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To: Stephanie Doolan, EPA Region VII
Rich Nussbaum, MO DNR

From: Michael House, Solutia Inc.

Date: June 30, 2006

**Re: Updated 2005 Risk Assessment and Conceptual Risk Management Plan, Solutia – J.F. Queeny Plant, St. Louis, Missouri**

Stephanie, Rich:

Attached is the updated 2005 risk assessment and conceptual risk management plan for Solutia's J.F. Queeny facility. This update was necessary following the additional data collection that was recently performed (per the recommendation of the 2005 risk assessment) at three of the four Solid Waste Management Units that we are still evaluating at the site. As you would expect, the calculated risk numbers changed but the overall risk outcomes and conceptual risk management plan hardly changed at all. This effort however does give us additional confidence that potential risks at the site have been accurately identified.

On April 6, 2006 Solutia submitted to the Agencies its Conceptual Risk Management Plan for the site. The Agencies responded in a letter received June 19 that they were in agreement with the proposed plan and requested that Solutia proceed with the Corrective Measures Study (CMS) for the site. If the EPA and the MDNR remain in agreement after review of the attached submittal, Solutia will proceed with development of the CMS as requested.

We look forward to receiving your response to this submittal. If you have any questions or concerns, I can be reached at 314-674-6717.

Sincerely yours,

Michael House

Michael House
Manager Remedial Projects

512880
RCRA

Attachment

Cc: Robert Hiller, Solutia
Atul M. Salhotra, RAM Group
Sungmi Kim, RAM Group
Bob Billman, URS
Thomas J. Adams, URS

# UPDATED 2005 RISK ASSESSMENT AND CONCEPTUAL RISK MANAGEMENT PLAN FOR SELECTED AREAS IN SOLUTIA – J.F. QUEENY PLANT

**June 2006**

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| | |
|---|---|
| APA | Former Acetanilides Production Area |
| CMS | Corrective Measures Study |
| COC | Constituent of Concern |
| DNAPL | Dense Non-Aqueous Phase Liquid |
| FBCSA | Former Bulk Chemical Storage Area |
| FF | Former FF Building Area |
| HI | Hazard Index |
| HQ | Hazard Quotient |
| IELCR | Individual Excess Lifetime Cancer Risk |
| LNAPL | Light Non-Aqueous Phase Liquid |
| MDNR | Missouri Department of Natural Resources |
| MRBCA | Missouri Risk-Based Corrective Action |
| QA/QC | Quality Assurance/Quality Control |
| RA | Risk Assessment |
| RAGS | Risk Assessment Guidance for Superfund |
| RCRA | Resource Conservation and Recovery Act |
| RM | Risk Management |
| SWMU | Solid Waste Management Unit |
| US EPA | United States Environmental Protection Agency |
| VOC | Volatile Organic Compound |
| SVOC | Semi-volatile Organic Compound |

# UPDATED 2005 RISK ASSESSMENT AND CONCEPTUAL RISK MANAGEMENT PLAN FOR SELECTED AREAS IN SOLUTIA – J.F. QUEENY PLANT

## 1.0 INTRODUCTION

This report presents the Updated 2005 Risk Assessment (RA) and the development of site-specific media cleanup goals for the following three solid waste management units (SWMUs) in Solutia – J.F. Queeny Plant (Queeny Plant):

(i) Former FF Building Area (RAM Group, Inc. and URS, February 2005),
(ii) Former Bulk Chemical Storage Area (RAM Group, Inc. and URS, February 2005),
(iii) Former Acetanilides Production Area (RAM Group, Inc. and URS, September 2005).

The results of the Updated 2005 RA, the media cleanup goals, and conceptual risk management options will be used to develop the Resource Conservation and Recovery Act (RCRA) Corrective Measures Study (CMS).

The risk and conceptual risk management plan for the VV Building Area have not been updated from the 2005 RA since no additional data were collected in the VV Building Area. However, the results and conceptual risk management plan from the 2005 RA are included in this report so that this comprehensive report can be referred to develop the CMS.

The report consists of six sections and five appendices.

Section 1.0 (this section) presents the overall objectives of the study and organization of the report.

Section 2.0 provides site background and chronology of events.

Section 3.0 presents the additional data collected in 2006.

Section 4.0 presents methodology used to update the 2005 RA and results of the Updated 2005 RA.

Section 5.0 summarizes the findings of the Updated 2005 RA and conceptual risk management plan, and repeats the conclusions for VV Building Area.

Section 6.0 presents the conclusions based on the findings of this study.

Section 7.0 presents the references used in the preparation of this report.

Section 7.0 is followed by five appendices. Appendix A includes field and laboratory

procedures used to collect the additional data that necessitated this update. Appendices B to D include details of update on risks and development of media cleanup goals for each of three areas. Appendix E includes information of the 2005 RA for the VV Building Area.

## 2.0 BACKGROUND

The Queeny Plant is an industrialized 37-acre parcel of land located west of the Mississippi River at 201 Russell Boulevard in St. Louis, Missouri. RCRA corrective action activities began at the Queeny Plant in the late 1980's. These corrective action activities focused on eight SWMUs and as a part of these activities, a RA was completed in 2002 using the Risk Assessment Guidance for Superfund (RAGS) (US EPA, 1989) procedure (URS, July 2002). The 2002 RA was approved by United States Environmental Protection Agency (US EPA) and identified the need to perform additional evaluation in four SWMUs, namely (i) Former FF Building Area (FF), (ii) VV Building Area, (iii) Former Bulk Chemical Storage Area (FBCSA), and (iv) Former Acetanilides Production Area (APA).

With US EPA and Missouri Department of Natural Resources' (MDNR) concurrence, additional data were collected in each of these SWMUs and a comprehensive RA completed for these areas in 2005 (RAM Group, February 2005; RAM Group, September 2005). The 2005 RA followed the draft Missouri Risk-Based Corrective Action (MRBCA) process (MDNR, Feb. 2005).

The 2002 RA and the 2005 RA were different due to the following two reasons:

(i) The 2005 RA was performed following draft MRBCA process; whereas, the 2002 RA was performed using the RAGS procedure.
(ii) The 2005 RA was based on additional data collected in 2004 – 2005 whereas the 2002 RA did not have these data.

As per US EPA's request, Solutia conducted an evaluation of the 2002 RA and the 2005 RA, and updated the 2002 RA for the additional data using the RAGS procedure. Based on these studies, following were the conclusions:

- The 2002 RA methodology and the 2005 RA methodology are comparable in terms of conservativeness.
- Based on the 2005 RA and the updated 2002 RA, it was concluded that while the numerical values of risk for the various receptors and exposure pathways were different, areas that warrant risk management were identical.

The above results were presented to the US EPA at a meeting on January 31, 2006. Based on the presentation, the US EPA requested Solutia to proceed with the development of risk management alternatives for each SWMU. Solutia agreed to this request and as a first step, in memo dated April 6, 2006 (Solutia, April 2006), Solutia proposed that CMS will evaluate relevant risk management alternatives for all areas and

receptors that require risk management per the updated 2002 RA or the 2005 RA.

For the submittal of the CMS, the following approach was proposed:

- Collection of additional samples as recommended by the 2005 RA,
- Update of risk assessment and media cleanup goals utilizing additional data based on the MRBCA process, and
- Management of unacceptable risks as per the updated risk assessments.

The US EPA approved the above approach. Therefore, additional samples were collected as discussed in Section 3.0. Update of the 2005 RA and development of media cleanup goals are discussed in Section 5.0.

## 3.0 ADDITIONAL SAMPLES

In April 2006, additional surficial soil and groundwater samples were collected in three SWMUs including FF, FBCSA, and APA. The following summarizes the additional samples collected:

| SWMU | Surficial Soil | | Groundwater | |
|---|---|---|---|---|
| | No. of Sample | Analyte | No. of Sample | Analyte |
| FF | 5 | VOCs | 1 | VOCs |
| FBCSA | 6 | SVOCs, arsenic, and lead | 1 | VOCs |
| APA | 9 | Mercury | 0 | N/A |

N/A: Not applicable
SVOCs: Semi-volatile organic compounds
VOCs: Volatile organic compounds

Additional details of the sampling and analytical procedures are included in Appendix A.

## 4.0 METHODOLOGY

The risks for each SWMU were updated with the additional data and the following steps were used:

**Step 1: Update of representative concentrations.** Using the additional data, representative concentrations for relevant complete exposure pathways were recalculated.

**Step 2: Update of risks.** Using the recalculated representative concentrations, risks for the potential receptors of concern were updated.

**Step 3: Update of risk management alternatives.** Based on the results from Step 2 above, risk management alternatives were updated. As a part of risk management alternatives, media cleanup goals were developed.

Identical assumptions and parameters as used in the 2005 RA were used to update the risk. The target risks, as per the MRBCA process, are based on the total risk (from all

complete exposure pathways for a specific receptor) for a constituent and cumulative risk (total risk for all the constituents for a specific receptor) and not on individual constituents and individual exposure pathway. Hence, the cleanup goals developed are not unique and several combinations of cleanup goals are possible.

The details of the update on risks are included in Appendices B, C and D for FF, FBCSA, and APA, respectively.

## 5.0 SUMMARY OF THE UPDATED 2005 RISK ASSESSMENT AND CONCEPTUAL RISK MANAGEMENT PLAN

The Updated 2005 RA is summarized as below:

### 5.1 Former FF Building Area

Using the additional surficial soil data and groundwater data, the representative concentrations were recalculated for the following exposure pathways:

- VOCs in surficial soil for a future on-site non-residential worker,
- VOCs in groundwater for a future on-site non-residential and construction worker, and
- VOCs in soil for a future on-site construction worker.

Using the recalculated representative concentrations, risks were updated for the following receptors of concern:

- Future on-site non-residential workers, and
- Future on-site construction workers.

The results of the Updated 2005 RA indicate that:

- Total carcinogenic risk to the potential future on-site non-residential worker for tetrachloroethene exceeded the acceptable target risk. The primary exposure pathways contributing to this exceedence are dermal contact with, ingestion of, and outdoor inhalation of vapors and particulates from surficial soil.

- Site-wide cumulative non-carcinogenic risk to the potential future construction worker exceeded the target risk level. Further examination indicates that the total non-carcinogenic risk for toluene exceeded the target risk level. The primary exposure pathway for this exceedence is dermal contact with groundwater.

- Sporadic measurement of light non-aqueous phase liquid (LNAPL) and dense NAPL (DNAPL) have been observed in a few wells and piezometers.

Unacceptable risks to the potential future non-residential worker can be managed by:

(i) Imposing an institutional control that requires the surface to remain covered. In this case, the direct contact with soil exposure pathway would not be complete and risks from surficial soil will be eliminated.

(ii) Reducing the representative surficial soil concentration for tetrachloroethene to 210,910 µg/kg.

Unacceptable risks to the potential future construction worker can be managed by:

(i) Imposing institutional controls e.g., requiring personal protective equipment during construction.

(ii) Reducing the representative concentration of toluene in groundwater to 62,590 µg/L.

Solutia intends to evaluate these and other options to manage risks and the sporadic occurrence of LNAPL and DNAPL during the CMS phase.

***The results of Updated 2005 RA and hence the conceptual risk management options are consistent with the 2005 RA in the Former FF Building Area.***

## 5.2 Former Bulk Chemical Storage Area

Using the additional surficial soil data and groundwater data, the representative concentrations were recalculated for the following exposure pathways:

- SVOCs, arsenic, and lead in surficial soil for a future on-site non-residential worker,
- VOCs in groundwater for a future on-site non-residential and construction worker, and
- SVOCs, arsenic, and lead in soil for a future on-site construction worker.

Using the recalculated representative concentrations, risks were updated for the following receptors of concern:

- Future on-site non-residential workers, and
- Future on-site construction workers.

The results of the Updated 2005 RA indicate that:

- Total carcinogenic risk to the potential future non-residential worker for arsenic and benzo(a)pyrene exceeded the acceptable target risk. The primary exposure pathways for these exceedences are ingestion of arsenic in surficial soil, and dermal contact with and ingestion of benzo(a)pyrene in surficial soil.

- Total carcinogenic risk to the potential future on-site construction worker for

vinyl chloride exceeded the acceptable target risk. The primary exposure pathway for this exceedence is dermal contact with groundwater. Site-wide cumulative non-carcinogenic risk to the potential future construction worker exceeded the acceptable target risk. The primary exposure pathway for this exceedence is dermal contact with groundwater. The constituents that contributed most to this exceedence were 1,2-dichloroethane, benzene, carbon tetrachloride, chlorobenzene, chloroform, cis-1,2-dichloroethene, iodomethane, and vinyl chloride. Thus, site-specific cleanup goals were developed for these constituents.

- Although site-specific cleanup goals for lead were not developed as a part of this evaluation, the representative surficial soil concentrations for the non-residential worker exceeded both the US EPA and the MRBCA target levels of 750 mg/kg and 660 mg/kg, respectively.

- Sporadic occurrence of light non-aqueous phase liquid (LNAPL) has been observed in a few wells and piezometers.

Unacceptable risks to the potential future non-residential worker can be managed by:

(i) Imposing an institutional control that requires the surface to remain covered. In this case, the direct contact with soil exposure pathway would not be complete and risks from surficial soil will be eliminated.

(ii) Reducing the representative surficial soil concentration to the following cleanup goals:

| | |
|---|---|
| • Arsenic | 19,750 µg/kg |
| • Benzo(a)pyrene | 1,870 µg/kg |
| • Lead | 660,000 µg/kg |

Unacceptable risks to the potential future construction worker can be managed by:

(i) Imposing institutional controls, e.g., requiring personal protective equipment during construction.

(ii) Reducing the representative groundwater concentration to the following cleanup goals:

| | |
|---|---|
| • 1,2-Dichloroethane | 590 µg/L |
| • Benzene | 1,230 µg/L |
| • Carbon tetrachloride | 60 µg/L |
| • Chlorobenzene | 1,680 µg/L |
| • Chloroform | 550 µg/L |
| • cis-1,2-Dichloroethene | 240 µg/L |
| • Iodomethane | 960 µg/L |
| • Vinyl chloride | 190 µg/L |

Solutia intends to evaluate these and other options to manage risks and the occurrence of LNAPL in this area during the CMS phase.

***The results of Updated 2005 RA and hence the conceptual risk management options are consistent with the 2005 RA in the Former Bulk Chemical Storage Area.***

## 5.3 Former Acetanilides Production Area

Using the additional soil data for mercury, the representative concentrations were recalculated for the following exposure pathways:

- Mercury in surficial soil for a current on-site non-residential worker,
- Mercury in surficial soil for a future on-site non-residential worker, and
- Mercury in soil for a future on-site construction worker.

Using the recalculated representative concentrations, risks were updated for the following receptors of concern:

- Current on-site non-residential workers,
- Future on-site non-residential workers, and
- Future on-site construction workers.

The results of the Updated 2005 RA indicate that:

- Risks for the current and potential future non-residential worker did not exceed the target risk level and does not need further evaluation or risk management.

- Total carcinogenic risk for alachlor and dibenzo(a,h)anthracene to the potential future on-site construction worker exceeded the acceptable target risk. The primary exposure pathway for this exceedence is dermal contact with groundwater.

- Site-wide cumulative non-carcinogenic risk to the potential future on-site construction worker exceeded the acceptable target risk. The constituents that contributed most to this exceedence were alachlor, chlorobenzene, and mercury. The primary exposure pathway for the exceedence of alachlor and chlorobenzene is dermal contact with groundwater and the primary exposure pathway for the exceedence of mercury is outdoor inhalation of vapors and particulates from soil.

- Representative concentrations of lead did not exceed the acceptable target levels.

Unacceptable risks to the potential future construction worker can be managed by:

(i) Imposing institutional controls, e.g., requiring personnel protective equipment during construction.

(ii) Reducing the representative soil concentration for mercury to 370 µg/kg.

(iii) Reducing the representative groundwater concentration to the following:

- Alachlor 20,210 µg/L
- Chlorobenzene 4,860 µg/L
- Dibenzo(a,h)anthracene 3 µg/L

Solutia intends to evaluate the options available to manage risks and the occurrence of NAPL in this area during the CMS.

***The updated risk to the non-residential worker in the Former Acetanilides Production Area is acceptable. Per the 2005 RA this risk was unacceptable. Therefore, a risk management plan for the non-residential worker is not required.***

## 5.4 VV Building Area

Since no additional data were collected, the 2005 RA was not updated. Therefore, for completion sake the results from the 2005 RA are presented below:

To develop cleanup goals, risk to potential receptors of concern – non-residential workers and construction workers were conservatively estimated for the complete routes of exposure. The evaluation was performed using site-specific data and conservative assumptions and parameters as per the MRBCA process. The results indicate that:

- Neither potential carcinogenic nor potential non-carcinogenic risks for non-residential workers exceeded the target risk levels, and
- Risks for potential construction workers exceeded the target risk levels.

Unacceptable risks to the potential future construction worker can be managed by either institutional controls e.g., by requiring personal protective equipment during construction or by reducing the representative soil concentrations to the following levels:

- Aroclor-1242 12,030 µg/kg
- Aroclor-1248 580 µg/kg
- Aroclor-1254 2,110 µg/kg
- Aroclor-1260 870 µg/kg

The target risks, as per the MRBCA process, are based on the total risk (from all complete routes of exposure) for a constituent and cumulative risk (total risk for all the constituents) and not on individual constituent and individual routes of exposure. Hence, the cleanup goals presented above are not unique and several other combinations of cleanup goals are possible.

Solutia intends to evaluate the options available to manage risks during the Corrective Measures Study (CMS).

***There is no change in the risks and the conceptual risk management plans for VV Building Area.***

## 6.0 CONCLUSIONS

The collection of the additional data described in Section 3.0 and its incorporation in the 2005 RA had the following two impacts:

Risk Assessment

- As expected, the numerical values of carcinogenic risk (IELCR) and non-carcinogenic risk (HQ) changed for all receptors and all areas. However, the impact on risk management is minimal.
- The updated risk to non-residential worker in the APA is acceptable, previously per 2005 RA the risk was unacceptable.
- Overall, our confidence in the RA, due to availability of current data and enhanced geographic distribution of data in each area, has increased further.

Risk Management

- The Updated 2005 RA has eliminated the need for risk management for the non-residential worker in the APA.
- For all other areas, the risk management alternatives presented in the 2005 RA and the Updated Conceptual Risk Management Plan are valid and will be addressed in the CMS.

Following are the receptors in each of the four areas that require risk management per the Updated 2005 RA and the Updated 2002 RA:

| Receptor | Former FF Building Area | | VV Building Area | | Former Bulk Chemical Storage Area | | Former Acetanilides Production Area | |
|---|---|---|---|---|---|---|---|---|
| | Updated 2005 RA | Updated 2002 RA | 2005 RA | Updated 2002 RA | Updated 2005 RA | Updated 2002 RA | Updated 2005 RA | Updated 2002 RA |
| Construction worker | **RM** | RA | **RM** | **RM** | **RM** | RA | **RM** | **RM** |
| Indoor site worker | --- | **RM** | --- | RA | --- | **RM** | --- | RA |
| Non-residential worker | **RM** | --- | RA | --- | **RM** | --- | RA | --- |

RA: Risk acceptable **RM**: Risk management required ---: Receptor not considered

The CMS will consider risk management options for the following:

**Former FF Building Area:**

- Construction worker,
- Indoor site worker, and
- Non-residential worker.

**VV Building Area:**

- Construction worker.

**Former Bulk Chemical Storage Area:**

- Construction worker,
- Indoor site worker, and
- Non-residential worker.

**Former Acetanilides Production Area:**

- Construction worker.

The CMS will evaluate relevant risk management alternatives including, but not limited to, (i) collection of any relevant additional data, (ii) institutional controls, and (iii) implementation of remedial technologies.

## 7.0 REFERENCES

MDNR, February 2005. Draft Departmental Missouri Risk-Based Corrective Action Technical Guidance.

RAM Group, Inc. and URS, February 2005. Updated Risk Assessment and Development of Site-specific Media Cleanup Goals for Selected Areas in Solutia – J.F. Queeny Plant.

RAM Group, Inc. and URS, September 2005. Updated Risk Assessment and Development of Site-specific Media Cleanup Goals for Former Acetanilides Production Area in Solutia – J.F. Queeny Plant.

Solutia, Inc. April 6, 2006. Conceptual Risk Management Plan, Solutia – J.F. Queeny Plant, St. Louis, Missouri.

URS Corporation, July 2002. RCRA Facility Investigation Data Gap Investigation Report.

US EPA, 1989. Risk Assessment Guidance for Superfund (RAGS): Volume I, Human Health Evaluation Manual, Part A. Office of Emergency and Remedial Response, Washington, D.C.

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**FIGURES**

Figure 1 Soil and Groundwater Sample Locations – Former FF Building Area
Figure 2 Soil Boring Locations – Former Acetanilides Production Area
Figure 3 Soil and Groundwater Sample Locations – Former Bulk Chemical Storage Area

**SOIL BORING LOGS**

**LABORATORY RESULTS**

## INTRODUCTION

URS Corporation (URS) conducted sampling activities at the Solutia J. F. Queeny plant in April 2006 as part of an effort to refine the MRBCA risk assessments for the Former FF Building Area, Former Bulk Chemical Storage Area (FBCSA), and the Former Acetanilides Production Area (APA). Sample location maps for these areas are presented as Figures 1, 2 and 3. The field sampling activities were conducted in accordance with the procedures outlined in the RCRA Corrective Measures Study (CMS), including the collection of appropriate quality assurance and quality control (QA/QC) samples.

## FIELD PROCEDURES

URS conducted the field activities on April 17th and 18th, 2006. Soil borings were advanced via direct-push techniques. Soil cores were collected using a 2-inch diameter by 4-ft long Macro-Core™ soil sampler with acetate liners. Soil samples from each boring were visually evaluated for evidence of impact and screened in the field using a photoionization detector (PID). A qualified field scientist logged the subsurface stratigraphy in accordance with the Unified Soil-Classification Site (USCS). The field scientist noted soil attributes such as color, particle size, consistency, moisture content, structure, plasticity, odor (if obvious) and organic content (if visible). Observations were noted on the soil boring logs. The samples were collected in accordance with soil sampling procedures that were implemented for the CMS. Soil boring logs follow this section.

Soil samples obtained from the three areas included the following:

- Eight soil borings (FF06-01 through FF06-08) were advanced to a depth of three feet to collect surface samples for VOC analysis within the former FF Building Area. Five of the locations (FF06-01 through FF06-05) represent corners of a square, centered on former location SB-2. Three additional locations (FF06-06 through FF06-08) were advanced as step out locations based on elevated PID readings at location FF06-04.

- Ten soil borings (APA06-01 through APA06-10) were advanced to a depth of three feet to collect surface samples for mercury analysis within the APA. Five of the locations (APA06-01 through APA06-05) represent corners of a square, centered on former location SB-A. One soil boring (APA06-06) was advanced as a step out due

to the location of a drum pad within the area. In addition, four soil borings (APA06-07 through APA06-10), distributed across the APA, were advanced to a depth of three feet to collect samples for mercury analysis.

- Six soil borings (FBCSA06-01 through FBCSA06-06) were advanced to a depth of three feet to collect surface samples for PAHs and Metals analyses within the FBCSA. The soil borings were evenly distributed across the FBCSA.

Groundwater samples from below the light non-aqueous phase liquid (LNAPL) were planned to be collected in the former FF Building Area and the FBCSA from piezometers LPZ-4 and PZ-5, respectively. This was accomplished for LPZ-4, however no LNAPL was present in PZ-5. Therefore, a groundwater sample was collected from beneath the LNAPL in well MW-24A. Monitoring well MW-24A was sampled using low flow methodologies with a submersible pump and clean polyethylene tubing. The well was purged at a maximum flow rate of 250ml/min with minimal drawdown of the water column and until field parameters became stable. During the purging process, the following field parameters were measured: pH, temperature, dissolved oxygen (DO), oxidation reduction potential (ORP), and conductivity. These parameters were measured after approximately each flow-thru cell volume (approximately 500mL) was removed. The purging process continued until three consecutive readings of the measured water quality parameters were within +/- 0.2 for temperature and pH, 3% for conductivity, +/- 0.2 or 10% which ever is greater for DO, and +/- 20 for ORP. Low flow methods could not be maintained for piezometer LPZ-4 due to the minimal amount of water within the piezometer; therefore it was sampled without being purged. Samples for both MW-24A and LPZ-4 were collected for VOC analysis.

## LABORATORY PROCEDURES and QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

The soil and water samples were submitted to Severn-Trent Laboratory's (STL) facility in Savannah, Georgia. This same facility conducted the CMS sample testing. Laboratory testing was performed in accordance with the procedures outlined in the CMS.

A total of 29 samples (22 investigative samples, 4 field duplicates, 2 equipment blanks and 1 trip blank) were reviewed by URS Corporation. Samples were analyzed by Severn-Trent Laboratory (STL) of Savannah, Georgia, and submitted as part of sample delivery groups (SDG) QCM16 and QCM17. Samples were tested for VOCs by Method 8260, Low Level PAHs by Method 8270, Metals by Method 6010 and Mercury by Method 7471. Evaluation of the analytical data

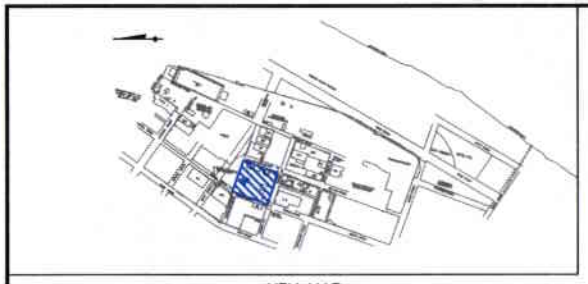
followed procedures outlined in the USEPA Contract Program National Functional Guidelines for Organic Data Review (USEPA 1999) and Inorganic Data Review (2004). Based on the mentioned criteria, it is recommended that the results reported for these analyses be accepted for their intended use. Acceptable levels of accuracy and precision, based on MS/MSD, LCS, and surrogate data were achieved for these SDGs with noted exceptions listed in the Review Assessment Sheets. In addition, completeness, defined to be the percentage of analytical results which are judged to be valid, including estimated (J) data, was 100 percent.

Data qualifiers were added, as appropriate, and are included with the analytical reports. Laboratory result pages (Form I's) for investigative and QA/QC samples are attached.

## RESULTS

The analytical results from the above sampling were integrated with the data from the 2005 risk assessments, and used for the subject addendum.

# Figures



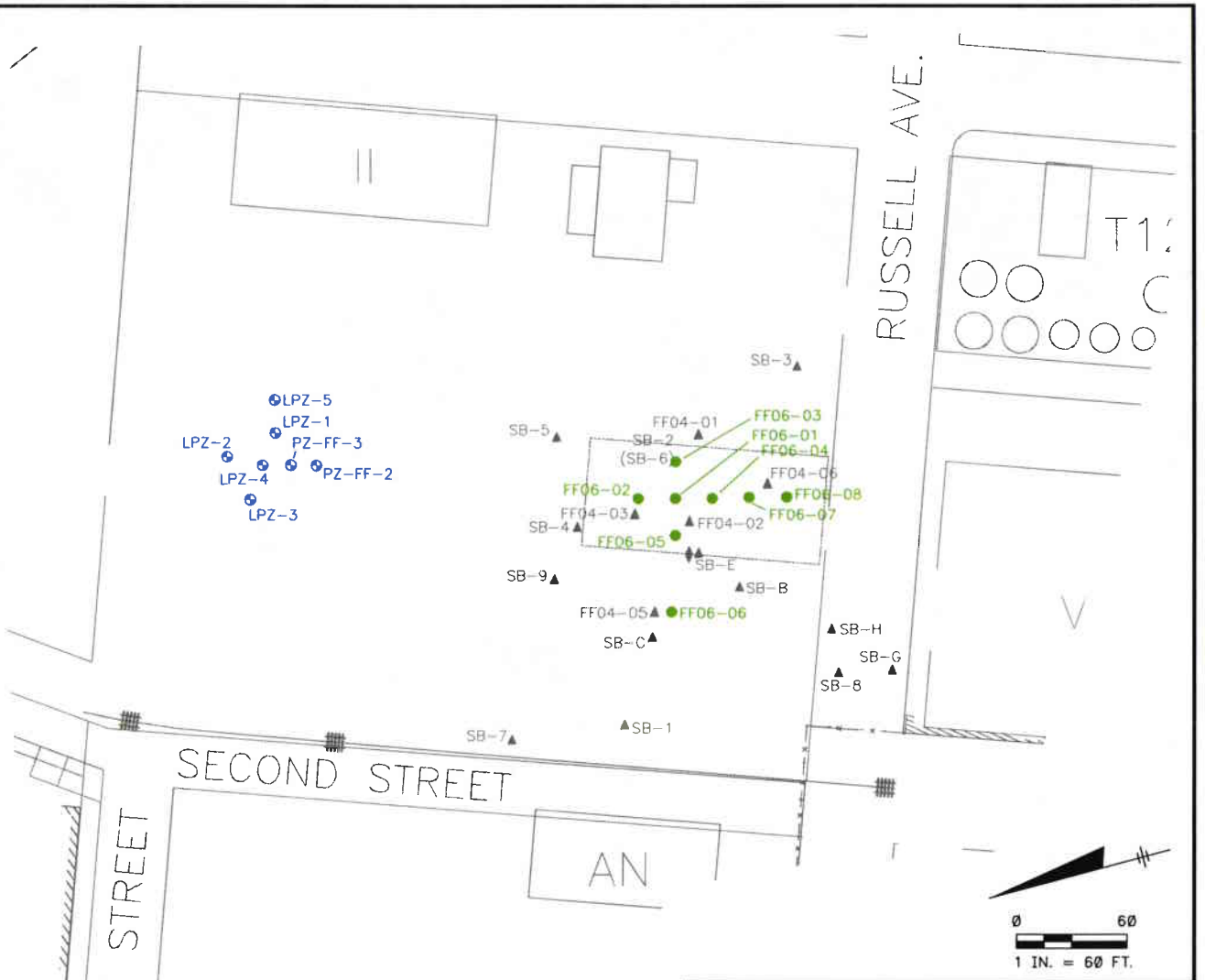
KEY MAP

LEGEND:

- 2006 SOIL BORINGS (DEPTH 3')
- GROUNDWATER SAMPLE LOCATIONS
- PREVIOUS RFI/CMS SOIL BORING LOCATION
- FORMER PCE TANK LOCATION
- x—x— FENCE

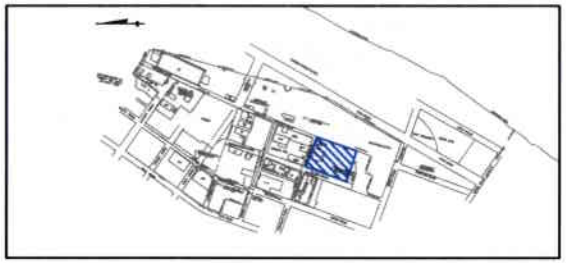
NOTES:

1) SB-6 IS A DUPLICATE SAMPLE COLLECTED FROM SB-2 (PHASE I INVESTIGATION, 1993).
2) DATA FROM THE LOCATIONS SHOWN ON THIS FIGURE WERE USED IN THE 2005 AND 2006 RISK ASSESSMENTS.
3) SOIL BORINGS FF04-02, FF04-03, AND FF04-05 WERE CONVERTED TO PIEZOMETERS FF-PZ-1, FF-PZ-2 AND FF-PZ-3, RESPECTIVELY.




