSOW Other Wells (Screened in a formation other than the Burlington-Keokuk): NONE						
Springs						
SP5201				*0.17*		
SP5303		52.56		*0.32*		
SP5602		3.39	0.39	2.61		
SP5605		36.95	0.14	1.05		
SP6301				*0.16*		
SP6303			0.35	1.77		

Concentration (µg/L) is based upon a normal confidence interval using the 99th percentile of the t-distribution taken from EPA Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities. Some points presented had mean, average, concentrations at or below the PRG, those points are identified in this table by *italics* . If all compounds identified for a particular well/spring had a mean concentration at or below the PRG, the well/spring is also identified using italics.

Table 5 -- Results of Nitroaromatic Trend Analysis for Select Wells and Springs

Well ID	Analytical Parameter	PRG	Mean	Upper Limit of 99% Confidence Interval	m	b	R^2	Estimated Time to Reach PRG in Years
MWS12	1,3-DNB	1	2.98	7.25	0.846	-1.820	0.439	a
SP5605	2,4,6-TNT	2.8	25.28	36.95	-0.318	3.753	0.111	9
MWV09	2,4,6-TNT	2.8	24.49	29.77	-0.135	3.441	0.203	18
SP5303	2,4,6-TNT	2.8	21.20	52.56	0.683	0.236	0.091	a
MWS16	2,4,6-TNT	2.8	3.00	3.41	-0.019	1.124	0.013	5
SP5602	2,4,6-TNT	2.8	2.41	3.39	NA	NA	NA	NA
MWS12	2,4,6-TNT	2.8	1.94	4.57	NA	NA	NA	NA
MWV01	2,4,6-TNT	2.8	1.62	5.59	NA	NA	NA	NA
MWS04	2,4,6-TNT	2.8	1.50	4.01	NA	NA	NA	NA
MWS12	2,4-DNT	0.11	79.85	180.62	0.862	1.638	0.578	a
MWV09	2,4-DNT	0.11	37.37	46.30	-0.036	3.621	0.008	163
MWS15	2,4-DNT	0.11	0.28	0.59	-0.223	-0.331	0.147	8
MWS21	2,4-DNT	0.11	0.23	0.30	-0.295	-0.714	0.466	5
MWV01	2,4-DNT	0.11	0.21	0.49	-1.030	1.720	0.419	4
MWS04	2,4-DNT	0.11	0.19	0.44	-0.494	-0.968	0.348	3
SP5602	2,4-DNT	0.11	0.18	0.39	-0.257	-1.106	0.044	4
MWS17	2,4-DNT	0.11	0.13	0.23	-0.143	-1.384	0.026	6
USGS4	2,4-DNT	0.11	0.12	0.19	0.108	-2.322	0.040	a
SP6303	2,4-DNT	0.11	0.12	0.35	NA	NA	NA	b
USGS9	2,4-DNT	0.11	0.10	0.21	NA	NA	NA	NA
SP5605	2,4-DNT	0.11	0.10	0.14	NA	NA	NA	NA
MWS12	2,6-DNT	0.13	59.92	100.79	0.532	2.572	0.632	a
MWV09	2,6-DNT	0.13	4.39	6.15	-0.135	1.946	0.150	29
USGS4	2,6-DNT	0.13	2.65	3.13	0.053	0.836	0.091	a
SP5602	2,6-DNT	0.13	1.56	2.61	-0.040	0.363	0.003	60
MWS04	2,6-DNT	0.13	1.11	1.36	-0.198	0.530	0.568	13
MWS10	2,6-DNT	0.13	0.97	1.34	-0.070	0.268	0.048	33
MWS16	2,6-DNT	0.13	0.83	0.90	0.055	-0.309	0.244	a
SP5605	2,6-DNT	0.13	0.70	1.05	-0.055	-0.359	0.004	31
MWV24R	2,6-DNT	0.13	0.67	0.78	-0.105	-0.198	0.323	18
MWS17	2,6-DNT	0.13	0.67	0.93	-0.145	-0.001	0.134	14
MWS15	2,6-DNT	0.13	0.64	1.18	0.001	-0.314	0.000	c
MWS07	2,6-DNT	0.13	0.50	0.62	0.034	-0.716	0.028	a
SP6303	2,6-DNT	0.13	0.45	1.77	NA	NA	NA	NA
MWD15	2,6-DNT	0.13	0.43	0.56	0.291	-1.296	0.568	a
MWS11	2,6-DNT	0.13	0.35	0.51	0.116	-1.088	0.118	a
MWV01	2,6-DNT	0.13	0.30	0.70	1.614	-6.363	0.912	a
MWV17	2,6-DNT	0.13	0.23	0.78	NA	NA	NA	d
MWS107	2,6-DNT	0.13	0.23	0.33	-0.007	-1.199	0.001	115
MWS06	2,6-DNT	0.13	0.15	0.43	NA	NA	NA	c
MWS01	2,6-DNT	0.13	0.15	0.21	-0.049	-1.433	0.016	12
MWD09	2,6-DNT	0.13	0.13	0.20	NA	NA	NA	NA
SP5303	2,6-DNT	0.13	0.11	0.32	NA	NA	NA	NA
SP6301	2,6-DNT	0.13	0.11	0.16	NA	NA	NA	NA
SP5201	2,6-DNT	0.13	0.11	0.17	NA	NA	NA	NA
MWV16	2,6-DNT	0.13	0.11	0.20	NA	NA	NA	NA
MWS22	2,6-DNT	0.13	0.10	0.17	NA	NA	NA	NA
MWV22	2,6-DNT	0.13	0.09	0.15	NA	NA	NA	NA
MWS110	2,6-DNT	0.13	0.09	0.14	NA	NA	NA	NA
MWS12	o-NT	37	280.39	464.74	0.683	3.695	0.412	a
MWS12	p-NT	37	143.17	268.65	0.662	2.918	0.422	a

a Concentrations show upward trend; therefore, no estimate performed. These monitoring points are discussed in Chapter 4

b No detects since Round 25. Therefore, well/spring is not in the current network

c Too few data points to establish a trend (trending focused on detections rather than a lack of detections. Results were primarily non-detect

d Spring 6303 is not part of the current network due to spring 6301 being more downgradient. As a result, there is not enough data to perform a trend analysis.

NA Not applicable. Wells and springs with mean concentrations below PRGs were not included in trend analysis.

Table B-4-1 WSTA and WSOW Overburden Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV01	1,3,5-TNB								U	U		U	U	U	
	1,3-DNB								U	U		U	U	U	
	NB								U	U		U	U	U	
	2,4,6-TNT								U	6.3		0.99	0.2 J	0.54	
	4-A-2,6-DNT								0.2 J	4.7		1.4	1.3	1.6	
	2-A-4,6-DNT								0.07 J	2.8		0.79	0.75	0.78	
	2,6-DNT								0.1 J	0.088 J		0.23 J	0.34 J	0.74 J	
	2,4-DNT								U	0.52 J		0.1 J	0.2 J	0.2 J	
	o-NT								U	U		U	U	U	
	p-NT								U	U		U	U	U	
	m-NT								U	U		U	U	U	
	2,6-DA-4-NT								U	U		U	U	U J	
	4,6-DA-2-NT								U	U		U	U	U	
	2-A-6-NT								U	U		U	U	U	
	4-A-2-NT								U	.60 J		U	U	U	
	2-A-4 NT								U	U		U	U	U	

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV02	1,3,5-TNB								0.3 J	U		U	U	U	
	1,3-DNB								U	U		U	U	U	
	NB								U	U		U	U	U	
	2,4,6-TNT								U	U		U	U	U	
	4-A-2,6-DNT								U	U		0.1 J	U	U	
	2-A-4,6-DNT								U	U		U	U	U	
	2,6-DNT								U	U		U	U	U	
	2,4-DNT								U	U		U	U	U	
	o-NT								U	U		U	U	U	
	p-NT								U	U		U	U	U	
	m-NT								U	U		U	U	U	
	2,6-DA-4-NT								U	U		U	U	U J	
	4,6-DA-2-NT								U	U		U	U	U	
	2-A-6-NT								U	U		U	U	U	
	4-A-2-NT								U	U		U	U	U	
	2-A-4 NT								U	U		U	U	U	

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-1 WSTA and WSOW Overburden Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV08	1,3,5-TNB								U				U		
	1,3-DNB								U				U		
	NB								U				U		
	2,4,6-TNT								U				U		
	4-A-2,6-DNT								U				U		
	2-A-4,6-DNT								U				U		
	2,6-DNT								U				U		
	2,4-DNT								U				U		
	o-NT								U				U		
	p-NT								U				U		
	m-NT								U				U		
	2,6-DA-4-NT								U				U		
	4,6-DA-2-NT								U				U		
	2-A-6-NT								U				U		
	4-A-2-NT								U				U		
	2-A-4 NT								U				U		

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV09	1,3,5-TNB	27	13.090 J	20	27	26	27	21	22	13	30	32	27	13	24.0
	1,3-DNB	0.78 J	10.210 R	0.4 J	0.77	0.71	0.88 J	0.69	U	U	0.76 J	0.74 J	0.72	0.3 J	0.64
	NB	U	13.900	U	U	U	0.08 J	U	U	U	U	U	U	U	U
	2,4,6-TNT	34	15.890	25	33	33 J	35	25 J	23	13	26	25	23	12	20.0
	4-A-2,6-DNT	17	10.980	13 J	15 J	22 J	20	16 J	14	9.3	16	14	13	8.5	13.0
	2-A-4,6-DNT	30	16.070 J	17 J	25	27 J	29	22	20	12.0	22	20	19	12	18.0
	2,6-DNT	U	3.110 R	4.2	6.5	U	7.5	5.2	7.6 J	3.1	5.5	5.0 J	4.8 J	2.8 J	4.8
	2,4-DNT	40	20.200 J	31	47	44	55	44	40	13	45	46 J	43	15	40.0
	o-NT	2.1 J	U	2.1 J	3.3 J	3.60 J	4.0	3.0 J	2.8	1.7	3.1	2.9 J	2.8	1.5	2.5
	p-NT	U	1.820	0.51 J	0.66 J	0.52 J	0.72 J	0.6 J	0.55 J	0.2 J	0.61 J	0.64 J	0.66 J	0.2 J	0.59 J
	m-NT	U	U	0.52 J	0.49 J	0.20 J	0.41 J	0.2 J	0.56 J	U	U	U	U	0.2 J	0.3 J
	2,6-DA-4-NT			8.7 R	1.4 R	U	U	U	U	2.5 R	U	U	4.2 R	U J	U
	4,6-DA-2-NT			3.2 J	2.9	0.60 J	U	U	2.4	U	U R	U	U	U	6.1
	2-A-6-NT			0.45 R	0.7 J	0.65 J	0.63	0.51 J	0.39 J	1.0	0.48	0.60	0.42 J	0.53 J	1.1 J
	4-A-2-NT			0.85	1.56 J	U	1.5 J	0.91	U	1.0 J	1.2 J	1.6 J	0.93	0.50 J	4.2
	2-A-4 NT			0.85	1.2 J	1.10 J	1.3	1.2	1.0 J	0.60 J	1.0 J	1.3 J	0.94 J	0.33 J	2.1

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U: non-detect

Table B-4-1 WSTA and WSOW Overburden Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV13	1,3,5-TNB	U R	U						U				U		
	1,3-DNB	U	U						U				U		
	NB	U	U						U				U		
	2,4,6-TNT	U	U						U				U		
	4-A-2,6-DNT	U	U						U				U		
	2-A-4,6-DNT	U	U						U				U		
	2,6-DNT	U	U						U				U		
	2,4-DNT	U	U						U				U		
	o-NT	U	U						U				U		
	p-NT	U	U						U				U		
	m-NT	U	U						U				U		
	2,6-DA-4-NT								U				U		
	4,6-DA-2-NT								U				U		
	2-A-6-NT								U				U		
	4-A-2-NT								U				U		
	2-A-4 NT								U				0.1 J		

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV16	1,3,5-TNB	0.76 J	2.626	4.0	0.08 J	U	.37	0.2 J	U	U	0.51	1.1	U	0.1 J	0.44
	1,3-DNB	U	0.732 J	U R	U	U	U	U	U	U	U	U	U	U	U
	NB	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	3.556	1.9	U	0 J	0.2 J	0.49 J	U	U	0.2 J	0.41	U	U	0.2 J
	4-A-2,6-DNT	0.84 J	2.560 J	2.2	U	0 J	0.63	0.45 J	U	U	0.50	0.77	U	U	0.38
	2-A-4,6-DNT	0.53 J	3.736 J	1.6	U	0 J	0.40	0.27 J	U	U	0.30	0.45	U	U	0.22 J
	2,6-DNT	U	0.531 J	0.27 J	U	0.09 J	U	U	U	U	U	0.1 J	U	U	U
	2,4-DNT	U	U	U	U	0 J	U	U	U	U	U	0.04 J	U	U	U
	o-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			18.1 R	U	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			2.1 R	0.52 R	U	U	U	U	U	U R	U	U	U	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			0.6	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U	U	U	U	U	U	U	U	U	U

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Table B-4-1 WSTA and WSOW Overburden Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV17	1,3,5-TNB								6.2			U	U	U	
	1,3-DNB								U			U	U	U	
	NB								U			U	U	U	
	2,4,6-TNT								2.1			U	U	U	
	4-A-2,6-DNT								3.0			U	U	0.25	
	2-A-4,6-DNT								2.1			U	U	0.1 J	
	2,6-DNT								0.66			U	U	0.16 J	
	2,4-DNT								U			U	U	U	
	o-NT								U			U	U	U	
	p-NT								U			U	U	U	
	m-NT								U			U	U	U	
	2,6-DA-4-NT								U			U	U	U	
	4,6-DA-2-NT								U			U	U	U	
	2-A-6-NT								U			U	U	U	
	4-A-2-NT								U			U	U	U	
	2-A-4 NT								U			U	U	U	

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV18	1,3,5-TNB								U						
	1,3-DNB								U						
	NB								U						
	2,4,6-TNT								U						
	4-A-2,6-DNT								U						
	2-A-4,6-DNT								U						
	2,6-DNT								U						
	2,4-DNT								U						
	o-NT								U						
	p-NT								U						
	m-NT								U						
	2,6-DA-4-NT								U						
	4,6-DA-2-NT								U						
	2-A-6-NT								U						
	4-A-2-NT								U						
	2-A-4 NT								U						

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Table B-4-1 WSTA and WSOW Overburden Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV22	1,3,5-TNB	U	U				U		U			U	U	U	U
	1,3-DNB	U	U				U		U			U	U	U	U
	NB	U	U				U		U			U	U	U	U
	2,4,6-TNT	U	U				U		U			U	U	U	U
	4-A-2,6-DNT	U	U				0.24		U			0.22	0.25	U	0.19
	2-A-4,6-DNT	U	U				0.09 J		U			0.08 J	0.1 J	U	0.07 J
	2,6-DNT	U	U				U		U			0.15 J	0.16 J	0.16	U
	2,4-DNT	U	U				U		U			U	U	U	U
	o-NT	U	U				U		U			U	U	U	U
	p-NT	U	U				U		U			U	U	U	U
	m-NT	U	U				U		U			U	U	U	U
	2,6-DA-4-NT						U		U			U	U	U	U
	4,6-DA-2-NT						U		U			U	U	U	U
	2-A-6-NT						0.1 J		U			U	U	U	U
	4-A-2-NT						U		U			U	U	U	U
	2-A-4 NT						U		U			U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV24R	1,3,5-TNB	1.3 J	1.490	0.71	0.8	1	0.74	0.56	0.55	0.91	0.85	0.89	0.66	1.1	1.2
	1,3-DNB	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	NB	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	0.585 J	U	U	0 J	U	U	U	U	U	U	U	0.1 J	0.2 J
	4-A-2,6-DNT	0.62 J	0.403 J	0.39	0.49	0 J	0.62	0.59	0.48	0.54	0.58	0.49	0.32	0.64	0.67
	2-A-4,6-DNT	U	0.478 J	0.1 J	0.1 J	0 J	0.18	0.2 J	0.2 J	0.2 J	0.2 J	0.2 J	0.09 J	0.21	0.21 J
	2,6-DNT	0.85 J	0.950	0.50 J	0.69	0.77	0.77	0.69	0.58	0.52 R	0.65	0.55 J	0.43 J	0.60 J	0.68
	2,4-DNT	U	U	U	0.06 J	0 J	0.1 J	0.05 J	U	U	0.05 J	0.06 J	U	U	U
	o-NT	U	U	U	0.1 J	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U J	U	U	U	U	U	U	U	U	U