REFERENCE:
RCRA FACILITY INVESTIGATION DATA GAP WORK PLAN JOHN F. QUEENY PLANT BY O'BRIEN & GERE ENGINEERS, INC., SEPTEMBER 1999

| | |
|---|---|
| SOLUTIA INC.<br>RCRA CORRECTIVE MEASURES STUDY (CMS)<br>J.F. QUEENY PLANT<br>ST. LOUIS, MISSOURI | PROJECT NO.<br>21561680.00002 |
| URS | |
| DRN. BY:djd 6/20/06<br>DSGN. BY:amc<br>CHKD. BY: | Soil and Groundwater Sample Locations-Former FF Building Area |
| | FIG. NO.<br>1 |



KEY MAP

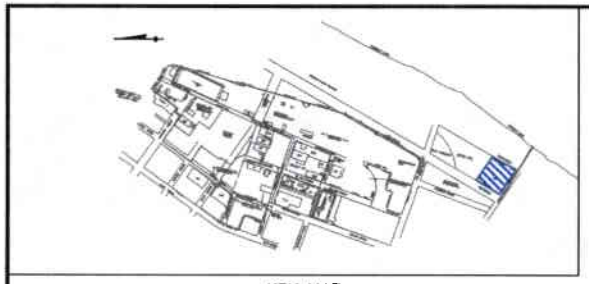
LEGEND:

- 2006 SOIL BORINGS (DEPTH 3')
- PREVIOUS RFI/CMS SOIL BORING LOCATION

NOTE:
DATA FROM THE LOCATIONS SHOWN ON THIS FIGURE WERE USED IN THE 2005 AND 2006 RISK ASSESSMENTS.

0 100
1 IN. = 100 FT.

| | |
|---|---|
| SOLUTIA INC.<br>RCRA CORRECTIVE MEASURES STUDY (CMS)<br>J.F. QUEENY PLANT<br>ST. LOUIS, MISSOURI | PROJECT NO.<br>21561680.00002 |
| URS | |
| DRN. BY: djd 6/20/06<br>DSGN. BY: amc<br>CHKD. BY: | Soil Boring Locations–<br>Former Acetanilides Production Area |
| | FIG. NO.<br>2 |



KEY MAP

LEGEND:

- 2006 SOIL BORINGS (DEPTH 3')
- GROUNDWATER SAMPLE LOCATIONS
- PREVIOUS RFI/CMS SOIL BORING LOCATION
- x——x—— FENCE

NOTE:
DATA FROM THE LOCATIONS SHOWN ON THIS FIGURE WERE USED IN THE 2005 AND 2006 RISK ASSESSMENTS.

0 60
1 IN. = 60 FT.

REFERENCE:
RCRA FACILITY INVESTIGATION DATA GAP WORK PLAN JOHN F. QUEENY PLANT BY O'BRIEN & GERE ENGINEERS, INC., SEPTEMBER 1999

| | |
|---|---|
| SOLUTIA INC.<br>RCRA CORRECTIVE MEASURES STUDY (CMS)<br>J.F. QUEENY PLANT<br>ST. LOUIS, MISSOURI | PROJECT NO.<br>21561680.00002 |
| URS | |
| DRN. BY: djd 6/20/06<br>DSGN. BY: amc<br>CHKD. BY: | Soil and Groundwater Sample Locations–Former Bulk Chemical Storage Area |
| | FIG. NO.<br>3 |

# Soil Boring Logs

# LOG OF BORING
## FF06-01

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth In feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 774<br>664 | | | | Asphalt cover<br>Loose, dry, gray, Gravel, with some sand<br>Loose, moist, light brown Clayey GRAVEL<br>Stiff, moist, dark brown, Silty CLAY, with brick fragments and cinders, gravel<br>Becomes very stiff | Sample FF06-01-2-3 and FF06-01-2-3-D at 0940 |
| | | | | | | | Bottom of boring at 3ft | *Note<br>Could not sample from 1-2 even though PID was higher due to gravel content |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
▽ Water level at time of drilling
▼ Water level after drilling
■ 3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS (ENVIRON) LOG 21561680.00001 SOLUTIA QUEENY.GPJ URSSTLEV.GDT 6/19/06

# LOG OF BORING
## FF06-02

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Asphalt cover | |
| | 36 | 36 | 30.1 | | | | Loose, moist, brown, Clayey GRAVEL, with some sand | 1/2in black staining |
| | | | 18.7 | | | | Moist, brown, Clayey GRAVEL, with some sand | |
| | | | | | | | Stiff, dark brown, Silty CLAY, with some cinders and wood fragments | Sample FF06-01-2-3 and FF06-01-2-3-D at 0835 |
| | | | | | | | Bottom of boring at 3ft | *Note Even though PID reading was higher from 1 to 2ft, it is mostly gravel, will not work with Terra core sampler |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS

# LOG OF BORING
## FF06-03

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth In feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 15.5 | | | | Asphalt cover<br>Loose, moist, light brown, Clayey SAND, with 1/2in large gravel | |
| | | | 6.5 | | | | Loose, moist, light brown, Clayey GRAVEL, with some sand<br>Stiff, moist, brown/gray Sandy CLAY, with some silt<br>Becomes very stiff | Sample FF06-03-2-3 at 0855 |
| 5 | | | | | | | Bottom of boring at 3ft | *Note<br>Even though PID reading was higher from 1 to 2ft, it is mostly gravel, will not work with Terra core sampler |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

# LOG OF BORING
## FF06-04

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 256<br>446 | | | | Asphalt cover<br>Loose, gray, GRAVEL, with some clay<br>Moist, light brown, Clayey GRAVEL, with some brick fragments and sand<br>Medium stiff, moist, dark brown, Silty CLAY, with cinders and brick fragments | Sample FFF06-04-2-3 at 0910 |
| | | | | | | | Bottom of boring at 3ft | *Note<br>Sample was stepped out 20ft |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS (ENVIRON) LOG 21561680.00001 SOLUTIA QUEENY.GPJ URSSTLEV.GDT 6/19/06

# LOG OF BORING
## FF06-05

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 5.8<br>573 | | | | Asphalt cover<br>Loose, dry, gray, Gravel, with some clay<br>Stiff, moist, dark brown, Sandy CLAY, with cinders | Sample FFF06-05-2-3 at 0920 |
| 5 | | | | | | | Bottom of boring at 3ft | *Note<br>Sample was stepped out 20ft |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS

# LOG OF BORING
## FF06-06

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth In feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 22.0<br>8.7 | | | | Asphlat cover<br>Loose, gray gravel, with clay<br>Medium moist, brown, Clayey GRAVEL, with some sand and brick fragments<br>Stiff, moist, medium brown/dark brown, Silty CLAY, with some sand<br>Becomes medium stiff | Sample FF06-06-2-3 at 1055 |
| | | | | | | | Bottom of boring at 3ft | *Note<br>Sample from 2 to 3ft even though PID reading was higher from 1 to 2ft due to gravel content |

5
10
15
20

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

# LOG OF BORING
## FF06-07

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 18.6<br>9999 | | | | Asphalt cover<br>Loose, moist, light brown, Clayey GRAVEL, with some sand<br>Stiff, dark brown, Silty CLAY, with gravel and brick fragments | Sample FF06-07-2-3 at 1015 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

# LOG OF BORING
## FF06-08

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth In feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 141.0<br>50.0 | | | | Asphalt cover<br>Loose, dry, gray Gravel, with some clay<br>Loose, moist, light brown, sandy Clayey GRAVEL, with some silt<br>Stiff, moist, dark brown, Clayey SILT, with brick fragments<br>Sttif, moist, dark brown/gray, Silty CLAY<br>Bottom of boring at 3ft | Sample FF08-03-2-3 at 1055 |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

# LOG OF BORING
## APA06-01

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 10.5 | | | | Gravel cover<br>Loose, dry, brown, Silty SAND, with cinders | |
| | | | 5.7 | | | | Stiff, moist, dark brown, Silty CLAY<br>Becomes soft, medium brown, and more silty | Sample APA06-01-2-3 and APA06-01-2-3-D at 1240 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS (ENVIRON) LOG 21561680.00001 SOLUTIA QUEENY.GPJ URSSTLEV.GDT 6/19/06

# LOG OF BORING
## APA06-02

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 2.9 | | | | Gravel cover<br>Stiff, moist, dark brown Silty CLAY<br>With gravel and cinders | Sample APA06-012 EB at 1215 |
| | | | 3.1 | | | | With large 1in gravel<br>Becomes medium stiff, with silt | Sample APA06-02-2-3 at 1230 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS

# LOG OF BORING
## APA06-03

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 1.4 | | | | Concrete cover | |
| | | | | | | | Medium stiff, moist, brown to dark brown Sandy CLAY, with brick fragments | |
| | | | 7.8 | | | | Loose, moist, brown, Clayey SAND | Sample APA06-03-2-3 at 1320 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

# LOG OF BORING
## APA06-04

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth In feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 5.3<br>4.9 | | | | Gravel cover<br>Loose, dry, brown, Clayey SAND, with large cinders and gravel<br>Stiff, moist, dark brown, Silty CLAY, with gravel<br>Becomes more silty | Sample APA06-04-2-3 at 1245 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS

# LOG OF BORING
## APA06-05

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 12 | 12 | 4.5 | | | | Gravloose, dry, light brown Gravelly SAND | Refusal at 1ft |
| | | | | | | | Loose, dark brown, Clayey SAND, with gravel and cinders | Sample APA06-05-0-1 at 1255 |
| | | | | | | | Bottom of boring at 1ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

# LOG OF BORING
## APA06-06

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 1.6<br>2.2 | | | | Gravel cover<br>Stiff, moist, dark brown Silty CLAY<br>With some gravel and brick fragments<br>Becomes soft | Sample APA06-06-2-3 at 1350 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
▽ Water level at time of drilling
▼ Water level after drilling
■ 3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS

# LOG OF BORING
## APA06-07

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth In feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 3.1 | | | | Asphalt cover<br>Loose, light brown, silty Sandy GRAVEL, with brick fragments and cinders<br>Stiff, moist, dark brown Silty CLAY | Sample APA06-07-EB at 1400 |
| | | | 2.3 | | | | | Sample APA06-07-2-3 at 1415 |
| | | | | | | | Soft, moist, dark brown Clayey SILT | |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS

# LOG OF BORING
## APA06-08

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 4.0 | | | | Gravel cover | |
| | | | | | | | Stiff, wet, brown, Gravelly CLAY, with cinders | |
| | | | 4.7 | | | | Becomes very soft, dark brown to black | Sample APA06-08-2-3 at 1445 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

# LOG OF BORING
## APA06-09

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth In feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 2.1<br>2.4 | | | | Asphalt cover<br>Loose, dry, gray gravel<br>Loose, moist, light brown, Clayey SAND, with some gravel | Sample APA06-09-2-3 at 1435 |
| 5 | | | | | | | Bottom of boring at 3ft | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS (ENVIRON) LOG 21561680.00001 SOLUTIA QUEENY.GPJ URSSTLEV.GDT 6/19/06

# LOG OF BORING
## APA06-10

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth In feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 3.3<br>4.3 | | | | Asphalt cover<br>Loose, light brown, Sandy GRAVEL, with brick fragments<br>Stiff, moist, brown, Silty CLAY, with gravel<br>Becomes soft, with brick fragments | Sample APA06-10-2-3, APA06-10-2-3-MS, and APA06-10-2-3-MSI) at 1430 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

# LOG OF BORING
## FBCSA06-01

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Loose, dry, gray Gravel | |
| | 36 | 36 | 2.8<br>4.0 | | | | Loose, dark brown, Silty SAND, with brick fragments<br>with large gravel | Sample FBCSA06-01-2-3 and FBCSA06-01-2-3-D at 1540 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS (ENVIRON) LOG 21561680.00001 SOLUTIA QUEENY.GPJ URSSTLEV.GDT 6/19/06

# LOG OF BORING
## FBCSA06-02

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Loose, dry, light brown Gravel SAND | |
| | 36 | 36 | 2.6<br>3.3 | | | | Medium stiff, moist, dark brown Clayey SILT, with cinders | Sample FBCSA06-02-2-3 at 1545 and FBCSA06-02-2-3-D at 1550 |
| | | | | | | | Medium stiff, moist, brown Silty CLAY | |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

# LOG OF BORING
## FBCSA06-03

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 1.0 | | | | Loose, dry, light brown Gravel SAND | |
| | | | | | | | Loose, moist, dark brown Clayey SAND | |
| | | | 1.1 | | | | Medium stiff, moist, brown, Silty CLAY, with brick fragments<br>Becomes very stiff | Sample FBCSA06-03-2-3 at 1605 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
▽ Water level at time of drilling
▼ Water level after drilling
■ 3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS

# LOG OF BORING
## FBCSA06-04

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth In feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 1.0 | | | | Loose, moist, brown, Clayey SAND | |
| | | | 2.2 | | | | With black cinders | |
| | | | | | | | With large black cinders | Sample FBCSA06-04-2-3 at 1625<br>With black staining and odor |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
▽ Water level at time of drilling
▼ Water level after drilling
■ 3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS

# LOG OF BORING
## FBCSA06-05

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | 36 | 36 | 0.7<br>1.8 | | | | loose, light brown Clayey SAND<br>With black cinders and gravel<br>Becomes moist<br>With more clay | Sample FBCSA06-05-2-3 at 1645 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

URS

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

# LOG OF BORING
## FBCSA06-06

Completion Date: 4/17/06
Casing Elevation:
Ground Elevation:

| Depth in feet | Inches Driven | Inches Recovered | PID (ppm) | Sampler Graphic | Symbol | USCS | DESCRIPTION | NOTES |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Loose, light brown, Silty SAND, with gravel | |
| | 36 | 36 | 1.4 | | | | Loose, moist, dark brown, Clayey SILT<br>With brick fragments | |
| | | | 5.5 | | | | With gravel<br>With cinders | Sample FBCSA06-06-2-3 at 1650 |
| | | | | | | | Bottom of boring at 3ft | |
| 5 | | | | | | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

Completion Depth: 3.00 Feet bgs
Project No.: 21561680.00001
Project Name: Solutia Quenny
Drilling Contractor: REDI
Drilling method: Geoprobe
Logged by: A. Christensen

Water Depth: _____ ft., After _____ hrs.
Water Depth: _____ ft., After _____ hrs.
Water level at time of drilling
Water level after drilling
3" Clear Acetate Liner
Hollow Stem Auger
Roto Sonic-3" Core Barrel
ATD - At time of drilling
Geoprobe Macro Sampler
Air Knife/Hand Auger Sampler
Unified Soil Classification based on field visual observations.

URS

# Laboratory Results

QCM16

## ORGANIC DATA ASSESSMENT

PROJECT NO. 21561680.00002
LABORATORY STL-Savannah
LABORATORY NO. 680-15698
NO. OF SAMPLES/
MATRIX 13/all soils

SITE Solutia Queeny

REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE May 23, 2006

## DATA ASSESSMENT WORKSHEET

| | VOCs 8260 | Low Level PAHs 8270 |
|---|---|---|
| 1. HOLDING TIMES | (1) | ✓ |
| 2. BLANKS | (2) | ✓ |
| 3. SURROGATES | (3) | (8) |
| 4. SCS (LCS) | (4) | ✓ |
| 5. DCS (LSCD) | (5) | N /A |
| 6. MATRIX SPIKE/DUP | N/A | (9) |
| 7. DILUTIONS | (6) | (10) |
| 8. DUPLICATES | (7) | ✓ |
| 9. INTERNAL STANDARDS | ✓ | ✓ |
| 10. OVERALL ASSESSMENT | X | O |

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data

ACTION ITEMS: (1) Samples FF06-01-2-3RADL* (reanalyzed and diluted) and FF06-04-2-3RADL* (reanalyzed and diluted) were analyzed 1 day and 2 days outside of hold time, respectively. Therefore, these samples detections were qualified "J" and non-detects qualified "UJ."
(7) Chlorobenzene, chloromethane, tetrachloroethene, trichloroethene and vinyl chloride in samples FF06-01-2-3 and FF06-01-2-3-D had a difference greater than 3.5 times the reporting limit. Therefore, these analytes in these two samples were qualified "J" and non-detects qualified "UJ."

**QCM16**

COMMENTS: (2) Acetone was detected in method blanks MB 680-43278, MB 680-43448 and MB 680-43537 with concentrations of 670 ug/kg, 530 ug/kg and 560 ug/kg, respectively. However, no action is necessary because acetone was not detected in any of the related samples or detected at a concentration greater than 10 times the method blank detections.
(3) Surrogates for samples FF06-01-2-3DL (diluted), FF06-01-2-3RADL (reanalyzed and diluted), FF06-01-2-3-D, FF06-01-2-3-D DL (diluted), FF06-02-2-3, FF06-04-2-3 DL (diluted), FF06-05-2-3 and FF06-05-2-3 DL (diluted) were not recovered due to dilutions; however, no action is necessary.
(4) Chloromethane LCS/LCSD RPD was high (65%RPD and limit is 50%RPD) in LCS sample 680-43075. However, no qualifiers were assigned to related samples because the LCS and LCSD chloromethane recoveries were within criteria.
(5) LCSD recovery for acetone in LCS sample 680-43275 was above the control limits (181%, 28-143%, 66%RPD and limit is 50%RPD). Acetone was non-detect in all related samples and no qualifiers were assigned.
(6) VOC samples FF06-01-2-3 (DL 100), FF06-01-2-3 DL (DL 5000), FF06-01-2-3 RADL (DL 5000), FF06-01-2-3-D (DL 5000), FF06-01-2-3-D DL (DL 25,000), FF06-02-2-3 (DL 2000), FF06-04-2-3 DL (DL 100), FF06-04-2-3 RADL (DL 100), FF06-05-2-3 (DL 5000) and FF06-05-2-3 DL (10,000) were diluted by 100 to 25,000 times due to target analyte abundance. However, no action is necessary.
(8) Surrogates for samples FBCSA06-01-2-3, FBCSA06-01-2-3-D, FBCSA06-02-2-3, FBCSA06-04-2-3, FBCSA06-04-2-3DL, FBCSA06-05-2-3 and FBCSA06-06-2-3 were not recovered due to dilutions. No qualifiers were assigned.
(9) The FBCSA06-02-2-3 MS/MSD% recoveries were high due to abundance of target analytes. No action is required because other QA/QC were within criteria.
(10) Low level PAH samples FBCSA06-01-2-3 (DL 100), FBCSA06-01-2-3-D (DL 100), FBCSA06-02-2-3 (DL 50), FBCSA06-03-2-3 (DL 5), FBCSA06-04-2-3 (DL 500), FBCSA06-04-2-3 DL (DL 1000), FBCSA06-05-2-3 (DL 10) and FBCSA06-06-2-3 (DL 20) were diluted by 5 to 1,000 times due to target analyte abundance. No qualifiers were assigned.

* Samples FF06-01-2-3 and FF06-04-2-3 were chosen instead of FF06-01-2-3 RADL and FF06-04-2-3 RADL.

NOTE
Several VOC samples and one SVOC sample were diluted and reanalyzed due to exceedances of the calibration range. These exceedances were denoted by the laboratory with E qualifiers. All the original runs have been kept with the exception of the analytes that had Es which were replaced with their diluted counterparts.

QCM16

## INORGANIC DATA ASSESSMENT

PROJECT NO. 21561680.00002
LABORATORY STL-Savannah
LABORATORY NO. 680-15698
NO. OF SAMPLES/
MATRIX 20/ 18 soils & 2 aqueous

SITE Solutia Queeny

REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE May 24, 2006

### DATA ASSESSMENT WORKSHEET

| | Hg Meth # 7471 | Pb & As Meth # 6010 |
|---|---|---|
| 1. HOLDING TIMES | ✓ | ✓ |
| 2. BLANKS | ✓ | NA |
| 3. DUPLICATES | ✓ | (3) |
| 4. SCS (LCS) | ✓ | ✓ |
| 5. DCS (LSCD) | NA | NA |
| 6. MATRIX SPIKE/DUP | (1) | ✓ |
| 7. DILUTIONS | (2) | (4) |
| 8. OVERALL ASSESSMENT | O | O |

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data
NA= Not available

ACTION ITEMS: (1) Mercury MSD% recovery was slightly low (77%, 80-120%). Therefore, mercury in the parent sample APA06-10-2-3 was qualified estimated "J."
(3) Laboratory duplicate RPD for lead was greater than 20% (42.3%). Therefore, lead was qualified "J" in related sample FBCSA06-02-2-3.

COMMENTS: (2) Mercury sample APA06-01-2-3-D was diluted by 5 times and sample APA06-08-2-3 was diluted by 2 times due to abundance of the target analyte. No qualifiers were assigned.
(4) Sample FBCSA06-06-2-3 was diluted by 5 times for the arsenic and lead analysis due to the abundance of lead. No qualifiers were assigned.

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FF06-01-2-3**

Lab Sample ID: 680-15698-1
Client Matrix: Solid % Moisture: 19.2

Date Sampled: 04/17/2006 0940
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5035
Dilution: 100
Date Analyzed: 04/27/2006 1807
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43275
Prep Batch: 680-42325

Instrument ID: GC/MS Volatiles - M
Lab File ID: m003.d
Initial Weight/Volume: 5.1 g
Final Weight/Volume: 5 g

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | <6100 | * | 360 | 6100 |
| Benzene | | <610 | | 100 | 610 |
| Bromodichloromethane | | <610 | | 120 | 610 |
| Bromoform | | <610 | | 270 | 610 |
| 2-Butanone (MEK) | | <3000 | | 490 | 3000 |
| Carbon tetrachloride | | <610 | | 110 | 610 |
| Carbon disulfide | | <610 | | 120 | 610 |
| Chlorobenzene | | 2000 | J | 84 | 610 |
| Chloroform | | <610 | | 110 | 610 |
| Chloromethane | | 200 | J J | 85 | 610 |
| Dibromochloromethane | | <610 | | 130 | 610 |
| 1,2-Dichloroethane | | <610 | | 150 | 610 |
| cis-1,2-Dichloroethene | | ~~30000~~ | ~~E~~ 89,000 | 110 D | 610 |
| trans-1,2-Dichloroethene | | 1200 | | 130 | 610 |
| Ethyl methacrylate | | <610 | | 93 | 610 |
| Ethylbenzene | | <610 | | 110 | 610 |
| Iodomethane | | <610 | | 120 | 610 |
| 4-Methyl-2-pentanone (MIBK) | | <3000 | | 700 | 3000 |
| Methylene Chloride | | <610 | | 190 | 610 |
| Tetrachloroethene | | ~~530000~~ | ~~E~~ 980,000 | 120 D J | 610 |
| Toluene | | <610 | | 120 | 610 |
| 1,1,1-Trichloroethane | | <610 | | 100 | 610 |
| Trichloroethene | | ~~31000~~ | ~~E~~ 45,000 | 150 D J | 610 |
| Vinyl chloride | | 360 | J J | 110 | 610 |
| Xylenes, Total | | <1200 | | 240 | 1200 |

| Surrogate | %Rec | Acceptance Limits |
|---|---|---|
| 4-Bromofluorobenzene | 100 | 68 - 121 |
| Dibromofluoromethane | 111 | 66 - 127 |
| Toluene-d8 | 121 | 65 - 128 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FF06-01-2-3**

Lab Sample ID: 680-15698-1
Client Matrix: Solid % Moisture: 19.2

Date Sampled: 04/17/2006 0940
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5035
Dilution: 5000
Date Analyzed: 04/27/2006 1849
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43275
Prep Batch: 680-42325
Run Type: DL

Instrument ID: GC/MS Volatiles - M
Lab File ID: m005.d
Initial Weight/Volume: 5.1 g
Final Weight/Volume: 5 g

DO NOT USE

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | <300000 | * | 18000 | 300000 |
| Benzene | | <30000 | | 5200 | 30000 |
| Bromodichloromethane | | <30000 | | 6100 | 30000 |
| Bromoform | | <30000 | | 13000 | 30000 |
| 2-Butanone (MEK) | | <150000 | | 24000 | 150000 |
| Carbon tetrachloride | | <30000 | | 5400 | 30000 |
| Carbon disulfide | | <30000 | | 6100 | 30000 |
| Chlorobenzene | | <30000 | | 4200 | 30000 |
| Chloroform | | <30000 | | 5300 | 30000 |
| Chloromethane | | <30000 | | 4200 | 30000 |
| Dibromochloromethane | | <30000 | | 6700 | 30000 |
| 1,2-Dichloroethane | | <30000 | | 7300 | 30000 |
| cis-1,2-Dichloroethene | | 89000 | D | 5300 | 30000 |
| trans-1,2-Dichloroethene | | <30000 | | 6700 | 30000 |
| Ethyl methacrylate | | <30000 | | 4700 | 30000 |
| Ethylbenzene | | <30000 | | 5300 | 30000 |
| Iodomethane | | <30000 | | 6100 | 30000 |
| 4-Methyl-2-pentanone (MIBK) | | <150000 | | 35000 | 150000 |
| Methylene Chloride | | <30000 | | 9700 | 30000 |
| Tetrachloroethene | | 980000 | D | 6100 | 30000 |
| Toluene | | <30000 | | 6100 | 30000 |
| 1,1,1-Trichloroethane | | <30000 | | 5200 | 30000 |
| Trichloroethene | | 45000 | D | 7300 | 30000 |
| Vinyl chloride | | <30000 | | 5600 | 30000 |
| Xylenes, Total | | <61000 | | 12000 | 61000 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| 4-Bromofluorobenzene | 0 | D | 68 - 121 |
| Dibromofluoromethane | 0 | D | 66 - 127 |
| Toluene-d8 | 0 | D | 65 - 128 |

Method: 8260B
Preparation: 5035
Dilution: 5000
Date Analyzed: 05/02/2006 1402
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43448
Prep Batch: 680-42325
Run Type: RADL

Instrument ID: GC/MS Volatiles - M
Lab File ID: m0165.d
Initial Weight/Volume: 5.1 g
Final Weight/Volume: 5 g

DO NOT USE

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | <300000 | H UJ | 18000 | 300000 |
| Benzene | | <30000 | H UJ | 5100 | 30000 |
| Bromodichloromethane | | <30000 | H UJ | 5900 | 30000 |
| Bromoform | | <30000 | H UJ | 13000 | 30000 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FF06-01-2-3**

Lab Sample ID: 680-15698-1
Client Matrix: Solid % Moisture: 19.2

Date Sampled: 04/17/2006 0940
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 8260B | Analysis Batch: 680-43448 | | Instrument ID: | GC/MS Volatiles - M |
| Preparation: | 5035 | Prep Batch: 680-42325 | | Lab File ID: | m0165.d |
| Dilution: | 5000 | | | Initial Weight/Volume: | 5.1 g |
| Date Analyzed: | 05/02/2006 1402 | Run Type: RADL | | Final Weight/Volume: | 5 g |
| Date Prepared: | 04/19/2006 1159 | | | | |

DO NOT USE

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 2-Butanone (MEK) | | <150000 | H UJ | 24000 | 150000 |
| Carbon tetrachloride | | <30000 | H UJ | 5300 | 30000 |
| Carbon disulfide | | <30000 | H UJ | 5900 | 30000 |
| Chlorobenzene | | <30000 | H UJ | 4100 | 30000 |
| Chloroform | | <30000 | H UJ | 5200 | 30000 |
| Chloromethane | | <30000 | H UJ | 4200 | 30000 |
| Dibromochloromethane | | <30000 | H UJ | 6500 | 30000 |
| 1,2-Dichloroethane | | <30000 | H UJ | 7100 | 30000 |
| cis-1,2-Dichloroethene | | 29000 | JD H J | 5200 | 30000 |
| trans-1,2-Dichloroethene | | <30000 | H UJ | 6500 | 30000 |
| Ethyl methacrylate | | <30000 | H UJ | 4600 | 30000 |
| Ethylbenzene | | <30000 | H UJ | 5200 | 30000 |
| Iodomethane | | <30000 | H UJ | 5900 | 30000 |
| 4-Methyl-2-pentanone (MIBK) | | <150000 | H UJ | 34000 | 150000 |
| Methylene Chloride | | <30000 | H UJ | 9500 | 30000 |
| Tetrachloroethene | | 840000 | H J | 5900 | 30000 |
| Toluene | | <30000 | H UJ | 5900 | 30000 |
| 1,1,1-Trichloroethane | | <30000 | H UJ | 5100 | 30000 |
| Trichloroethene | | 28000 | JD H J | 7100 | 30000 |
| Vinyl chloride | | <30000 | H UJ | 5500 | 30000 |
| Xylenes, Total | | <59000 | H UJ | 12000 | 59000 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| 4-Bromofluorobenzene | 0 | D | 68 - 121 |
| Dibromofluoromethane | 0 | D | 66 - 127 |
| Toluene-d8 | 0 | D | 65 - 128 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** FF06-01-2-3-D

Lab Sample ID: 680-15698-2
Client Matrix: Solid % Moisture: 22.1

Date Sampled: 04/17/2006 0940
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5035
Dilution: 5000
Date Analyzed: 05/01/2006 0314
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43278
Prep Batch: 680-42325

Instrument ID: GC/MS Volatiles - M
Lab File ID: m0118.d
Initial Weight/Volume: 4.7 g
Final Weight/Volume: 5 g

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | <340000 | | 20000 | 340000 |
| Benzene | | <34000 | | 5900 | 34000 |
| Bromodichloromethane | | <34000 | | 6800 | 34000 |
| Bromoform | | <34000 | | 15000 | 34000 |
| 2-Butanone (MEK) | | <170000 | | 27000 | 170000 |
| Carbon tetrachloride | | <34000 | | 6100 | 34000 |
| Carbon disulfide | | <34000 | | 6800 | 34000 |
| Chlorobenzene | | 12000 | J J | 4700 | 34000 |
| Chloroform | | <34000 | | 6000 | 34000 |
| Chloromethane | | <34000 | UJ | 4800 | 34000 |
| Dibromochloromethane | | <34000 | | 7500 | 34000 |
| 1,2-Dichloroethane | | <34000 | | 8200 | 34000 |
| cis-1,2-Dichloroethene | | 160000 | | 6000 | 34000 |
| trans-1,2-Dichloroethene | | <34000 | | 7500 | 34000 |
| Ethyl methacrylate | | <34000 | | 5300 | 34000 |
| Ethylbenzene | | <34000 | | 5900 | 34000 |
| Iodomethane | | <34000 | | 6800 | 34000 |
| 4-Methyl-2-pentanone (MIBK) | | <170000 | | 40000 | 170000 |
| Methylene Chloride | | <34000 | | 11000 | 34000 |
| Tetrachloroethene | 7100,000 | ~~5900000~~ | ~~E~~ DJ | 6800 | 34000 |
| Toluene | | <34000 | | 6800 | 34000 |
| 1,1,1-Trichloroethane | | <34000 | | 5800 | 34000 |
| Trichloroethene | | 200000 | J | 8200 | 34000 |
| Vinyl chloride | | <34000 | UJ | 6300 | 34000 |
| Xylenes, Total | | <68000 | | 14000 | 68000 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| 4-Bromofluorobenzene | 0 | D | 68 - 121 |
| Dibromofluoromethane | 0 | D | 66 - 127 |
| Toluene-d8 | 0 | D | 65 - 128 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FF06-01-2-3-D**

Lab Sample ID: 680-15698-2
Client Matrix: Solid % Moisture: 22.1

Date Sampled: 04/17/2006 0940
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5035
Dilution: 25000
Date Analyzed: 05/01/2006 0833
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43278
Prep Batch: 680-42325
Run Type: DL

Instrument ID: GC/MS Volatiles - M
Lab File ID: m0133.d
Initial Weight/Volume: 4.7 g
Final Weight/Volume: 5 g

DO NOT USE

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | 450000 | JD B | 110000 | 1800000 |
| Benzene | | <180000 | | 31000 | 180000 |
| Bromodichloromethane | | <180000 | | 36000 | 180000 |
| Bromoform | | <180000 | | 80000 | 180000 |
| 2-Butanone (MEK) | | <910000 | | 150000 | 910000 |
| Carbon tetrachloride | | <180000 | | 32000 | 180000 |
| Carbon disulfide | | <180000 | | 36000 | 180000 |
| Chlorobenzene | | <180000 | | 25000 | 180000 |
| Chloroform | | <180000 | | 32000 | 180000 |
| Chloromethane | | <180000 | | 25000 | 180000 |
| Dibromochloromethane | | <180000 | | 40000 | 180000 |
| 1,2-Dichloroethane | | <180000 | | 44000 | 180000 |
| cis-1,2-Dichloroethene | | 180000 | JD | 32000 | 180000 |
| trans-1,2-Dichloroethene | | <180000 | | 40000 | 180000 |
| Ethylbenzene | | <180000 | | 32000 | 180000 |
| 4-Methyl-2-pentanone (MIBK) | | <910000 | | 210000 | 910000 |
| Methylene Chloride | | <180000 | | 58000 | 180000 |
| Tetrachloroethene | | 7100000 | D | 36000 | 180000 |
| Toluene | | <180000 | | 36000 | 180000 |
| 1,1,1-Trichloroethane | | <180000 | | 31000 | 180000 |
| Trichloroethene | | 260000 | D | 44000 | 180000 |
| Vinyl chloride | | <180000 | | 33000 | 180000 |
| Xylenes, Total | | <360000 | | 73000 | 360000 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| 4-Bromofluorobenzene | 0 | D | 68 - 121 |
| Dibromofluoromethane | 0 | D | 66 - 127 |
| Toluene-d8 | 0 | D | 65 - 128 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FF06-02-2-3**

Lab Sample ID: 680-15698-3
Client Matrix: Solid % Moisture: 24.8

Date Sampled: 04/17/2006 0835
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5035
Dilution: 2000
Date Analyzed: 04/27/2006 1931
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43275
Prep Batch: 680-42325

Instrument ID: GC/MS Volatiles - M
Lab File ID: m007.d
Initial Weight/Volume: 5.7 g
Final Weight/Volume: 5 g

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | <120000 | * | 7000 | 120000 |
| Benzene | | <12000 | | 2000 | 12000 |
| Bromodichloromethane | | <12000 | | 2300 | 12000 |
| Bromoform | | <12000 | | 5100 | 12000 |
| 2-Butanone (MEK) | | <58000 | | 9300 | 58000 |
| Carbon tetrachloride | | <12000 | | 2100 | 12000 |
| Carbon disulfide | | <12000 | | 2300 | 12000 |
| Chlorobenzene | | <12000 | | 1600 | 12000 |
| Chloroform | | <12000 | | 2100 | 12000 |
| Chloromethane | | <12000 | | 1600 | 12000 |
| Dibromochloromethane | | <12000 | | 2600 | 12000 |
| 1,2-Dichloroethane | | <12000 | | 2800 | 12000 |
| cis-1,2-Dichloroethene | | 6700 | J | 2100 | 12000 |
| trans-1,2-Dichloroethene | | <12000 | | 2600 | 12000 |
| Ethyl methacrylate | | <12000 | | 1800 | 12000 |
| Ethylbenzene | | <12000 | | 2000 | 12000 |
| Iodomethane | | <12000 | | 2300 | 12000 |
| 4-Methyl-2-pentanone (MIBK) | | <58000 | | 14000 | 58000 |
| Methylene Chloride | | <12000 | | 3700 | 12000 |
| Tetrachloroethene | | 160000 | | 2300 | 12000 |
| Toluene | | <12000 | | 2300 | 12000 |
| 1,1,1-Trichloroethane | | <12000 | | 2000 | 12000 |
| Trichloroethene | | 10000 | J | 2800 | 12000 |
| Vinyl chloride | | <12000 | | 2100 | 12000 |
| Xylenes, Total | | <23000 | | 4700 | 23000 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| 4-Bromofluorobenzene | 0 | D | 68 - 121 |
| Dibromofluoromethane | 0 | D | 66 - 127 |
| Toluene-d8 | 0 | D | 65 - 128 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** FF06-03-2-3

Lab Sample ID: 680-15698-4
Client Matrix: Solid % Moisture: 16.0

Date Sampled: 04/17/2006 0855
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5035
Dilution: 1.0
Date Analyzed: 04/27/2006 1725
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43075
Prep Batch: 680-42325

Instrument ID: GC/MS Volatiles - M
Lab File ID: m001.d
Initial Weight/Volume: 7.6 g
Final Weight/Volume: 5 g

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | 16 | J | 1.5 | 26 |
| Benzene | | 11 | | 0.44 | 2.6 |
| Bromodichloromethane | | <2.6 | | 0.52 | 2.6 |
| Bromoform | | <2.6 | | 1.1 | 2.6 |
| 2-Butanone (MEK) | | <13 | | 2.1 | 13 |
| Carbon tetrachloride | | <2.6 | | 0.46 | 2.6 |
| Carbon disulfide | | <2.6 | | 0.52 | 2.6 |
| Chlorobenzene | | 44 | | 0.36 | 2.6 |
| Chloroform | | <2.6 | | 0.45 | 2.6 |
| Chloromethane | | <2.6 | * | 0.36 | 2.6 |
| Dibromochloromethane | | <2.6 | | 0.57 | 2.6 |
| 1,2-Dichloroethane | | <2.6 | | 0.62 | 2.6 |
| cis-1,2-Dichloroethene | | <2.6 | | 0.45 | 2.6 |
| trans-1,2-Dichloroethene | | <2.6 | | 0.57 | 2.6 |
| Ethyl methacrylate | | <2.6 | | 0.40 | 2.6 |
| Ethylbenzene | | <2.6 | | 0.45 | 2.6 |
| Iodomethane | | <2.6 | | 0.52 | 2.6 |
| 4-Methyl-2-pentanone (MIBK) | | <13 | | 3.0 | 13 |
| Methylene Chloride | | <2.6 | | 0.82 | 2.6 |
| Tetrachloroethene | | <2.6 | | 0.52 | 2.6 |
| Toluene | | <2.6 | | 0.52 | 2.6 |
| 1,1,1-Trichloroethane | | <2.6 | | 0.44 | 2.6 |
| Trichloroethene | | <2.6 | | 0.62 | 2.6 |
| Vinyl chloride | | <2.6 | | 0.47 | 2.6 |
| Xylenes, Total | | <5.2 | | 1.0 | 5.2 |

| Surrogate | %Rec | Acceptance Limits |
|---|---|---|
| 4-Bromofluorobenzene | 91 | 68 - 121 |
| Dibromofluoromethane | 98 | 66 - 127 |
| Toluene-d8 | 108 | 65 - 128 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FF06-04-2-3**

Lab Sample ID: 680-15698-5
Client Matrix: Solid % Moisture: 21.3

Date Sampled: 04/17/2006 0910
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5035
Dilution: 1.0
Date Analyzed: 04/27/2006 1746
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43075
Prep Batch: 680-42325

Instrument ID: GC/MS Volatiles - M
Lab File ID: m002.d
Initial Weight/Volume: 5.8 g
Final Weight/Volume: 5 g

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | 37 | J | 2.8 | 47 |
| Benzene | | 2.4 | J | 0.81 | 4.7 |
| Bromodichloromethane | | <4.7 | | 0.94 | 4.7 |
| Bromoform | | <4.7 | | 2.1 | 4.7 |
| 2-Butanone (MEK) | | 9.0 | J | 3.8 | 24 |
| Carbon tetrachloride | | <4.7 | | 0.84 | 4.7 |
| Carbon disulfide | | 7.3 | | 0.94 | 4.7 |
| Chlorobenzene | | ~~720~~ 3200 | ~~E~~ D | 0.65 | 4.7 |
| Chloroform | | <4.7 | | 0.83 | 4.7 |
| Chloromethane | | <4.7 | | 0.66 | 4.7 |
| Dibromochloromethane | | <4.7 | | 1.0 | 4.7 |
| 1,2-Dichloroethane | | <4.7 | | 1.1 | 4.7 |
| cis-1,2-Dichloroethene | | ~~4600~~ 7400 | ~~E~~ D | 0.83 | 4.7 |
| trans-1,2-Dichloroethene | | ~~530~~ 840 | ~~E~~ D | 1.0 | 4.7 |
| Ethylbenzene | | <4.7 | | 0.82 | 4.7 |
| 4-Methyl-2-pentanone (MIBK) | | <24 | | 5.5 | 24 |
| Methylene Chloride | | <4.7 | | 1.5 | 4.7 |
| Tetrachloroethene | | ~~8600~~ 13,000 | ~~E~~ D | 0.94 | 4.7 |
| Toluene | | 3.7 | J | 0.94 | 4.7 |
| 1,1,1-Trichloroethane | | <4.7 | | 0.80 | 4.7 |
| Trichloroethene | | ~~4500~~ 5,900 | ~~E~~ D | 1.1 | 4.7 |
| Vinyl chloride | | ~~920~~ 2,000 | ~~E~~ D | 0.87 | 4.7 |
| Xylenes, Total | | <9.4 | | 1.9 | 9.4 |

| Surrogate | %Rec | Acceptance Limits |
|---|---|---|
| 4-Bromofluorobenzene | 87 | 68 - 121 |
| Dibromofluoromethane | 96 | 66 - 127 |
| Toluene-d8 | 105 | 65 - 128 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** FF06-04-2-3

Lab Sample ID: 680-15698-5
Client Matrix: Solid % Moisture: 21.3

Date Sampled: 04/17/2006 0910
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5035
Dilution: 100
Date Analyzed: 05/01/2006 0854
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43278
Prep Batch: 680-42325
Run Type: DL

Instrument ID: GC/MS Volatiles - M
Lab File ID: m0134.d
Initial Weight/Volume: 5.9 g
Final Weight/Volume: 5 g

DO NOT USE

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | <4600 | | 270 | 4600 |
| Benzene | | <460 | | 79 | 460 |
| Bromodichloromethane | | <460 | | 91 | 460 |
| Bromoform | | <460 | | 200 | 460 |
| 2-Butanone (MEK) | | <2300 | | 370 | 2300 |
| Carbon tetrachloride | | <460 | | 81 | 460 |
| Carbon disulfide | | <460 | | 91 | 460 |
| Chlorobenzene | | 3200 | D | 63 | 460 |
| Chloroform | | <460 | | 80 | 460 |
| Chloromethane | | <460 | | 64 | 460 |
| Dibromochloromethane | | <460 | | 100 | 460 |
| 1,2-Dichloroethane | | <460 | | 110 | 460 |
| cis-1,2-Dichloroethene | | 7400 | D | 80 | 460 |
| trans-1,2-Dichloroethene | | 840 | D | 100 | 460 |
| Ethylbenzene | | <460 | | 79 | 460 |
| 4-Methyl-2-pentanone (MIBK) | | <2300 | | 530 | 2300 |
| Methylene Chloride | | <460 | | 150 | 460 |
| Tetrachloroethene | | 13000 | D | 91 | 460 |
| Toluene | | <460 | | 91 | 460 |
| 1,1,1-Trichloroethane | | <460 | | 78 | 460 |
| Trichloroethene | | 5900 | D | 110 | 460 |
| Vinyl chloride | | 2000 | D | 84 | 460 |
| Xylenes, Total | | <910 | | 180 | 910 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| 4-Bromofluorobenzene | 0 | D | 68 - 121 |
| Dibromofluoromethane | 0 | D | 66 - 127 |
| Toluene-d8 | 0 | D | 65 - 128 |

Method: 8260B
Preparation: 5035
Dilution: 100
Date Analyzed: 05/03/2006 1116
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43537
Prep Batch: 680-42325
Run Type: RADL

Instrument ID: GC/MS Volatiles - M
Lab File ID: m0189.d
Initial Weight/Volume: 5.9 g
Final Weight/Volume: 5 g

DO NOT USE

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | <5400 | H UJ | 320 | 5400 |
| Benzene | | <540 | H UJ | 93 | 540 |
| Bromodichloromethane | | <540 | H UJ | 110 | 540 |
| Bromoform | | <540 | H UJ | 240 | 540 |
| 2-Butanone (MEK) | | <2700 | H UJ | 430 | 2700 |
| Carbon tetrachloride | | <540 | H UJ | 96 | 540 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FF06-04-2-3**

Lab Sample ID: 680-15698-5
Client Matrix: Solid % Moisture: 21.3

Date Sampled: 04/17/2006 0910
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5035
Dilution: 100
Date Analyzed: 05/03/2006 1116
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43537
Prep Batch: 680-42325
Run Type: RADL

Instrument ID: GC/MS Volatiles - M
Lab File ID: m0189.d
Initial Weight/Volume: 5.9 g
Final Weight/Volume: 5 g

DO NOT USE

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | | MDL | RL |
|---|---|---|---|---|---|---|
| Carbon disulfide | | 940 | D H | J | 110 | 540 |
| Chlorobenzene | | 4100 | D H | J | 74 | 540 |
| Chloroform | | <540 | H | UJ | 95 | 540 |
| Chloromethane | | <540 | H | UJ | 75 | 540 |
| Dibromochloromethane | | <540 | H | UJ | 120 | 540 |
| 1,2-Dichloroethane | | <540 | H | UJ | 130 | 540 |
| cis-1,2-Dichloroethene | | 9800 | D H | J | 95 | 540 |
| trans-1,2-Dichloroethene | | 1100 | D H | J | 120 | 540 |
| Ethyl methacrylate | | <540 | H | UJ | 83 | 540 |
| Ethylbenzene | | <540 | H | UJ | 94 | 540 |
| Iodomethane | | <540 | H | UJ | 110 | 540 |
| 4-Methyl-2-pentanone (MIBK) | | <2700 | H | UJ | 620 | 2700 |
| Methylene Chloride | | <540 | H | UJ | 170 | 540 |
| Tetrachloroethene | | 17000 | D H | J | 110 | 540 |
| Toluene | | <540 | H | UJ | 110 | 540 |
| 1,1,1-Trichloroethane | | <540 | H | UJ | 92 | 540 |
| Trichloroethene | | 6800 | D H | J | 130 | 540 |
| Vinyl chloride | | 2300 | D H | J | 99 | 540 |
| Xylenes, Total | | <1100 | H | UJ | 220 | 1100 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| 4-Bromofluorobenzene | 111 | D | 68 - 121 |
| Dibromofluoromethane | 127 | D | 66 - 127 |
| Toluene-d8 | 123 | D | 65 - 128 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FF06-05-2-3**

Lab Sample ID: 680-15698-6
Client Matrix: Solid % Moisture: 15.2

Date Sampled: 04/17/2006 0920
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5035
Dilution: 5000
Date Analyzed: 04/27/2006 1952
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43275
Prep Batch: 680-42325

Instrument ID: GC/MS Volatiles - M
Lab File ID: m008.d
Initial Weight/Volume: 5.9 g
Final Weight/Volume: 5 g

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | <250000 | * | 15000 | 250000 |
| Benzene | | <25000 | | 4300 | 25000 |
| Bromodichloromethane | | <25000 | | 5000 | 25000 |
| Bromoform | | <25000 | | 11000 | 25000 |
| 2-Butanone (MEK) | | <120000 | | 20000 | 120000 |
| Carbon tetrachloride | | <25000 | | 4400 | 25000 |
| Carbon disulfide | | <25000 | | 5000 | 25000 |
| Chlorobenzene | | 630000 | | 3400 | 25000 |
| Chloroform | | <25000 | | 4400 | 25000 |
| Chloromethane | | <25000 | | 3500 | 25000 |
| Dibromochloromethane | | <25000 | | 5500 | 25000 |
| 1,2-Dichloroethane | | <25000 | | 6000 | 25000 |
| cis-1,2-Dichloroethene | | 26000 | | 4400 | 25000 |
| trans-1,2-Dichloroethene | | <25000 | | 5500 | 25000 |
| Ethyl methacrylate | | <25000 | | 3800 | 25000 |
| Ethylbenzene | | <25000 | | 4300 | 25000 |
| Iodomethane | | <25000 | | 5000 | 25000 |
| 4-Methyl-2-pentanone (MIBK) | | <120000 | | 29000 | 120000 |
| Methylene Chloride | | <25000 | | 8000 | 25000 |
| Tetrachloroethene | 900,000 | ~~1100000~~ | ~~E~~ D | 5000 | 25000 |
| Toluene | | <25000 | | 5000 | 25000 |
| 1,1,1-Trichloroethane | | <25000 | | 4200 | 25000 |
| Trichloroethene | | 93000 | | 6000 | 25000 |
| Vinyl chloride | | <25000 | | 4600 | 25000 |
| Xylenes, Total | | <50000 | | 10000 | 50000 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| 4-Bromofluorobenzene | 0 | D | 68 - 121 |
| Dibromofluoromethane | 0 | D | 66 - 127 |
| Toluene-d8 | 0 | D | 65 - 128 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FF06-05-2-3**

Lab Sample ID: 680-15698-6
Client Matrix: Solid % Moisture: 15.2

Date Sampled: 04/17/2006 0920
Date Received: 04/18/2006 0915

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5035
Dilution: 10000
Date Analyzed: 05/01/2006 0355
Date Prepared: 04/19/2006 1159

Analysis Batch: 680-43278
Prep Batch: 680-42325
Run Type: DL

Instrument ID: GC/MS Volatiles - M
Lab File ID: m0120.d
Initial Weight/Volume: 5.9 g
Final Weight/Volume: 5 g

DO NOT USE

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Acetone | | <500000 | | 30000 | 500000 |
| Benzene | | <50000 | | 8600 | 50000 |
| Bromodichloromethane | | <50000 | | 10000 | 50000 |
| Bromoform | | <50000 | | 22000 | 50000 |
| 2-Butanone (MEK) | | <250000 | | 40000 | 250000 |
| Carbon tetrachloride | | <50000 | | 8900 | 50000 |
| Carbon disulfide | | <50000 | | 10000 | 50000 |
| Chlorobenzene | | 510000 | D | 6900 | 50000 |
| Chloroform | | <50000 | | 8800 | 50000 |
| Chloromethane | | <50000 | | 7000 | 50000 |
| Dibromochloromethane | | <50000 | | 11000 | 50000 |
| 1,2-Dichloroethane | | <50000 | | 12000 | 50000 |
| cis-1,2-Dichloroethene | | 25000 | JD | 8800 | 50000 |
| trans-1,2-Dichloroethene | | <50000 | | 11000 | 50000 |
| Ethyl methacrylate | | <50000 | | 7700 | 50000 |
| Ethylbenzene | | <50000 | | 8700 | 50000 |
| Iodomethane | | <50000 | | 10000 | 50000 |
| 4-Methyl-2-pentanone (MIBK) | | <250000 | | 58000 | 250000 |
| Methylene Chloride | | <50000 | | 16000 | 50000 |
| Tetrachloroethene | | 900000 | D | 10000 | 50000 |
| Toluene | | <50000 | | 10000 | 50000 |
| 1,1,1-Trichloroethane | | <50000 | | 8500 | 50000 |
| Trichloroethene | | 66000 | D | 12000 | 50000 |
| Vinyl chloride | | <50000 | | 9200 | 50000 |
| Xylenes, Total | | <100000 | | 20000 | 100000 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| 4-Bromofluorobenzene | 0 | D | 68 - 121 |
| Dibromofluoromethane | 0 | D | 66 - 127 |
| Toluene-d8 | 0 | D | 65 - 128 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FBCSA06-01-2-3**

Lab Sample ID: 680-15698-23
Client Matrix: Solid % Moisture: 17.8

Date Sampled: 04/17/2006 1540
Date Received: 04/18/2006 0915

**8270C Semivolatile Organic Compounds by GCMS - Low Levels**

Method: 8270C
Preparation: 3550B
Dilution: 100
Date Analyzed: 04/19/2006 1958
Date Prepared: 04/19/2006 0846

Analysis Batch: 680-42290
Prep Batch: 680-42274

Instrument ID: GC/MS SemiVolatiles - K
Lab File ID: k1519.d
Initial Weight/Volume: 30.04 g
Final Weight/Volume: 1.0 mL
Injection Volume:

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 1-Methylnaphthalene | | 170 | J | 130 | 810 |
| 2-Methylnaphthalene | | 150 | J | 120 | 810 |
| Acenaphthene | | 580 | J | 120 | 810 |
| Acenaphthylene | | <810 | | 120 | 810 |
| Anthracene | | 1900 | | 120 | 810 |
| Benzo[a]anthracene | | 5700 | | 120 | 810 |
| Benzo[a]pyrene | | 5500 | | 100 | 810 |
| Benzo[b]fluoranthene | | 5100 | | 130 | 810 |
| Benzo[g,h,i]perylene | | 2800 | | 120 | 810 |
| Benzo[k]fluoranthene | | 5000 | | 100 | 810 |
| Chrysene | | 6000 | | 110 | 810 |
| Dibenz(a,h)anthracene | | 1300 | | 170 | 810 |
| Fluoranthene | | 14000 | | 130 | 810 |
| Fluorene | | 550 | J | 150 | 810 |
| Indeno[1,2,3-cd]pyrene | | 2600 | | 190 | 810 |
| Naphthalene | | 250 | J | 150 | 810 |
| Phenanthrene | | 7400 | | 160 | 810 |
| Pyrene | | 11000 | | 150 | 810 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 0 | D | 14 - 129 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FBCSA06-01-2-3-D**

Lab Sample ID: 680-15698-24
Client Matrix: Solid % Moisture: 18.6

Date Sampled: 04/17/2006 1540
Date Received: 04/18/2006 0915

**8270C Semivolatile Organic Compounds by GCMS - Low Levels**

Method: 8270C
Preparation: 3550B
Dilution: 100
Date Analyzed: 04/19/2006 2022
Date Prepared: 04/19/2006 0846

Analysis Batch: 680-42290
Prep Batch: 680-42274

Instrument ID: GC/MS SemiVolatiles - K
Lab File ID: k1520.d
Initial Weight/Volume: 30.12 g
Final Weight/Volume: 1.0 mL
Injection Volume:

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 1-Methylnaphthalene | | <820 | | 130 | 820 |
| 2-Methylnaphthalene | | 130 | J | 120 | 820 |
| Acenaphthene | | 610 | J | 120 | 820 |
| Acenaphthylene | | <820 | | 120 | 820 |
| Anthracene | | 1900 | | 120 | 820 |
| Benzo[a]anthracene | | 5200 | | 120 | 820 |
| Benzo[a]pyrene | | 4900 | | 100 | 820 |
| Benzo[b]fluoranthene | | 4800 | | 130 | 820 |
| Benzo[g,h,i]perylene | | 2400 | | 120 | 820 |
| Benzo[k]fluoranthene | | 4300 | | 100 | 820 |
| Chrysene | | 5700 | | 110 | 820 |
| Dibenz(a,h)anthracene | | 1000 | | 170 | 820 |
| Fluoranthene | | 13000 | | 130 | 820 |
| Fluorene | | 420 | J | 150 | 820 |
| Indeno[1,2,3-cd]pyrene | | 2200 | | 200 | 820 |
| Naphthalene | | 240 | J | 150 | 820 |
| Phenanthrene | | 6900 | | 160 | 820 |
| Pyrene | | 11000 | | 150 | 820 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 0 | D | 14 - 129 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FBCSA06-02-2-3**

Lab Sample ID: 680-15698-25
Client Matrix: Solid % Moisture: 43.1

Date Sampled: 04/17/2006 1545
Date Received: 04/18/2006 0915

**8270C Semivolatile Organic Compounds by GCMS - Low Levels**

Method: 8270C
Preparation: 3550B
Dilution: 50
Date Analyzed: 04/19/2006 2046
Date Prepared: 04/19/2006 0846