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U: non-detect

Table B-4-1 WSTA and WSOW Overburden Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV27	1,3,5-TNB												0.3 J	0.3 J	0.82
	1,3-DNB												U	U	U
	NB												U	U	U
	2,4,6-TNT												0.35	0.3 J	0.66 J
	4-A-2,6-DNT												2.2	2.2	3.5
	2-A-4,6-DNT												1.5	1.5	2.3
	2,6-DNT												0.48 R	0.64 R	0.68
	2,4-DNT												U	0.05 R	0.04 R
	o-NT												U	U	U
	p-NT												U	U	U
	m-NT												U	U	U
	2,6-DA-4-NT												U	U	U
	4,6-DA-2-NT												U	U	1.2 R
	2-A-6-NT												U	U	U
	4-A-2-NT												U	U	U
	2-A-4 NT												U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV28	1,3,5-TNB												U	U	U
	1,3-DNB												U	U	U
	NB												U	U	U
	2,4,6-TNT												U	U	U
	4-A-2,6-DNT												U	U	U
	2-A-4,6-DNT												U	U	U
	2,6-DNT												U	U	U
	2,4-DNT												U	U	U
	o-NT												U	U	U
	p-NT												U	U	U
	m-NT												U	U	U
	2,6-DA-4-NT												U	U	U
	4,6-DA-2-NT												U	U	U
	2-A-6-NT												U	U	U
	4-A-2-NT												U	U	U
	2-A-4 NT												U	U	U

Concentrations are in µg/L
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Table B-4-1 WSTA and WSOW Overburden Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV29	1,3,5-TNB											U	U	U	U
	1,3-DNB											U	U	U	U
	NB											U	U	U	U
	2,4,6-TNT											U	U	U	U
	4-A-2,6-DNT											U	U	U	U
	2-A-4,6-DNT											U	U	U	U
	2,6-DNT											U	U	U	U
	2,4-DNT											U	U	U	U
	o-NT											U	U	U	U
	p-NT											U	U	U	U
	m-NT											U	U	U	U
	2,6-DA-4-NT											U	U	U	U
	4,6-DA-2-NT											U	U	U	U
	2-A-6-NT											U	U	U	U
	4-A-2-NT											U	U	U	U
	2-A-4 NT											U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (May-03)
MWV103	1,3,5-TNB													U	
	1,3-DNB													U	
	NB													U	
	2,4,6-TNT													U	
	4-A-2,6-DNT													U	
	2-A-4,6-DNT													U	
	2,6-DNT													U	
	2,4-DNT													U	
	o-NT													U	
	p-NT													U	
	m-NT													U	
	2,6-DA-4-NT													U J	
	4,6-DA-2-NT													U	
	2-A-6-NT													U	
	4-A-2-NT													U	
	2-A-4 NT													U	

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS01	1,3,5-TNB	U	U	U	0.07 R	U J	U	U	0.08 R	U	U	U	U	U	U
	1,3-DNB	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	NB	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	0.08 J	U J	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U J	U	0.1 J	U	U	U	U	U	U	0.1 J
	2-A-4,6-DNT	U	U	U	U	U J	U	0.08 J	U	U	U	U	U	U	U
	2,6-DNT	0.047	U	U	0.16 J	U J	0.24	U	0.23	.26	U	0.24 J	0.23 J	0.28 J	0.1 J
	2,4-DNT	U	U	U	U	U J	U	U	U	U	U	U	U	0.04 J	U
	o-NT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U J	U	U	U	U	U	U	U	U J	U
	4,6-DA-2-NT			U	0.2 R	U J	U	U	U	U	U	U	U	U J	U
	2-A-6-NT			U	0.1 J	U J	U	0.2 J	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U J	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U J	U	U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS02	1,3,5-TNB	U	U				U		U			U	U	U	U
	1,3-DNB	U	U				U		U			U	U	U	U
	NB	U	U				U		U			U	U	U	U
	2,4,6-TNT	U	U				U		U			U	U	U	U
	4-A-2,6-DNT	U	U				U		U			U	U	U	U
	2-A-4,6-DNT	U	U				U		U			U	U	U	U
	2,6-DNT	U	U				U		U			U	U	U	U
	2,4-DNT	U	U				U		U			U	U	U	U
	o-NT	U	U				U		U			U	U	U	U
	p-NT	U	U				U		U			U	U	U	U
	m-NT	U	U				U		U			U	U	U	U
	2,6-DA-4-NT						U		U			U	U	U J	U
	4,6-DA-2-NT						U		U			U	U	U	U
	2-A-6-NT						U		U			U	U	U	U
	4-A-2-NT						U		U			U	U	U	U
	2-A-4 NT						U		U			U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS04	1,3,5-TNB		11.300 J	10	9.8	9	8.3	7.4	10	9.2	10	10	8.8	9.3	9.8
	1,3-DNB		1.540 J	U	U	U	U	U	U	U	0.09 J	0.1 J	0.1 J	0.09 J	0.09 J
	NB		1.250 J	U	0.07 J	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT		12.800 J	U	1.2	U	0.82	0.65	0.74	.59	0.59	0.52	0.49 J	0.49	0.56 J
	4-A-2,6-DNT		3.170 J	4.4	5.2	6	5.1	4.6 J	4.1	5.0	4.2	3.4	3.5	3.5	3.3
	2-A-4,6-DNT		5.940 J	4.1	4.6 J	4	4.7	4.3 J	3.7	4.5	3.7	3.4	3.4	3.4	3.4
	2,6-DNT		2.150 J	1.2	1.2	0.86	1.1	1.2 J	1.1	1.1	1.1	0.87 J	0.94 J	0.77 J	0.81
	2,4-DNT		1.320 J	0.1 J	U	0 J	0.06 J	0.1 J	0.09 J	0.1 J	0.09 J	0.06 J	0.07 J	0.1 J	0.1 J
	o-NT		U	0.1 J	0.1 J	U	U	0.24 J	U	0.19 J	U	0.18 J	U	U	0.1 J
	p-NT		U	U	U	U	U	0.1 R	U	U	U	U	U	U	U
	m-NT		U	0.08 R	U	U	U	0.1 R	U	0.09 R	U	U	U	U	U
	2,6-DA-4-NT			U	U	U	U	U	1.4 R	U	U	U	U	U J	U
	4,6-DA-2-NT			U	0.8 J	1.70	U	U	1.8	1.3	1.0 J	U	U	U	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	0.10 R	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	7.9 R	U	U	U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS07	1,3,5-TNB	10	10.400 J	11	12	12	12	8.8	13	11	12	13	16	13	13.0
	1,3-DNB	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	NB	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	1.2 R	1.020 J	0.74	1.7 J	U	U	1.0 J	1.1	0.78 J	0.71	0.72	0.90	0.77	0.73
	4-A-2,6-DNT	9.4	8.640 J	7.4	9.7	10	11	8.2 J	7.8	8.10	8.7	7.7	10	8.9	8.7
	2-A-4,6-DNT	4 J	6.020 J	3.2	4.3 J	4	4.8	3.7 J	3.4	3.50	3.7	3.4	4.6	3.9	3.8
	2,6-DNT	0.58 J	U	0.32 J	0.58	0.44 J	0.69	0.61 J	0.42 J	0.65	0.49 J	0.45 J	0.62 J	0.66 J	0.50
	2,4-DNT	U	U	U	0.04 J	0 J	U	0.05 J	0.07 J	0.2 J	0.04 J	0.06 J	0.07 J	0.08 J	0.04 J
	o-NT	U	U	0.1 R	0.23 R	0.20 R	U	0.2 R	U	U	U	U	0.24	U	U
	p-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	0.2 R	U	0.20 R	U	0.2 R	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U	U	U	U	0.59 J	U	U	U	U	U
	4,6-DA-2-NT			1.1 J	0.34	0.24	U	U	U	1.2 J	0.21 R	U	U	U	U
	2-A-6-NT			0.38 R	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			0.60 R	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	6.2 R	U	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
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Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS08	1,3,5-TNB	U	U	U	U	U	U	0.1 R	U	U	U	U	U	U	U
	1,3-DNB	U	U	U	U	0.10 R	U	U	U	U	U	U	U	U	U
	NB	3.1	U	U	0.1 J	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	0.65 J	U	U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U R	U	0.10 J	U	U	U	U R	U	U	U	U	U
	2,4-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	o-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	0.1 J	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U R	0.42 R	U	U	U	U	U	U	U	U	U J	U
	2-A-6-NT			U	U	U	U	U	U	U	0.07 J	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U	U	U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS09	1,3,5-TNB	U	U	U	U	U	U	U	U	U	U		U		
	1,3-DNB	U	U	U	U	U	U	U	U	U	U		U		
	NB	U	U	U	U	U	U	U	U	U	U		U		
	2,4,6-TNT	U	U	U	U	U J	U	U	U	U	U		U		
	4-A-2,6-DNT	U	U	U	U	U	U	U	U	U	U		U		
	2-A-4,6-DNT	U	U	U	U	U	U	U	U	U	U		U		
	2,6-DNT	U	U	U R	U	U	U	U	U	U	U		U		
	2,4-DNT	U	U	U	U	U	U	U	U	U	U		U		
	o-NT	U	U	U	U	U	U	U	U	U	U		U		
	p-NT	U	U	U R	U	U	U	U	U	U	U		U		
	m-NT	U	U	U	U	U	U	U	U	U	U		U		
	2,6-DA-4-NT			U	U	U	U	U	U	U	U		U		
	4,6-DA-2-NT			U R	U	U	U	U	U	U	U R		U		
	2-A-6-NT			U	U	U	U	U	U	U	U		U		
	4-A-2-NT			U	U	U	U	U	U	U	U		U		
	2-A-4 NT			U	U	U J	U	U	U	U	U		U		

Concentrations are in µg/L
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Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS10	1,3,5-TNB	U R	1.720 J	0.90	0.72	1 J	0.74	0.64 J	0.99	1.2	0.94 J	0.90 J	U	0.89 J	0.9 J
	1,3-DNB	U R	0.800 R	U	U	U J	U	U	U	U	U	U J	U	U	U
	NB	0.48 R		U	0.08 J	U J	U	U	U	U	U	U J	U	U	U
	2,4,6-TNT	U R	U	U	0.2 J	U J	U	0.7 J	U	U	U	0.1 J	U	U	U
	4-A-2,6-DNT	14 R	11.700 J	8.9	11	11 J	11	9.2	9	9.8	8.7	8.1 J	11	10	10.0
	2-A-4,6-DNT	6 R	5.100 J	3.7	4.5	4 J	4.6	3.8 J	3.8	3.7	3.5	3.1 J	4.1	3.6	4.0 J
	2,6-DNT	2 R	4.580 R	1.2	1.4	1.00 J	1.5	1.2	0.58	1.2	1.2	1.2 J	U	1.0 J	U
	2,4-DNT	U R	U	U	U	U J	U	0.05 J	0.07 J	0.1 J	U	0.06 J	U	U	U
	o-NT	U R	U	U	U	U J	U	U	U	U	U	0.09 J	U	U	U
	p-NT	U R	U	U	0.29	U J	U	U	U	U	U	U J	U	U	U
	m-NT	U R		U	U	U J	U	U	U	U	U	U J	U	U	U
	2,6-DA-4-NT			1.1 J	U	U J	U	U	U	U	U	U J	U	U J	0.4 R
	4,6-DA-2-NT			4.5 J	0.52	0.10 J	U	U	U	0.67 J	U	U J	U	U	U
	2-A-6-NT			U	U	0.32 R	U	U	U	U	U	U J	U	U	U
	4-A-2-NT			U	U	0.28 R	U	U	U	U	U	U J	1 J	U	U
	2-A-4 NT			U	U	U J	U	U	U	U	U	U J	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS11	1,3,5-TNB	U R	U	0.3 J	0.09 J	U	0.2 J	0.2 J	U	0.1 J	0.2 J	U	0.2 J	U	U
	1,3-DNB	U R	U	U	U	U	U	U	U	U	U	U	U	U	U
	NB	U R	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	1.4 R	U	U	U	U J	U	0.41 J	U	U	U	U	U	U	U
	4-A-2,6-DNT	0.45 R	U	1.3	1.9	2 J	2.3	1.8	1.8	1.8	1.92	1.5	2.1	U	2.6 R
	2-A-4,6-DNT	U R	U	0.25 J	0.38 J	1 J	0.5	0.34 J	0.39	0.36	0.37	0.33	0.43	U	U
	2,6-DNT	U R	U	0.34 R	0.44	0.26 J	0.62	0.39	0.46	0.48	0.48	0.42 J	0.52 J	U	U
	2,4-DNT	U R	U	U	U	U	U	U	U	U	U	U	U	U	U
	o-NT	U R	U	U	U	U	U	0.08 R	U	0.1 R	U	U	U	U	U
	p-NT	U R	U	U	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U R	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			0.21	U	U	U	U	U	U	0.1 J	U	U	U	U
	4,6-DA-2-NT			0.76 R	U	0.29 R	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	0.20 R	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	0.10 R	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U J	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
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Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS12	1,3,5-TNB	1.1 R	8.490 J	6.8	4	5	29	3.2	24	86	6.9	17	47	360	5.8 J
	1,3-DNB	0.66 R	10.910 R	0.3 J	0.8 J	0.40 J	0.7 J	0.64	1.8 J	5.0	0.9 J	1.0 J	3 J	20	1.2 J
	NB	U R	U	U	U	U	U	U	U	U	0.6 J	1.0 J	U	6.5	U
	2,4,6-TNT	U R	U	U	U	0 J	U	6.8 J	0.3 J	2.6 J	U	0.95 J	2 J	12	U
	4-A-2,6-DNT	3.2 R	2.050 J	1.5	2.5	3 J	2.2	2.6 J	4.2 J	5.0	4.2 J	4.4	6.1	24	7.9
	2-A-4,6-DNT	0.98 R	9.760 J	0.52	0.63	1 J	1 J	0.71 J	1.1 J	2.3 J	1.0 J	1.0 J	2 J	8.8	4.6 J
	2,6-DNT	23 R	67.800 R	20	33	26.00	41 J	32	54	63	44	55 J	71	220 J	60.0
	2,4-DNT	9.7 R	15.900 J	9.1	18	10	24 J	23	59	130	30	54	100	520	45.0
	o-NT	74 R	U	120	163	91.00 J	200.0	210	440 J	260	240	380 J	440	960	330.
	p-NT	15 R	113.000 R	39	83 J	16.00 J	62	74	200 J	110 J	55 J	160 J	210	620 J	89.0
	m-NT	8.6 R	17.300 J	9.1	17 J	5.30 J	17 J	16	29	17	19	26	30	72	25.0
	2,6-DA-4-NT			U	1.9 R	U	U	U	U	U	11 R	U	U	U J	U
	4,6-DA-2-NT			U	0.84	0.51 J	U	0.4	U	3.7 J	U R	U	U	12	U
	2-A-6-NT			2.9	7.7	1.20 J	7.9	6.7	13	2.0 J	8.9	12	10	4.0	12.0
	4-A-2-NT			1.1	3.8 J	1.80 J	6.3	5.1	6.7	3.7 J	9.5	15	11	3.3 J	14.0
	2-A-4 NT			0.48	0.94 J	0.38 J	1.5 J	1.3 J	2.0 J	0.4 J	2.7	3.5	3.7	2.0 J	4.4

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS13	1,3,5-TNB	U R	U						U				U		
	1,3-DNB	U	U						U				U		
	NB	U	U						U				U		
	2,4,6-TNT	U	U						U				U		
	4-A-2,6-DNT	U	U						U				U		
	2-A-4,6-DNT	U	U						U				U		
	2,6-DNT	U	U						U				U		
	2,4-DNT	U	U						U				U		
	o-NT	U	U						U				U		
	p-NT	U	U						U				U		
	m-NT	U	U						U				U		
	2,6-DA-4-NT								U				U		
	4,6-DA-2-NT								U				U		
	2-A-6-NT								U				U		
	4-A-2-NT								U				U		
	2-A-4 NT								U				U		

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U: non-detect

Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS14	1,3,5-TNB	U R	U						U			U	U	U	U
	1,3-DNB	U	U						U			U	U	U	U
	NB	U	U						U			U	U	U	U
	2,4,6-TNT	U	U						U			U	U	U	U
	4-A-2,6-DNT	U	U						U			U	U	U	U
	2-A-4,6-DNT	U	U						U			U	U	U	U
	2,6-DNT	U	U						U			U	U	U	U
	2,4-DNT	U	U						U			U	U	U	U
	o-NT	U	U						U			U	U	U	U
	p-NT	U	U						U			U	U	U	U
	m-NT	U	U						U			U	U	U	U
	2,6-DA-4-NT								U			U	U	U	U
	4,6-DA-2-NT								U			U	U	U	U
	2-A-6-NT								U			U	U	U	U
	4-A-2-NT								U			U	U	U	U
	2-A-4 NT								U			U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS15	1,3,5-TNB	U	0.282 J	0.2 J	0.2 J	0 J	U	U	U	U	U	U	U	U	U
	1,3-DNB	U	0.194 R	U	U	U	U	U	U	U	U	U	U	U	U
	NB	U	0.760	U	U	U	U	U	U	U	U	0.2 J	U	U	U
	2,4,6-TNT	U	4.030	1.1	U	1 J	U	U	U	0.37	U	0.37 J	0.09 J	0.68	0.77
	4-A-2,6-DNT	1.7 J	3.470 J	5.4	5.7	2	U	U	0.22 J	2.6	2.5	1.4	2.7	4.5	4.7
	2-A-4,6-DNT	0.78 J	7.390 J	2.8 J	3.2	0 J	U	U	0.09 J	1.1	0.91	0.37	1.0	2.3	2.2
	2,6-DNT	U	0.844 R	0.60 R	2.2	0.42	U	U	U	0.39	0.30 J	0.51 J	1.2 J	1.6 J	0.88
	2,4-DNT	U	0.455 J	0.26	1.7	U	0.05 J	U	U	U	U	0.28	0.60	U	0.2 J
	o-NT	U	U	U	0.61	1.20 J	0.2	U	U	U	U	U	0.47	0.39	U
	p-NT	U	U	U R	U	U	1.3	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	0.06 J	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	0.3	U	U	U	U	U	0.1 J	0.25	0.31 J	0.1 J	U
	4,6-DA-2-NT			0.50 R	2.5 R	U	U	U	U	1.9 R	0.85	2.3	3.4	0.39 J	U
	2-A-6-NT			U R	0.39 J	0.06 J	U	U	0.33	0.28	0.09 J	0.64	0.87	0.25 J	0.24
	4-A-2-NT			U	0.48	U	U	U	U	U	0.1 J	0.55 J	0.71	0.44 J	0.23
	2-A-4 NT			U	0.17 R	U J	U	U	U	U	U	0.2 J	0.22	0.2 J	0.1 J

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD15	1,3,5-TNB	U R	0.101 J	U R	0.1	U J	0.1 J	U	0.1 J	U	0.2 J	U	0.2 J	0.1 J	U
	1,3-DNB	U R	U	U R	U	U J	U	U	U	U	U	U	U	U	U
	NB	U R	1.229 J	U R	U	U J	0.1 J	U	U	U	U	U	U	U	U
	2,4,6-TNT	U R	U	U R	U	2 J	U	0.37 J	U	U	U	U	U	U	U
	4-A-2,6-DNT	U R	1.514 J	2.2 R	3.4	4 J	3	3.8	4.9 J	4.1 J	4.8 J	4.3	3.3 J	5.4 J	4.9 J
	2-A-4,6-DNT	0.52 R	0.675 J	0.81 R	0.98	1 J	1.2	1.1 J	1.4	1.1	1.2	1.1	1.4	1.3	1.0 J
	2,6-DNT	U R	0.666 R	0.18 R	0.29	0.47 J	0.4	0.4	0.55	0.47	0.48 J	0.45 J	0.53 J	0.64 J	U
	2,4-DNT	U R	U	U R	U	0 J	0.1 J	0.06 J	0.08 J	U	U	U	U	U	U
	o-NT	U R	U	U R	U	U J	U	U	0.1 J	U	U	U	U	U	U
	p-NT	U R	U	U R	U	U J	0.1 J	U	U	U	U	U	U	U	U
	m-NT	U R	U	U R	U	U J	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			7.5 R	0.1 R	U J	U	U	U	U	0.69	0.58	U	0.46 J	U
	4,6-DA-2-NT			3.5 R	0.46	U J	U	U	U	0.40 J	U	U	U	U	U
	2-A-6-NT			U R	U	U J	U	U	U	U	0.1 J	U	0.07 J	U	U
	4-A-2-NT			U R	U	U J	U	U	U	U	0.1 J	U	U	U	U
	2-A-4 NT			U R	U	U J	U	U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS16	1,3,5-TNB	7.9	2.925	12	13	12	9.3	8.3	12	18	10	15	17	13	14.0
	1,3-DNB	U	0.480 J	U	U	U J	U	U	U	U	U	U	U	U	U
	NB	U	U	U	U	0.07 JC	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	2.5 J	2.940	3.2	3.9	4	2.9	2.8	3.6	2.1	2.2	3.0	3.9	2.8	2.6
	4-A-2,6-DNT	5 J	3.160 J	4.4	4.6	5 J	5.5	4.4 J	5.1	4.7	3.7	4.2	5.3	4.2	4.6
	2-A-4,6-DNT	3.1 J	4.850 J	3.2	3.4	3 J	3.6	2.9 J	3.2	3.2	2.4	2.8	3.6	2.7	2.8
	2,6-DNT	0.63 J	0.734	0.80	0.82	0.89 J	0.95	0.87	0.86	0.91	0.69	0.77 J	1.0 J	0.84 J	0.90
	2,4-DNT	U	U	U	U	0 J	0.07 J	0.08 J	0.09 J	0.1 J	0.05 J	0.07 J	0.1 J	0.07 J	0.08 J
	o-NT	U	U	U	U	0.10 J	0.1 J	0.19 J	U	0.2 J	U	0.29	0.26 J	U	0.2 J
	p-NT	U	U	U	U	U	0.1 J	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	0.20 J	0.04 J	U	U	U	U	U	U	U	0.1 J
	2,6-DA-4-NT			26 R	0.08 R	U	U	U	U	0.32	U	U	U	U	U
	4,6-DA-2-NT			3.8 R	0.1 R	0.27 R	U	U	U	U	U R	U	U	U	U
	2-A-6-NT			U	0.1 R	0.20 J	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	0.7	U	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
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R: rejected
U: non-detect

Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS19	1,3,5-TNB	U R	U	0.1 R	0.6 J	U	U	U	U	U	U	U	U	U	U
	1,3-DNB	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	NB	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U R	U	U	U	U	U	U	U	0.1 J	U	U	0.2 J
	2-A-4,6-DNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	0.07 J
	2,6-DNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,4-DNT	U	U	U R	U	U	U	U	U	U	U	0.05 J	U	U	U
	o-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			5.9 R	U	U	U	U	U	U	U	U	1.1 R	U	U
	4,6-DA-2-NT			0.07 R	1.3 R	U	U	U	U	0.73 R	U R	U	U	U	U
	2-A-6-NT			0.20 R	0.1 J	U	U	U	U	U	U	0.1 J	0.2 J	U	U
	4-A-2-NT			U R	0.67 J	U	U	U	0.1 J	U	U	0.21	0.2 J	U	U
	2-A-4 NT			0.1 R	0.93 R	U	U	U	0.1 R	U	U	U	0.1 J	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS20	1,3,5-TNB	U	U						U				U		
	1,3-DNB	U	U						U				U		
	NB	U	U						U				U		
	2,4,6-TNT	U	U						U				U		
	4-A-2,6-DNT	U	U						U				U		
	2-A-4,6-DNT	U	U						U				U		
	2,6-DNT	U	U						U				U		
	2,4-DNT	U	U						U				U		
	o-NT	U	U						U				U		
	p-NT	U	U						U				U		
	m-NT	U	U						U				U		
	2,6-DA-4-NT								U				U		
	4,6-DA-2-NT								U				U		
	2-A-6-NT								U				U		
	4-A-2-NT								U				U		
	2-A-4 NT								U				U		

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS21	1,3,5-TNB	U	0.119 J	0.07 J	U	0 J	0.1 J	U	0.07 J	U	U	U	U	U	U
	1,3-DNB	U	U	U R	U	U	0.08 R	U	U	U	U	U	U	U	U
	NB	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U	0.1 J	0.44 J	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	0.19 J	0.3	U	0.4	0.38 J	0.45	0.67	0.76	0.43	0.58	0.44	0.35
	2-A-4,6-DNT	U	U	0.1 J	0.2 J	U	0.24	0.22 J	0.21	0.3	0.31	0.2 J	0.27	0.2 J	0.1 J
	2,6-DNT	U	U	U	0.21 J	U	U	U	0.1 J	U R	0.15 J	0.1 J	0.09 J	U	U
	2,4-DNT	U	0.463 R	0.29	0.36	0 J	0.33	0.34	0.28	0.27	0.27	0.2 J	0.2 J	0.1 J	U
	o-NT	U	U	U R	U	U	U	0.1 J	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U	U	0.1 R	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	U	0.06 R	U	U	U	U	U	U	U
	2,6-DA-4-NT			2.7 R	U	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U R	U	0.20 R	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	0.07 J
	4-A-2-NT			0.45	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U	U	U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS22	1,3,5-TNB	U R	U				U		U			U	U	U	U
	1,3-DNB	U	U				U		U			U	U	U	U
	NB	U	U				U		U			U	U	U	U
	2,4,6-TNT	U	U				U		1.28			U	U	U	U
	4-A-2,6-DNT	U	0.061 J				0.23		1.65			0.23	U	U	0.24
	2-A-4,6-DNT	U	U				0.1 J		1.06			0.08 J	U	U	0.09 J
	2,6-DNT	U	U				U		0.26			0.1 J	0.15 J	U	U
	2,4-DNT	U	U				U		0.06 J			U	U	U	U
	o-NT	U	U				U		U			U	U	U	U
	p-NT	U	U				U		U			U	U	U	U
	m-NT	U	U				U		U			U	U	U	U
	2,6-DA-4-NT						U		U			U	U	U	U
	4,6-DA-2-NT						U		U			U	U	U	U
	2-A-6-NT						U		U			U	U	U	U
	4-A-2-NT						U		U			U	U	U	U
	2-A-4 NT						U		U			U	U	U	U

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R: rejected
U: non-detect

Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS23	1,3,5-TNB	U	U						U				U		
	1,3-DNB	U	U						U				U		
	NB	U	U						U				U		
	2,4,6-TNT	U	U						U				U		
	4-A-2,6-DNT	U	U						U				U		
	2-A-4,6-DNT	U	U						U				U		
	2,6-DNT	U	U						U				U		
	2,4-DNT	U	U						U				U		
	o-NT	U	U						U				U		
	p-NT	U	U						U				U		
	m-NT	U	U						U				U		
	2,6-DA-4-NT								U				U		
	4,6-DA-2-NT								U				U		
	2-A-6-NT								U				U		
	4-A-2-NT								U				U		
	2-A-4 NT								U				U		

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS25	1,3,5-TNB									U				U	
	1,3-DNB									U				U	
	NB									U				U	
	2,4,6-TNT									U				U	
	4-A-2,6-DNT									U				U	
	2-A-4,6-DNT									U				U	
	2,6-DNT									U				U	
	2,4-DNT									U				U	
	o-NT									U				U	
	p-NT									U				U	
	m-NT									U				U	
	2,6-DA-4-NT									U				U	
	4,6-DA-2-NT									U				U	
	2-A-6-NT									U				U	
	4-A-2-NT									U				U	
	2-A-4 NT									U				U	

Concentrations are in µg/L
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Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS26	1,3,5-TNB														
	1,3-DNB														
	NB														
	2,4,6-TNT														
	4-A-2,6-DNT														
	2-A-4,6-DNT														
	2,6-DNT														
	2,4-DNT														
	o-NT														
	p-NT														
	m-NT														
	2,6-DA-4-NT														
	4,6-DA-2-NT														
	2-A-6-NT														
	4-A-2-NT														
	2-A-4 NT														

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS27	1,3,5-TNB												U	U	U
	1,3-DNB												U	U	U
	NB												U	U	U
	2,4,6-TNT												U	U	U
	4-A-2,6-DNT												U	U	U
	2-A-4,6-DNT												U	U	U
	2,6-DNT												U	U	U
	2,4-DNT												U	U	U
	o-NT												U	U	U
	p-NT												U	U	U
	m-NT												U	U	U
	2,6-DA-4-NT												U	U	U
	4,6-DA-2-NT												U	U	U
	2-A-6-NT												U	U	U
	4-A-2-NT												U	U	U
	2-A-4 NT												U	U	U

Concentrations are in µg/L
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R: rejected
U: non-detect

Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS28	1,3,5-TNB												U	U	U
	1,3-DNB												U	U	U
	NB												U	U	U
	2,4,6-TNT												U	U	U
	4-A-2,6-DNT												U	U	U
	2-A-4,6-DNT												U	U	U
	2,6-DNT												U	U	U
	2,4-DNT												U	U	U
	o-NT												U	U	U
	p-NT												U	U	U
	m-NT												U	U	U
	2,6-DA-4-NT												U	U	U
	4,6-DA-2-NT												U	U	U
	2-A-6-NT												U	U	U
	4-A-2-NT												U	U	U
	2-A-4 NT												U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS29	1,3,5-TNB											U	U	U	U
	1,3-DNB											U	U	U	U
	NB											U	U	U	U
	2,4,6-TNT											U	U	U	U
	4-A-2,6-DNT											U	U	U	U
	2-A-4,6-DNT											U	U	U	U
	2,6-DNT											U	U	U	U
	2,4-DNT											U	U	U	U
	o-NT											U	U	U	U
	p-NT											U	U	U	U
	m-NT											U	U	U	U
	2,6-DA-4-NT											U	U	U	U
	4,6-DA-2-NT											U	U	U	U
	2-A-6-NT											U	U	U	U
	4-A-2-NT											U	U	U	U
	2-A-4 NT											U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS30	1,3,5-TNB														U
WSOW	1,3-DNB														U
	NB														U
	2,4,6-TNT														U
	4-A-2,6-DNT														U
	2-A-4,6-DNT														U
	2,6-DNT														U
	2,4-DNT														U
	o-NT														U
	p-NT														U
	m-NT														U
	2,6-DA-4-NT														U
	4,6-DA-2-NT														U
	2-A-6-NT														U
	4-A-2-NT														U
	2-A-4 NT														U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS31	1,3,5-TNB														1.1
WSOW	1,3-DNB														U
	NB														U
	2,4,6-TNT														U
	4-A-2,6-DNT														1.5
	2-A-4,6-DNT														1.2
	2,6-DNT														0.36
	2,4-DNT														U
	o-NT														0.08 R
	p-NT														U
	m-NT														U
	2,6-DA-4-NT														U
	4,6-DA-2-NT														U
	2-A-6-NT														U
	4-A-2-NT														U
	2-A-4 NT														U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-2 WSTA Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS32	1,3,5-TNB														0.1 R
WSOW	1,3-DNB														U
	NB														U
	2,4,6-TNT														U
	4-A-2,6-DNT														0.97
	2-A-4,6-DNT														0.08 R
	2,6-DNT														0.20 R
	2,4-DNT														U
	o-NT														U
	p-NT														U
	m-NT														U
	2,6-DA-4-NT														U
	4,6-DA-2-NT														U
	2-A-6-NT														U
	4-A-2-NT														U
	2-A-4 NT														U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS33	1,3,5-TNB														U
WSOW	1,3-DNB														U
	NB														U
	2,4,6-TNT														U
	4-A-2,6-DNT														U
	2-A-4,6-DNT														U
	2,6-DNT														U
	2,4-DNT														U
	o-NT														U
	p-NT														U
	m-NT														U
	2,6-DA-4-NT														U
	4,6-DA-2-NT														U
	2-A-6-NT														U
	4-A-2-NT														U
	2-A-4 NT														U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-3 WSTA Unweathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD02	1,3,5-TNB	U	U	U	U	U		U	U	U	U	U	U	U	U
	1,3-DNB	U	U	U	U	U		U	U	U	U	U	U	U	U
	NB	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,4-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	o-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	p-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U		U	U	U	U	U	U	U J	U
	4,6-DA-2-NT			U	U	U		U	U	U	U	U	U	U J	U
	2-A-6-NT			U	U	U		U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U		U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U		U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS03	1,3,5-TNB	U	U	U	U	U		U	U	U	U	U	U	U	U
	1,3-DNB	U	U	U	U	U		U	U	U	U	U	U	U	U
	NB	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U	U	U		U	U	U R	U	U	U	U	U
	2,4-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	o-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	p-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U		U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U	U	U		U	U	U	U R	U	U	U	U
	2-A-6-NT			U	U	U		U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	0.10 J		U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U		U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-3 WSTA Unweathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS05	1,3,5-TNB	U	U						U			U	U	U	U
	1,3-DNB	U	U						U			U	U	U	U
	NB	U	U						U			U	U	U	U
	2,4,6-TNT	U	U						U			U	U	U	U
	4-A-2,6-DNT	U	U						U			U	U	U	U
	2-A-4,6-DNT	U	U						U			U	U	U	U
	2,6-DNT	U	U						U			U	U	U	U
	2,4-DNT	U	U						U			U	U	U	U
	o-NT	U	U						U			U	U	U	U
	p-NT	U	U						U			U	U	U	U
	m-NT	U	U						U			U	U	U	U
	2,6-DA-4-NT								U			U	U	U	U
	4,6-DA-2-NT								U			U	U	U	U
	2-A-6-NT								U			U	U	U	U
	4-A-2-NT								U			U	U	U	U
	2-A-4 NT								U			U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS06	1,3,5-TNB	U	0.213 J				U	U	U			U	U	U	U
	1,3-DNB	U	0.464 J				U	U	U			U	U	U	U
	NB	U	U				U	U	U			U	U	U	U
	2,4,6-TNT	U	1.040 J				U	U	U			U	U	U	U
	4-A-2,6-DNT	U	0.459 J				U	U	U			U	U	U	U
	2-A-4,6-DNT	U	0.356 J				U	U	U			U	U	U	U
	2,6-DNT	U	0.935 J				U	U	U			U	U	U	U
	2,4-DNT	U	U				U	U	U			U	U	U	U
	o-NT	U	U				U	U	U			U	U	U	U
	p-NT	U	0.291 J				U	U	U			U	U	U	U
	m-NT	U	U				U	U	U			U	U	U	U
	2,6-DA-4-NT						U	U	U			U	U	U	U
	4,6-DA-2-NT						U	U	U			U	U	U	U
	2-A-6-NT						U	U	U			U	U	U	U
	4-A-2-NT						U	U	U			U	U	U	U
	2-A-4 NT						U	U	U			U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-3 WSTA Unweathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD06	1,3,5-TNB	U	U						U			U	U	U	U
	1,3-DNB	U	U						U			U	U	U	U
	NB	U	U						U			U	U	U	U
	2,4,6-TNT	U	U						U			U	U	U	U
	4-A-2,6-DNT	U	U						U			U	U	U	U
	2-A-4,6-DNT	U	U						U			U	U	U	U
	2,6-DNT	U	U						U			U	U	U	U
	2,4-DNT	U	U						U			U	U	U	U
	o-NT	U	U						U			U	U	U	U
	p-NT	U	U						U			U	U	U	U
	m-NT	U	U						U			U	U	U	U
	2,6-DA-4-NT								U			U	U	U	U
	4,6-DA-2-NT								U			U	U	U	U
	2-A-6-NT								U			U	U	U	U
	4-A-2-NT								U			U	U	U	U
	2-A-4 NT								U			U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD09	1,3,5-TNB	U	U	U	0.1 J	U	0.1 J	U	0.3 J	U	U	U	0.2 J	0.1 J	0.1 J
	1,3-DNB	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	NB	U	U	U	0.1 J	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U J	U	0.3 J	U	U	U	U	U	U	U
	4-A-2,6-DNT	0.45 J	U	U	0.44	1 J	0.65	0.56	U	U	0.59	U	0.47	0.62	0.53
	2-A-4,6-DNT	U	U	U	0.08 J	0 J	0.2 J	0.1 J	U	U	0.09 J	U	0.09 J	0.2 J	0.09 J
	2,6-DNT	U	U	U R	0.16	U	0.29 J	U	U	U	0.19 J	U	0.15 J	0.35 J	0.18 J
	2,4-DNT	U	U	U	U	U	0.1 J	U	U	U	U	U	U	U	U
	o-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U	U	U	U	U	U	U	U R	U	U	U	U
	2-A-6-NT			U R	U	U	U	U	1 R	U	U	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U J	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-3 WSTA Unweathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS17	1,3,5-TNB	U	0.179 J	0.1 J	U	0 J	0.1 J	0.07 J	0.35 J	0.09 J	U	0.06 J	U	U	U
	1,3-DNB	U	0.424 J	U	U	U	U	U	U	U	U	U	U	U	U
	NB	U	U	U	U	U	0.08 J	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	1.010 J	U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U R	U	0.2 J	0.75	0 J	0.58	0.61 J	0.5	0.42	U	0.30	0.42	0.34 J	0.26
	2-A-4,6-DNT	U R	0.316 J	0.1 J	0.46 J	0 J	0.31	0.32 J	0.27	0.21	U	U	0.24	0.2 J	0.1 J
	2,6-DNT	U	0.967 J	0.33	1.4	0.83	1	0.88	0.73 J	0.73 J	U	0.50 J	0.85 J	0.60 J	0.42
	2,4-DNT	U	U	U	U	0	0.1 J	0.1 J	U	0.26	U	0.1 J	0.38	0.1 J	U
	o-NT	2	0.500 J	0.34	U	5.50 J	1.9	0.59 J	U	2.8	0.83	1.3	3.8	1.2	0.33
	p-NT	U	U	U	U	1.50 J	0.51 J	0.1 J	U	0.78 J	0.32 J	0.47 J	1.3 J	0.2 J	U
	m-NT	U	U	U	U	0.30 J	0.1 J	U	U	0.1 J	U	0.1 J	0.31	0.1 J	U
	2,6-DA-4-NT			U	0.1 R	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U	0.64 R	U	U	U	U	U	U R	U	U	U	U
	2-A-6-NT			U	U	U	0.23	0.1 J	U	0.42	0.1 J	0.25	0.49	0.1 J	U
	4-A-2-NT			U	U	U	0.2 R	0.1 R	U	0.44	0.1 J	0.2 J	0.38	0.22 J	U
	2-A-4 NT			U	U	U	0.1 J	U	U	0.23	U	0.1 J	0.25	0.08 J	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD23	1,3,5-TNB	U	U	U	U	U		U	0.2 R	U	U		U		
	1,3-DNB	U	U	U	U	U		U	U	U	U		U		
	NB	U	U	U	U	U		U	U	U	U		U		
	2,4,6-TNT	U	U	U	U	U		U	U	U	U		U		
	4-A-2,6-DNT	U	U	U	U	U		U	U	U	U		U		
	2-A-4,6-DNT	U	U	U	U	U		U	U	U	U		U		
	2,6-DNT	U	U	U R	U	U		U	U	U	U		U		
	2,4-DNT	U	U	U	U	U		U	U	U	U		U		
	o-NT	U	U	U	U	U		U	U	U	U		U		
	p-NT	U	U	U R	U	U		U	U	U	U		U		
	m-NT	U	U	U	U	U		U	U	U	U		U		
	2,6-DA-4-NT			U	U	U		U	U	U	U		U		
	4,6-DA-2-NT			U	U	U		U	U	U	U R		U		
	2-A-6-NT			U R	U	U		U	0.2 R	U	U		U		
	4-A-2-NT			U	U	U		U	0.1 R	U	U		U		
	2-A-4 NT			U	U	U		U	U	U	U		U		

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-3 WSTA Unweathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD25	1,3,5-TNB	U	U	0.3 R	U	U J		U	U	U	U	U	U	U	U
	1,3-DNB	U	U	0.2 R	0.3 J	U J		U	0.3 J	U	U	0.3 J	0.4 J	0.2 J	U
	NB	U	U	U R	U	U J		U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U R	U	U J		U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U R	U	U J		0.1 R	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U R	U	U J		U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U R	U	U J		U	U	U	U	U	U	U	U
	2,4-DNT	U	U	U R	U	U J		U	U	U	U	U	U	U	U
	o-NT	U	U	U R	U	U J		U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U J		U	U	U	U	U	U	U	U
	m-NT	U	U	U R	U	U J		U	U	U	U	U	U	U	U
	2,6-DA-4-NT			0.9 R	U	U J		U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U R	U	U J		U	U	U	U R	U	U	U	U
	2-A-6-NT			U R	U	U J		0.1 R	U	U	U	U	U	U	U
	4-A-2-NT			U R	U	U J		U	U	U	U	U	U	U	U
	2-A-4 NT			U R	U	U J		U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-4 WSOW Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS104	1,3,5-TNB	U	U	U R	U	U		U	U	U	U	U	U	U	U
	1,3-DNB	U	U	U	U	U		U	U	U	U	U	U	U	U
	NB	U	U	U R	U	U		U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U	U	U		U	U	U R	U	U	U	U	U
	2,4-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	o-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	p-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U R	U	U		U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U R	U	U		U	U	U	U R	U	U	U	U
	2-A-6-NT			U R	U	U		U	U	U	U	U	U	U	U
	4-A-2-NT			U R	U	U		U	U	U	U	U	U	U	U
	2-A-4 NT			U R	U	U		U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS107	1,3,5-TNB	U R	0.165 J	U	0.57	0 J	0.69	0.46	0.37	0.44	0.62	U	0.3 J	0.59	0.50
	1,3-DNB	U R	U	U	U	U	U	U	U	U	U	U	U	U	U
	NB	U R	U	U	U	0.08 R	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U R	U	U	U	0 J	U	0.44 J	U	U	U	U	U	U	U
	4-A-2,6-DNT	1.6 R	U	U	1.3	2	1.9	1.5	0.78	1.2	1.6	U	0.90	1.4	1.6
	2-A-4,6-DNT	U R	0.561 J	U	0.1 J	0 J	0.23	0.2 J	0.08 J	0.1 J	0.2 J	U	U	0.2 J	0.2 J
	2,6-DNT	U R	U	U	0.25	0.33	0.46	0.32 J	0.18	U	0.32	U	0.20 J	0.39 J	0.32
	2,4-DNT	U R	U	U	0.07 J	0 J	0.1 J	0.07 J	0.06 J	U	0.08 J	U	U	0.08 J	0.1 J
	o-NT	U R	U	U	U	0.10 R	0.1 R	U	U	0.1 R	U	U	U	0.1 R	U
	p-NT	U R	U	U	U	U	U	U	U	0.1 J	U	U	U	U	U
	m-NT	U R	U	U	U	0.10 R	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U	U	U	U	U	0.09 J	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-4 WSOW Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS110	1,3,5-TNB	U	0.140 J	U R	0.06 J	U	U	U	0.38	0.07 J	U	U	U	0.09 J	U
	1,3-DNB	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	NB	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U R	U	1 J	0.3 J	U	U	U	0.2 J	U	U	U	U
	4-A-2,6-DNT	0.56 J	U	2.5 R	2.1	2 J	2.5	0.53 J	0.36	0.7	2.0	1.4	0.69	0.31	1.7
	2-A-4,6-DNT	U	U	1.3 R	1.2	1 J	1.3	0.26 J	0.2 J	0.3	0.99	0.73	0.33	0.2 J	0.88
	2,6-DNT	U	U	0.33 R	0.18	0.23	U	U	U	U	0.18 J	0.1 J	U	U	U
	2,4-DNT	U	U	U R	U	0 R	U	U	U	U	U	0.03 R	U	U	U
	o-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U	U	U	U	U	U	0.2 J	U	U J	U
	4,6-DA-2-NT			U	U	U	U	U	U	U	U R	U	U	U	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U J	U	U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS111	1,3,5-TNB	U	U						U			U	U	U	U
	1,3-DNB	U	U						U			U	U	U	U
	NB	U	U						U			U	U	U	U
	2,4,6-TNT	U	U						U			U	U	U	U
	4-A-2,6-DNT	U	U						U			U	U	U	U
	2-A-4,6-DNT	U	U						U			U	U	U	U
	2,6-DNT	U	U						U			U	U	U	U
	2,4-DNT	U	U						U			U	U	U	U
	o-NT	U	U						U			U	U	U	U
	p-NT	U	U						U			U	U	U	U
	m-NT	U	U						U			U	U	U	U
	2,6-DA-4-NT								U			U	U	U J	U
	4,6-DA-2-NT								U			U	U	U	U
	2-A-6-NT								U			U	U	U	U
	4-A-2-NT								U			U	U	U	U
	2-A-4 NT								U			U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-4 WSOW Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS112	1,3,5-TNB	U	U	U	U	U	U	U	U	U	U	U	U	U	U J
	1,3-DNB	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	NB	0.44 J	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U	U	U	U	U	U	U R	U	U	U	U	U
	2,4-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	o-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U	U	U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS113	1,3,5-TNB														U
	1,3-DNB														U
	NB														U
	2,4,6-TNT														U
	4-A-2,6-DNT														0.1 J
	2-A-4,6-DNT														0.08 R
	2,6-DNT														U
	2,4-DNT														U
	o-NT														U
	p-NT														U
	m-NT														U
	2,6-DA-4-NT														U
	4,6-DA-2-NT														U
	2-A-6-NT														U
	4-A-2-NT														U
	2-A-4 NT														U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-4 WSOW Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS115	1,3,5-TNB											U	U	U	U J
	1,3-DNB											U	U	U	U
	NB											U	U	U	U
	2,4,6-TNT											U	U	U	U
	4-A-2,6-DNT											U	U	U	U
	2-A-4,6-DNT											U	U	U	U
	2,6-DNT											U	U	U	U
	2,4-DNT											U	U	U	U
	o-NT											U	U	U	U
	p-NT											U	U	U	U
	m-NT											U	U	U	U
	2,6-DA-4-NT											U	U	U	U
	4,6-DA-2-NT											U	U	U	U
	2-A-6-NT											U	U	U	U
	4-A-2-NT											U	U	U	U
	2-A-4 NT											U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS116	1,3,5-TNB											U	U	U	U
	1,3-DNB											U	U	U	U
	NB											U	U	U	U
	2,4,6-TNT											U	U	U	U
	4-A-2,6-DNT											U	U	U	U
	2-A-4,6-DNT											U	U	U	U
	2,6-DNT											U	U	U	U
	2,4-DNT											U	U	U	U
	o-NT											U	U	U	U
	p-NT											U	U	U	U
	m-NT											U	U	U	U
	2,6-DA-4-NT											U	U	U	U
	4,6-DA-2-NT											U	U	U	U
	2-A-6-NT											U	U	U	U
	4-A-2-NT											U	U	U	U
	2-A-4 NT											U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-4 WSOW Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
USGS2A	1,3,5-TNB	U	U	U R	U	U		U	U	U	U		U		
	1,3-DNB	U	U	U	U	U		U	U	U	U		U		
	NB	U	U	U	U	U		U	U	U	U		U		
	2,4,6-TNT	U	U	U	U	U		U	U	U	U		U		
	4-A-2,6-DNT	U	U	U	U	U		U	U	U	U		U		
	2-A-4,6-DNT	U	U	U	U	U		U	U	U	U		U		
	2,6-DNT	U	U	U	U	U		U	U	U	U		U		
	2,4-DNT	U	U	U	U	U		U	U	U	U		U		
	o-NT	U	U	U	U	U		U	U	U	U		U		
	p-NT	U	U	U R	U	U		U	U	U	U		U		
	m-NT	U	U	U	U	U		U	U	U	U		U		
	2,6-DA-4-NT			U R	U	U		U	U	U	U		U		
	4,6-DA-2-NT			U R	U	U		U	U	U	U		U		
	2-A-6-NT			U R	U	U		U	U	U	U		U		
	4-A-2-NT			U R	U	U		U	U	U	U		U		
	2-A-4 NT			U R	U	U		U	U	U	U		U		