Analysis Batch: 680-42290
Prep Batch: 680-42274

Instrument ID: GC/MS SemiVolatiles - K
Lab File ID: k1521.d
Initial Weight/Volume: 30.18 g
Final Weight/Volume: 1.0 mL
Injection Volume:

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 1-Methylnaphthalene | | <590 | | 96 | 590 |
| 2-Methylnaphthalene | | <590 | | 85 | 590 |
| Acenaphthene | | <590 | | 87 | 590 |
| Acenaphthylene | | <590 | | 86 | 590 |
| Anthracene | | 180 | J | 87 | 590 |
| Benzo[a]anthracene | | 930 | | 87 | 590 |
| Benzo[a]pyrene | | 1100 | | 73 | 590 |
| Benzo[b]fluoranthene | | 1200 | | 96 | 590 |
| Benzo[g,h,i]perylene | | 560 | J | 87 | 590 |
| Benzo[k]fluoranthene | | 1100 | | 74 | 590 |
| Chrysene | | 1200 | | 81 | 590 |
| Dibenz(a,h)anthracene | | <590 | | 120 | 590 |
| Fluoranthene | | 1600 | | 96 | 590 |
| Fluorene | | <590 | | 100 | 590 |
| Indeno[1,2,3-cd]pyrene | | 510 | J | 140 | 590 |
| Naphthalene | | <590 | | 100 | 590 |
| Phenanthrene | | 820 | | 110 | 590 |
| Pyrene | | 1400 | | 100 | 590 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 0 | D | 14 - 129 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FBCSA06-03-2-3**

Lab Sample ID: 680-15698-26
Client Matrix: Solid % Moisture: 15.8

Date Sampled: 04/17/2006 1605
Date Received: 04/18/2006 0915

**8270C Semivolatile Organic Compounds by GCMS - Low Levels**

Method: 8270C
Preparation: 3550B
Dilution: 5.0
Date Analyzed: 04/20/2006 1842
Date Prepared: 04/19/2006 0846

Analysis Batch: 680-42425
Prep Batch: 680-42274

Instrument ID: GC/MS SemiVolatiles - K
Lab File ID: k1528.d
Initial Weight/Volume: 30.16 g
Final Weight/Volume: 1.0 mL
Injection Volume:

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 1-Methylnaphthalene | | <40 | | 6.5 | 40 |
| 2-Methylnaphthalene | | <40 | | 5.7 | 40 |
| Acenaphthene | | <40 | | 5.9 | 40 |
| Acenaphthylene | | <40 | | 5.8 | 40 |
| Anthracene | | 13 | J | 5.9 | 40 |
| Benzo[a]anthracene | | 37 | J | 5.9 | 40 |
| Benzo[a]pyrene | | 37 | J | 4.9 | 40 |
| Benzo[b]fluoranthene | | 37 | J | 6.5 | 40 |
| Benzo[g,h,i]perylene | | 23 | J | 5.9 | 40 |
| Benzo[k]fluoranthene | | 33 | J | 5.0 | 40 |
| Chrysene | | 46 | | 5.5 | 40 |
| Dibenz(a,h)anthracene | | <40 | | 8.3 | 40 |
| Fluoranthene | | 82 | | 6.5 | 40 |
| Fluorene | | <40 | | 7.1 | 40 |
| Indeno[1,2,3-cd]pyrene | | 19 | J | 9.5 | 40 |
| Naphthalene | | 7.5 | J | 7.1 | 40 |
| Phenanthrene | | 51 | | 7.7 | 40 |
| Pyrene | | 75 | | 7.1 | 40 |

| Surrogate | %Rec | Acceptance Limits |
|---|---|---|
| o-Terphenyl | 69 | 14 - 129 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FBCSA06-04-2-3**

Lab Sample ID: 680-15698-27
Client Matrix: Solid % Moisture: 23.2

Date Sampled: 04/17/2006 1625
Date Received: 04/18/2006 0915

**8270C Semivolatile Organic Compounds by GCMS - Low Levels**

Method: 8270C
Preparation: 3550B
Dilution: 500
Date Analyzed: 04/19/2006 2135
Date Prepared: 04/19/2006 0846

Analysis Batch: 680-42290
Prep Batch: 680-42274

Instrument ID: GC/MS SemiVolatiles - K
Lab File ID: k1523.d
Initial Weight/Volume: 30.07 g
Final Weight/Volume: 1.0 mL
Injection Volume:

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 1-Methylnaphthalene | | 87000 | | 710 | 4400 |
| 2-Methylnaphthalene | | 200000 | | 630 | 4400 |
| Acenaphthene | | 210000 | | 650 | 4400 |
| Acenaphthylene | | <4400 | | 640 | 4400 |
| Anthracene | | 45000 | | 650 | 4400 |
| Benzo[a]anthracene | | 12000 | | 650 | 4400 |
| Benzo[a]pyrene | | 7000 | | 540 | 4400 |
| Benzo[b]fluoranthene | | 7100 | | 710 | 4400 |
| Benzo[g,h,i]perylene | | 2500 | J | 650 | 4400 |
| Benzo[k]fluoranthene | | 6900 | | 550 | 4400 |
| Chrysene | | 11000 | | 600 | 4400 |
| Dibenz(a,h)anthracene | | <4400 | | 910 | 4400 |
| Fluoranthene | | 73000 | | 710 | 4400 |
| Fluorene | | 85000 | | 780 | 4400 |
| Indeno[1,2,3-cd]pyrene | | 2600 | J | 1000 | 4400 |
| Naphthalene | 730,000 | ~~670000~~ | ~~E~~ D | 780 | 4400 |
| Phenanthrene | | 230000 | | 840 | 4400 |
| Pyrene | | 41000 | | 780 | 4400 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 0 | D | 14 - 129 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FBCSA06-04-2-3**

Lab Sample ID: 680-15698-27
Client Matrix: Solid % Moisture: 23.2

Date Sampled: 04/17/2006 1625
Date Received: 04/18/2006 0915

**8270C Semivolatile Organic Compounds by GCMS - Low Levels**

Method: 8270C
Preparation: 3550B
Dilution: 1000
Date Analyzed: 04/20/2006 1907
Date Prepared: 04/19/2006 0846

Analysis Batch: 680-42425
Prep Batch: 680-42274
Run Type: DL

Instrument ID: GC/MS SemiVolatiles - K
Lab File ID: k1529.d
Initial Weight/Volume: 30.07 g
Final Weight/Volume: 1.0 mL
Injection Volume:

DO NOT USE

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 1-Methylnaphthalene | | 91000 | D | 1400 | 8700 |
| 2-Methylnaphthalene | | 210000 | D | 1300 | 8700 |
| Acenaphthene | | 230000 | D | 1300 | 8700 |
| Acenaphthylene | | <8700 | | 1300 | 8700 |
| Anthracene | | 45000 | D | 1300 | 8700 |
| Benzo[a]anthracene | | 12000 | D | 1300 | 8700 |
| Benzo[a]pyrene | | 7300 | J D | 1100 | 8700 |
| Benzo[b]fluoranthene | | 5700 | J D | 1400 | 8700 |
| Benzo[g,h,i]perylene | | 2500 | J D | 1300 | 8700 |
| Benzo[k]fluoranthene | | 7500 | J D | 1100 | 8700 |
| Chrysene | | 12000 | D | 1200 | 8700 |
| Dibenz(a,h)anthracene | | <8700 | | 1800 | 8700 |
| Fluoranthene | | 72000 | D | 1400 | 8700 |
| Fluorene | | 95000 | D | 1600 | 8700 |
| Indeno[1,2,3-cd]pyrene | | <8700 | | 2100 | 8700 |
| Naphthalene | | 730000 | D | 1600 | 8700 |
| Phenanthrene | | 240000 | D | 1700 | 8700 |
| Pyrene | | 45000 | D | 1600 | 8700 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 0 | D | 14 - 129 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FBCSA06-05-2-3**

Lab Sample ID: 680-15698-28
Client Matrix: Solid % Moisture: 22.9

Date Sampled: 04/17/2006 1645
Date Received: 04/18/2006 0915

**8270C Semivolatile Organic Compounds by GCMS - Low Levels**

Method: 8270C
Preparation: 3550B
Dilution: 10
Date Analyzed: 04/26/2006 1812
Date Prepared: 04/19/2006 0846

Analysis Batch: 680-42972
Prep Batch: 680-42274

Instrument ID: GC/MS SemiVolatiles - K
Lab File ID: k1606.d
Initial Weight/Volume: 30.11 g
Final Weight/Volume: 1.0 mL
Injection Volume:

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 1-Methylnaphthalene | | 27 | J | 14 | 87 |
| 2-Methylnaphthalene | | 37 | J | 13 | 87 |
| Acenaphthene | | 51 | J | 13 | 87 |
| Acenaphthylene | | <87 | | 13 | 87 |
| Anthracene | | 100 | | 13 | 87 |
| Benzo[a]anthracene | | 320 | | 13 | 87 |
| Benzo[a]pyrene | | 300 | | 11 | 87 |
| Benzo[b]fluoranthene | | 290 | | 14 | 87 |
| Benzo[g,h,i]perylene | | 160 | | 13 | 87 |
| Benzo[k]fluoranthene | | 240 | | 11 | 87 |
| Chrysene | | 350 | | 12 | 87 |
| Dibenz(a,h)anthracene | | 71 | J | 18 | 87 |
| Fluoranthene | | 770 | | 14 | 87 |
| Fluorene | | 36 | J | 16 | 87 |
| Indeno[1,2,3-cd]pyrene | | 210 | | 21 | 87 |
| Naphthalene | | 66 | J | 16 | 87 |
| Phenanthrene | | 550 | | 17 | 87 |
| Pyrene | | 580 | | 16 | 87 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 0 | D | 14 - 129 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID:** **FBCSA06-06-2-3**

Lab Sample ID: 680-15698-29
Client Matrix: Solid % Moisture: 16.3

Date Sampled: 04/17/2006 1650
Date Received: 04/18/2006 0915

**8270C Semivolatile Organic Compounds by GCMS - Low Levels**

Method: 8270C
Preparation: 3550B
Dilution: 20
Date Analyzed: 04/20/2006 1931
Date Prepared: 04/19/2006 0846

Analysis Batch: 680-42425
Prep Batch: 680-42274

Instrument ID: GC/MS SemiVolatiles - K
Lab File ID: k1530.d
Initial Weight/Volume: 30.07 g
Final Weight/Volume: 1.0 mL
Injection Volume:

| Analyte | DryWt Corrected: Y | Result (ug/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| 1-Methylnaphthalene | | 41 | J | 26 | 160 |
| 2-Methylnaphthalene | | 65 | J | 23 | 160 |
| Acenaphthene | | 39 | J | 24 | 160 |
| Acenaphthylene | | <160 | | 23 | 160 |
| Anthracene | | 84 | J | 24 | 160 |
| Benzo[a]anthracene | | 330 | | 24 | 160 |
| Benzo[a]pyrene | | 390 | | 20 | 160 |
| Benzo[b]fluoranthene | | 490 | | 26 | 160 |
| Benzo[g,h,i]perylene | | 280 | | 24 | 160 |
| Benzo[k]fluoranthene | | 350 | | 20 | 160 |
| Chrysene | | 400 | | 22 | 160 |
| Dibenz(a,h)anthracene | | 120 | J | 33 | 160 |
| Fluoranthene | | 630 | | 26 | 160 |
| Fluorene | | 31 | J | 29 | 160 |
| Indeno[1,2,3-cd]pyrene | | 270 | | 38 | 160 |
| Naphthalene | | 75 | J | 29 | 160 |
| Phenanthrene | | 360 | | 31 | 160 |
| Pyrene | | 650 | | 29 | 160 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| o-Terphenyl | 0 | D | 14 - 129 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-01-2-3**

| | | | | |
|---|---|---|---|---|
| Lab Sample ID: | 680-15698-10 | | Date Sampled: | 04/17/2006 1240 |
| Client Matrix: | Solid | % Moisture: 18.2 | Date Received: | 04/18/2006 0915 |

**7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)**

| | | | | |
|---|---|---|---|---|
| Method: | 7471A | Analysis Batch: 680-42757 | Instrument ID: | LEEMAN1 |
| Preparation: | 7471A | Prep Batch: 680-42610 | Lab File ID: | N/A |
| Dilution: | 1.0 | | Initial Weight/Volume: | 1.00 g |
| Date Analyzed: | 04/24/2006 1400 | | Final Weight/Volume: | 50 mL |
| Date Prepared: | 04/21/2006 1327 | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.30 | | 0.0049 | 0.024 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-01-2-3-D**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 680-15698-11 | Date Sampled: | 04/17/2006 1240 |
| Client Matrix: | Solid % Moisture: 13.9 | Date Received: | 04/18/2006 0915 |

**7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 7471A | Analysis Batch: 680-42757 | | Instrument ID: | LEEMAN1 |
| Preparation: | 7471A | Prep Batch: 680-42610 | | Lab File ID: | N/A |
| Dilution: | 5.0 | | | Initial Weight/Volume: | 1.01 g |
| Date Analyzed: | 04/24/2006 1613 | | | Final Weight/Volume: | 50 mL |
| Date Prepared: | 04/21/2006 1327 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.62 | | 0.023 | 0.11 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-02-EB**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 680-15698-12 | Date Sampled: | 04/17/2006 1215 |
| Client Matrix: | Water | Date Received: | 04/18/2006 0915 |

**7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 7470A | Analysis Batch: 680-42758 | | Instrument ID: | LEEMAN1 |
| Preparation: | 7470A | Prep Batch: 680-42642 | | Lab File ID: | N/A |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 50 mL |
| Date Analyzed: | 04/24/2006 1519 | | | Final Weight/Volume: | 50 mL |
| Date Prepared: | 04/24/2006 0857 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Mercury | <0.20 | | 0.080 | 0.20 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-02-2-3**

| | | | | |
|---|---|---|---|---|
| Lab Sample ID: | 680-15698-13 | | Date Sampled: | 04/17/2006 1230 |
| Client Matrix: | Solid | % Moisture: 19.0 | Date Received: | 04/18/2006 0915 |

**7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 7471A | Analysis Batch: 680-42757 | | Instrument ID: | LEEMAN1 |
| Preparation: | 7471A | Prep Batch: 680-42610 | | Lab File ID: | N/A |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.08 g |
| Date Analyzed: | 04/24/2006 1616 | | | Final Weight/Volume: | 50 mL |
| Date Prepared: | 04/21/2006 1327 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.017 | J | 0.0046 | 0.023 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-03-2-3**

| | | | | |
|---|---|---|---|---|
| Lab Sample ID: | 680-15698-14 | | Date Sampled: | 04/17/2006 1320 |
| Client Matrix: | Solid | % Moisture: 17.6 | Date Received: | 04/18/2006 0915 |

**7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)**

| | | | | |
|---|---|---|---|---|
| Method: | 7471A | Analysis Batch: 680-42757 | Instrument ID: | LEEMAN1 |
| Preparation: | 7471A | Prep Batch: 680-42610 | Lab File ID: | N/A |
| Dilution: | 1.0 | | Initial Weight/Volume: | 1.00 g |
| Date Analyzed: | 04/24/2006 1409 | | Final Weight/Volume: | 50 mL |
| Date Prepared: | 04/21/2006 1327 | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.020 | J | 0.0049 | 0.024 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-04-2-3**

| | | | | |
|---|---|---|---|---|
| Lab Sample ID: | 680-15698-15 | | Date Sampled: | 04/17/2006 1245 |
| Client Matrix: | Solid | % Moisture: 22.9 | Date Received: | 04/18/2006 0915 |

**7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)**

| | | | | |
|---|---|---|---|---|
| Method: | 7471A | Analysis Batch: 680-42757 | Instrument ID: | LEEMAN1 |
| Preparation: | 7471A | Prep Batch: 680-42610 | Lab File ID: | N/A |
| Dilution: | 1.0 | | Initial Weight/Volume: | 1.12 g |
| Date Analyzed: | 04/24/2006 1412 | | Final Weight/Volume: | 50 mL |
| Date Prepared: | 04/21/2006 1327 | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.054 | | 0.0046 | 0.023 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-05-0-1**

Lab Sample ID: 680-15698-16
Client Matrix: Solid % Moisture: 9.9

Date Sampled: 04/17/2006 1255
Date Received: 04/18/2006 0915

**7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)**

Method: 7471A
Preparation: 7471A
Dilution: 1.0
Date Analyzed: 04/24/2006 1415
Date Prepared: 04/21/2006 1327

Analysis Batch: 680-42757
Prep Batch: 680-42610

Instrument ID: LEEMAN1
Lab File ID: N/A
Initial Weight/Volume: 1.20 g
Final Weight/Volume: 50 mL

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.022 | | 0.0037 | 0.018 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-07-EB**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 680-15698-18 | Date Sampled: | 04/17/2006 1400 |
| Client Matrix: | Water | Date Received: | 04/18/2006 0915 |

**7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 7470A | Analysis Batch: 680-42758 | | Instrument ID: | LEEMAN1 |
| Preparation: | 7470A | Prep Batch: 680-42642 | | Lab File ID: | N/A |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 50 mL |
| Date Analyzed: | 04/24/2006 1522 | | | Final Weight/Volume: | 50 mL |
| Date Prepared: | 04/24/2006 0857 | | | | |

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Mercury | <0.20 | | 0.080 | 0.20 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-07-2-3**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 680-15698-19 | Date Sampled: | 04/17/2006 1415 |
| Client Matrix: | Solid % Moisture: 15.7 | Date Received: | 04/18/2006 0915 |

**7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 7471A | Analysis Batch: 680-42757 | | Instrument ID: | LEEMAN1 |
| Preparation: | 7471A | Prep Batch: 680-42610 | | Lab File ID: | N/A |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.03 g |
| Date Analyzed: | 04/24/2006 1424 | | | Final Weight/Volume: | 50 mL |
| Date Prepared: | 04/21/2006 1327 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.021 | J | 0.0046 | 0.023 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-08-2-3**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 680-15698-20 | Date Sampled: | 04/17/2006 1445 |
| Client Matrix: | Solid % Moisture: 34.5 | Date Received: | 04/18/2006 0915 |

**7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 7471A | Analysis Batch: 680-42757 | | Instrument ID: | LEEMAN1 |
| Preparation: | 7471A | Prep Batch: 680-42610 | | Lab File ID: | N/A |
| Dilution: | 2.0 | | | Initial Weight/Volume: | 1.05 g |
| Date Analyzed: | 04/24/2006 1544 | | | Final Weight/Volume: | 50 mL |
| Date Prepared: | 04/21/2006 1327 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.60 | | 0.012 | 0.058 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-09-2-3**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 680-15698-21 | Date Sampled: | 04/17/2006 1435 |
| Client Matrix: | Solid % Moisture: 5.2 | Date Received: | 04/18/2006 0915 |

**7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 7471A | Analysis Batch: 680-42757 | | Instrument ID: | LEEMAN1 |
| Preparation: | 7471A | Prep Batch: 680-42610 | | Lab File ID: | N/A |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.02 g |
| Date Analyzed: | 04/24/2006 1430 | | | Final Weight/Volume: | 50 mL |
| Date Prepared: | 04/21/2006 1327 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | <0.021 | | 0.0041 | 0.021 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: APA06-10-2-3**

| | | | | |
|---|---|---|---|---|
| Lab Sample ID: | 680-15698-22 | | Date Sampled: | 04/17/2006 1430 |
| Client Matrix: | Solid | % Moisture: 21.8 | Date Received: | 04/18/2006 0915 |

**7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)**

| | | | | |
|---|---|---|---|---|
| Method: | 7471A | Analysis Batch: 680-42757 | Instrument ID: | LEEMAN1 |
| Preparation: | 7471A | Prep Batch: 680-42610 | Lab File ID: | N/A |
| Dilution: | 1.0 | | Initial Weight/Volume: | 1.00 g |
| Date Analyzed: | 04/24/2006 1432 | | Final Weight/Volume: | 50 mL |
| Date Prepared: | 04/21/2006 1327 | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Mercury | | 0.074 | J | 0.0051 | 0.026 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: FBCSA06-01-2-3**

| | | | | |
|---|---|---|---|---|
| Lab Sample ID: | 680-15698-23 | | Date Sampled: | 04/17/2006 1540 |
| Client Matrix: | Solid | % Moisture: 17.8 | Date Received: | 04/18/2006 0915 |

**6010B Inductively Coupled Plasma - Atomic Emission Spectrometry**

| | | | | |
|---|---|---|---|---|
| Method: | 6010B | Analysis Batch: 680-42483 | Instrument ID: | ICP/AES |
| Preparation: | 3050B | Prep Batch: 680-42294 | Lab File ID: | N/A |
| Dilution: | 1.0 | | Initial Weight/Volume: | 1.06 g |
| Date Analyzed: | 04/19/2006 2346 | | Final Weight/Volume: | 100 mL |
| Date Prepared: | 04/19/2006 0956 | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Arsenic | | 16 | | 0.77 | 1.1 |
| Lead | | 650 | | 0.24 | 0.57 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: FBCSA06-01-2-3-D**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 680-15698-24 | Date Sampled: | 04/17/2006 1540 |
| Client Matrix: | Solid % Moisture: 18.6 | Date Received: | 04/18/2006 0915 |

**6010B Inductively Coupled Plasma - Atomic Emission Spectrometry**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 6010B | Analysis Batch: 680-42483 | | Instrument ID: | ICP/AES |
| Preparation: | 3050B | Prep Batch: 680-42294 | | Lab File ID: | N/A |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.12 g |
| Date Analyzed: | 04/20/2006 0000 | | | Final Weight/Volume: | 100 mL |
| Date Prepared: | 04/19/2006 0956 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Arsenic | | 15 | | 0.73 | 1.1 |
| Lead | | 690 | | 0.23 | 0.55 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: FBCSA06-02-2-3**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 680-15698-25 | Date Sampled: | 04/17/2006 1545 |
| Client Matrix: | Solid % Moisture: 43.1 | Date Received: | 04/18/2006 0915 |

**6010B Inductively Coupled Plasma - Atomic Emission Spectrometry**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 6010B | Analysis Batch: 680-42483 | | Instrument ID: | ICP/AES |
| Preparation: | 3050B | Prep Batch: 680-42294 | | Lab File ID: | N/A |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.02 g |
| Date Analyzed: | 04/20/2006 0005 | | | Final Weight/Volume: | 100 mL |
| Date Prepared: | 04/19/2006 0956 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Arsenic | | 39 | | 1.2 | 1.7 |
| Lead | | 1900 | J | 0.36 | 0.86 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: FBCSA06-03-2-3**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 680-15698-26 | Date Sampled: | 04/17/2006 1605 |
| Client Matrix: | Solid % Moisture: 15.8 | Date Received: | 04/18/2006 0915 |

**6010B Inductively Coupled Plasma - Atomic Emission Spectrometry**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 6010B | Analysis Batch: 680-42483 | | Instrument ID: | ICP/AES |
| Preparation: | 3050B | Prep Batch: 680-42294 | | Lab File ID: | N/A |
| Dilution: | 1.0 | | | Initial Weight/Volume: | 1.00 g |
| Date Analyzed: | 04/20/2006 0029 | | | Final Weight/Volume: | 100 mL |
| Date Prepared: | 04/19/2006 0956 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Arsenic | | 12 | | 0.80 | 1.2 |
| Lead | | 210 | | 0.25 | 0.59 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: FBCSA06-04-2-3**

| | | | | |
|---|---|---|---|---|
| Lab Sample ID: | 680-15698-27 | | Date Sampled: | 04/17/2006 1625 |
| Client Matrix: | Solid | % Moisture: 23.2 | Date Received: | 04/18/2006 0915 |

**6010B Inductively Coupled Plasma - Atomic Emission Spectrometry**

| | | | | |
|---|---|---|---|---|
| Method: | 6010B | Analysis Batch: 680-42483 | Instrument ID: | ICP/AES |
| Preparation: | 3050B | Prep Batch: 680-42294 | Lab File ID: | N/A |
| Dilution: | 1.0 | | Initial Weight/Volume: | 1.08 g |
| Date Analyzed: | 04/20/2006 0034 | | Final Weight/Volume: | 100 mL |
| Date Prepared: | 04/19/2006 0956 | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Arsenic | | 16 | | 0.81 | 1.2 |
| Lead | | 540 | | 0.25 | 0.60 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: FBCSA06-05-2-3**

| | | | | |
|---|---|---|---|---|
| Lab Sample ID: | 680-15698-28 | | Date Sampled: | 04/17/2006 1645 |
| Client Matrix: | Solid | % Moisture: 22.9 | Date Received: | 04/18/2006 0915 |

**6010B Inductively Coupled Plasma - Atomic Emission Spectrometry**

| | | | | |
|---|---|---|---|---|
| Method: | 6010B | Analysis Batch: 680-42483 | Instrument ID: | ICP/AES |
| Preparation: | 3050B | Prep Batch: 680-42294 | Lab File ID: | N/A |
| Dilution: | 1.0 | | Initial Weight/Volume: | 1.12 g |
| Date Analyzed: | 04/20/2006 0038 | | Final Weight/Volume: | 100 mL |
| Date Prepared: | 04/19/2006 0956 | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Arsenic | | 12 | | 0.78 | 1.2 |
| Lead | | 880 | | 0.24 | 0.58 |

Client: URS Corporation

Job Number: 680-15698-1
Sdg Number: QCM16

**Client Sample ID: FBCSA06-06-2-3**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 680-15698-29 | Date Sampled: | 04/17/2006 1650 |
| Client Matrix: | Solid % Moisture: 16.3 | Date Received: | 04/18/2006 0915 |

**6010B Inductively Coupled Plasma - Atomic Emission Spectrometry**

| | | | | | |
|---|---|---|---|---|---|
| Method: | 6010B | Analysis Batch: 680-42483 | | Instrument ID: | ICP/AES |
| Preparation: | 3050B | Prep Batch: 680-42294 | | Lab File ID: | N/A |
| Dilution: | 5.0 | | | Initial Weight/Volume: | 1.11 g |
| Date Analyzed: | 04/20/2006 1003 | | | Final Weight/Volume: | 100 mL |
| Date Prepared: | 04/19/2006 0956 | | | | |

| Analyte | DryWt Corrected: Y | Result (mg/Kg) | Qualifier | MDL | RL |
|---|---|---|---|---|---|
| Arsenic | | 27 | | 3.6 | 5.4 |
| Lead | | 2800 | | 1.1 | 2.7 |

QCM17

## ORGANIC DATA ASSESSMENT

PROJECT NO. 21561680.00002
LABORATORY STL-Savannah
LABORATORY NO. 680-15733
NO. OF SAMPLES/MATRIX 4/ aqueous

SITE Solutia Queeny
REVIEWER URS Corporation
REVIEWER'S NAME A. Turnell
COMPLETION DATE May 24, 2006

## DATA ASSESSMENT WORKSHEET

| | VOCs Meth # 8260 |
|---|---|
| 1. HOLDING TIMES | ✓ |
| 2. BLANKS | ✓ |
| 3. SURROGATES | (1) |
| 4. SCS (LCS) | (2) |
| 5. DCS (LSCD) | NA |
| 6. MATRIX SPIKE/DUP | ✓ |
| 7. DILUTIONS | (3) |
| 8. DUPLICATE | (4) |
| 9. INTERNAL STANDARDS | (5) |
| 10. OVERALL ASSESSMENT | O |

O = Data has no problems/or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data
NA = Not available

ACTION ITEMS: (1) Toluene surrogate recoveries were low in samples LPZ-4 (25%, 79-122%) and LPZ-4-D (43%, 79-122%). Therefore, detections in these samples were qualified "J" and non-detects were qualified "UJ."

COMMENTS: (2) Chloromethane LCS recovery was slightly high (138%, 51-133%) in LCS 680-43213. No qualifiers were assigned because all related chloromethane results were non-detect.
(3) Samples MW-24A (DL 10), MW-24A diluted (DL 100), LPZ-4 diluted (DL 5000) and LPZ-4-D diluted (DL 5000) were diluted by 10 to 5000 times due to analyte abundance. No qualifiers were assigned.
(4) Ethylbenzene (79%), tetrachloroethene (60%), trichloroethene (55%) and xylenes (85%) RPDs were greater than 50% in samples LPZ-4 and LPZ-4DUP. No qualifiers were assigned because the two samples were qualified due to action (1).
(5) Chlorobenzene internal standard area in sample LPZ-4 was slightly low (58,160, 65,188-260,750). This sample was already qualified due to action (1) and no additional qualifiers were assigned.