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
USGS3	1,3,5-TNB	U	0.338 J	0.36 R	0.3 J	0 J	0.3 J	0.3 J	U	0.3 J	0.3 J	0.46	0.39	0.3 J	0.54 J
	1,3-DNB	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	NB	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	0.07 J
	2-A-4,6-DNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	0.1 J
	2,4-DNT	U	U	U R	0.06 J	U	U	U	U	U	U	U	U	U	U
	o-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U	U	U	U	U	U	U	U	U	U	U J	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-4 WSOW Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
USGS4	1,3,5-TNB	5.3 J	2.505	5.0 R	5.7	4	4.2	3.2	6.5	7.0 J	3.2	5.7	7.1	5.2	6.1
	1,3-DNB	U	1.310 J	U	U	U	U	U	U	U J	U	U	U	U	U
	NB	U	U	U R	0.2 J	0.10 J	0.3 J	U	U	U J	U	U	U	U	U
	2,4,6-TNT	U	2.720 J	U	U	1 J	U	1.5 J	0.3 J	0.39 J	U	U	U	U	U
	4-A-2,6-DNT	2.5 J	2.390 J	2.5	2.5	3 J	2.6	2.2 J	2.6	2.7 J	2.6	2.3	3.4	2.3	3.7 J
	2-A-4,6-DNT	2 J	2.470 J	1.7 J	2	2 J	2	1.6 J	1.9	2.0 J	1.6	1.5	2.3	1.5	2.0 J
	2,6-DNT	2.5 J	3.140	2.0 R	2	2.20	2.4	2.2	2.2	2.6 R	4.2	2.8 J	2.6 J	2.4 J	3.2
	2,4-DNT	U	U	0.1 J	0.2 J	0 J	U	0.1 J	0.2 J	0.1 J	0.08 J	0.1 J	U	0.09 J	0.4 J
	o-NT	U	U	U	0.22	U	U	0.28 J	0.36	U J	0.49 J	0.19 J	U	0.25 J	U
	p-NT	U	U	U	U	U	U	U	U	U J	U	U	U	U	U
	m-NT	U	U	U	U	U	U	0.06 J	U	U J	U	U	U	U	U
	2,6-DA-4-NT			U R	U	0.10 R	U	U	U	1.6 J R	U	U	U	U	U
	4,6-DA-2-NT			U R	0.83	1.90	0.4 J	U	U	3.6 J	U	0.33	U	U	U
	2-A-6-NT			U R	U	0.20 R	U	0.1 R	U	U J	U	U	U	U	U
	4-A-2-NT			U R	U	0.07 J	U	U	0.20 J	U J	U	U	U	U	U
	2-A-4 NT			U R	U	U	U	U	U	0.07 J	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
USGS5	1,3,5-TNB	U	U	U	U	U		U	U	U	U		U		
	1,3-DNB	U	U	U	U	U		U	U	U	U		U		
	NB	U	U	U	U	U		U	U	U	U		U		
	2,4,6-TNT	U	U	U	U	U		U	U	U	U		U		
	4-A-2,6-DNT	U	U	U	U	U		U	U	U	U		U		
	2-A-4,6-DNT	U	U	U	U	U		U	U	U	U		U		
	2,6-DNT	U	U	U	U	U		U	U	U	U		U		
	2,4-DNT	U	U	U	U	U		U	U	U	U		U		
	o-NT	U	U	U	U	U		U	U	U	U		U		
	p-NT	U	U	U	U	U		U	U	U	U		U		
	m-NT	U	U	U	U	U		U	U	U	U		U		
	2,6-DA-4-NT			U	U	U		U	U	U	U		U		
	4,6-DA-2-NT			U	U	U		U	U	U	U		U		
	2-A-6-NT			U	U	U		U	U	U	U		U		
	4-A-2-NT			U	U	U		U	U	U	U		U		
	2-A-4 NT			U	U	U		U	U	U	U		U		

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-4 WSOW Weathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
USGS8	1,3,5-TNB	U	U	U	U	U J		U	U	U	U		U		
	1,3-DNB	U	U	U	U	U J		U	U	U	U		U		
	NB	U	U	U	U	U J		U	U	U	U		U		
	2,4,6-TNT	U	U	U	U	U J		U	U	U	U		U		
	4-A-2,6-DNT	U	U	U	U	U J		U	U	U	U		U		
	2-A-4,6-DNT	U	U	U	U	U J		U	U	U	U		U		
	2,6-DNT	U	U	U	U	U J		U	U	U	U		U		
	2,4-DNT	U	U	U	U	U J		U	U	U	U		U		
	o-NT	U	U	U	U	U J		U	U	U	U		U		
	p-NT	U	U	U	U	U J		U	U	U	U		U		
	m-NT	U	U	U	U	U J		U	U	U	U		U		
	2,6-DA-4-NT			U	R	U J		U	U	U	U		U		
	4,6-DA-2-NT			U	R	U J		U	U	U	U R		U		
	2-A-6-NT			U	R	U J		U	U	U	U		U		
	4-A-2-NT			U	R	U J		U	U	U	U		U		
	2-A-4 NT			U	R	U J		U	U	U	U		U		

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
USGS9	1,3,5-TNB	U	0.318 J	U	U	U	U	U	U	U	U	U	U	U	U
	1,3-DNB	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	NB	U	0.314 J	U	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	1.830 J	U	U	U	U	0.44 J	U	U	U	U	U	U	U
	4-A-2,6-DNT	1.7 J	1.107 J	1.3 J	1.6	2 J	1.9	1.4 J	1.6	2.0	1.6	1.3	2.1	1.4	1.8
	2-A-4,6-DNT	1.3 J	1.826 J	1.1 J	1.4	1 J	1.5	1.1 J	1.2	1.4	1.2	1.0	1.6	1.1	1.3
	2,6-DNT	U	U	U	U	U	U	U	U	U R	U	U	U	U	U
	2,4-DNT	0.63 J	U	U	U	U	U	U	U	U	U	0.1 J	0.08 J	0.06 J	0.06 J
	o-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	U	0.07 R	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U	U	U	U	U	0.22 J	0.47	U R	0.62 J	U	U	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-5 WSOW Unweathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS105	1,3,5-TNB	U	U						U			U	U	U	U
	1,3-DNB	U	U						U			U	U	U	U
	NB	U	U						U			U	U	U	U
	2,4,6-TNT	U	U						U			U	U	U	U
	4-A-2,6-DNT	U	U						U			U	U	U	U
	2-A-4,6-DNT	U	U						U			U	U	U	U
	2,6-DNT	U	U						U			U	U	0.1 J	U
	2,4-DNT	U	U						U			U	U	U	U
	o-NT	U	U						U			U	U	U	U
	p-NT	U	U						U			U	U	U	U
	m-NT	U	U						U			U	U	U	U
	2,6-DA-4-NT								U			U	U	U	U
	4,6-DA-2-NT								U			U	U	U J	U
	2-A-6-NT								U			U	U	U	U
	4-A-2-NT								U			U	U	U	U
	2-A-4 NT								U			U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD105	1,3,5-TNB	U	U						U			U	U	U	U
	1,3-DNB	U	U						U			U	U	U	U
	NB	U	U						U			U	U	U	U
	2,4,6-TNT	U	U						U			U	U	U	U
	4-A-2,6-DNT	U	U						U			U	U	U	U
	2-A-4,6-DNT	U	U						U			U	U	U	U
	2,6-DNT	U	U						U			U	U	U	U
	2,4-DNT	U	U						U			U	U	U	U
	o-NT	U	U						U			U	U	U	U
	p-NT	U	U						U			U	U	U	U
	m-NT	U	U						U			U	U	U	U
	2,6-DA-4-NT								U			U	U	U	U
	4,6-DA-2-NT								U			U	U	U J	U
	2-A-6-NT								U			U	U	U	U
	4-A-2-NT								U			U	U	U	U
	2-A-4 NT								U			U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-5 WSOW Unweathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS106	1,3,5-TNB	U	U	U R	U	U		U	U	U	U		U		
	1,3-DNB	U	U	U R	U	U		U	U	U	U		U		
	NB	U	U	U R	U	U		U	U	U	U		U		
	2,4,6-TNT	U	U	U R	U	U		U	U	U	U		U		
	4-A-2,6-DNT	U	U	U R	U	U		U	U	U	U		U		
	2-A-4,6-DNT	U	U	U R	U	U		U	U	U	U		U		
	2,6-DNT	U	U	U R	U	U		U	U	U R	U		U		
	2,4-DNT	U	U	U R	U	U		U	U	U	U		U		
	o-NT	U	U	U R	U	U		U	U	U	U		U		
	p-NT	U	U	U R	U	U		U	U	U	U		U		
	m-NT	U	U	U R	U	U		U	U	U	U		U		
	2,6-DA-4-NT			U R	U	U		U	U	U	U		U		
	4,6-DA-2-NT			U R	U	U		U	U	U	U		U		
	2-A-6-NT			U R	U	U		U	U	U	U		U		
	4-A-2-NT			U R	U	U		U	U	U	U		U		
	2-A-4 NT			U R	U	U		U	U	U	U		U		

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD106	1,3,5-TNB	U	U						U				U		
	1,3-DNB	U	U						U				U		
	NB	U	U						U				U		
	2,4,6-TNT	U	U						U				U		
	4-A-2,6-DNT	U	U						U				U		
	2-A-4,6-DNT	U	U						U				U		
	2,6-DNT	U	U						U				U		
	2,4-DNT	U	U						U				U		
	o-NT	U	U						U				U		
	p-NT	U	U						U				U		
	m-NT	U	U						U				U		
	2,6-DA-4-NT								U				U		
	4,6-DA-2-NT								U				U		
	2-A-6-NT								U				U		
	4-A-2-NT								U				U		
	2-A-4 NT								U				U		

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-5 WSOW Unweathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD107	1,3,5-TNB	U	U	U	U	U		U	U	U	U		U		
	1,3-DNB	U	U	U	U	U		U	U	U	U		U		
	NB	U	U	U	U	U		U	U	U	U		U		
	2,4,6-TNT	U	U	U	U	U		U	U	U	U		U		
	4-A-2,6-DNT	U	U	U	U	U		U	U	U	U		U		
	2-A-4,6-DNT	U	U	U	U	U		U	U	U	U		U		
	2,6-DNT	U	U	U	U	U		U	U	U	U		U		
	2,4-DNT	U	U	U	U	U		U	U	U	U		U		
	o-NT	U	U	U	U	U		U	U	U	U		U		
	p-NT	U	U	U	U	U		U	U	U	U		U		
	m-NT	U	U	U	U	U		U	U	U	U		U		
	2,6-DA-4-NT			U	U	U		U	U	U	U		U		
	4,6-DA-2-NT			U	U	U		U	U	U	U		U		
	2-A-6-NT			U	U	U		U	U	U	U		U		
	4-A-2-NT			U	U	U		U	U	U	U		U		
	2-A-4 NT			U	U	U		U	U	U	U		U		

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS108	1,3,5-TNB	U	U	U R	U	U J		U	U	U	U	U	U	U	U
	1,3-DNB	U	U	U	U	U J		U	U	U	U	U	U	U	U
	NB	U	U	U	U	U J		U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U J		U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U J		U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U J		U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U	U	U J		U	U	U	U	U	U	U	U
	2,4-DNT	U	U	U	U	U J		U	U	U	U	U	U	U	U
	o-NT	U	U	U	U	U J		U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U J		U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U J		U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U R	U	U J		U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U R	U	U J		U	U	U	U R	U	U	U	U
	2-A-6-NT			U R	U	U J		U	U	U	U	U	U	U	U
	4-A-2-NT			U R	U	U J		U	U	U	U	U	U	U	U
	2-A-4 NT			U R	U	U J		U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-5 WSOW Unweathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS109	1,3,5-TNB	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	1,3-DNB	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	NB	U	U	U R	0.09	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,4-DNT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	o-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U	U	U	U	U	U	U	U	U	U	U J	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U	U	U	0.58 J	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD109	1,3,5-TNB	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	1,3-DNB	U	U	U	U	U	U	U	U	U	0.09 J	U	U	U	U
	NB	U	U	U	0.2 R	0.20 R	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,4-DNT	U	U	U	U	U	U	U	U	U	U	0.03 J	U	U	U
	o-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U R	U	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U R	U	U	U	U	U	U	U	U	U	U J	U
	2-A-6-NT			U R	U	U	U	U	U	U	0.06 J	U	U	U	U
	4-A-2-NT			U R	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U R	U	U	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-5 WSOW Unweathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD112	1,3,5-TNB	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	1,3-DNB	U	0.076 J	U	U	U J	U	U	U	U	U	U	U	U	U
	NB	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U	U	U J	U	U	U	U R	U	U	U	U	U
	2,4-DNT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	o-NT	U	U	U	U	U J	U	U	U	U	U	U	U	0.24	U
	p-NT	U	U	U	U	0.18 R	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U J	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			0.1 R	U	U J	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U J	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U J	U	U	U	U	U	0.08 J	U	0.08 J	U
	2-A-4 NT			U	U	U J	U	U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
USGS1	1,3,5-TNB	U	0.271 J	0.56 R	U	U	0.1 J	0.1 J	U	0.1 J	U	0.3 J	0.2 J	0.08 J	0.3 J
	1,3-DNB	U	0.417 J	U	U	U	0.09 J	0.09 J	U	U	0.1 J	0.1 J	0.1 J	0.1 J	U
	NB	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U	U	U	U	U	U	0.08 J	U	U	U
	4-A-2,6-DNT	U	U	0.1 J	0.2 J	U	U	0.2 J	0.19	U	U	U	0.20	U	0.25 J
	2-A-4,6-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U	U	U	U	U	U	U	U	0.1 J	U	U	U
	2,4-DNT	U	U	U	U	0 J	U	U	U	U	U	U	U	U	U
	o-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U R	U	U	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			U R	0.68 R	0.38 R	U	U	U	U	U	U	0.38 R	U	U
	2-A-6-NT			U R	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U R	U	U	U	U	U	U	U	0.2 J	U	U	0.1 J
	2-A-4 NT			U R	U	U	U	U	U	U	U	0.06 J	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-5 WSOW Unweathered Burlington-Keokuk Bedrock Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
USGS6	1,3,5-TNB	U	U	U R	U	U J		U	U	U	U		U		
	1,3-DNB	U	U	U R	U	U J		U	U	U	U		U		
	NB	U	U	U R	U	U J		U	U	U	U		U		
	2,4,6-TNT	U	U	U R	U	U J		U	U	U	U		U		
	4-A-2,6-DNT	U	U	U R	U	U J		U	U	U	U		U		
	2-A-4,6-DNT	U	U	U R	U	U J		U	U	U	U		U		
	2,6-DNT	U	U	U R	U	U J		U	U	U	U		U		
	2,4-DNT	U	U	U R	U	U J		U	U	U	U		U		
	o-NT	U	U	U R	U	U J		U	U	U	U		U		
	p-NT	U	U	U R	U	U J		U	U	U	U		U		
	m-NT	U	U	U R	U	U J		U	U	U	U		U		
	2,6-DA-4-NT			U	U	U J		U	U	U	U		U		
	4,6-DA-2-NT			U	U	U J		U	U	U	U		U		
	2-A-6-NT			U	U	U J		U	U	U	U		U		
	4-A-2-NT			U	U	U J		U	U	U	U		U		
	2-A-4 NT			U	U	U J		U	U	U	U		U		