Client: URS Corporation

Job Number: 680-15733-1
Sdg Number: QCM17

**Client Sample ID:** **MW-24A**

Lab Sample ID: 680-15733-1
Client Matrix: Water

Date Sampled: 04/18/2006 1420
Date Received: 04/19/2006 0902

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5030B
Dilution: 10
Date Analyzed: 04/26/2006 1421
Date Prepared: 04/26/2006 1421

Analysis Batch: 680-42913

Instrument ID: GC/MS Volatiles - P
Lab File ID: p0082.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Acetone | 130 | J | 73 | 250 |
| Benzene | ~~7100~~ | ~~E~~ 7100 D | 5.4 | 10 |
| Bromodichloromethane | <10 | | 4.2 | 10 |
| Bromoform | <10 | | 3.6 | 10 |
| 2-Butanone (MEK) | <100 | | 7.2 | 100 |
| Carbon tetrachloride | <10 | | 9.1 | 10 |
| Carbon disulfide | <20 | | 7.5 | 20 |
| Chlorobenzene | 1900 | | 4.1 | 10 |
| Chloroform | <10 | | 5.2 | 10 |
| Chloromethane | <10 | | 5.3 | 10 |
| Dibromochloromethane | <10 | | 4.0 | 10 |
| 1,2-Dichloroethane | <10 | | 2.8 | 10 |
| cis-1,2-Dichloroethene | <10 | | 5.5 | 10 |
| trans-1,2-Dichloroethene | <10 | | 8.0 | 10 |
| Ethyl methacrylate | <10 | | 3.3 | 10 |
| Ethylbenzene | 950 | | 6.2 | 10 |
| Iodomethane | <50 | | 9.6 | 50 |
| 4-Methyl-2-pentanone (MIBK) | <100 | | 4.5 | 100 |
| Methylene Chloride | <50 | | 4.4 | 50 |
| Tetrachloroethene | <10 | | 7.5 | 10 |
| Toluene | 180 | | 6.2 | 10 |
| 1,1,1-Trichloroethane | <10 | | 7.9 | 10 |
| Trichloroethene | <10 | | 7.1 | 10 |
| Vinyl chloride | <10 | | 9.2 | 10 |
| Xylenes, Total | 2300 | | 13 | 20 |

| Surrogate | %Rec | Acceptance Limits |
|---|---|---|
| 4-Bromofluorobenzene | 94 | 77 - 120 |
| Dibromofluoromethane | 112 | 75 - 123 |
| Toluene-d8 | 102 | 79 - 122 |

Client: URS Corporation

Job Number: 680-15733-1
Sdg Number: QCM17

**Client Sample ID:** **MW-24A**

Lab Sample ID: 680-15733-1
Client Matrix: Water

Date Sampled: 04/18/2006 1420
Date Received: 04/19/2006 0902

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5030B
Dilution: 100
Date Analyzed: 04/28/2006 1338
Date Prepared: 04/28/2006 1338

Analysis Batch: 680-43213
Run Type: DL

Instrument ID: GC/MS Volatiles - A
Lab File ID: a804.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

DO NOT USE

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Acetone | <2500 | | 730 | 2500 |
| Benzene | 7100 | D | 54 | 100 |
| Bromodichloromethane | <100 | | 42 | 100 |
| Bromoform | <100 | | 36 | 100 |
| 2-Butanone (MEK) | <1000 | | 72 | 1000 |
| Carbon tetrachloride | <100 | | 91 | 100 |
| Carbon disulfide | <200 | | 75 | 200 |
| Chlorobenzene | 1700 | D | 41 | 100 |
| Chloroform | <100 | | 52 | 100 |
| Chloromethane | <100 | * | 53 | 100 |
| Dibromochloromethane | <100 | | 40 | 100 |
| 1,2-Dichloroethane | <100 | | 28 | 100 |
| cis-1,2-Dichloroethene | <100 | | 55 | 100 |
| trans-1,2-Dichloroethene | <100 | | 80 | 100 |
| Ethyl methacrylate | <100 | | 33 | 100 |
| Ethylbenzene | 820 | D | 62 | 100 |
| Iodomethane | <500 | | 96 | 500 |
| 4-Methyl-2-pentanone (MIBK) | <1000 | | 45 | 1000 |
| Methylene Chloride | <500 | | 44 | 500 |
| Tetrachloroethene | <100 | | 75 | 100 |
| Toluene | 180 | D | 62 | 100 |
| 1,1,1-Trichloroethane | <100 | | 79 | 100 |
| Trichloroethene | <100 | | 71 | 100 |
| Vinyl chloride | <100 | | 92 | 100 |
| Xylenes, Total | 2100 | D | 130 | 200 |

| Surrogate | %Rec | Acceptance Limits |
|---|---|---|
| 4-Bromofluorobenzene | 100 | 77 - 120 |
| Dibromofluoromethane | 92 | 75 - 123 |
| Toluene-d8 | 103 | 79 - 122 |

Client: URS Corporation

Job Number: 680-15733-1
Sdg Number: QCM17

**Client Sample ID:** **LPZ-4**

Lab Sample ID: 680-15733-2
Client Matrix: Water

Date Sampled: 04/18/2006 1300
Date Received: 04/19/2006 0902

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 04/26/2006 1834
Date Prepared: 04/26/2006 1834

Analysis Batch: 680-42913

Instrument ID: GC/MS Volatiles - P
Lab File ID: p0092.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

| Analyte | | Result (ug/L) | | Qualifier | MDL | RL |
|---|---|---|---|---|---|---|
| Acetone | | 60 | J | | 7.3 | 25 |
| Benzene | | 280 | J | E | 0.54 | 1.0 |
| Bromodichloromethane | | <1.0 | UJ | | 0.42 | 1.0 |
| Bromoform | | <1.0 | UJ | | 0.36 | 1.0 |
| 2-Butanone (MEK) | | <10 | UJ | | 0.72 | 10 |
| Carbon tetrachloride | | <1.0 | UJ | | 0.91 | 1.0 |
| Carbon disulfide | | <2.0 | UJ | | 0.75 | 2.0 |
| Chlorobenzene | | 1100 | J | E | 0.41 | 1.0 |
| Chloroform | | <1.0 | UJ | | 0.52 | 1.0 |
| Chloromethane | | <1.0 | UJ | | 0.53 | 1.0 |
| Dibromochloromethane | | <1.0 | UJ | | 0.40 | 1.0 |
| 1,2-Dichloroethane | | <1.0 | UJ | | 0.28 | 1.0 |
| cis-1,2-Dichloroethene | | 3800 | J | E | 0.55 | 1.0 |
| trans-1,2-Dichloroethene | | 130 | J | | 0.80 | 1.0 |
| Ethyl methacrylate | | <1.0 | UJ | | 0.33 | 1.0 |
| Ethylbenzene | | 30 | J | | 0.62 | 1.0 |
| Iodomethane | | <5.0 | UJ | | 0.96 | 5.0 |
| 4-Methyl-2-pentanone (MIBK) | | <10 | UJ | | 0.45 | 10 |
| Methylene Chloride | | <5.0 | UJ | | 0.44 | 5.0 |
| Tetrachloroethene | | 3700 | J | E | 0.75 | 1.0 |
| Toluene | 420,000 | ~~20000~~ | J | ~~E~~ D | 0.62 | 1.0 |
| 1,1,1-Trichloroethane | | <1.0 | UJ | | 0.79 | 1.0 |
| Trichloroethene | | 3500 | J | E | 0.71 | 1.0 |
| Vinyl chloride | | 830 | J | E | 0.92 | 1.0 |
| Xylenes, Total | | 37 | J | | 1.3 | 2.0 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| 4-Bromofluorobenzene | 86 | | 77 - 120 |
| Dibromofluoromethane | 106 | | 75 - 123 |
| Toluene-d8 | 25 | * | 79 - 122 |

Client: URS Corporation

Job Number: 680-15733-1
Sdg Number: QCM17

**Client Sample ID:** **LPZ-4**

Lab Sample ID: 680-15733-2
Client Matrix: Water

Date Sampled: 04/18/2006 1300
Date Received: 04/19/2006 0902

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5030B
Dilution: 5000
Date Analyzed: 04/28/2006 1314
Date Prepared: 04/28/2006 1314

Analysis Batch: 680-43213
Run Type: DL

Instrument ID: GC/MS Volatiles - A
Lab File ID: a803.d
Initial Weight/Volume: 5 g
Final Weight/Volume: 5 mL

DO NOT USE

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Acetone | <130000 | | 37000 | 130000 |
| Benzene | <5000 | | 2700 | 5000 |
| Bromodichloromethane | <5000 | | 2100 | 5000 |
| Bromoform | <5000 | | 1800 | 5000 |
| 2-Butanone (MEK) | <50000 | | 3600 | 50000 |
| Carbon tetrachloride | <5000 | | 4600 | 5000 |
| Carbon disulfide | <10000 | | 3800 | 10000 |
| Chlorobenzene | <5000 | | 2100 | 5000 |
| Chloroform | <5000 | | 2600 | 5000 |
| Chloromethane | <5000 | | 2700 | 5000 |
| Dibromochloromethane | <5000 | | 2000 | 5000 |
| 1,2-Dichloroethane | <5000 | | 1400 | 5000 |
| cis-1,2-Dichloroethene | <5000 | | 2800 | 5000 |
| trans-1,2-Dichloroethene | <5000 | | 4000 | 5000 |
| Ethyl methacrylate | <5000 | | 1700 | 5000 |
| Ethylbenzene | <5000 | | 3100 | 5000 |
| Iodomethane | <25000 | | 4800 | 25000 |
| 4-Methyl-2-pentanone (MIBK) | <50000 | | 2300 | 50000 |
| Methylene Chloride | <25000 | | 2200 | 25000 |
| Tetrachloroethene | <5000 | | 3800 | 5000 |
| Toluene | 420000 | D | 3100 | 5000 |
| 1,1,1-Trichloroethane | <5000 | | 4000 | 5000 |
| Trichloroethene | <5000 | | 3600 | 5000 |
| Vinyl chloride | <5000 | | 4600 | 5000 |
| Xylenes, Total | <10000 | | 6500 | 10000 |

| Surrogate | %Rec | Acceptance Limits |
|---|---|---|
| 4-Bromofluorobenzene | 99 | 77 - 120 |
| Dibromofluoromethane | 91 | 75 - 123 |
| Toluene-d8 | 102 | 79 - 122 |

Client: URS Corporation

Job Number: 680-15733-1
Sdg Number: QCM17

**Client Sample ID: LPZ-4-D**

Lab Sample ID: 680-15733-3
Client Matrix: Water

Date Sampled: 04/18/2006 1300
Date Received: 04/19/2006 0902

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 04/26/2006 1859
Date Prepared: 04/26/2006 1859

Analysis Batch: 680-42913

Instrument ID: GC/MS Volatiles - P
Lab File ID: p0093.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Acetone | 52 J | | 7.3 | 25 |
| Benzene | 180 J | | 0.54 | 1.0 |
| Bromodichloromethane | <1.0 UJ | | 0.42 | 1.0 |
| Bromoform | <1.0 UJ | | 0.36 | 1.0 |
| 2-Butanone (MEK) | <10 UJ | | 0.72 | 10 |
| Carbon tetrachloride | <1.0 UJ | | 0.91 | 1.0 |
| Carbon disulfide | <2.0 UJ | | 0.75 | 2.0 |
| Chlorobenzene | 730 J | E | 0.41 | 1.0 |
| Chloroform | <1.0 UJ | | 0.52 | 1.0 |
| Chloromethane | <1.0 UJ | | 0.53 | 1.0 |
| Dibromochloromethane | <1.0 UJ | | 0.40 | 1.0 |
| 1,2-Dichloroethane | <1.0 UJ | | 0.28 | 1.0 |
| cis-1,2-Dichloroethene | 3100 J | E | 0.55 | 1.0 |
| trans-1,2-Dichloroethene | 110 J | | 0.80 | 1.0 |
| Ethyl methacrylate | <1.0 UJ | | 0.33 | 1.0 |
| Ethylbenzene | 13 J | | 0.62 | 1.0 |
| Iodomethane | <5.0 UJ | | 0.96 | 5.0 |
| 4-Methyl-2-pentanone (MIBK) | <10 UJ | | 0.45 | 10 |
| Methylene Chloride | <5.0 UJ | | 0.44 | 5.0 |
| Tetrachloroethene | 2000 J | E | 0.75 | 1.0 |
| Toluene 370,000 | ~~30000 J~~ | ~~E~~ D | 0.62 | 1.0 |
| 1,1,1-Trichloroethane | <1.0 UJ | | 0.79 | 1.0 |
| Trichloroethene | 2000 J | E | 0.71 | 1.0 |
| Vinyl chloride | 620 J | E | 0.92 | 1.0 |
| Xylenes, Total | 15 J | | 1.3 | 2.0 |

| Surrogate | %Rec | | Acceptance Limits |
|---|---|---|---|
| 4-Bromofluorobenzene | 82 | | 77 - 120 |
| Dibromofluoromethane | 119 | | 75 - 123 |
| Toluene-d8 | 43 | * | 79 - 122 |

Client: URS Corporation

Job Number: 680-15733-1
Sdg Number: QCM17

**Client Sample ID:** LPZ-4-D

Lab Sample ID: 680-15733-3
Client Matrix: Water

Do NOT USE

Date Sampled: 04/18/2006 1300
Date Received: 04/19/2006 0902

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5030B
Dilution: 5000
Date Analyzed: 04/28/2006 1402
Date Prepared: 04/28/2006 1402

Analysis Batch: 680-43213
Run Type: DL

Instrument ID: GC/MS Volatiles - A
Lab File ID: a805.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Acetone | <130000 | | 37000 | 130000 |
| Benzene | <5000 | | 2700 | 5000 |
| Bromodichloromethane | <5000 | | 2100 | 5000 |
| Bromoform | <5000 | | 1800 | 5000 |
| 2-Butanone (MEK) | <50000 | | 3600 | 50000 |
| Carbon tetrachloride | <5000 | | 4600 | 5000 |
| Carbon disulfide | <10000 | | 3800 | 10000 |
| Chlorobenzene | <5000 | | 2100 | 5000 |
| Chloroform | <5000 | | 2600 | 5000 |
| Chloromethane | <5000 | * | 2700 | 5000 |
| Dibromochloromethane | <5000 | | 2000 | 5000 |
| 1,2-Dichloroethane | <5000 | | 1400 | 5000 |
| cis-1,2-Dichloroethene | <5000 | | 2800 | 5000 |
| trans-1,2-Dichloroethene | <5000 | | 4000 | 5000 |
| Ethyl methacrylate | <5000 | | 1700 | 5000 |
| Ethylbenzene | <5000 | | 3100 | 5000 |
| Iodomethane | <25000 | | 4800 | 25000 |
| 4-Methyl-2-pentanone (MIBK) | <50000 | | 2300 | 50000 |
| Methylene Chloride | <25000 | | 2200 | 25000 |
| Tetrachloroethene | <5000 | | 3800 | 5000 |
| Toluene | 370000 | D | 3100 | 5000 |
| 1,1,1-Trichloroethane | <5000 | | 4000 | 5000 |
| Trichloroethene | <5000 | | 3600 | 5000 |
| Vinyl chloride | <5000 | | 4600 | 5000 |
| Xylenes, Total | <10000 | | 6500 | 10000 |

| Surrogate | %Rec | Acceptance Limits |
|---|---|---|
| 4-Bromofluorobenzene | 97 | 77 - 120 |
| Dibromofluoromethane | 91 | 75 - 123 |
| Toluene-d8 | 100 | 79 - 122 |

Client: URS Corporation

Job Number: 680-15733-1
Sdg Number: QCM17

**Client Sample ID:** **TB-1**

Lab Sample ID: 680-15733-4
Client Matrix: Water

Date Sampled: 04/18/2006 1600
Date Received: 04/19/2006 0902

**8260B Volatile Organic Compounds by GC/MS**

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 04/28/2006 1512
Date Prepared: 04/28/2006 1512

Analysis Batch: 680-43213

Instrument ID: GC/MS Volatiles - A
Lab File ID: a808.d
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

| Analyte | Result (ug/L) | Qualifier | MDL | RL |
|---|---|---|---|---|
| Acetone | <25 | | 7.3 | 25 |
| Benzene | <1.0 | | 0.54 | 1.0 |
| Bromodichloromethane | <1.0 | | 0.42 | 1.0 |
| Bromoform | <1.0 | | 0.36 | 1.0 |
| 2-Butanone (MEK) | <10 | | 0.72 | 10 |
| Carbon tetrachloride | <1.0 | | 0.91 | 1.0 |
| Carbon disulfide | <2.0 | | 0.75 | 2.0 |
| Chlorobenzene | <1.0 | | 0.41 | 1.0 |
| Chloroform | <1.0 | | 0.52 | 1.0 |
| Chloromethane | <1.0 | | 0.53 | 1.0 |
| Dibromochloromethane | <1.0 | | 0.40 | 1.0 |
| 1,2-Dichloroethane | <1.0 | | 0.28 | 1.0 |
| cis-1,2-Dichloroethene | <1.0 | | 0.55 | 1.0 |
| trans-1,2-Dichloroethene | <1.0 | | 0.80 | 1.0 |
| Ethyl methacrylate | <1.0 | | 0.33 | 1.0 |
| Ethylbenzene | <1.0 | | 0.62 | 1.0 |
| Iodomethane | <5.0 | | 0.96 | 5.0 |
| 4-Methyl-2-pentanone (MIBK) | <10 | | 0.45 | 10 |
| Methylene Chloride | <5.0 | | 0.44 | 5.0 |
| Tetrachloroethene | <1.0 | | 0.75 | 1.0 |
| Toluene | <1.0 | | 0.62 | 1.0 |
| 1,1,1-Trichloroethane | <1.0 | | 0.79 | 1.0 |
| Trichloroethene | <1.0 | | 0.71 | 1.0 |
| Vinyl chloride | <1.0 | | 0.92 | 1.0 |
| Xylenes, Total | <2.0 | | 1.3 | 2.0 |

| Surrogate | %Rec | Acceptance Limits |
|---|---|---|
| 4-Bromofluorobenzene | 98 | 77 - 120 |
| Dibromofluoromethane | 92 | 75 - 123 |
| Toluene-d8 | 100 | 79 - 122 |

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***Several tables in the 2005 RA (RAM Group, Inc. and URS, February 2005) were revised. The revised tables are distinguished with an (R) in the table number.***

## B.1 INTRODUCTION

The 2005 risk assessment (RA) for Former FF Building Area (FF) presented in the *Updated Risk Assessment and Development of Site-Specific Media Cleanup Goals for Selected Areas in Solutia – J.F. Queeny Plant, Part 1* (RAM Group, Inc. and URS, February 2005) concluded that total risk to the future on-site non-residential worker exceeded the acceptable target risk. The primary exposure pathways for this exceedence were dermal contact with, ingestion of, and outdoor inhalation of vapors and particulates from surficial soil. The only surficial soil data available was from the 1993 investigation with highest concentration in boring SB-2. Therefore, one of the risk management alternatives to address the exceedence was to collect additional surficial soil samples in the vicinity of SB-2 that would be more representative of current conditions and to update the risk.

## B.2 ADDITIONAL SAMPLES

In April 2006, five soil borings (FF06-01 to FF06-05) were advanced to a depth of approximately 3 ft in corners of a square, centered on former soil boring SB-2. Locations were approximately 20 ft apart from the center. One surficial soil sample was collected from each soil boring and analyzed for volatile organic compounds (VOCs). One groundwater sample was also collected from piezometer LPZ-4. Figure 1 of Appendix A shows the location of these additional soil borings as well as soil borings and a piezometer presented in the Updated 2005 RA. Additional details of the sampling and analytical procedures are included in Appendix A.

## B.3 UPDATE OF 2005 RISK ASSESSMENT

### B.3.1 STEP 1: UPDATE OF REPRESENTATIVE CONCENTRATIONS

Additional soil and groundwater data were added to Table 2-3 (Soil Analytical Data Showing Constituents with At Least One Detection) and Table 2-4 (Groundwater Analytical Data Showing Constituents with At Least One Detection) in the 2005 RA. The corresponding Tables 2-3(R) and 2-4(R) are included. Using these additional soil and groundwater data, representative concentrations were recalculated for VOCs for the following media – receptor combinations:

- Surficial soil for a future on-site non-residential worker,
- Groundwater for a future on-site non-residential and construction workers, and
- Soil for a future on-site construction worker.

The revised tables for representative concentrations are presented in Tables 4-1(a)(R), 4-1(c)(R), and 4-1(d)(R). Two constituents that were not detected in the 2005 RA were detected in the April 2006 sampling event. These include chloromethane in the soil samples and acetone in the groundwater sample. Additional constituents of concern (COCs) for each of media – receptor combination were identified as below:

**Surficial Soil for a Future On-site Non-residential Worker**

- 2-Butanone (MEK)
- Acetone
- Benzene
- Carbon disulfide
- Chlorobenzene
- Chloromethane
- cis-1,2-Dichloroethene
- Toluene
- trans-1,2-Dichloroethene
- Vinyl chloride

**Groundwater for a Future On-site Non-residential and Construction Workers**

- Acetone

**Soil for a Future On-site Construction Worker**

- Chloromethane
- Toluene

Risk calculations were performed for these additional COCs. Tables 4-2(R) and 4-3(R) show the physical/chemical properties and toxicity values for each of the COC.

### B.3.2 STEP 2: UPDATE OF RISKS

Using the recalculated representative concentrations, risks were updated for the following receptors of concern:

- Future on-site non-residential workers, and
- Future on-site construction workers.

In updating the representative concentrations and risks, identical assumptions and parameters as used in the 2005 RA were used.

The recalculated risks are presented in Tables 4-6(a)(R) to 4-6(b)(R) for future on-site non-residential worker and future on-site construction worker, respectively. Based on these tables, following are the key observations.

#### B.3.2.1 Future On-site Non-residential Worker

***Carcinogenic Risk:***

As indicated in Table 4-6(a)(R), the site-wide cumulative individual excess lifetime cancer risk (IELCR) is $5.5 \times 10^{-5}$, which is below the acceptable target risk level of 1 x

$10^{-4}$. However, further examination of the table indicates that the total IELCR for tetrachloroethene is $4.8 \times 10^{-5}$, which is above the acceptable target risk for each COC of $1 \times 10^{-5}$. The primary exposure pathways for this exceedence are dermal contact with, ingestion of, and outdoor inhalation of vapors and particulates from surficial soil.

*Non-carcinogenic Risk:*

As shown in Table 4-6(a)(R), the site-wide cumulative hazard index (HI) is 0.297, which is below the acceptable target risk level of 1.0. In addition, the cumulative risk for each COC is less than 1.0 – the acceptable target risk level.

***Total carcinogenic risk for tetrachloroethene for the potential future non-residential worker exceeded the target risk level and will be addressed in the CMS.***

### B.3.2.2 Future On-site Construction Worker

*Carcinogenic Risk:*

As indicated in Table 4-6(b)(R), the site-wide cumulative IELCR is $6.3 \times 10^{-6}$ which is below the acceptable target risk level of $1 \times 10^{-4}$. In addition, the risk for each COC and each route of exposure is less than $1 \times 10^{-5}$ – the acceptable target risk level.

*Non-carcinogenic Risk:*

As shown in Table 4-6(b), the site-wide cumulative HI is 2.7 which is above the acceptable target risk level of 1.0. Further examination of the table indicates that the total non-carcinogenic risk for toluene is 1.9, which is above the acceptable target risk for each COC of 1.0. The primary exposure pathway for this exceedence is dermal contact with groundwater.

***Total risk for toluene for the potential future construction worker exceeded the target risk level and will be addressed in the CMS.***

## B.3.3 STEP 3: UPDATE OF RISK MANAGEMENT ALTERNATIVES

The evaluation of the Updated 2005 RA indicates that:

- Total carcinogenic risk to the potential future on-site non-residential worker for tetrachloroethene exceeded the acceptable target risk. The primary exposure pathways contributing to this exceedence are dermal contact with, ingestion of, and outdoor inhalation of vapors and particulates from surficial soil.

- Site-wide cumulative non-carcinogenic risk to the potential future construction worker exceeded the target risk level. Further examination indicates that the total non-carcinogenic risk for toluene exceeded the target risk level. The primary exposure pathway for this exceedence is dermal contact with groundwater.

- Sporadic measurement of light non-aqueous phase liquid (LNAPL) and dense NAPL (DNAPL) have been observed in a few wells and piezometers.

Unacceptable risks to the potential future non-residential worker can be managed by:

(i) Imposing an institutional control that requires the surface to remain covered. In this case, the direct contact with soil exposure pathway would not be complete and risks from surficial soil will be eliminated (refer Table 5-1(a)(R)).

(ii) Reducing the representative surficial soil concentration for tetrachloroethene to 210,910 µg/kg (refer Table 5-1(b)(R)).

Unacceptable risks to the potential future construction worker can be managed by:

(i) Imposing institutional controls e.g., requiring personal protective equipment during construction.

(ii) Reducing the representative concentration of toluene in groundwater to 62,590 µg/L (refer Table 5-2(R)).

Solutia intends to evaluate these and other options available to manage risks and the sporadic occurrence of LNAPL and DNAPL during the corrective measures study (CMS) phase.

***Since the target risks, as per the Missouri Risk-Based Corrective Action process, are based on the total risk and not on individual constituents and individual exposure pathways, the cleanup goals developed are not unique and several other combinations of cleanup goals are possible.***

**Table 2-3(R)**
**Soil Analytical Data Showing Constituents with At Least One Detection**
**Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | 2-Butanone (MEK) | Acetone | Benzene | Carbon disulfide | Chlorobenzene | Chloromethane | cis-1,2-Dichloroethene | Ethyl methacrylate | Tetrachloroethene | Toluene | trans-1,2-Dichloroethene | Trichloroethene | Vinyl chloride |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-1 | 6/10/93 | 2-4 | | | | | | | | | 110 | | | <6.5 | |
| | | 10-12 | | | | | | | | | 30000 | | | <770 | |
| SB-2 | 6/10/93 | 2-4 | | | | | | | | | 2000000 | | | <63000 | |
| | | 8-10 | | | | | | | | | 280000 | | | 21000 | |
| SB-3 | 6/10/93 | 6.5-8.5 | | | | | | | | | 4100 | | | 760 | |
| | | 10.5-12.5 | | | | | | | | | 93 | | | <6.8 | |
| SB-4 | 6/10/93 | 2-4 | | | | | | | | | 22000 | | | 1000 | |
| | | 8-10 | | | | | | | | | 390 | | | <32 | |
| SB-5 | 6/10/93 | 2.5-4.5 | | | | | | | | | 28 | | | <6.6 | |
| | | 10.5-12.5 | | | | | | | | | 8.9 | | | 44 | |
| SB-6 | 6/10/93 | 2-4 | | | | | | | | | 3100 | | | <840 | |
| SB-7 | 9/2/93 | 2-4 | | | | | | | | | <6.5 | | | <6.5 | |
| | | 6-8 | | | | | | | | | 34 | | | 39 | |
| SB-8 | 9/3/93 | 3-5 | | | | | | | | | <6.4 | | | <6.4 | |
| | | 9-11 | | | | | | | | | <6.2 | | | <6.2 | |
| SB-9 | 9/2/93 | 3-5 | | | | | | | | | 30 | | | <6 | |
| | | 11-13 | | | | | | | | | 9.2 | | | <6.2 | |
| SB-10 | 9/2/93 | 2-4 | | | | | | | | | <6.6 | | | <6.6 | |
| | | 6-8 | | | | | | | | | <6.4 | | | <6.4 | |
| SB-11 | 9/3/93 | 5-7 | | | | | | | | | <6.5 | | | <6.5 | |
| | | 9-11 | | | | | | | | | <6.3 | | | <6.3 | |
| SB-12 | 9/30/93 | 0-4 | | | | | | | | | <6.0 | | | <6.0 | |
| | | 4-6 | | | | | | | | | <6.3 | | | <6.3 | |
| SB-A | 6/1/88 | 10-11.5 | | | | | | | | | ND | | | | |
| SB-B | 6/1/88 | 10-11.5 | | | | | | | | | 225300 | | | | |
| SB-C | 6/1/88 | 10-11.5 | | | | | | | | | 104600 | | | | |
| SB-D | 6/1/88 | 10-11.5 | | | | | | | | | ND | | | | |
| SB-E | 6/1/88 | 3-6.5 | | | | | | | | | 1933000 | | | | |
| SB-G | 6/1/88 | 10-11.5 | | | | | | | | | ND | | | | |
| SB-H | 6/1/88 | 10-11.5 | | | | | | | | | 33300 | | | | |
| FF04-01-6 | 6/15/04 | 6 | 7.5 J | 15 J | 34 | <4.9 | 53 | | <4.9 | <4.9 | 3.3 J | <4.9 | <4.9 | <4.9 | <4.9 |
| FF04-01-14 | 6/15/04 | 14 | <26 | <52 | 25 | <5.2 | 80 | | <5.2 | <5.2 | 30 | <5.2 | <5.2 | <5.2 | <5.2 |
| FF04-02-10 | 6/15/04 | 10 | <1100 | <2200 | <220 | <220 | 3900 J | | | <220 | <220 | <220 | 260 J | <220 | 320 J |
| FF04-02-16 | 6/15/04 | 16 | | | | <480 | | | | | <480 | | | <480 | |
| FF04-03-8 | 6/18/04 | 8 | <14000 | <28000 | <2800 | <2800 | 63000 | | <2800 | 2800 | <2800 | <2800 | <2800 | <2800 | <2800 |
| FF04-03-18 | 6/18/04 | 18 | <890 | <1800 | 200 | <180 | 7800 | | 480 | <180 | <180 | <180 | <180 | <180 | 100 J |
| FF04-04-10 | 6/15/04 | 19 | <940 | <1900 | <190 | 640 | 53 J | | 3500 | <190 | <190 | <190 | <190 | <190 | 1100 |
| FF04-04-16 | 6/15/04 | 16 | <1000 | <2000 | <200 | 120 J | 880 | | 12000 | <200 | <200 | <200 | 69 J | <200 | 2200 |
| FF04-05-12-14 | 7/2/04 | 13 | <23 | 12 J | <4.5 | 3.4 J | 100 | | 17000 | <4.5 | 14 | <4.5 | 110 | 6.4 | 1000 J |
| FF04-05-18-20 | 7/2/04 | 19 | <25 | 13 J | 2.4 J | <5 | 970 J | | 45000 | <5 | 10000 | 2.2 J | 420 | 6000 | 1200 |
| FF04-06-12 | 6/15/04 | 12 | <210000 | <430000 | <43000 | <43000 | 450000 | | 32000 J | <43000 | 2400000 | <43000 | <43000 | 69000 | <43000 |
| FF04-06-12-DUP | 6/15/04 | 12 | <240000 | <480000 | <48000 | <48000 | 580000 | | 38000 J | <48000 | 3100000 | <48000 | <48000 | 87000 | <48000 |
| FF04-06-16 | 6/15/04 | 16 | <390000 | <780000 | <78000 | <78000 | 630000 | | 22000 J | <78000 | 3100000 | <78000 | <78000 | 69000 J | <78000 |
| FF06-01-2-3 | 4/17/06 | 2-3 | <3000 | <6100 | <610 | <610 | 2000 J | 200 J | 89000 | <610 | 980000 J | <610 | 1200 | 45000 J | 360 J |
| FF06-01-2-3-D | 4/17/06 | 2-3 | <170000 | <340000 | <34000 | <34000 | 12000 J | <34000 | 160000 | <34000 | 7100000 J | <34000 | <34000 | 200000 J | <34000 |
| FF06-02-2-3 | 4/17/06 | 2-3 | <58000 | <120000 | <12000 | <12000 | <12000 | <12000 | 6700 J | <12000 | 160000 | <12000 | <12000 | 10000 J | <12000 |
| FF06-03-2-3 | 4/17/06 | 2-3 | <13 | 16 J | 11 | <2.6 | 44 | <2.6 | <2.6 | <2.6 | <2.6 | <2.6 | <2.6 | <2.6 | <2.6 |
| FF06-04-2-3 | 4/17/06 | 2-3 | 9 J | 37 J | 2.4 J | 7.3 | 3200 | <4.7 | 7400 | <4.7 | 13000 | 3.7 J | 840 | 5900 | 2000 |
| FF06-05-2-3 | 4/17/06 | 2-3 | <120000 | <250000 | <25000 | <25000 | 630000 | <25000 | 26000 | <25000 | 900000 | <25000 | <25000 | 93000 | <25000 |
| **Number of Samples** | | | 18 | 18 | 18 | 19 | 18 | 6 | 17 | 18 | 49 | 18 | 18 | 42 | 18 |
| **Number of Detects** | | | 1 | 3 | 4 | 4 | 12 | 1 | 8 | 1 | 25 | 1 | 4 | 10 | 6 |
| **Maximum Detected Concentration** | | | 7.5 | 15 | 200 | 640 | 630000 | 200 | 45000 | 2800 | 3100000 | 2.2 | 420 | 87000 | 2200 |

Notes:
All concentrations in ug/kg (micrograms/kilogram)
ft bgs: Feet below ground surface
ND: Not detected

Table 2-4(R)
Groundwater Analytical Data Showing Constituents with At Least One Detection
Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | 1,2,4-Trichlorobenzene | 1,2-Dichlorobenzene | 1,4-Dichlorobenzene | 2,4,6-Trichlorophenol | 2,4-Dichlorophenol | 2,4-Dimethylphenol | 2-Chlorophenol | Acetone | Acenaphthene | Arsenic | Barium | Barium Dissolved | Benzene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,I)perylene | Benzo(k)fluoranthene | Bis(2-ethylhexyl)phthalate | Butylbenzylphthalate | Cadmium | Cadmium Dissolved | Chlorobenzene | Chloroform | Chromium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fill and Silty Clay Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FF-PZ-1 | 8/26/2004 | | | | | | | | | | | | | 81 | | | | | | | | | | 12000 | <20 | |
| FF-PZ-2 | 8/26/2004 | | | | | | | | | | | | | <2000 | | | | | | | | | | 6500 | <2000 | |
| FF-PZ-3 | 8/26/2004 | | | | | | | | | | | | | <2000 | | | | | | | | | | 680 J | <2000 | |
| GP-25 | 8/30/1993 | | | | | | | | | | | | | | | | | | | | | | | | | |
| GP-26 | 8/31/1993 | | | | | | | | | | | | | <10000 | | | | | | | | | | 14000 | 6300 | |
| GP-29 | 8/31/1993 | | | | | | | | | | | | | | | | | | | | | | | | | |
| LPZ-1 | 7/14/2000 | | | | | | | | | | | | | 68 J | | | | | | | | | | 660 | <500 | |
| LPZ-2 | 6/20/2000 | | | | | | | | | | | | | <2500 | | | | | | | | | | <2500 | <2500 | |
| LPZ-2 | 4/29/2004 | | | | | | | | | | | | | 14 | | | | | | | | | | 14 | <10 | |
| LPZ-3 | 7/27/2000 | | | | | | | | | | | | | 66 J | | | | | | | | | | 130 J | <200 | |
| LPZ-4 | 8/1/2000 | | | | | | | | | | | | | 770 J | | | | | | | | | | 2300 J | <2500 | |
| LPZ-4 | 4/18/2006 | | | | | | | | 60 J | | | | | 280 J | | | | | | | | | | 1100 J | <1 | |
| LPZ-4-D | 4/18/2006 | | | | | | | | 52 J | | | | | 180 J | | | | | | | | | | 730 J | <1 | |
| LPZ-5 | 7/14/2000 | | | | | | | | | | | | | 300 J | | | | | | | | | | 15000 | <5000 | |
| LPZ-5 | 4/29/2004 | | | | | | | | | | | | | 1400 | | | | | | | | | | 8200 | <20 | |
| PTW-1 | 10/25/1994 | <10 | <5 | <5 | <10 | <10 | <10 | <10 | | <10 | | | | <5 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | | | <5 | <5 | |
| PTW-2 | 10/28/1994 | <10 | <5 | <5 | <10 | <10 | <10 | <10 | | <10 | | | | <5 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | | | <5 | <5 | |
| PTW-3 | 11/8/1994 | <10 | | <10 | <10 | <10 | <10 | | | <10 | | | | <5 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | | | <5 | <5 | |
| PZ-12 | 3/14/1994 | | | | | | | | | | | | | <25 | | | | | | | | | | <25 | <25 | |
| PZ-2 | 3/14/1994 | | | | | | | | | | | | | <250 | | | | | | | | | | <250 | <250 | |
| PZ-5 | 3/14/1994 | | | | | | | | | | | | | <50 | | | | | | | | | | 660 | <50 | |
| PZ-7C | 3/14/1994 | | | | | | | | | | | | | <5000 | | | | | | | | | | 16000 | <5000 | |
| PZ-7CD | 3/14/1994 | | | | | | | | | | | | | <5000 | | | | | | | | | | 16000 | <5000 | |
| PZ-7CR | 3/14/1994 | | | | | | | | | | | | | <5 | | | | | | | | | | <5 | <5 | |
| PZ-FF2 | 6/20/2000 | | | | | | | | | | | | | 140 J | | | | | | | | | | <2500 | <2500 | |
| PZ-FF3 | 6/22/2000 | | | | | | | | | | | | | 350 J | | | | | | | | | | 960 J | <5000 | |
| **Silty Clay and Sand Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-3 | 11/5/1991 | | | | | | | <10 | | | 22 | 460 | 120 | <250 | | | | | | | | <5 | | 1300 | <250 | 38 |
| MW-3 | 11/10/1993 | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-3 | 6/10/1993 | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-3F | 6/20/2000 | | | | | | | | | | | | 760 | | | | | | | | | | 3.8 B | | | |
| MW-3 | 4/30/2004 | | | | | | | | | | | | | <25 | | | | | | | | | | 39 | <25 | |
| MW-3 (MW-D) | 6/11/1991 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | | <10 | <10 | 130 | 140 | <50 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | 7.2 | | 840 | <50 | <10 |
| REC-1 | 6/3/1993 | | | | | | | | | | | | | | | | | | | | | | | | | |
| REC-1 | 7/11/2000 | 5.1 J | 160 | 13 | 1.1 J | 1.5 J | 1.0 J | 0.58 J | | 0.35 J | | | | <2500 | 1.0 J | 0.83 J | 0.76 J | 0.84 J | 0.86 J | 16 | | 5.1 J | | 16000 | <2500 | |
| REC-1 | 4/30/2004 | | | | | | | | | | | | | <50 | | | | | | | | | | 140 | <50 | |
| REC-1-DUP | 4/30/2004 | | | | | | | | | | | | | <50 | | | | | | | | | | 130 | <50 | |
| REC-2 | 6/3/1993 | | | | | | | | | | | | | | | | | | | | | | | | | |
| REC-2 | 6/28/2000 | 1.6 J | 47 | 5.7 J | <10 | <10 | <10 | 0.67 J | | <10 | | | | <2000 | <0.53 | <10 | <10 | <10 | <10 | 37 J | <10 | | | 1200 J | <2000 | |
| REC-3 | 6/4/1993 | | | | | | | | | | | | | | | | | | | | | | | | | |
| REC-3 | 6/28/2000 | 0.76 J | 31 | 2.4 J | <10 | <10 | <10 | 5.0 J | | <10 | | | | <1000 | <0.45 | <10 | <10 | <10 | <10 | 90 J | <10 | | | 1100 | <1000 | |
| REC-4 | 6/4/1993 | | | | | | | | | | | | | | | | | | | | | | | | | |
| REC-4 | 6/28/2000 | <10 | 3.3 J | 1.0 J | <10 | <10 | <10 | <10 | | <10 | | | | <250 | <1.2 | <10 | <10 | <10 | <10 | 13 J | 0.71 J | | | 200 J | <250 | |
| REC-4 | 4/30/2004 | | | | | | | | | | | | | <120 | | | | | | | | | | 520 | <120 | |
| **Bedrock Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OBW-1 | 8/12/1994 | | | | | | | | | | | | | <25000 | | | | | | | | | | <25000 | <25000 | |
| OBW-1 | 6/7/2000 | | | | | | | | | | <10 | 69 | | | | | | | | | | <5 | | | | 14 |
| OBW-1 (aqueous) | 6/7/2000 | 2.1 J | 74 | 6.2 J | 1.4 J | 5.7 J | 5.5 J | 4.2 J | | <10 | 4.8 | 110 | | <1000 | <10 | <10 | <10 | <10 | <10 | 61 J | 0.47 J | <5 | | 4400 | <1000 | 15 |
| OBW-2 | 7/7/2000 | 5 J | 97 | 11 | <10 | 19 | 3.4 J | 13 | | <10 | | | | 67 | <10 | <10 | <10 | <10 | <10 | 31 J | 0.97 J | | | 15000 | <50 | |

Note:
All concentrations in ug/L (micrograms/liter).

## Table 2-4(R)
## Groundwater Analytical Data Showing Constituents with At Least One Detection
## Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Chromium Dissolved | Chrysene | cis-1,2-Dichloroethene | Cobalt | Cobalt Dissolved | Copper | Copper Dissolved | Diethylphthalate | Di-n-butylphthalate | Di-n-octylphthalate | Ethylbenzene | Fluoranthene | Fluorene | Indeno-(1,2,3-cd)pyrene | Iron | Iron Dissolved | Lead | Lead Dissolved | Methylene chloride | Naphthalene | Nickel | Nickel Dissolved | Nitrobenzene | p-Chloroaniline | Phenacetin | Phenanthrene | Phenol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fill and Silty Clay Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FF-PZ-1 | 8/26/2004 | | | 460 | | | | | | | | <20 | | | | | | | | <100 | | | | | | | | |
| FF-PZ-2 | 8/26/2004 | | | 37000 | | | | | | | | <2000 | | | | | | | | <10000 | | | | | | | | |
| FF-PZ-3 | 8/26/2004 | | | 49000 | | | | | | | | <2000 | | | | | | | | <10000 | | | | | | | | |
| GP-25 | 8/30/1993 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GP-26 | 8/31/1993 | | | 14000 | | | | | | | | <10000 | | | | | | | | <10000 | | | | | | | | |
| GP-29 | 8/31/1993 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LPZ-1 | 7/14/2000 | | | 19000 | | | | | | | | <500 | | | | | | | | <500 | | | | | | | | |
| LPZ-2 | 6/20/2000 | | | 820 | | | | | | | | <2500 | | | | | | | | 1500 J | | | | | | | | |
| LPZ-2 | 4/29/2004 | | | 100 | | | | | | | | <10 | | | | | | | | <50 | | | | | | | | |
| LPZ-3 | 7/27/2000 | | | <200 | | | | | | | | <200 | | | | | | | | 18 J | | | | | | | | |
| LPZ-4 | 8/1/2000 | | | 4100 | | | | | | | | <2500 | | | | | | | | <2500 | | | | | | | | |
| LPZ-4 | 4/18/2006 | | | 3800 J | | | | | | | | 30 J | | | | | | | | <5 | | | | | | | | |
| LPZ-4-D | 4/18/2006 | | | 3100 J | | | | | | | | 13 J | | | | | | | | <5 | | | | | | | | |
| LPZ-5 | 7/14/2000 | | | 750 J | | | | | | | | <5000 | | | | | | | | <5000 | | | | | | | | |
| LPZ-5 | 4/29/2004 | | | 3500 | | | | | | | | 85 | | | | | | | | <100 | | | | | | | | |
| PTW-1 | 10/25/1994 | | <10 | <5 | | | | | <10 | <10 | <10 | <5 | <10 | <10 | <10 | | | | | <5 | <10 | | | <10 | | | <10 | <10 |
| PTW-2 | 10/28/1994 | | <10 | <5 | | | | | <10 | <10 | <10 | <5 | <10 | <10 | <10 | | | | | <5 | <10 | | | <10 | | | <10 | <10 |
| PTW-3 | 11/8/1994 | | <10 | <25 | | | | | <10 | <10 | <10 | <5 | <10 | <10 | <10 | | | | | <5 | <10 | | | <10 | | | <10 | <10 |
| PZ-12 | 3/14/1994 | | | <250 | | | | | | | | <25 | | | | | | | | 38 | | | | | | | | |
| PZ-2 | 3/14/1994 | | | <50 | | | | | | | | <250 | | | | | | | | 430 | | | | | | | | |
| PZ-5 | 3/14/1994 | | | 110000 | | | | | | | | 1100 | | | | | | | | 80 | | | | | | | | |
| PZ-7C | 3/14/1994 | | | 99000 | | | | | | | | <5000 | | | | | | | | 8900 | | | | | | | | |
| PZ-7CD | 3/14/1994 | | | <5 | | | | | | | | <5000 | | | | | | | | 9300 | | | | | | | | |
| PZ-7CR | 3/14/1994 | | | | | | | | | | | <5 | | | | | | | | <5 | | | | | | | | |
| PZ-FF2 | 6/20/2000 | | | 810 J | | | | | | | | <2500 | | | | | | | | <2500 | | | | | | | | |
| PZ-FF3 | 6/22/2000 | | | 1500 J | | | | | | | | <5000 | | | | | | | | <5000 | | | | | | | | |
| **Silty Clay and Sand Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-3 | 11/5/1991 | <10 | | 530 | 24 | | 66 | | | | | <250 | | | | | | 36 | 14 | <250 | | 69 | | | | | | |
| MW-3 | 11/10/1993 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-3 | 6/10/1993 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-3F | 6/20/2000 | <10 | | | | 11 | | 5.9 B | | | | | | | | | 95 J | | <5 | | | | 27 B | | | | | |
| MW-3 | 4/30/2004 | | | 1100 | | | | | | | | <25 | | | | | | | | <120 | | | | | | | | |
| MW-3 (MW-D) | 6/11/1991 | <10 | <10 | | <10 | | <25 | | <10 | <10 | <10 | <50 | <10 | <10 | <10 | | | 8.5 | <5 | <50 | <10 | <40 | | <10 | <20 | <20 | <10 | <10 |
| REC-1 | 6/3/1993 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REC-1 | 7/11/2000 | | 1.3 J | 1300 | | | | | 1.4 J | 22 | 2.1 J | <2500 | 1.2 J | <10 | 0.85 J | | | | | 980 J | 0.9 J | | | 1.2 J | 32 | 10 | 2.1 J | 28 |
| REC-1 | 4/30/2004 | | | 130 | | | | | | | | <50 | | | | | | | | <250 | | | | | | | | |
| REC-1-DUP | 4/30/2004 | | | 120 | | | | | | | | <50 | | | | | | | | <250 | | | | | | | | |
| REC-2 | 6/3/1993 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REC-2 | 6/28/2000 | | <10 | 1500 | | | | | <10 | 0.76 J | <10 | <2000 | <10 | <10 | <10 | | | | | 640 J | <10 | | | <10 | 24 | <10 | 0.72 J | <10 |
| REC-3 | 6/4/1993 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REC-3 | 6/28/2000 | | <10 | 3400 | | | | | <10 | 0.88 J | <10 | <1000 | 0.38 J | <10 | <10 | | | | | 230 J | <10 | | | <10 | 35 | <10 | 0.81 J | <10 |
| REC-4 | 6/4/1993 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REC-4 | 6/28/2000 | | <10 | 260 | | | | | <10 | 0.89 J | <10 | <250 | <10 | <10 | <10 | | | | | <25 | <10 | | | <10 | 120 | <10 | 0.74 J | <10 |
| REC-4 | 4/30/2004 | | | 1100 | | | | | | | | <120 | | | | | | | | <620 | | | | | | | | |
| **Bedrock Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OBW-1 | 8/12/1994 | | | <25000 | | | | | | | | <25000 | | | | | | | | 26000 | | | | | | | | |
| OBW-1 | 6/7/2000 | | | | <10 | | 2.6 | | | | | | | | | 23 | | <5 | | | | <40 | | | | | | |
| OBW-1 (aqueous) | 6/7/2000 | | <10 | 2500 | <10 | | 8.8 | | 0.6 J | 1.2 J | <10 | <1000 | 0.42 J | 0.44 J | <10 | 430 | | 7.5 | | <1000 | 3.8 J | <40 | | 2100 | 320 | <10 | 1.2 J | 250 |
| OBW-2 | 7/7/2000 | | | 3700 | | | | | 2 J | 1.4 J | <10 | <50 | <10 | 0.5 J | <10 | | | | | <50 | 3.4 J | | | 2.4 J | 300 | <10 | <10 | 48 |

Note:
All concentrations in ug/L (micrograms/liter).

## Table 2-4(R)
## Groundwater Analytical Data Showing Constituents with At Least One Detection
## Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Pyrene | Tetrachloroethene | Toluene | trans-1,2-Dichloroethene | Trichloroethene | Vanadium | Vinyl chloride | Xylene | Zinc | Zinc Dissolved |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fill and Silty Clay Unit** | | | | | | | | | | | |
| FF-PZ-1 | 8/26/2004 | | 790 | <20 | 58 | 19 J | | 220 | <40 | | |
| FF-PZ-2 | 8/26/2004 | | 42000 | <2000 | 840 J | 2600 | | 2500 | <4000 | | |
| FF-PZ-3 | 8/26/2004 | | 1800 J | <2000 | <2000 | 1900 J | | 4300 | <4000 | | |
| GP-25 | 8/30/1993 | | 160000 | | | 5900 | | | | | |
| GP-26 | 8/31/1993 | | 7800 | 480000 | <10000 | 18000 | | <20000 | <10000 | | |
| GP-29 | 8/31/1993 | | <5 | | | <5 | | | | | |
| LPZ-1 | 7/14/2000 | | 170 J | 310000 | 19000 | 3200 | | 2500 | <1000 | | |
| LPZ-2 | 6/20/2000 | | <2500 | 70000 | 820 | <2500 | | 460 | <5000 | | |
| LPZ-2 | 4/29/2004 | | <10 | 48000 | 6 J | 5.1 J | | 60 | 10 J | | |
| LPZ-3 | 7/27/2000 | | <200 | 4200 | <200 | <200 | | <20 | <400 | | |
| LPZ-4 | 8/1/2000 | | 3800 | 660000 | 4100 | 3100 | | 2400 | <5000 | | |
| LPZ-4 | 4/18/2006 | | 3700 J | 420000 J | 130 J | 3500 J | | 830 J | 37 J | | |
| LPZ-4-D | 4/18/2006 | | 2000 J | 370000 J | 110 J | 2000 J | | 620 J | 15 J | | |
| LPZ-5 | 7/14/2000 | | <5000 | 170000 | 750 J | <5000 | | 840 | <10000 | | |
| LPZ-5 | 4/29/2004 | | 17 | 140000 | 48 | 160 | | 1500 | 130 | | |
| PTW-1 | 10/25/1994 | <10 | <5 | <5 | <5 | <5 | | <10 | <5 | | |
| PTW-2 | 10/28/1994 | <10 | <5 | <5 | <5 | <5 | | <10 | <5 | | |
| PTW-3 | 11/8/1994 | <10 | <5 | <5 | <5 | <5 | | <10 | | | |
| PZ-12 | 3/14/1994 | | <25 | 670 | <25 | <25 | | <50 | <25 | | |
| PZ-2 | 3/14/1994 | | <250 | 2100 | <250 | <250 | | <500 | 1300 | | |
| PZ-5 | 3/14/1994 | | <50 | 610 | <50 | <50 | | <100 | 2000 | | |
| PZ-7C | 3/14/1994 | | <5000 | 27000 | <5000 | <5000 | | 22000 | <5000 | | |
| PZ-7CD | 3/14/1994 | | <5000 | 27000 | <5000 | <5000 | | 19000 | <5000 | | |
| PZ-7CR | 3/14/1994 | | <5 | <5 | <5 | <5 | | <10 | <5 | | |
| PZ-FF2 | 6/20/2000 | | <2500 | 200000 | 810 J | <2500 | | 740 | <5000 | | |
| PZ-FF3 | 6/22/2000 | | <5000 | 5700000 | 1500 J | 1500 J | | 1100 | <10000 | | |
| **Silty Clay and Sand Unit** | | | | | | | | | | | |
| MW-3 | 11/5/1991 | | 380 | <250 | <250 | 570 | 73 | <500 | <250 | 210 | 22 |
| MW-3 | 11/10/1993 | | | | | | | | | | |
| MW-3 | 6/10/1993 | | 250 | | | 250 | | | | | |
| MW-3F | 6/20/2000 | | | | | | | | | | 26 |
| MW-3 | 4/30/2004 | | 630 | <15 | <25 | 280 | | <25 | <50 | | |
| MW-3 (MW-D) | 6/11/1991 | <10 | 97 | <50 | <50 | 510 | 14 | <100 | <50 | 25 | 26 |
| REC-1 | 6/3/1993 | | 61000 | | | <2500 | | | | | |
| REC-1 | 7/11/2000 | 0.9 J | 57000 | <2500 | | 1000 J | | <250 | <5000 | | |
| REC-1 | 4/30/2004 | | 2400 | <50 | <50 | 220 | | <50 | <100 | | |
| REC-1-DUP | 4/30/2004 | | 2600 | <50 | <50 | 220 | | <50 | <100 | | |
| REC-2 | 6/3/1993 | | 150000 | | | <5000 | | | | | |
| REC-2 | 6/28/2000 | <10 | 59000 | <2000 | 1500 | 1400 J | | <200 | <4000 | | |
| REC-3 | 6/4/1993 | | 36 | | | <5 | | | | | |
| REC-3 | 6/28/2000 | <10 | 28000 | <1000 | 3400 | 3400 | | 130 | <2000 | | |
| REC-4 | 6/4/1993 | | 3400 | | | 570 | | | | | |
| REC-4 | 6/28/2000 | <10 | 9400 | <250 | 260 | 1100 | | 26 | <500 | | |
| REC-4 | 4/30/2004 | | 2200 | <120 | <120 | 4000 | | <120 | <250 | | |
| **Bedrock Unit** | | | | | | | | | | | |
| OBW-1 | 8/12/1994 | | 120000 | <25000 | <25000 | <25000 | | <50000 | <25000 | | |
| OBW-1 | 6/7/2000 | | | | | | 6.3 | | | <20 | |
| OBW-1 (aqueous) | 6/7/2000 | <10 | 92000 | 190 J | | 1500 | 9 | 140 | <2000 | 93 | |
| OBW-2 | 7/7/2000 | <10 | 120000 | 140 | | 4100 J | | 45 | <100 | | |

Note:
All concentrations in ug/L (micrograms/liter).