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-6 Other Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD05	1,3,5-TNB	U	U	U	U	U		U	U	U	U	U	U	U	U
WSTA	1,3-DNB	U	U	U	U	U		U	U	U	U	U	U	U	U
	NB	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U J		U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U R	U	U		U	U	U R	U	U	U	U	U
	2,4-DNT	U R	U	U	U	U		U	U	U	U	U	U	U	U
	o-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U		U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U		U	U	U	U	U	U	U	U
	4,6-DA-2-NT			0.6 R	U	U		U	U	U	U	U	U	U	U
	2-A-6-NT			U R	U	U		U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U		U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U J		U	U	U	0.09 J	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS18	1,3,5-TNB	U	U						U			U			
WSTA	1,3-DNB	U	U						U			U			
	NB	U	U						U			U			
	2,4,6-TNT	U	U						U			U			
	4-A-2,6-DNT	U	U						U			U			
	2-A-4,6-DNT	U	U						U			U			
	2,6-DNT	U	U						U			U			
	2,4-DNT	U R	U						U			U			
	o-NT	U	U						U			U			
	p-NT	U	U						U			U			
	m-NT	U	U						U			U			
	2,6-DA-4-NT								U			U			
	4,6-DA-2-NT								U			U			
	2-A-6-NT								U			U			
	4-A-2-NT								U			U			
	2-A-4 NT								U			U			

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-6 Other Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWD18	1,3,5-TNB	U	U						U			U	U	U	U
WSTA	1,3-DNB	U	U						U			U	U	U	U
	NB	U	U						U			U	U	U	U
	2,4,6-TNT	U	U						U			U	U	U	U
	4-A-2,6-DNT	U	U						U			U	U	U	U
	2-A-4,6-DNT	U	U						U			U	U	U	U
	2,6-DNT	U	U						U			U	U	U	U
	2,4-DNT	U R	U						U			U	U	U	U
	o-NT	U	U						U			U	U	U	U
	p-NT	U	U						U			U	U	U	U
	m-NT	U	U						U			U	U	U	U
	2,6-DA-4-NT								U			U	U	U	U
	4,6-DA-2-NT								U			U	U	U	U
	2-A-6-NT								U			U	U	U	U
	4-A-2-NT								U			U	U	U	U
	2-A-4 NT								U			U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS101	1,3,5-TNB	U	U	U	U	U		U	U	U	U	U	U	U	U
WSOW	1,3-DNB	U	U	U R	U	U		U	U	U	U	U	U	U	U
	NB	U	U	U R	U	U		U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U	U	U		U	U	U R	U	U	U	U	U
	2,4-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	o-NT	U	U	U R	U	U		0.2 R	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U		U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	0.93		1.7 J	U	2.9	U	U	U	U	U
	2,6-DA-4-NT			U R	U	U		U	U	U	U	U	U	U J	U
	4,6-DA-2-NT			0.1 R	U	U		U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U		U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U		U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U		U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-6 Other Wells: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS102	1,3,5-TNB	U	0.269 J	U	U	U	U	U	U	U	U	U	U	U	U
WSOW	1,3-DNB	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	NB	U	U	U	U	U	0.2 R	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U	0.07 R	U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U	U	U	0.1 J	U	U	U	U	U	U	U	U
	2,4-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	o-NT	0.8 J	U	U	U	U	0.1 J	U	U	U	U	U	U	U	U
	p-NT	U	U	U	U	U	0.09 R	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	2.2	U	2.2	1.9	U	U	U	U	U
	2,6-DA-4-NT			0.2 R	U	U	U	U	U	U	U	U	U	U J	U
	4,6-DA-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U	U	U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
MWS103	1,3,5-TNB	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
WSOW	1,3-DNB	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	NB	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2,6-DNT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2,4-DNT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	o-NT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U	U	U J	U	U	U	U	U	U	U	U J	U
	4,6-DA-2-NT			U	U	U J	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U J	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U J	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U J	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-7 Springs: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP5101	1,3,5-TNB								U	U	U	U	U	U	U
	1,3-DNB								U	U	U	U	U	U	U
	NB								U	U	U	U	U	U	U
	2,4,6-TNT								U	U	U	U	U	U	U
	4-A-2,6-DNT								U	U	U	U	U	U	U
	2-A-4,6-DNT								U	U	U	U	U	U	U
	2,6-DNT								U	U	U	U	U	U	U
	2,4-DNT								U	U	U	U	U	U	U
	o-NT								U	U	U	U	U	U	U
	p-NT								U	U	U	U	U	U	U
	m-NT								U	U	U	U	U	U	U
	2,6-DA-4-NT								U	U	U	0.54	U	U J	U
	4,6-DA-2-NT								U	U	U R	U	U	U	U
	2-A-6-NT								U	U	U	U	U	U	U
	4-A-2-NT								U	U	U	U	U	U	U
	2-A-4 NT								U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP5201	1,3,5-TNB	U	0.623 J	0.73	1	1 J	0.1 J	0.3 J	0.58	0.39	U	0.3 J	U	0.39	U
	1,3-DNB	U	U	U R	U	U J	U	U	U	U	U	U	U	U	U
	NB	U	1.056 J	U R	U	U J	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	3.380 J	1.2	1.5	1 J	0.5 J	1.6 J	0.61	1.2	0.1 J	0.40	0.3 J	0.56	U
	4-A-2,6-DNT	5.6	1.928 J	2.9	1.9	2 J	3.3	2.6 J	0.9	0.84	2.1	1.9	0.55	0.89	1.7
	2-A-4,6-DNT	2.8 J	1.036 J	1.6	0.92	1 J	1.7	1.2 J	0.37	0.34	0.87	0.80	0.2 J	0.32	0.74 J
	2,6-DNT	U	U	0.19 J	0.2	U J	0.28	0.21	U	U	U	0.19 J	U	U	U
	2,4-DNT	U	U	U	0.03 J	U J	0.1 J	0.06 J	U	U	U	U	U	U	U
	o-NT	U	U	U R	U	U J	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U J	U	U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U J	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			U R	U	U J	U	U	U	U	U	U	U	U J	U
	4,6-DA-2-NT			3.2 R	0.27 R	U J	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U J	U	U	U	U	U	U	U	U	U
	4-A-2-NT			0.54 R	U	U J	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	0.84 R	U J	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-7 Springs: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP5303	1,3,5-TNB								0.2 J	U		0.42	U	U	0.36
	1,3-DNB								U	U		U	U	U	U
	NB								U	U		U	U	U	U
	2,4,6-TNT								11	3.4		59	2.6	6.2	45.0
	4-A-2,6-DNT								1.6 R	0.87		12	0.73	1.0	16.0
	2-A-4,6-DNT								1	0.38		5.3	0.26	0.51	7.3
	2,6-DNT								0.1 R	U		0.36 J	U	U	U
	2,4-DNT								0.05 R	U		0.08 J	U	U	U
	o-NT								U	U		U	U	U	U
	p-NT								U	U		U	U	U	U
	m-NT								U	U		U	U	U	U
	2,6-DA-4-NT								U	U		U	U	U J	U
	4,6-DA-2-NT								U	U		U	U	U J	0.37 J
	2-A-6-NT								U	U		U	U	U	0.2 J
	4-A-2-NT								U	U		U	U	U	U
	2-A-4 NT								U	U		U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP5304	1,3,5-TNB								U						
	1,3-DNB								U						
	NB								U						
	2,4,6-TNT								0.3 J						
	4-A-2,6-DNT								0.67						
	2-A-4,6-DNT								0.31						
	2,6-DNT								U						
	2,4-DNT								0.09 R						
	o-NT								U						
	p-NT								U						
	m-NT								U						
	2,6-DA-4-NT								U						
	4,6-DA-2-NT								U						
	2-A-6-NT								U						
	4-A-2-NT								U						
	2-A-4 NT								U						

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-7 Springs: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP5401	1,3,5-TNB	U	U	U R	U	U J		U	U	U		U	U	U	U
	1,3-DNB	U	U	U R	U	U		U	U	U		U	U	U	U
	NB	U	U	U R	U	U		U	U	U		U	U	U	U
	2,4,6-TNT	U	U	U R	U	U		U	U	U		U	U	U	U
	4-A-2,6-DNT	U	U	U R	U	U		U	U	U		U	U	U	U
	2-A-4,6-DNT	U	U	U R	U	U		U	U	U		U	U	U	U
	2,6-DNT	U	U	U R	U	U		U	U	U		U	U	U	U
	2,4-DNT	U	U	U R	U	U		U	U	U		U	U	U	U
	o-NT	U	U	U R	U	U		U	U	U		U	U	U	U
	p-NT	U	U	U R	U	U		U	U	U		U	U	U	U
	m-NT	U	U	U R	U	U		U	U	U		U	U	U	U
	2,6-DA-4-NT			0.1 R	U	U		U	U	U		U	U	U J	U
	4,6-DA-2-NT			0.35 R	U	U		U	U	U		U	U	U J	U
	2-A-6-NT			U R	U	U		U	U	U		U	U	U	U
	4-A-2-NT			U R	U	U		U	U	U		U	U	U	U
	2-A-4 NT			U R	U	U		U	U	U		U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP5501	1,3,5-TNB	U R	0.073 J	U	U	U	U	U	U	U	U	U	U	U	U
	1,3-DNB	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	NB	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	0.520 J	U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	0.218 J	0.28	0.23 J	0 J	0.48	0.34 J	U	U	U	0.30	U	U	0.25
	2-A-4,6-DNT	U	0.157 J	0.1 J	0.1 J	0 J	0.27	0.26 J	U	U	U	0.1 J	U	U	0.1 J
	2,6-DNT	U	0.108 R	U	U	U	0.18 J	U	U	U R	U	U	U	U	U
	2,4-DNT	U	U	U	U	U	0.09 J	U	U	U	U	0.05 J	U	U	U
	o-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	p-NT	U	U	U	U	U	U	0.2 R	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			2.5 R	U	U	U	U	U	U	U	U	U	U J	U
	4,6-DA-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-7 Springs: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP5602	1,3,5-TNB	0.63 R	1.560 J		0.39	U	0.75	.49 J	0.50	U	0.83	0.76	0.2 J	0.78	0.90
	1,3-DNB	U	U		U	U	U	U	U	U	U	U	U	U	U
	NB	U	U		U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	1.2 J	4.310 J		4.1	4	1.3	1.4	3.7	0.39	1.6	2.2	2.3	3.2	1.4 J
	4-A-2,6-DNT	4.1 J	5.010 J		3.2	4 J	4.8	3.4 J	2.6	0.29	4.2	4.4	0.83	2.2	3.9
	2-A-4,6-DNT	2.8 J	2.370 J		2.0 J	3 J	3.3	2.1	1.6	0.2 J	2.5	2.8	0.37	1.2	2.5
	2,6-DNT	0.76 J	1.980 R		4.5	1.30 J	U	1.6	3.1	0.30	1.0	0.92 J	1.1 J	3.3 J	0.84
	2,4-DNT	U	U		0.34 J	0 J	U	0.04 J	0.08 J	0.25	0.07 J	0.08 J	1.1	0.1 J	0.09 J
	o-NT	U	U		U	U	U	U	U	0.33 J	U	U	1.7	U	U
	p-NT	U	U		U	U	U	U	U	0.2 J	U	U	0.48 J	U	U
	m-NT	U	U		U	U	U	U	U	U	U	U	0.27	U	U
	2,6-DA-4-NT				U	U	U	U	U	U	U	U	U	U J	U
	4,6-DA-2-NT				1.1 J	0.85	U	U	U	U	U	U	U	U	U
	2-A-6-NT				0.1 R	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT				0.07 R	U	U	U	U	U	U	U	U	U	0.07 R
	2-A-4 NT				0.32 R	U	U	U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP5603	1,3,5-TNB	U R	U	U	U	U		U	U	U	U	U	U	U	U J
	1,3-DNB	U	U	U R	U	U		U	U	U	U	U	U	U	U
	NB	U	U	U R	U	U		U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U	U	U	U J		U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U	U	U	1 R		U	U	U	U	U	0.1 R	U	0.20
	2-A-4,6-DNT	U	U	U	U	0 R		U	U	U	U	U	0.08 R	U	0.1 R
	2,6-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,4-DNT	U	U	U	U	U		U	U	U	U	U	U	U	U
	o-NT	U	U	U R	U	U		U	U	U	U	U	U	U	U
	p-NT	U	U	U R	U	U		U	U	U	U	U	U	U	U
	m-NT	U	U	U	U	U		U	U	U	U	U	U	U	U
	2,6-DA-4-NT			0.28 R	U	U		U	U	U	U	U	U	U J	U
	4,6-DA-2-NT			U R	U	U		U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U		U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U		U	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U J		U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-7 Springs: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP5605	1,3,5-TNB			0.2 J	0.49	1 J	0.75	0.21 J	0.59 J	0.3 J	0.89	1.0	U	0.60	0.99
	1,3-DNB			U	U	U J	U	U	U	U	U	U	U	U	U
	NB			U	U	U J	U	U	U	U	U	U	U	U	U
	2,4,6-TNT			30	21	27 J	49	33	16	4.9	34	47	3.4	8.4	30.0
	4-A-2,6-DNT			12 J	2.8	4 J	9.3	2.9 J	2.1	1.5	6.1	6.8	0.85	1.5	5.6
	2-A-4,6-DNT			3.7	1.2	2 J	4.2	2.5 J	0.93	0.57	2.9	3.1	0.30	0.63	2.5
	2,6-DNT			0.70	0.41	0.66 J	1.4	0.54	0.43	U	1.3	1.1 J	0.08 J	0.52 J	1.2
	2,4-DNT			U	0.08 J	U J	0.1 J	0.07 J	0.06 J	0.2 J	0.08 J	0.1 J	0.25	U	U
	o-NT			U	U	U J	U	0.1 R	U	0.31 R	U	U	0.56	U	U
	p-NT			U	U	U J	U	0.1 R	U	0.1 R	U	U	0.2 R	U	U
	m-NT			U	U	U J	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			2.1 R	U	U J	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT			3.0 R	U	U J	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U J	0.21 R	U	U	U	0.09 R	U	U	U	0.07 R
	4-A-2-NT			U	U	U J	U	U	U	U	0.08 J	U	U	U	0.06 J
	2-A-4 NT			U	U	U J	U	U	U	U	U	U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP6301	1,3,5-TNB		0.270 J	U	U	U	U	U	U	U	U	U	U	U	U
	1,3-DNB		U	U R	U	U	U	U	U	U	U	U	U	U	U
	NB		0.531 J	U R	U	U	U	U	U	U	U	U	U	U	U
	2,4,6-TNT		2.490 J	U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT		1.071 J	0.85 J	0.70 J	1	0.84	0.36 J	0.46	U	0.83	0.52	0.37	U	0.83
	2-A-4,6-DNT		0.775 J	0.58	0.45 J	0	0.54	0.21	0.24	U	0.42	0.27	0.2 J	U	0.36 J
	2,6-DNT		1.110 R	0.19 J	U	U	0.23 J	U	U	U	0.19	0.16 J	0.08 J	U	0.16
	2,4-DNT		U	U	U	U	U	U	U	U	U	U	U	U	U
	o-NT		U	U R	U	U	U	U	U	U	U	U	U	U	U
	p-NT		U	U R	U	U	U	U	U	U	U	U	U	U	U
	m-NT			U	U	U	U	U	U	U	U	U	U	U	U
	2,6-DA-4-NT			0.67 R	U	U	U	U	U	U	U	U	U	U J	U
	4,6-DA-2-NT			U R	U	U	U	U	U	U	U	U	U	U	U
	2-A-6-NT			U	U	U	U	U	U	U	U	U	U	U	U
	4-A-2-NT			U	U	U	U	0.07 J	U	U	U	U	U	U	U
	2-A-4 NT			U	U	U	U	U	U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-7 Springs: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP6303	1,3,5-TNB	U R	0.262 J	U	U	0 J									
	1,3-DNB	U	U	U R	U	U									
	NB	U	0.547 J	U R	U	U									
	2,4,6-TNT	U	2.550 J	U	U	U									
	4-A-2,6-DNT	U R	1.150 J	0.85 J	1	U									
	2-A-4,6-DNT	U R	0.822 J	0.58	0.51	U									
	2,6-DNT	U	1.139 R	0.19 J	1.5	U									
	2,4-DNT	U	U	U	0.39	U									
	o-NT	U	U	U R	U	U									
	p-NT	U	U	U R	U	U									
	m-NT	U	U	U	U	U									
	2,6-DA-4-NT			0.67 R	U	U									
	4,6-DA-2-NT			U R	U	0.41									
	2-A-6-NT			U	0.1	U									
	4-A-2-NT			U	U	U									
	2-A-4 NT			U	U	U									

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP6306	1,3,5-TNB	U R	U		U	U J	U	U	U	U	U	U	U	U	U
	1,3-DNB	U	U		U	U J	U	U	U	U	U	U	U	U	U
	NB	U	U		U	U J	U	U	U	U	U	U	U	U	U
	2,4,6-TNT	U	U		U	U J	U	U	U	U	U	U	U	U	U
	4-A-2,6-DNT	U	U		U	U J	U	U	U	U	U	U	U	U	U
	2-A-4,6-DNT	U	U		U	U J	U	0.07 R	U	U	U	U	U	U	U
	2,6-DNT	U	U		U	U J	U	U	U	U R	U	U	U	U	U
	2,4-DNT	U	U		U	U J	U	U	U	U	U	U	U	U	U
	o-NT	U	U		U	U J	0.1 R	0.1 R	U	U	U	U	U	U	U
	p-NT	U	U		U	U J	0.1 R	0.2 R	U	U	U	U	U	U	U
	m-NT	U	U		U	U J	2.9 R*	2.7 R*	2.83 R*	3.0 R*	U	U	U	U	U
	2,6-DA-4-NT				U	U J	U	U	U	U	U	U	U	U	U
	4,6-DA-2-NT				U	U J	U	U	U	U	U R	0.60	U	U	U
	2-A-6-NT				U	U J	U	U	U	U	U	U	U	U	U
	4-A-2-NT				U	U J	U	U	U	U	U	U	U	U	U
	2-A-4 NT				U	U J	U	U	U	U	U	U	U	U	U

R*=The data qualifier was placed on the data by the data user not by the laboratory. This data qualifier was placed on the data after further information was gained for the specific spring. After round 30 a new sample was run b

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-7 Springs: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP6501	1,3,5-TNB								U	U		U	U	U	U J
	1,3-DNB								U	U		U	U	U	U
	NB								U	U		U	U	U	U
	2,4,6-TNT								U	U		U	U	U	U
	4-A-2,6-DNT								U	U		U	U	U	U
	2-A-4,6-DNT								U	U		U	U	U	U
	2,6-DNT								U	U		U	U	U	U
	2,4-DNT								U	U		U	U	U	U
	o-NT								U	U		U	U	U	U
	p-NT								U	U		U	U	U	U
	m-NT								U	U		U	U	U	U
	2,6-DA-4-NT								U	U		U	U	U J	U
	4,6-DA-2-NT								U	U		U	U	U	U
	2-A-6-NT								U	U		U	U	U	U
	4-A-2-NT								U	U		U	U	U	U
	2-A-4 NT								U	U		U	U	U	U

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP6502	1,3,5-TNB	U R	0.653 J	U	U	U	U	U	U	U		U	U	U	
	1,3-DNB	U	U	U R	U	U	U	U	U	U		U	U	U	
	NB	U	1.020 J	U R	U	U	U	U	U	U		U	U	U	
	2,4,6-TNT	U	3.284 J	U	U	U J	U	U	U	U		U	U	U	
	4-A-2,6-DNT	U	1.970 J	U	U	U	U	U	U	U		U	U	U	
	2-A-4,6-DNT	U	1.010 J	U	U	U	U	U	U	U		U	U	U	
	2,6-DNT	U	U	U	U	U	U	U	U	U		U	U	U	
	2,4-DNT	U	U	U	U	U	U	U	U	U		U	U	U	
	o-NT	U	U	U R	U	U	U	U	U	U		U	U	U	
	p-NT	U	U	U R	U	U	U	U	U	U		U	U	U	
	m-NT	U	U	U	U	U	U	U	U	U		U	U	U	
	2,6-DA-4-NT			0.1 R	U	U	U	0.28	U	U		U	U	U J	
	4,6-DA-2-NT			U R	U	U	U	0.49 R	U	U		U	U	U	
	2-A-6-NT			U	U	U	U	0.1 R	U	U		U	U	U	
	4-A-2-NT			U	U	U	U	U	U	U		U	U	U	
	2-A-4 NT			U	U	U J	U	U	U	U		U	U	U	

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table B-4-7 Springs: Nitroaromatic Concentrations (ug/L)

Well ID	Analytical Parameter	Round 22 (Oct-99)	Round 23 (Jul-00)	Round 24 (Nov-00)	Round 25 (Feb-01)	Round 26 (May-01)	Round 27 (Aug-01)	Round 28 (Oct-01)	Round 29 (Feb-02)	Round 30 (May-02)	Round 31 (Sept-02)	Round 32 (Dec-02)	Round 33 (Feb-03)	Round 34 (May-03)	Round 35 (Aug-03)
SP6601	1,3,5-TNB								U	U	U	U	U	U	U
	1,3-DNB								U	U	U	U	U	U	U
	NB								U	U	U	U	U	U	U
	2,4,6-TNT								U	U	U	U	U	U	U
	4-A-2,6-DNT								U	U	0.72	0.64	U	U	0.45
	2-A-4,6-DNT								U	U	0.41	0.42	U	U	0.29 J
	2,6-DNT								U	U	U	0.08 J	U	U	U
	2,4-DNT								U	U	U	U	U	U	U
	o-NT								U	U	U	U	U	U	U
	p-NT								U	U	U	U	U	U	U
	m-NT								U	U	U	U	U	U	U
	2,6-DA-4-NT								U	U	U	U	U	U J	U
	4,6-DA-2-NT								U	U	U	U	U	U	U
	2-A-6-NT								U	U	U	U	U	U	U
	4-A-2-NT								U	U	U	U	U	U	U
	2-A-4 NT								U	U	U	U	U	U	U

Concentrations are in µg/L
J: estimated
R: rejected
U: non-detect

Table 2-3 -- Results of Nitroaromatic Trend Analysis for Select Wells and Springs

Well ID	Analytical Parameter	PRG	Mean*	Upper Limit of 99% Confidence Interval	Trend Analysis**		Estimated Time to Reach PRG in Years
					Slope (m)	y-intercept (b)	
MWS12	1,3-DNB	1	2.98	7.25	0.846	-1.820	a
SP5605*	2,4,6-TNT	2.8	25.28	36.95	-0.318	3.753	9
MWV09	2,4,6-TNT	2.8	24.49	29.77	-0.135	3.441	18
SP5303	2,4,6-TNT	2.8	21.20	52.56	0.683	0.236	a
MWS16	2,4,6-TNT	2.8	3.00	3.41	-0.019	1.124	5
SP5602	2,4,6-TNT	2.8	2.41	3.39	NA	NA	NA
MWS12	2,4,6-TNT	2.8	1.94	4.57	NA	NA	NA
MWV01	2,4,6-TNT	2.8	1.62	5.59	NA	NA	NA
MWS04	2,4,6-TNT	2.8	1.50	4.01	NA	NA	NA
MWS12	2,4-DNT	0.11	79.85	180.62	0.862	1.638	a
MWV09	2,4-DNT	0.11	37.37	46.30	-0.036	3.621	163
MWS15	2,4-DNT	0.11	0.28	0.59	-0.223	-0.331	8
MWS21	2,4-DNT	0.11	0.23	0.30	-0.295	-0.714	5
MWV01	2,4-DNT	0.11	0.21	0.49	-1.030	1.720	4
MWS04	2,4-DNT	0.11	0.19	0.44	-0.494	-0.968	3
SP5602	2,4-DNT	0.11	0.18	0.39	-0.257	-1.106	4
MWS17	2,4-DNT	0.11	0.13	0.23	-0.143	-1.384	6
USGS4	2,4-DNT	0.11	0.12	0.19	0.108	-2.322	a
SP6303	2,4-DNT	0.11	0.12	0.35	NA	NA	b
USGS9	2,4-DNT	0.11	0.10	0.21	NA	NA	NA
SP5605	2,4-DNT	0.11	0.10	0.14	NA	NA	NA
MWS12	2,6-DNT	1.3	59.92	100.79	0.532	2.572	a
MWV09	2,6-DNT	1.3	4.39	6.15	-0.135	1.946	12
USGS4	2,6-DNT	1.3	2.65	3.13	0.053	0.836	a
SP5602	2,6-DNT	1.3	1.56	2.61	-0.040	0.363	3
MWS04	2,6-DNT	1.3	1.11	1.36	NA	NA	NA
MWS10	2,6-DNT	1.3	0.97	1.34	NA	NA	NA
SP6303	2,6-DNT	1.3	0.45	1.77	NA	NA	NA
MWS12	o-NT	37	280.39	464.74	0.683	3.695	a
MWS12	p-NT	37	143.17	268.65	0.662	2.918	a

* Period of evaluation is Round 22 through Round 35 (October 1999 to August 2003 from GMAR document)

** Trend is based upon a linear "best fit" evaluation related to the following equation: C = Co * e^(-kt) where the results of the linear "best fit", m, and b, are used to determine the initial concentration, Co, ant the rate constant, k. The calculated value, "m", is used as "-k". Co is determined using the equation Co = mx + b.

*** ***Bolding with italics indicates the well/spring had a mean concentration that exceeded the PRG.***

a Concentrations show upward trend; therefore, no estimate performed.

b Well/spring is not in the current network. No detects since Round 25. Results were primarily non-detect, therefore there were too few data points to determine a trend. There have been no detects since Round 25. The next downgradient point is SP6301.

NA Not applicable. Wells and springs with mean concentrations below PRGs were not included in trend analysis.

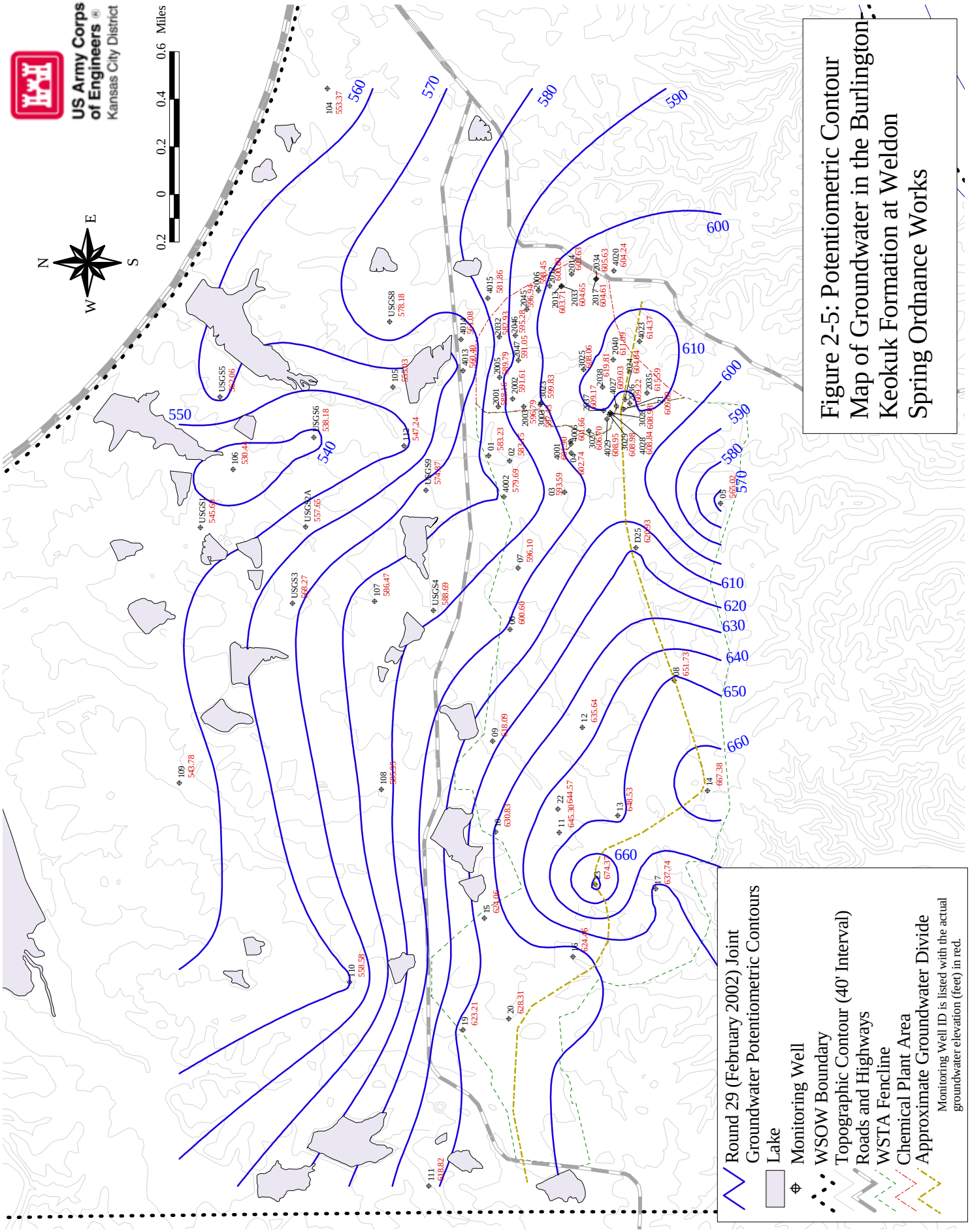
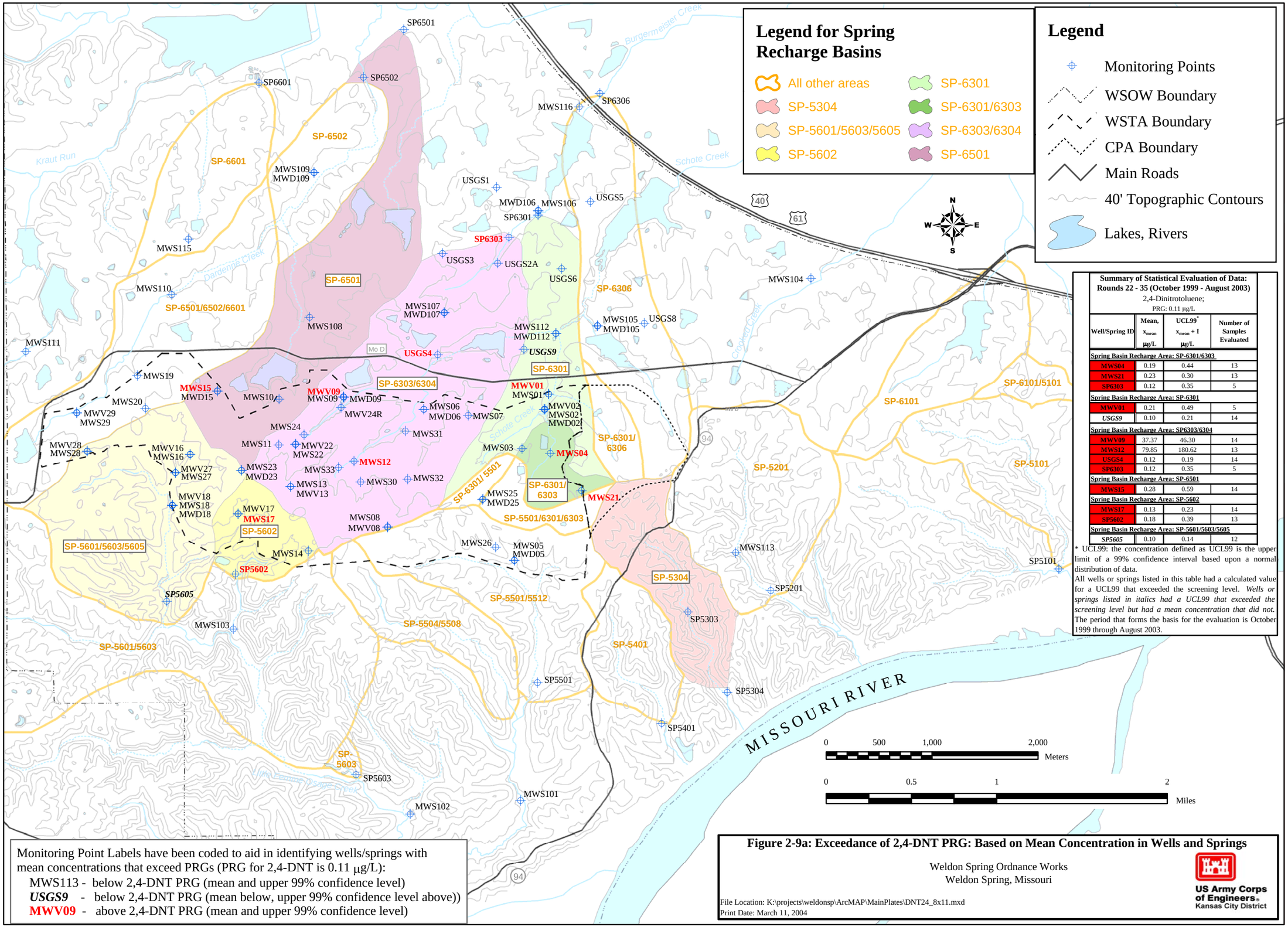