Table 4-1(d)(R)

**Representative Concentration for Dermal Contact with, Ingestion of, and Outdoor Inhalation of Vapors from Soil by a Future On-site Construction Worker**

**Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | 2-Butanone (MEK) | Acetone | Benzene | Carbon disulfide | Chlorobenzene | Chloromethane | cis-1,2-Dichloroethene | Ethyl methacrylate | Tetrachloroethene | Toluene | trans-1,2-Dichloroethene | Trichloroethene | Vinyl chloride |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-1 | 6/10/93 | 2-4 | | | | | | | | | 110 | | | <6.5 | |
| | | 10-12 | | | | | | | | | 30000 | | | <770 | |
| SB-2 | 6/10/93 | 2-4 | | | | | | | | | 2000000 | | | <63000 | |
| | | 8-10 | | | | | | | | | 280000 | | | 21000 | |
| SB-3 | 6/10/93 | 6.5-8.5 | | | | | | | | | 4100 | | | 760 | |
| | | 10.5-12.5 | | | | | | | | | 93 | | | <6.8 | |
| SB-4 | 6/10/93 | 2-4 | | | | | | | | | 22000 | | | 1000 | |
| | | 8-10 | | | | | | | | | 390 | | | <32 | |
| SB-5 | 6/10/93 | 2.5-4.5 | | | | | | | | | 28 | | | <6.6 | |
| | | 10.5-12.5 | | | | | | | | | 8.9 | | | 44 | |
| SB-6 | 6/10/93 | 2-4 | | | | | | | | | 3100 | | | <840 | |
| SB-7 | 9/2/93 | 2-4 | | | | | | | | | <6.5 | | | <6.5 | |
| | | 6-8 | | | | | | | | | 34 | | | 39 | |
| SB-9 | 9/2/93 | 3-5 | | | | | | | | | 30 | | | <6 | |
| | | 11-13 | | | | | | | | | 9.2 | | | <6.2 | |
| SB-B | 6/1/88 | 10-11.5 | | | | | | | | | 225300 | | | | |
| SB-C | 6/1/88 | 10-11.5 | | | | | | | | | 104600 | | | | |
| SB-E | 6/1/88 | 3-6.5 | | | | | | | | | 1933000 | | | | |
| SB-H | 6/1/88 | 10-11.5 | | | | | | | | | 33300 | | | | |
| FF04-01-6 | 6/15/04 | 6 | 7.5 J | 15 J | 34 | <4.9 | 53 | | <4.9 | <4.9 | 3.3 J | | <4.9 | <4.9 | <4.9 |
| FF04-01-14 | 6/15/04 | 14 | <26 | <52 | 25 | <5.2 | 80 | | <5.2 | <5.2 | 30 | | <5.2 | <5.2 | <5.2 |
| FF04-02-10 | 6/15/04 | 10 | <1100 | <2200 | <220 | <220 | 3900 J | | | <220 | <220 | | 260 J | <220 | 320 J |
| FF04-03-8 | 6/18/04 | 8 | <14000 | <28000 | <2800 | <2800 | 63000 | | <2800 | 2800 | <2800 | | <2800 | <2800 | <2800 |
| FF04-05-12-14 | 7/2/04 | 12 | <23 | 12 J | <4.5 | 3.4 J | 100 | | 17000 | <4.5 | 14 | | 110 | 6.4 | 1000 J |
| FF04-06-12 | 6/15/04 | 12 | <210000 | <430000 | <43000 | <43000 | 450000 | | 32000 J | <43000 | 2400000 | | <43000 | 69000 | <43000 |
| FF04-06-12-DUP | 6/15/04 | 12 | <240000 | <480000 | <48000 | <48000 | 580000 | | 38000 J | <48000 | 3100000 | | <48000 | 87000 | <48000 |
| FF06-01-2-3 | 4/17/06 | 2-3 | <3000 | <6100 | <610 | <610 | 2000 J | 200 J | 89000 | <610 | 980000 J | <610 | 1200 | 45000 J | 360 J |
| FF06-01-2-3-D | 4/17/06 | 2-3 | <170000 | <340000 | <34000 | <34000 | 12000 J | <34000 | 160000 | <34000 | 7100000 J | <34000 | <34000 | 200000 J | <34000 |
| FF06-02-2-3 | 4/17/06 | 2-3 | <58000 | <120000 | <12000 | <12000 | <12000 | <12000 | 6700 J | <12000 | 160000 | <12000 | <12000 | 10000 J | <12000 |
| FF06-03-2-3 | 4/17/06 | 2-3 | <13 | 16 J | 11 | <2.6 | 44 | <2.6 | <2.6 | <2.6 | <2.6 | <2.6 | <2.6 | <2.6 | <2.6 |
| FF06-04-2-3 | 4/17/06 | 2-3 | 9 J | 37 J | 2.4 J | 7.3 | 3200 | <4.7 | 7400 | <4.7 | 13000 | 3.7 J | 840 | 5900 | 2000 |
| FF06-05-2-3 | 4/17/06 | 2-3 | <120000 | <250000 | <25000 | <25000 | 630000 | <25000 | 26000 | <25000 | 900000 | <25000 | <25000 | 93000 | <25000 |
| **Representative Concentration** | | | 31,392 | 63,712 | 6,376 | 6,372 | 134,644 | 5,951 | 31,459 | 6,479 | 602,833 | 5,968 | 6,524 | 20,236 | 6,622 |
| **Maximum Detected Concentration** | | | 7.5 | 15 | 34 | 3.4 | 630,000 | 200 | 38,000 | 2,800 | 3,100,000 | 3.7 | 260 | 93,000 | 1,000 |
| **Concentration Ratio (Max./Rep.)** | | | 0.0002 | 0.0002 | 0.0053 | 0.0005 | 4.7 | 0.03 | 1.2 | 0.43 | 5.1 | 0.001 | 0.04 | 4.6 | 0.15 |

Notes:

All concentrations in ug/kg (micrograms/kilogram)

ft bgs: Feet below ground surface

**Table 4-1(c)(R)**
**Representative Concentration of Groundwater for a Future On-site Non-residential and Construction Workers**
**Former FF Building Area, Solutia - J.F. Queeny, St. Louis, Missouri**

| Sample ID | Sample Date | Acetone | Benzene | Chlorobenzene | cis-1,2-Dichloroethene | Ethylbenzene | Methylene chloride | Tetrachloroethene | Toluene | trans-1,2-Dichloroethene | Trichloroethene | Vinyl chloride | Xylene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FF-PZ-1 | 8/26/2004 | | 81 | 12000 | 460 | <20 | <100 | 790 | <20 | 58 | 19 J | 220 | <40 |
| FF-PZ-2 | 8/26/2004 | | <2000 | 6500 | 37000 | <2000 | <10000 | 42000 | <2000 | 840 J | 2600 | 2500 | <4000 |
| FF-PZ-3 | 8/26/2004 | | <2000 | 680 J | 49000 | <2000 | <10000 | 1800 J | <2000 | <2000 | 1900 J | 4300 | <4000 |
| LPZ-1 | 7/14/2000 | | 68 J | 660 | 19000 | <500 | <500 | 170 J | 310000 | 19000 | 3200 | 2500 | <1000 |
| LPZ-2 | 6/20/2000 | | <2500 | <2500 | 820 | <2500 | 1500 J | <2500 | 70000 | 820 | <2500 | 460 | <5000 |
| LPZ-2 | 4/29/2004 | | 14 | 14 | 100 | <10 | <50 | <10 | 48000 | 6 J | 5.1 J | 60 | 10 J |
| LPZ-2 (Average) | | | 632 | 632 | 460 | 628 | 763 | 628 | 59000 | 413 | 628 | 260 | 1255 |
| LPZ-3 | 7/27/2000 | | 66 J | 130 J | <200 | <200 | 18 J | <200 | 4200 | <200 | <200 | <20 | <400 |
| LPZ-4 | 8/1/2000 | | 770 J | 2300 J | 4100 | <2500 | <2500 | 3800 | 660000 | 4100 | 3100 | 2400 | <5000 |
| LPZ-4 | 4/18/2006 | 60 J | 280 J | 1100 J | 3800 J | 30 J | <5 | 3700 J | 420000 J | 130 J | 3500 J | 830 J | 37 J |
| LPZ-4-D | 4/18/2006 | 52 J | 180 J | 730 J | 3100 J | 13 J | <5 | 2000 J | 370000 J | 110 J | 2000 J | 620 J | 15 J |
| LPZ-4 (Average) | | 56 | 410 | 1377 | 3667 | 431 | 418 | 3167 | 483333 | 1447 | 2867 | 1283 | 851 |
| LPZ-5 | 7/14/2000 | | 300 J | 15000 | 750 J | <5000 | <5000 | <5000 | 170000 | 750 J | <5000 | 840 | <10000 |
| LPZ-5 | 4/29/2004 | | 1400 | 8200 | 3500 | 85 | <100 | 17 | 140000 | 48 | 160 | 1500 | 130 |
| LPZ-5 (Average) | | | 850 | 11600 | 2125 | 1293 | 1275 | 1259 | 155000 | 399 | 1330 | 1170 | 2565 |
| PZ-FF2 | 6/20/2000 | | 140 J | <2500 | 810 J | <2500 | <2500 | <2500 | 200000 | 810 J | <2500 | 740 | <5000 |
| PZ-FF3 | 6/22/2000 | | 350 J | 960 J | 1500 J | <5000 | <5000 | <5000 | 5700000 | 1500 J | 1500 J | 1100 | <10000 |
| **Representative Concentration** | | 163 | 488 | 3,463 | 10,747 | 883 | 1,616 | 5,224 | 688,504 | 2,697 | 1,681 | 1,498 | 1,763 |
| **Maximum Detected Concentration** | | 60 | 1,400 | 15,000 | 49,000 | 85 | 1,500 | 42,000 | 5,700,000 | 19,000 | 3,500 | 4,300 | 130 |
| **Concentration Ratio (Max./Rep.)** | | 0.4 | 2.9 | 4.3 | 4.6 | 0.1 | 0.9 | 8.0 | 8.3 | 7.0 | 2.1 | 2.9 | 0.1 |

Notes:
All concentrations in ug/L (micrograms/liter).

**Table 4-1(a)(R)**
**Representative Concentration for Dermal Contact with and Ingestion of Surficial Soil by a Future On-site Non-residential Worker**
**Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | 2-Butanone (MEK) | Acetone | Benzene | Carbon disulfide | Chlorobenzene | Chloromethane | cis-1,2-Dichloroethene | Tetrachloroethene | Toluene | trans-1,2-Dichloroethene | Trichloroethene | Vinyl chloride |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-1 | 6/10/93 | 2-4 | | | | | | | | 110 | | | <6.5 | |
| SB-2 | 6/10/93 | 2-4 | | | | | | | | 2000000 | | | <63000 | |
| SB-4 | 6/10/93 | 2-4 | | | | | | | | 22000 | | | 1000 | |
| SB-6 | 6/10/93 | 2-4 | | | | | | | | 3100 | | | <840 | |
| FF06-01-2-3 | 4/17/06 | 2-3 | <3000 | <6100 | <610 | <610 | 2000 J | 200 J | 89000 | 980000 J | <610 | 1200 | 45000 J | 360 J |
| FF06-01-2-3-D | 4/17/06 | 2-3 | <170000 | <340000 | <34000 | <34000 | 12000 J | <34000 | 160000 | 7100000 J | <34000 | <34000 | 200000 J | 34000 |
| FF06-02-2-3 | 4/17/06 | 2-3 | <58000 | <120000 | <12000 | <12000 | <12000 | <12000 | 6700 J | 160000 | <12000 | <12000 | 10000 J | <12000 |
| FF06-03-2-3 | 4/17/06 | 2-3 | <13 | 16 J | 11 | <2.6 | 44 | <2.6 | <2.6 | <2.6 | <2.6 | <2.6 | <2.6 | <2.6 |
| FF06-04-2-3 | 4/17/06 | 2-3 | 9 J | 37 J | 2.4 J | 7.3 | 3200 | <4.7 | 7400 | 13000 | 3.7 J | 840 | 5900 | 2000 |
| FF06-05-2-3 | 4/17/06 | 2-3 | <120000 | <250000 | <25000 | <25000 | 630000 | <25000 | 26000 | 900000 | <25000 | <25000 | 93000 | <25000 |
| **Representative Concentration** | | | 29,253 | 59,684 | 5,970 | 5,969 | 108,874 | 5,951 | 48,184 | 1,117,821 | 5,968 | 6,257 | 38,682 | 6,310 |
| **Maximum Detected Concentration** | | | 9 | 37 | 11 | 7.3 | 630,000 | 200 | 160,000 | 2,000,000 | 3.7 | 1,200 | 93,000 | 2,000 |
| **Concentration Ratio (Max./Rep.)** | | | 0.0003 | 0.0006 | 0.002 | 0.001 | 5.8 | 0.03 | 3.3 | 1.8 | 0.0006 | 0.2 | 2.4 | 0.3 |

OK

Notes:
All concentrations in ug/kg (micrograms/kilogram)
ft bgs: Feet below ground surface

## Table 4-2(R)
## Physical and Chemical Properties of Constituents
## Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Constituents | CAS # | MCL (mg/L) | Molecular Weight, MW (g/mol) | Water Solubility, S (mg/L) | Henry's Law Constant, H (L-water/L-air) | Organic Carbon Adsorption Coefficient, $K_{oc}$ ($cm^3/g$) | Soil-Water Partition Coefficient, $K_d$ (L/kg) | Diffusion Coefficient in Air, $D_i$ ($cm^2/s$) | Diffusion Coefficient in Water, $D_w$ ($cm^2/s$) | Vapor Pressure, P (mmHg) | Octanol-Water Partition Coefficient, $K_{ow}$ ($cm^3/g$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Butanone | 78-93-3 | | **72** | **2.23E+05** | **2.33E-03** | **4.50E+00** | NA | **8.95E-02** | **9.80E-06** | *9.10E+01* | *1.80E+00* |
| Acetone | 67-64-1 | | **58** | **1.00E+06** | **1.59E-03** | **5.75E-01** | NA | **1.24E-01** | **1.14E-05** | *2.27E+02* | *5.80E-01* |
| Benzene | 71-43-2 | 0.005 | 78 | 1.75E+03 | 2.28E-01 | 5.89E+01 | NA | 8.80E-02 | 9.80E-06 | 9.50E+01 | *9.84E+01* |
| Carbon disulfide | 75-15-0 | | **76** | **1.19E+03** | **1.24E+00** | **4.57E+01** | NA | **1.04E-01** | **1.00E-05** | *3.40E+02* | *8.71E+01* |
| Chlorobenzene | 108-90-7 | | **113** | **4.72E+02** | **1.52E-01** | **2.19E+02** | NA | **7.30E-02** | **8.70E-06** | *1.21E+01* | *4.37E+02* |
| Chloromethane | 74-87-3 | | ***51*** | ***8.20E+03*** | ***9.80E-01*** | ***3.50E+01*** | NA | ***1.10E-01*** | ***6.50E-06*** | *3.77E+03* | *1.23E+01* |
| cis-1,2-Dichloroethylene | 156-59-2 | 0.07 | **97** | **3.50E+03** | **1.67E-01** | **3.55E+01** | NA | **7.36E-02** | **1.13E-05** | *1.75E+02* | *7.24E+01* |
| Ethylbenzene | 100-41-4 | 0.7 | 106 | 1.69E+02 | 3.23E-01 | 3.63E+02 | NA | 7.50E-02 | 7.80E-06 | 9.60E+00 | *1.07E+03* |
| Ethyl methacrylate | 97-63-2 | | *114* | ***2.00E+01*** | ***1.00E+01*** | ***8.40E+02*** | NA | ***9.10E-02*** | ***8.60E-06*** | *1.75E+01* | *1.77E+00* |
| Methylene chloride | 75-09-2 | 0.005 | **85** | **1.30E+04** | **8.98E-02** | **1.17E+01** | NA | **1.01E-01** | **1.17E-05** | *4.55E+02* | *2.19E+01* |
| Tetrachloroethylene | 127-18-4 | 0.005 | **166** | **2.00E+02** | **7.54E-01** | **1.55E+02** | NA | **7.20E-02** | **8.20E-06** | *1.84E+01* | *9.23E+02* |
| Toluene | 108-88-3 | 1 | 92 | 5.26E+02 | 2.72E-01 | 1.82E+02 | NA | 8.70E-02 | 8.60E-06 | 2.82E+01 | *3.47E+02* |
| trans-1,2-Dichloroethylene | 156-60-5 | 0.1 | **97** | **6.30E+03** | **3.85E-01** | **5.25E+01** | NA | **7.07E-02** | **1.19E-05** | *3.52E+02* | *1.18E+02* |
| Trichloroethylene | 79-01-6 | 0.005 | **131** | **1.10E+03** | **4.22E-01** | **1.66E+02** | NA | **7.90E-02** | **9.10E-06** | *7.20E+01* | *2.95E+02* |
| Vinyl chloride | 75-01-4 | 0.002 | **63** | **2.76E+03** | **1.11E+00** | **1.86E+01** | NA | **1.06E-01** | **1.23E-06** | *2.80E+03* | *4.17E+01* |
| Xylenes (total) | 1330-20-7 | 10 | 106 | 1.61E+02 | 3.01E-01 | 4.07E+02 | NA | 7.00E-02 | 7.80E-06 | 8.06E+00 | *1.23E+03* |

Sources:

| | |
|---|---|
| Regular underlined font: | Properties from MDNR UST-RBCA Guidance. |
| **Bold font**: | CALM (1998) as revised in 2001, Table A4. |
| ***Bold and italic font:*** | EPA Region IX, PRGs InterCalc Tables: Phys-Chem Data (10/01/02). |
| *Italic font:* | Texas Comission on Environmental Quality's TRRP Chemical/Physical Properties Table; March, 2004. |
| MCLs: (Maximum Contaminant Level) | USEPA (Winter 2004) Edition of Drinking Water Standards and Health Advisories. |

**Table 4-3(R)**
**Toxicity Values of Constituents**
**Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Constituents | CAS # | Slope Factor | | | | | Reference Dose | | | | | Absorption Factor | | | Permeability Constant, $K_p$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Oral, $SF_o$ (mg/kg-day)$^{-1}$ | | Inhalation, $SF_i$ (mg/kg-day)$^{-1}$ | | Dermal, $SF_d$ (mg/kg-day)$^{-1}$ | Oral, $RfD_o$ (mg/kg-day) | | Inhalation, $RfD_i$ (mg/kg-day) | | Dermal, $RfD_d$ (mg/kg-day) | Dermal, $RAF_d$ (unitless) | | Oral, $RAF_o$ (unitless) | (cm/hr) | |
| 2-Butanone (MEK) | 78-93-3 | | | | | | 6.0E-01 | *i* | 1.4E+00 | *i* | 6.0E-01 | 0.1 | *RA* | 1.0 | 9.60E-04 | *RE* |
| Acetone | 67-64-1 | | | | | | 9.0E-01 | *i* | 9.0E-01 | *r* | 9.0E-01 | 0.1 | *RA* | 1.0 | 5.23E-04 | *e* |
| Benzene | 71-43-2 | 2.9E-02 | *u* | 2.9E-02 | *u* | | 3.0E-03 | *u* | 1.7E-03 | *u* | 3.0E-03 | 0.3 | *u* | 1.0 | 1.65E-02 | *u* |
| Carbon disulfide | 75-15-0 | | | | | | 1.0E-01 | *i* | 2.0E-01 | *i* | 1.0E-01 | 0.1 | *RA* | 1.0 | 1.70E-02 | *RE* |
| Chlorobenzene | 108-90-7 | | | | | | 2.0E-02 | *i* | 1.7E-02 | *n* | 2.0E-02 | 0.1 | *RA* | 1.0 | 2.80E-02 | *RE* |
| Chloromethane | 74-87-3 | 1.3E-02 | *t* | 6.3E-03 | *t* | 1.3E-02 | 2.6E-02 | *r* | 2.6E-02 | *i* | 2.6E-02 | 0.1 | *RA* | 1.0 | 3.30E-03 | *RE* |
| cis-1,2-Dichloroethylene | 156-59-2 | | | | | | 1.0E-02 | *p* | 1.0E-02 | *r* | 1.0E-02 | 0.1 | *RA* | 1.0 | 7.67E-03 | *e* |
| Ethylbenzene | 100-41-4 | NA | *u* | NA | *u* | | 1.0E-01 | *u* | 2.9E-01 | *u* | 1.0E-01 | 0.3 | *u* | 0.9 | 6.09E-02 | *u* |
| Ethyl methacrylate | 97-63-2 | | | | | | 9.0E-02 | *h* | 1.4E-01 | *t* | 9.0E-02 | 0.1 | *RA* | 1.0 | 5.31E-04 | *e* |
| Methylene chloride | 75-09-2 | 7.5E-03 | *i* | 1.6E-03 | *i* | 7.5E-03 | 6.0E-02 | *i* | 1.1E-01 | *c* | 6.0E-02 | 0.1 | *RA* | 1.0 | 3.50E-03 | *RE* |
| Tetrachloroethylene | 127-18-4 | 5.2E-02 | *n* | 1.0E-02 | *n* | 5.2E-02 | 1.0E-02 | *i* | 1.7E-01 | *n* | 1.0E-02 | 0.1 | *RA* | 1.0 | 3.30E-02 | *RE* |
| Toluene | 108-88-3 | NA | *u* | NA | *u* | | 2.0E-01 | *u* | 1.1E-01 | *u* | 2.0E-01 | 0.03 | *u* | 1.0 | 3.32E-02 | *u* |
| trans-1,2-Dichloroethylene | 156-60-5 | | | | | | 2.0E-02 | *i* | 2.0E-02 | *r* | 2.0E-02 | 0.1 | *RA* | 1.0 | 1.06E-02 | *e* |
| Trichloroethylene | 79-01-6 | 1.3E-02 | *c* | 7.0E-03 | *c* | 1.3E-02 | 1.7E-01 | *r* | 1.7E-01 | *c* | 1.7E-01 | 0.1 | *RA* | 1.0 | 1.20E-02 | *RE* |
| Vinyl chloride | 75-01-4 | 7.2E-01 | *i* | 1.3E-03 | *i* | 7.2E-01 | 3.0E-03 | *i* | 2.9E-02 | *i* | 3.0E-03 | 0.1 | *RA* | 1.0 | 5.60E-03 | *RE* |
| Xylenes (total) | 1330-20-7 | NA | *u* | NA | *u* | | 2.0E+00 | *u* | 2.0E-01 | *u* | 2.0E+00 | 0.3 | *u* | 0.9 | 6.68E-02 | *u* |

Notes:
A - Human carcinogen
B2 - Sufficient evidence in animals and inadequate evidence in humans
D - Not classifiable as to human carcinogenicity
NA - Not available

The letters in the table represent following sources:
i - USEPA IRIS
p - USEPA PPRTV's
n - USEPA NCEA
c - CALEPA OEHHA
t - TCEQ's TRRP Tier 1 PCL Table
h - HEAST
r - Route-to route extrapolation was used.
u - Value provided by MDNR UST-RBCA Guidance
RA - RAGS Part A
RE - RAGS Part E
e - Estimated by RAGS Part E

**Table 4-6(a)(R)**
**Calculation of Risks for a Future On-site Non-residential Worker**
**Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| 2-Butanone (MEK) | 29,253 | NA | 4.50E-05 | NA | 4.77E-05 | NA | 2.09E-05 | 2,519 | NA | 1.26E-06 | --- | --- | --- | NA | 1.15E-04 |
| Acetone | 59,684 | NA | 6.12E-05 | NA | 6.49E-05 | NA | 8.04E-05 | 5,038 | NA | 5.66E-06 | 163 | NA | 3.95E-08 | NA | 2.12E-04 |
| Benzene | 5,970 | 1.71E-07 | 5.51E-03 | 6.05E-08 | 1.95E-03 | 1.01E-07 | 5.72E-03 | 515 | 9.90E-09 | 5.58E-04 | 488 | 9.01E-09 | 5.08E-04 | 3.52E-07 | 1.42E-02 |
| Carbon disulfide | 5,969 | NA | 5.51E-05 | NA | 5.84E-05 | NA | 1.27E-04 | --- | --- | --- | --- | --- | --- | NA | 2.41E-04 |
| Chlorobenzene | 108,874 | NA | 5.02E-03 | NA | 5.33E-03 | NA | 4.55E-03 | 22,318 | NA | 4.58E-04 | 3,463 | NA | 2.12E-04 | NA | 1.56E-02 |
| Chloromethane | 5,951 | 2.55E-08 | 2.13E-04 | 2.70E-08 | 2.26E-04 | 5.74E-08 | 9.92E-04 | --- | --- | --- | --- | --- | --- | 1.10E-07 | 1.43E-03 |
| cis-1,2-Dichloroethene | 48,184 | NA | 4.44E-03 | NA | 4.71E-03 | NA | 7.76E-03 | --- | --- | --- | 10,747 | NA | 1.28E-03 | NA | 1.82E-02 |
| Ethylbenzene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 883 | NA | 6.41E-06 | NA | 6.41E-06 |
| Ethyl methacrylate | --- | --- | --- | --- | --- | --- | --- | 971 | NA | 4.51E-05 | --- | --- | --- | NA | 4.51E-05 |
| Methylene chloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,616 | 8.89E-10 | 1.32E-05 | 8.89E-10 | 1.32E-05 |
| Tetrachloroethene | 1,117,821 | 1.92E-05 | 1.03E-01 | 2.03E-05 | 1.09E-01 | 6.87E-06 | 1.13E-02 | 163,275 | 1.19E-06 | 1.96E-03 | 5,224 | 8.35E-08 | 1.38E-04 | **4.76E-05** | 2.26E-01 |
| Toluene | 5,968 | NA | 8.26E-06 | NA | 2.92E-05 | NA | 5.66E-05 | --- | NA | 0.00E+00 | 688,504 | NA | 1.23E-02 | NA | 1.24E-02 |
| trans-1,2-Dichloroethene | 6,257 | NA | 2.89E-04 | NA | 3.06E-04 | NA | 6.18E-04 | 554 | NA | 7.46E-05 | 2,697 | NA | 3.22E-04 | NA | 1.61E-03 |
| Trichloroethene | 38,682 | 1.66E-07 | 2.10E-04 | 1.76E-07 | 2.23E-04 | 1.28E-07 | 3.02E-04 | 1,981 | 6.04E-09 | 1.42E-05 | 1,681 | 1.19E-08 | 2.79E-05 | 4.88E-07 | 7.77E-04 |
| Vinyl chloride | 6,310 | 2.91E-06 | 1.94E-03 | 3.09E-06 | 2.06E-03 | 1.50E-08 | 1.17E-03 | 574 | 4.99E-09 | 3.89E-04 | 1,498 | 6.29E-09 | 4.90E-04 | 6.02E-06 | 6.05E-03 |
| Xylene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,763 | NA | 1.61E-05 | NA | 1.61E-05 |
| CUMULATIVE RISK | | 2.24E-05 | 1.21E-01 | 2.37E-05 | 1.24E-01 | 7.17E-06 | 3.27E-02 | | 1.21E-06 | 3.51E-03 | | 1.12E-07 | 1.53E-02 | 5.46E-05 | 2.97E-01 |

Notes:
NA: Not available
---: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard Quotient
HI: Hazard index
**Values in bold** exceed target risk.

Table 4-6(b)(R)
Calculation of Risks for a Future On-site Construction Worker
Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Conc. | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groudnwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| 2-Butanone (MEK) | 31,392 | NA | 2.61E-05 | NA | 1.84E-05 | NA | 1.11E-04 | --- | --- | --- | --- | --- | NA | 1.55E-04 |
| Acetone | 63,712 | NA | 3.53E-05 | NA | 2.49E-05 | NA | 4.23E-04 | 163 | NA | 1.57E-06 | NA | 4.18E-10 | NA | 4.85E-04 |
| Benzene | 6,376 | 3.95E-09 | 3.18E-03 | 9.30E-10 | 7.49E-04 | 2.14E-08 | 3.01E-02 | 488 | 5.54E-08 | 4.46E-02 | 2.50E-12 | 3.52E-06 | 8.16E-08 | 7.86E-02 |
| Carbon disulfide | 6,372 | NA | 3.17E-05 | NA | 2.24E-05 | NA | 6.71E-04 | --- | NA | 0.00E+00 | NA | 0.00E+00 | NA | 7.25E-04 |
| Chlorobenzene | 134,644 | NA | 3.35E-03 | NA | 2.37E-03 | NA | 2.78E-02 | 3,463 | NA | 8.05E-02 | NA | 1.59E-06 | NA | 1.14E-01 |
| Chloromethane | 5,951 | 5.51E-10 | 1.15E-04 | 3.89E-10 | 8.15E-05 | 1.13E-08 | 4.89E-03 | --- | --- | --- | --- | --- | 1.23E-08 | 5.09E-03 |
| cis-1,2-Dichloroethene | 31,459 | NA | 1.57E-03 | NA | 1.11E-03 | NA | 2.50E-02 | 10,747 | NA | 1.37E-01 | NA | 9.78E-06 | NA | 1.65E-01 |
| Ethylbenzene | --- | --- | --- | --- | --- | --- | --- | 883 | NA | 8.93E-03 | NA | 4.20E-08 | NA | 8.93E-03 |
| Ethyl methacrylate | 6,479 | NA | 3.59E-05 | NA | 2.54E-05 | NA | 7.00E-04 | --- | --- | --- | --- | --- | NA | 7.61E-04 |
| Methylene chloride | --- | --- | --- | --- | --- | --- | --- | 1,616 | 1.01E-08 | 1.57E-03 | 2.88E-13 | 1.07E-07 | 1.01E-08 | 1.57E-03 |
| Tetrachloroethene | 602,833 | 2.23E-07 | 3.00E-02 | 1.58E-07 | 2.12E-02 | 7.31E-07 | 3.01E-02 | 5,224 | 2.13E-06 | 2.86E-01 | 2.02E-11 | 8.34E-07 | 3.24E-06 | 3.68E-01 |
| Toluene | 5,968 | NA | 4.46E-06 | NA | 1.05E-05 | NA | 2.79E-04 | 688,504 | NA | 1.90E+00 | NA | 8.19E-05 | NA | **1.90E+00** |
| trans-1,2-Dichloroethene | 6,524 | NA | 1.62E-04 | NA | 1.15E-04 | NA | 3.18E-03 | 2,697 | NA | 2.36E-02 | NA | 2.20E-06 | NA | 2.71E-02 |
| Trichloroethene | 20,236 | 1.87E-09 | 5.93E-05 | 1.32E-09 | 4.19E-05 | 1.33E-08 | 7.80E-04 | 1,681 | 6.22E-08 | 1.97E-03 | 3.05E-12 | 1.79E-07 | 7.87E-08 | 2.85E-03 |
| Vinyl chloride | 6,622 | 6.60E-08 | 1.10E-03 | 4.67E-08 | 7.78E-04 | 3.10E-09 | 6.05E-03 | 1,498 | 2.79E-06 | 4.64E-02 | 1.40E-12 | 2.73E-06 | 2.90E-06 | 5.44E-02 |
| Xylenes | --- | --- | --- | --- | --- | --- | --- | 1,763 | NA | 9.78E-04 | NA | 1.07E-07 | NA | 9.78E-04 |
| CUMULATIVE RISK | | 2.95E-07 | 3.97E-02 | 2.07E-07 | 2.66E-02 | 7.80E-07 | 1.30E-01 | | 5.04E-06 | 2.53E+00 | 2.75E-11 | 1.03E-04 | 6.32E-06 | **2.73E+00** |

Notes:
NA: Not available
---: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard Quotient
HI: Hazard index
**Values in bold** exceed target risk.

**Table 5-1(a)(R)**
**Calculated Risks and Cleanup Goals for a Future On-site Non-residential Worker (Ground Surface Pavement)**
**Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. (ug/L) | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | | IELCR | HQ | | |
| 2-Butanone (MEK) | 29,253 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2,519 | NA | 1.26E-06 | --- | --- | --- | NA | 1.26E-06 |
| Acetone | 59,684 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5,038 | NA | 5.66E-06 | 163 | NA | 3.95E-08 | NA | 5.70E-06 |
| Benzene | 5,970 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 515 | 9.90E-09 | 5.58E-04 | 488 | 9.01E-09 | 5.08E-04 | 1.89E-08 | 1.07E-03 |
| Carbon disulfide | 5,969 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Chlorobenzene | 108,874 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 22,318 | NA | 4.58E-04 | 3,463 | NA | 2.12E-04 | NA | 6.70E-04 |
| Chloromethane | 5,951 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| cis-1,2-Dichloroethene | 48,184 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | 10,747 | NA | 1.28E-03 | NA | 1.28E-03 |
| Ethylbenzene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 883 | NA | 6.41E-06 | NA | 6.41E-06 |
| Ethyl methacrylate | --- | --- | --- | --- | --- | --- | --- | 971 | NA | 4.51E-05 | --- | --- | --- | NA | 4.51E-05 |
| Methylene chloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,616 | 8.89E-10 | 1.32E-05 | 8.89E-10 | 1.32E-05 |
| Tetrachloroethene | 1,117,821 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 163,275 | 1.19E-06 | 1.96E-03 | 5,224 | 8.35E-08 | 1.38E-04 | 1.28E-06 | 2.10E-03 |
| Toluene | 5,968 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | NA | 0.00E+00 | 688,504 | NA | 1.23E-02 | NA | 1.23E-02 |
| trans-1,2-Dichloroethene | 6,257 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 554 | NA | 7.46E-05 | 2,697 | NA | 3.22E-04 | NA | 3.96E-04 |
| Trichloroethene | 38,682 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1,981 | 6.04E-09 | 1.42E-05 | 1,681 | 1.19E-08 | 2.79E-05 | 1.79E-08 | 4.21E-05 |
| Vinyl chloride | 6,310 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 574 | 4.99E-09 | 3.89E-04 | 1,498 | 6.29E-09 | 4.90E-04 | 1.13E-08 | 8.79E-04 |
| Xylene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,763 | NA | 1.61E-05 | NA | 1.61E-05 |
| CUMULATIVE RISK | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.21E-06 | 3.51E-03 | | 1.12E-07 | 1.53E-02 | 1.33E-06 | 1.88E-02 |

Notes:
NA: Not available
---: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard Quotient
HI: Hazard index
Highlighted pathways are not complete under this scenario.