Figure 2-5: Potentiometric Contour Map of Groundwater in the Burlington-Keokuk Formation at Weldon Spring Ordnance Works



Summary of Statistical Evaluation of Data: Rounds 22 - 35 (October 1999 - August 2003)
2,4-Dinitrotoluene;
PRG: 0.11 µg/L

Well/Spring ID	Mean, x_{mean} µg/L	UCL99* x_{mean} + 1 µg/L	Number of Samples Evaluated
Spring Basin Recharge Area: SP-6301/6303			
MWS04	0.19	0.44	13
MWS21	0.23	0.30	13
SP6303	0.12	0.35	5
Spring Basin Recharge Area: SP-6301			
MWV01	0.21	0.49	5
USGS9	0.10	0.21	14
Spring Basin Recharge Area: SP6303/6304			
MWV09	37.37	46.30	14
MWS12	79.85	180.62	13
USGS4	0.12	0.19	14
SP6303	0.12	0.35	5
Spring Basin Recharge Area: SP-6501			
MWS15	0.28	0.59	14
Spring Basin Recharge Area: SP-5602			
MWS17	0.13	0.23	14
SP5602	0.18	0.39	13
Spring Basin Recharge Area: SP-5601/5603/5605			
SP5605	0.10	0.14	12

* UCL99: the concentration defined as UCL99 is the upper limit of a 99% confidence interval based upon a normal distribution of data.
All wells or springs listed in this table had a calculated value for a UCL99 that exceeded the screening level. *Wells or springs listed in italics had a UCL99 that exceeded the screening level but had a mean concentration that did not.* The period that forms the basis for the evaluation is October 1999 through August 2003.

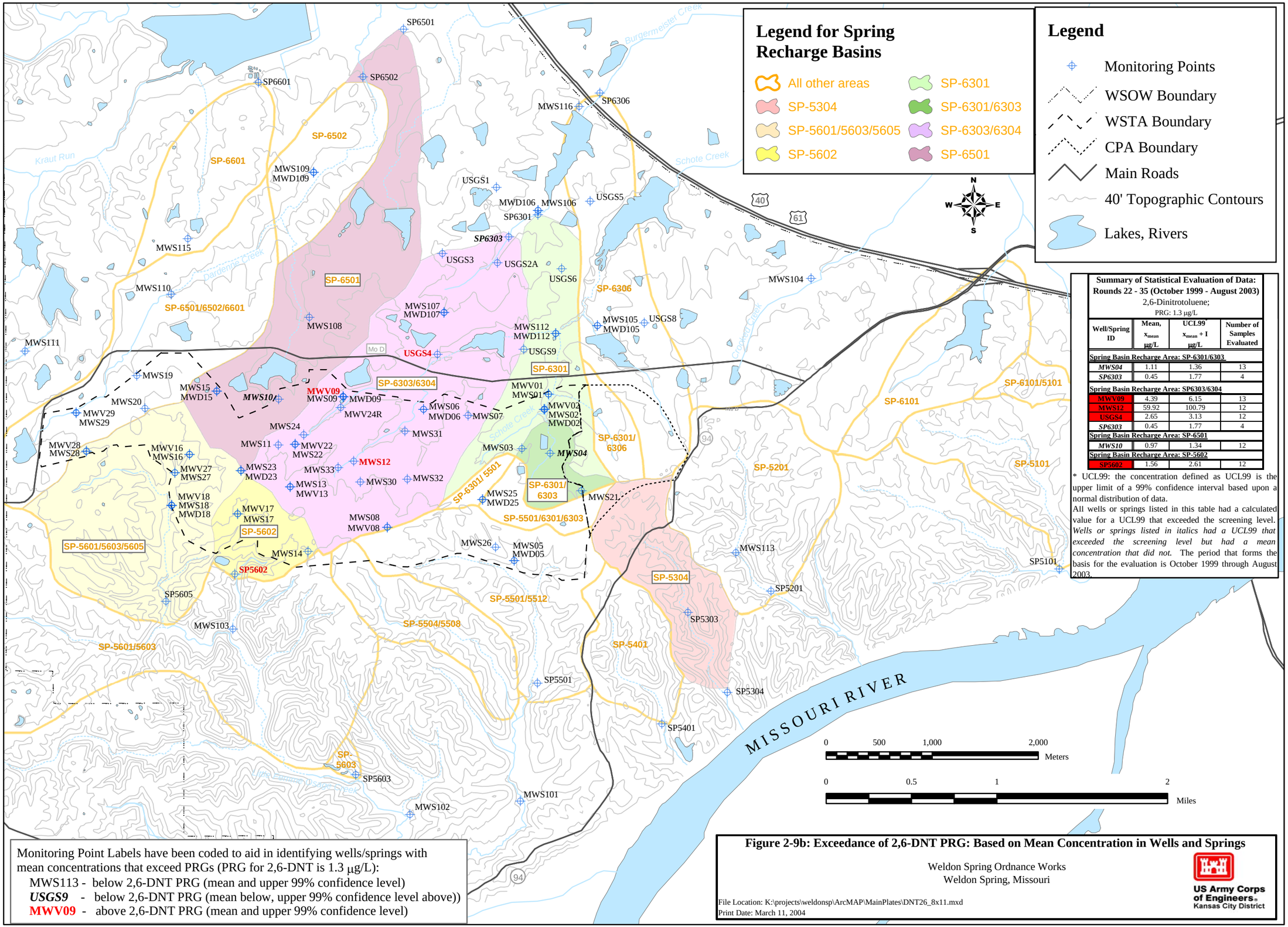
Monitoring Point Labels have been coded to aid in identifying wells/springs with mean concentrations that exceed PRGs (PRG for 2,4-DNT is 0.11 µg/L):
MWS113 - below 2,4-DNT PRG (mean and upper 99% confidence level)
USGS9 - below 2,4-DNT PRG (mean below, upper 99% confidence level above))
MWV09 - above 2,4-DNT PRG (mean and upper 99% confidence level)

Figure 2-9a: Exceedance of 2,4-DNT PRG: Based on Mean Concentration in Wells and Springs

Weldon Spring Ordnance Works
Weldon Spring, Missouri

File Location: K:\projects\weldonsp\ArcMAP\MainPlates\DNT24_8x11.mxd
Print Date: March 11, 2004

US Army Corps of Engineers
Kansas City District



Summary of Statistical Evaluation of Data: Rounds 22 - 35 (October 1999 - August 2003)
2,6-Dinitrotoluene;
PRG: 1.3 µg/L

Well/Spring ID	Mean, x_{mean} µg/L	UCL99 x_{mean} + I µg/L	Number of Samples Evaluated
Spring Basin Recharge Area: SP-6301/6303			
MWS04	1.11	1.36	13
SP6303	0.45	1.77	4
Spring Basin Recharge Area: SP6303/6304			
MWV09	4.39	6.15	13
MWS12	59.92	100.79	12
USGS4	2.65	3.13	12
SP6303	0.45	1.77	4
Spring Basin Recharge Area: SP-6501			
MWS10	0.97	1.34	12
Spring Basin Recharge Area: SP-5602			
SP5602	1.56	2.61	12

* UCL99: the concentration defined as UCL99 is the upper limit of a 99% confidence interval based upon a normal distribution of data.
All wells or springs listed in this table had a calculated value for a UCL99 that exceeded the screening level. *Wells or springs listed in italics had a UCL99 that exceeded the screening level but had a mean concentration that did not.* The period that forms the basis for the evaluation is October 1999 through August 2003.

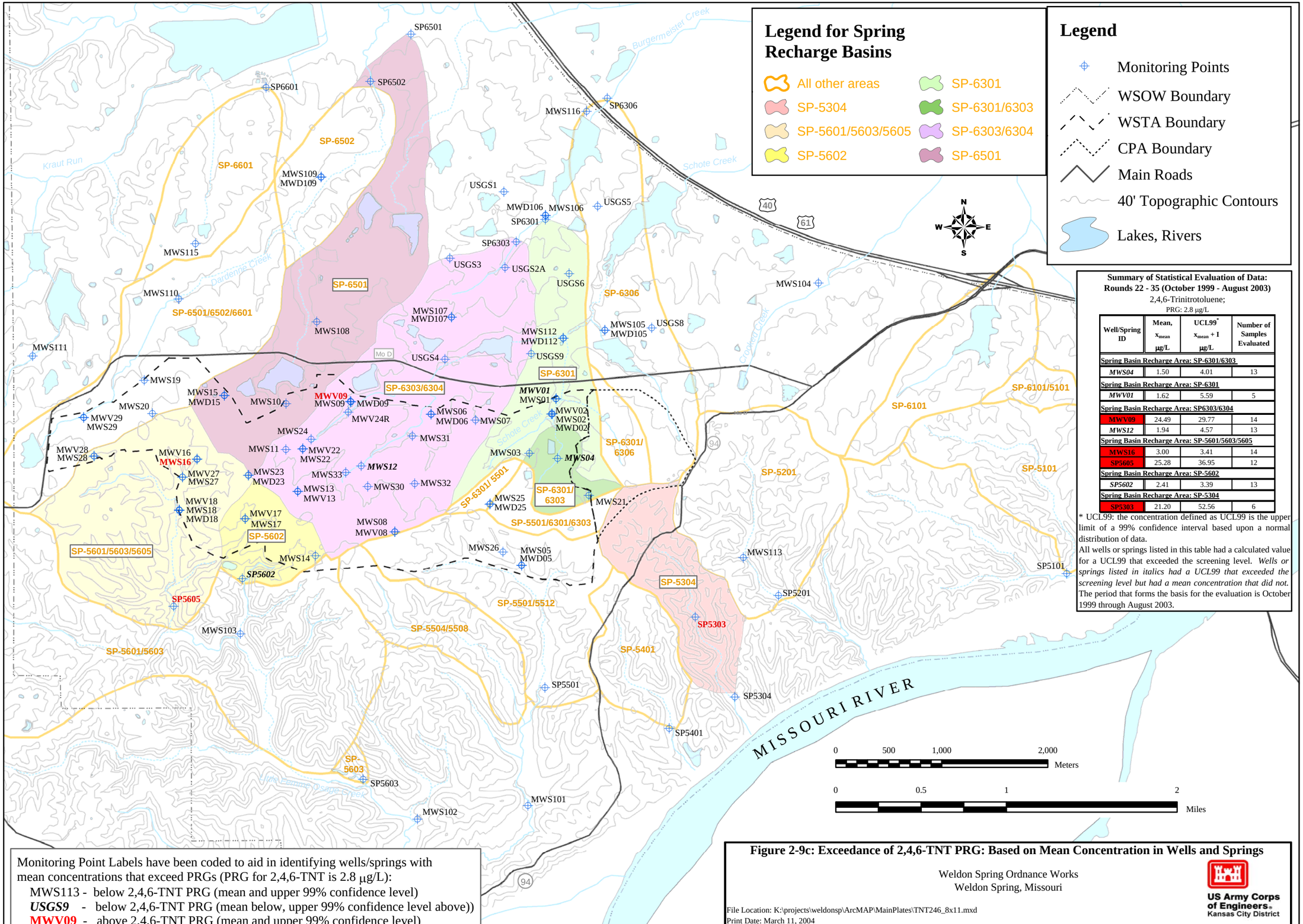
Monitoring Point Labels have been coded to aid in identifying wells/springs with mean concentrations that exceed PRGs (PRG for 2,6-DNT is 1.3 µg/L):
MWS113 - below 2,6-DNT PRG (mean and upper 99% confidence level)
USGS9 - below 2,6-DNT PRG (mean below, upper 99% confidence level above))
MWV09 - above 2,6-DNT PRG (mean and upper 99% confidence level)

Figure 2-9b: Exceedance of 2,6-DNT PRG: Based on Mean Concentration in Wells and Springs

Weldon Spring Ordnance Works
Weldon Spring, Missouri

US Army Corps of Engineers
Kansas City District

File Location: K:\projects\weldonsp\ArcMAP\MainPlates\DNT26_8x11.mxd
Print Date: March 11, 2004



Summary of Statistical Evaluation of Data: Rounds 22 - 35 (October 1999 - August 2003)

2,4,6-Trinitrotoluene;

PRG: 2.8 µg/L

Well/Spring ID	Mean, x_{mean} µg/L	UCL99* x_{mean} + I µg/L	Number of Samples Evaluated
Spring Basin Recharge Area: SP-6301/6303			
MWS04	1.50	4.01	13
Spring Basin Recharge Area: SP-6301			
MWV01	1.62	5.59	5
Spring Basin Recharge Area: SP6303/6304			
MWV09	24.49	29.77	14
MWS12	1.94	4.57	13
Spring Basin Recharge Area: SP-5601/5603/5605			
MWS16	3.00	3.41	14
SP5605	25.28	36.95	12
Spring Basin Recharge Area: SP-5602			
SP5602	2.41	3.39	13
Spring Basin Recharge Area: SP-5304			
SP5303	21.20	52.56	6

* UCL99: the concentration defined as UCL99 is the upper limit of a 99% confidence interval based upon a normal distribution of data.

All wells or springs listed in this table had a calculated value for a UCL99 that exceeded the screening level. *Wells or springs listed in italics had a UCL99 that exceeded the screening level but had a mean concentration that did not.* The period that forms the basis for the evaluation is October 1999 through August 2003.

Figure 2-9c: Exceedance of 2,4,6-TNT PRG: Based on Mean Concentration in Wells and Springs

Weldon Spring Ordnance Works
Weldon Spring, Missouri