Table 5-1(b)(R)
**Calculated Risks and Cleanup Goals for a Future On-site Non-residential Worker (Reduction of Surficial Soil Concentration)**
**Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Cleanup Goals | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| 2-Butanone (MEK) | 29,253 | NA | 4.50E-05 | NA | 4.77E-05 | NA | 2.09E-05 | 2,519 | NA | 1.26E-06 | --- | --- | --- | NA | 1.15E-04 |
| Acetone | 59,684 | NA | 6.12E-05 | NA | 6.49E-05 | NA | 8.04E-05 | 5,038 | NA | 5.66E-06 | 163 | NA | 3.95E-08 | NA | 2.12E-04 |
| Benzene | 5,970 | 1.71E-07 | 5.51E-03 | 6.05E-08 | 1.95E-03 | 1.01E-07 | 5.72E-03 | 515 | 9.90E-09 | 5.58E-04 | 488 | 9.01E-09 | 5.08E-04 | 3.52E-07 | 1.42E-02 |
| Carbon disulfide | 5,969 | NA | 5.51E-05 | NA | 5.84E-05 | NA | 1.27E-04 | --- | --- | --- | --- | --- | --- | NA | 2.41E-04 |
| Chlorobenzene | 108,874 | NA | 5.02E-03 | NA | 5.33E-03 | NA | 4.55E-03 | 22,318 | NA | 4.58E-04 | 3,463 | NA | 2.12E-04 | NA | 1.56E-02 |
| Chloromethane | 5,951 | 2.55E-08 | 2.13E-04 | 2.70E-08 | 2.26E-04 | 5.74E-08 | 9.92E-04 | --- | --- | --- | --- | --- | --- | 1.10E-07 | 1.43E-03 |
| cis-1,2-Dichloroethene | 48,184 | NA | 4.44E-03 | NA | 4.71E-03 | NA | 7.76E-03 | --- | --- | --- | 10,747 | NA | 1.28E-03 | NA | 1.82E-02 |
| Ethylbenzene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 883 | NA | 6.41E-06 | NA | 6.41E-06 |
| Ethyl methacrylate | --- | --- | --- | --- | --- | --- | --- | 971 | NA | 4.51E-05 | --- | --- | --- | NA | 4.51E-05 |
| Methylene chloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,616 | 8.89E-10 | 1.32E-05 | 8.89E-10 | 1.32E-05 |
| Tetrachloroethene | 210,910 | 3.61E-06 | 1.95E-02 | 3.83E-06 | 2.06E-02 | 1.30E-06 | 2.13E-03 | 163,275 | 1.19E-06 | 1.96E-03 | 5,224 | 8.35E-08 | 1.38E-04 | 1.00E-05 | 4.43E-02 |
| Toluene | 5,968 | NA | 8.26E-06 | NA | 2.92E-05 | NA | 5.66E-05 | --- | NA | 0.00E+00 | 688,504 | NA | 1.23E-02 | NA | 1.24E-02 |
| trans-1,2-Dichloroethene | 6,257 | NA | 2.89E-04 | NA | 3.06E-04 | NA | 6.18E-04 | 554 | NA | 7.46E-05 | 2,697 | NA | 3.22E-04 | NA | 1.61E-03 |
| Trichloroethene | 38,682 | 1.66E-07 | 2.10E-04 | 1.76E-07 | 2.23E-04 | 1.28E-07 | 3.02E-04 | 1,981 | 6.04E-09 | 1.42E-05 | 1,681 | 1.19E-08 | 2.79E-05 | 4.88E-07 | 7.77E-04 |
| Vinyl chloride | 6,310 | 2.91E-06 | 1.94E-03 | 3.09E-06 | 2.06E-03 | 1.50E-08 | 1.17E-03 | 574 | 4.99E-09 | 3.89E-04 | 1,498 | 6.29E-09 | 4.90E-04 | 6.02E-06 | 6.05E-03 |
| Xylene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,763 | NA | 1.61E-05 | NA | 1.61E-05 |
| CUMULATIVE RISK | | 6.89E-06 | 3.73E-02 | 7.18E-06 | 3.56E-02 | 1.60E-06 | 2.35E-02 | | 1.21E-06 | 3.51E-03 | | 1.12E-07 | 1.53E-02 | 1.70E-05 | 1.15E-01 |

Notes:
NA: Not available
---: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard Quotient
HI: Hazard index

Table 5-2(R)
**Calculation of Risks for a Future On-site Construction Worker (Reduction of Groundwater Concentration)**
**Former FF Building Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Cleanup Goals | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groudnwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| 2-Butanone (MEK) | 31,392 | NA | 2.61E-05 | NA | 1.84E-05 | NA | 1.11E-04 | --- | --- | --- | --- | --- | NA | 1.55E-04 |
| Acetone | 63,712 | NA | 3.53E-05 | NA | 2.49E-05 | NA | 4.23E-04 | 163 | NA | 1.57E-06 | NA | 4.18E-10 | NA | 4.85E-04 |
| Benzene | 6,376 | 3.95E-09 | 3.18E-03 | 9.30E-10 | 7.49E-04 | 2.14E-08 | 3.01E-02 | 488 | 5.54E-08 | 4.46E-02 | 2.50E-12 | 3.52E-06 | 8.16E-08 | 7.86E-02 |
| Carbon disulfide | 6,372 | NA | 3.17E-05 | NA | 2.24E-05 | NA | 6.71E-04 | --- | --- | --- | --- | --- | NA | 7.25E-04 |
| Chlorobenzene | 134,644 | NA | 3.35E-03 | NA | 2.37E-03 | NA | 2.78E-02 | 3,463 | NA | 8.05E-02 | NA | 1.59E-06 | NA | 1.14E-01 |
| Chloromethane | 5,951 | 5.51E-10 | 1.15E-04 | 3.89E-10 | 8.15E-05 | 1.13E-08 | 4.89E-03 | --- | --- | --- | --- | --- | 1.23E-08 | 5.09E-03 |
| cis-1,2-Dichloroethene | 31,459 | NA | 1.57E-03 | NA | 1.11E-03 | NA | 2.50E-02 | 10,747 | NA | 1.37E-01 | NA | 9.78E-06 | NA | 1.65E-01 |
| Ethylbenzene | --- | --- | --- | --- | --- | --- | --- | 883 | NA | 8.93E-03 | NA | 4.20E-08 | NA | 8.93E-03 |
| Ethyl methacrylate | 6,479 | NA | 3.59E-05 | NA | 2.54E-05 | NA | 7.00E-04 | --- | --- | --- | --- | --- | NA | 7.61E-04 |
| Methylene chloride | --- | --- | --- | --- | --- | --- | --- | 1,616 | 1.01E-08 | 1.57E-03 | 2.88E-13 | 1.07E-07 | 1.01E-08 | 1.57E-03 |
| Tetrachloroethene | 602,833 | 2.23E-07 | 3.00E-02 | 1.58E-07 | 2.12E-02 | 7.31E-07 | 3.01E-02 | 5,224 | 2.13E-06 | 2.86E-01 | 2.02E-11 | 8.34E-07 | 3.24E-06 | 3.68E-01 |
| Toluene | 5,968 | NA | 4.46E-06 | NA | 1.05E-05 | NA | 2.79E-04 | 62,591 | NA | 1.73E-01 | NA | 7.45E-06 | NA | 1.73E-01 |
| trans-1,2-Dichloroethene | 6,524 | NA | 1.62E-04 | NA | 1.15E-04 | NA | 3.18E-03 | 2,697 | NA | 2.36E-02 | NA | 2.20E-06 | NA | 2.71E-02 |
| Trichloroethene | 20,236 | 1.87E-09 | 5.93E-05 | 1.32E-09 | 4.19E-05 | 1.33E-08 | 7.80E-04 | 1,681 | 6.22E-08 | 1.97E-03 | 3.05E-12 | 1.79E-07 | 7.87E-08 | 2.85E-03 |
| Vinyl chloride | 6,622 | 6.60E-08 | 1.10E-03 | 4.67E-08 | 7.78E-04 | 3.10E-09 | 6.05E-03 | 1,498 | 2.79E-06 | 4.64E-02 | 1.40E-12 | 2.73E-06 | 2.90E-06 | 5.44E-02 |
| Xylenes | --- | --- | --- | --- | --- | --- | --- | 1,763 | NA | 9.78E-04 | NA | 1.07E-07 | NA | 9.78E-04 |
| CUMULATIVE RISK | | 2.95E-07 | 3.97E-02 | 2.07E-07 | 2.66E-02 | 7.80E-07 | 1.30E-01 | | 5.04E-06 | 8.04E-01 | 2.75E-11 | 2.85E-05 | 6.32E-06 | 1.00E+00 |

Notes:
NA: Not available
---: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard Quotient
HI: Hazard index

# APPENDIX C
# UPDATE OF 2005 RISK ASSESSMENT FOR FORMER BULK CHEMICAL STORAGE AREA


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Table 4-2(c)(R) – Without Free Product
Table 4-8(a)(R) – Without Free Product
Table 4-8(b)(R) – Without Free Product


***Several tables in the 2005 RA (RAM Group, Inc. and URS, February 2005) were revised. The revised tables are distinguished with an (R) in the table number.***

## C.1 INTRODUCTION

The 2005 risk assessment (RA) for Former Bulk Chemical Storage Area (FBCSA) presented in the *Updated Risk Assessment and Development of Site-Specific Media Cleanup Goals for Selected Areas in Solutia – J.F. Queeny Plant, Part 3* (RAM Group, Inc. and URS, February 2005) concluded that total risk to the future on-site non-residential worker for arsenic and benzo(a)pyrene exceeded the acceptable target risk. The primary exposure pathways for these exceedences were ingestion of arsenic in surficial soil and dermal contact with and ingestion of benzo(a)pyrene in surficial soil. Only three surficial soil samples were available to estimate the risk for the non-residential worker. Therefore, one of risk management alternatives to address this was to collect additional surficial soil samples that would be more representative of current conditions and to update the risk.

## C.2 ADDITIONAL SAMPLES

In April 2006, six borings (FBCSA06-01 to FBCSA06-06) were advanced to a depth of approximately 3 ft. The soil borings were evenly distributed across the FBCSA. One surficial soil sample was collected from each soil boring and analyzed for semi-volatile organic compounds (SVOCs), arsenic, and lead analysis. In addition to collecting the additional soil samples, one groundwater sample was collected from monitoring well MW-24A and analyzed for volatile organic compounds (VOCs). Figure 3 of Appendix A shows the location of these additional soil borings as well as soil borings and a monitoring well presented in the Updated 2005 RA. Additional details of the sampling and analytical procedures are included in Appendix A.

## C.3 UPDATE OF 2005 RISK ASSESSMENT

### C.3.1 STEP 1: UPDATE OF REPRESENTATIVE CONCENTRATIONS

Additional soil and groundwater data were added to Table 2-3 (Soil Analytical Data Showing Constituents with At Least One Detection) and Table 2-4 (Groundwater Analytical Data Showing Constituents with At Least One Detection) in the 2005 RA. In addition Table 2-6 in the 2005 RA was updated to a correct minor error. The corresponding Tables 2-3(R), 2-4(R), and 2-6(R) are included. Using these additional soil and groundwater data, representative concentrations were recalculated for the following media – receptor combinations:

- SVOCs, arsenic, and lead in surficial soil for a future on-site non-residential worker,
- VOCs in groundwater for a future on-site non-residential and construction worker, and
- SVOCs, arsenic, and lead in soil for a future on-site construction worker.

The revised tables for representative concentrations are presented in Tables 4-2(a)(R), 4-2(c)(R), and 4-2(d)(R). 1-Methylnaphthalene that was not detected in the soil samples

used in the 2005 RA was detected in the April 2006 soil samples. Additional constituents of concern (COCs) for each of media – receptor combination were identified as below:

**Surficial Soil for a Future On-site Non-residential Worker**

- 1-Methylnaphthalene
- 2-Methylnaphthalene
- Naphthalene

**Soil for a Future On-site Construction Worker**

- 1-Methylnaphahatlene

Risk calculations were performed for these additional COCs. Tables 4-3(R) and 4-4(R) show the physical/chemical properties and toxicity values for each of the COC.

### C.3.2 STEP 2: UPDATE OF RISKS

Using the recalculated representative concentrations, risks were updated for the following receptors of concern:

- Future on-site non-residential workers, and
- Future on-site construction workers.

In updating the representative concentrations and risks, the same assumptions and parameters as used in the 2005 RA were used.

The recalculated risks are presented in Tables 4-8(a)(R) to 4-8(b)(R) for future on-site non-residential worker and future on-site construction worker, respectively. Based on these tables, following are the key observations.

#### C.3.2.1 Future On-site Non-residential Worker

***Carcinogenic Risk:***

As indicated in Table 4-8(a)(R), the site-wide cumulative individual excess lifetime cancer risk (IELCR) is $4.5 \times 10^{-5}$, which is below the acceptable target risk level of $1 \times 10^{-4}$. However, further examination of the table indicates that the total IELCR for arsenic and benzo(a)pyrene are above the acceptable target risk for each COC of $1 \times 10^{-5}$. The primary exposure pathways for these exceedences are ingestion of arsenic in surficial soil and dermal contact with and ingestion of benzo(a)pyrene in surficial soil.

***Non-carcinogenic Risk:***

As shown in Table 4-8(a)(R), the site-wide cumulative hazard index (HI) is 0.399 that is below the acceptable target risk level of 1.0. In addition, the hazard quotient (HQ) for

each COC and each exposure pathway is less than the acceptable target risk level of 1.0.

***Total risk for arsenic and benzo(a)pyrene for the potential future non-residential worker exceeded the target risk level and will be addressed in the CMS.***

### C.3.2.2 Future On-site Construction Worker

*Carcinogenic Risk:*

As indicated in Table 4-8(b)(R), the site-wide cumulative IELCR is $2.7 \times 10^{-5}$ which is well below the acceptable target risk level of $1 \times 10^{-4}$. However, further examination of the table indicates that the total IELCR for vinyl chloride is above the acceptable target risk for each COC of $1 \times 10^{-5}$. The primary exposure pathway for this exceedence is dermal contact with groundwater.

*Non-carcinogenic Risk:*

As shown in Table 4-8(b)(R), the site-wide cumulative HI is 9.3 that is above the acceptable target risk level of 1.0. The table indicates that constituents contributed most to this exceedence were 4,6-dinitro-2-methylphenol, 1,2-dichloroethane, benzene, carbon tetrachloride, chlorobenzene, chloroform, cis-1,2-dichloroethene, iodomethane, and vinyl chloride.

Further, the primary exposure pathway for the exceedence of 4,6-dinitro-2-methylphenol is outdoor inhalation of vapors and particulates from surficial soil. Note this constituent was positively detected in only one of five samples (boring SB-E). This constituent was also analyzed for groundwater samples in monitoring wells MW-25A and MW-25B located near SB-E but was not detected. For these reasons, this constituent is not considered to be site related and was not included in the development of cleanup goals.

***Risks to the potential future construction worker exceeded the target risk level and will be addressed in the CMS.***

## C.3.3 STEP 3: UPDATE OF RISK MANAGEMENT ALTERNATIVES

The evaluation of the Updated 2005 RA indicates that:

- Total carcinogenic risk to the potential future non-residential worker for arsenic and benzo(a)pyrene exceeded the acceptable target risk. The primary exposure pathways for these exceedences are ingestion of arsenic in surficial soil, and dermal contact with and ingestion of benzo(a)pyrene in surficial soil.

- Total carcinogenic risk to the potential future on-site construction worker for vinyl chloride exceeded the acceptable target risk. The primary exposure pathway for this exceedence is dermal contact with groundwater. Site-wide cumulative non-carcinogenic risk to the potential future construction worker exceeded the

acceptable target risk. The primary exposure pathway for this exceedence is dermal contact with groundwater. The constituents that contributed most to this exceedence were 1,2-dichloroethane, benzene, carbon tetrachloride, chlorobenzene, chloroform, cis-1,2-dichloroethene, iodomethane, and vinyl chloride. Thus, site-specific cleanup goals were developed for these constituents.

- Although site-specific cleanup goals for lead were not developed as a part of this evaluation, the representative surficial soil concentrations for the non-residential worker exceeded both the USEPA and the Missouri Risk-Based Target Level (MRBCA) target levels of 750 mg/kg and 660 mg/kg.

- Sporadic occurrence of light non-aqueous phase liquid (LNAPL) has been observed in a few wells and piezometers.

Unacceptable risks to the potential future non-residential worker can be managed by:

(i) Imposing an institutional control that requires the surface to remain covered. In this case, the direct contact with soil exposure pathway would not be complete and risks from surficial soil will be eliminated (refer Table 5-1(a)(R)).

(ii) Reducing the representative surficial soil concentrations to the following cleanup goals (refer Table 5-1(b)(R)):

| | |
|---|---|
| • Arsenic | 19,750 μg/kg |
| • Benzo(a)pyrene | 1,870 μg/kg |
| • Lead | 660,000 μg/kg |

Unacceptable risks to the potential future construction worker can be managed by:

(i) Imposing institutional controls, e.g., requiring personal protective equipment during construction.

(ii) Reducing the representative groundwater concentration to the following cleanup goals (refer Table 5-2(R)):

| | |
|---|---|
| • 1,2-Dichloroethane | 590 μg/L |
| • Benzene | 1,230 μg/L |
| • Carbon tetrachloride | 60 μg/L |
| • Chlorobenzene | 1,680 μg/L |
| • Chloroform | 550 μg/L |
| • cis-1,2-Dichloroethene | 240 μg/L |
| • Iodomethane | 960 μg/L |
| • Vinyl chloride | 190 μg/L |

***Since the target risks, as per the MRBCA process, are based on the total risk and not on individual constituents and individual exposure pathways, the cleanup goals***

***developed are not unique and several other combinations of cleanup goals are possible.***

Solutia intends to evaluate the options available to manage risks and the occurrence of LNAPL in this area during the corrective measures study (CMS). The representative concentrations used to estimate the risks presented in Sections C.3.2 considered the presence of free product on-site. As a part of sensitivity analysis, the risk calculations were performed under the assumption that no free product is present on-site.

The representative concentrations of groundwater were updated and are presented in Table 4-2(c)(R) – Without Free Product which did not include data from PZ-5. The calculated risks without free product are presented in Tables 4-8(a)(R) – Without Free Product and 4-8(b)(R) – Without Free Product for future on-site non-residential worker and future on-site construction worker, respectively. Based on these results, following are the key observations:

- Total carcinogenic risk to the potential future non-residential worker for arsenic and benzo(a)pyrene still exceed the acceptable target risk when free product is not present on-site. Note for this scenario the exceedences are due to the pathways related to surficial soil that are not affected by free product.

- Total carcinogenic risk to the potential future on-site construction worker for vinyl chloride is acceptable when free product is not present on-site.

- Site-wide cumulative non-carcinogenic risk to the potential future construction worker exceeds the acceptable target risk when free product is not present on-site. The primary exposure pathway for this exceedence is outdoor inhalation of 4,6-dinitro-2-methylphenol from surficial soil. This constituent was not considered to be site-related as per the 2005 RA. Therefore, if this constituent is not considered, the site-wide cumulative non-carcinogenic risk to the potential future construction worker will be 0.96 which is below the acceptable target risk.

When free product is not present on-site, the risks to the potential future construction worker are acceptable; therefore, there is no need for risk management plan for the construction worker. This implies that the unacceptable risk to the construction worker presented in Section C.3.2 can be managed by removing free product. This option will be further evaluated in the CMS.

## Table 2-3(R)
## Soil Analytical Data Showing Constituents with At Least One Detection
## Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Depth (ft bgs) | | 1,2,4-Trichlorobenzene | 2,4,6-Trichlorophenol | 2,4-Dichlorophenol | 2,4-Dimethylphenol | 2-Chlorophenol | 1-Methylnaphthalene | 2-Methylnaphthalene | 2-Nitrophenol | 4,6-Dinitro-2-methylphenol | 4-Chloro-3-methylphenol | 4-Methyl-2-pentanone (MIBK) | Acenaphthene | Acetone | Anthracene | Antimony | Arsenic | Barium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-D (18-20') | 6/19/2000 | 18 | 20 | <360 | <360 | <360 | <360 | <360 | | 120 J | <360 | <1900 | <360 | <1200 | <360 | <2400 | <360 | 2200 | 2800 | 62000 |
| SB-E (0-2') | 6/19/2000 | 0 | 2 | <410 | 410 J | 410 J | 410 J | 410 J | | <410 | 410 J | 2100 J | 410 J | <42 | 89 J | <83 | 180 J | 11000 J | 34000 | 1000000 |
| VS-1 | 3/6/1991 | 11 | 13 | <15000 | <15000 | <15000 | <15000 | <15000 | | 41000 | <15000 | <77000 | <15000 | <420000 | <15000 | <850000 | <15000 | <7400 | 20000 | 580000 |
| VS-10D | 3/8/1994 | 8 | | <10000 | | | | | | <10000 | | | | <160000 | <10000 | <160000 | <10000 | <7900 | 9300 | 380000 |
| VS-10S | 3/8/1994 | 3 | | <410 | | | | | | 870 | | | | <62 | <410 | <62 | 560 | <6200 | 5300 | 150000 |
| VS-11D | 3/8/1994 | 6.5 | | <710 | | | | | | <710 | | | | <54 | <710 | <54 | 1700 | <5400 | 5100 | 73000 |
| VS-11S | 3/8/1994 | 4 | | <410 | | | | | | <410 | | | | <62 | <410 | 170 | <410 | 11000 | 4000 | 400000 |
| VS-12D | 3/8/1994 | 6.5 | | <4600 | | | | | | <4600 | | | | 380 | <4600 | <350 | 4900 | <6900 | 13000 | 3400000 |
| VS-12M | 3/8/1994 | 4 | | <410 | | | | | | <460 | | | | <350 | <460 | 540 | 860 | <6900 | 12000 | 770000 |
| VS-12S | 3/8/1994 | 2.5 | | <3900 | | | | | | <3900 | | | | <60 | <3900 | 81 | 8100 | <6000 | 20000 | 420000 |
| VS-2 | 3/7/1991 | 7 | 9 | <12000 | <12000 | <12000 | <12000 | <12000 | | <12000 | <12000 | <60000 | <12000 | <63 | <12000 | 29 | <12000 | <5400 | 7600 | 290000 |
| VS-3 | 3/8/1991 | 9 | 11 | <450 | <450 | <450 | <450 | <450 | | <450 | <450 | <2200 | <450 | <68 | <450 | <140 | 970 | <5900 | 8000 | 490000 |
| VS-4 | 3/8/1991 | 9 | 11 | <12000 | <12000 | <12000 | <12000 | <12000 | | <12000 | <12000 | <60000 | <12000 | <330 | <12000 | 280 | <12000 | <5700 | 8000 | 1600000 |
| VS-5D | 3/8/1994 | 6 | | <23000 | | | | | | <23000 | | | | <69 | 43000 | <69 | 110000 | <6900 | 7100 | 670000 |
| VS-5M | 3/8/1994 | 4 | | <480 | | | | | | <480 | | | | <72 | <480 | <72 | 820 | <7200 | 5900 | 340000 |
| VS-5S | 3/8/1994 | 2 | | <820 | | | | | | <820 | | | | <62 | 1600 | <62 | 3500 | 7300 | 42000 | 540000 |
| VS-6D | 3/8/1994 | 6 | | <1900 | | | | | | <1900 | | | | <58 | <1900 | 200 | 5100 | <5800 | 4600 | 470000 |
| VS-6S | 3/8/1994 | 3.5 | | 900 | | | | | | <350 | | | | <54 | <350 | <54 | <350 | <5400 | 5700 | 440000 |
| VS-7D | 3/8/1994 | 7 | | <430 | | | | | | <430 | | | | <32000 | <430 | <32000 | 580 | <6500 | 8900 | 130000 |
| VS-7M | 3/8/1994 | 4 | | <20000 | | | | | | 75000 | | | | <62 | 74000 | 210 | <20000 | 7900 | 15000 | 1600000 |
| VS-7S | 3/8/1994 | 3 | | <5100 | | | | | | <5100 | | | | <77 | 6400 | 170 | 18000 | 25000 | 16000 | 1700000 |
| VS-8D | 3/8/1994 | 8 | | <8900 | | | | | | <8900 | | | | <140000 | <8900 | <140000 | <8900 | <6800 | 14000 | 260000 |
| VS-8S | 3/8/1994 | 3 | | <510 | | | | | | <510 | | | | <9600 | <510 | <9600 | 1700 | 45000 | 20000 | 320000 |
| VS-9D | 3/8/1994 | 7 | | <9300 | | | | | | <9300 | | | | <350000 | <9300 | <350000 | <9300 | <7000 | 9200 | 1400000 |
| VS-9M | 3/8/1994 | 5 | | <9300 | | | | | | <9300 | | | | <1800000 | <9300 | <1800000 | <9300 | <7000 | 5500 | 210000 |
| VS-9S | 3/8/1994 | 4 | | <3900 | | | | | | <3900 | | | | <300000 | <3900 | <300000 | <3900 | 6400 | 6900 | 250000 |
| FBCSA04-01-10 | 6/14/2004 | 10 | | | | | | | | | | | | <2600 | | <5300 | | | | |
| FBCSA04-01-5 | 6/14/2004 | 5 | | | | | | | | | | | | <4000 | | <8000 | | | | |
| FBCSA04-01-5-DUP | 6/14/2004 | 5 | | | | | | | | | | | | <3200 | | <6500 | | | | |
| FBCSA04-02-10 | 6/14/2004 | 10 | | | | | | | | | | | | <6300 | | <13000 | | | | |
| FBCSA04-02-5 | 6/14/2004 | 5 | | | | | | | | | | | | <2900 | | <5800 | | | | |
| FBCSA04-03-11 | 6/14/2004 | 11 | | | | | | | | | | | | <60000 | | <120000 | | | | |
| FBCSA04-03-9 | 6/14/2004 | 9 | | | | | | | | | | | | <66000 | | <130000 | | | | |
| FBCSA04-04-4 | 6/14/2004 | 4 | | | | | | | | | | | | <31 | | <62 | | | | |
| FBCSA04-04-8 | 6/14/2004 | 8 | | | | | | | | | | | | <22000 | | <43000 | | | | |
| FBCSA04-05-5 | 6/14/2004 | 5 | | | | | | | | | | | | <1500 | | <3000 | | | | |
| FBCSA04-05-9 | 6/14/2004 | 9 | | | | | | | | | | | | <71000 | | <140000 | | | | |
| FBCSA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | 170 | 150 | | | | | 580 | | 1900 | | 16000 | |
| FBCSA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | <820 | 130 | | | | | 610 | | 1900 | | 15000 | |
| FBCSA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | <590 | <590 | | | | | <590 | | 180 | | 39000 | |
| FBCSA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | <40 | <40 | | | | | <40 | | 13 | | 12000 | |
| FBCSA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | 87000 | 200000 | | | | | 210000 | | 45000 | | 16000 | |
| FBCSA06-05-2-3 | 4/17/2006 | 2 | 3 | | | | | | 27 | 37 | | | | | 51 | | 100 | | 12000 | |
| FBCSA06-06-2-3 | 4/17/2006 | 2 | 3 | | | | | | 41 | 65 | | | | | 39 | | 84 | | 27000 | |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface

## Table 2-3(R)
## Soil Analytical Data Showing Constituents with At Least One Detection
## Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Depth (ft bgs) | | Benzene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Beryllium | Bis(2-ethylhexyl)phthalate | Cadmium | Carbon disulfide | Chlorobenzene | Chromium | Chrysene | Cobalt | Copper | Cyanide, Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-D (18-20') | 6/19/2000 | 18 | 20 | <240 | <360 | 38 J | <360 | 34 J | <360 | 180 | 79 J | <550 | <240 | 250 | 5000 | <360 | 3000 | 2900 | <1100 |
| SB-E (0-2') | 6/19/2000 | 0 | 2 | <8.3 | 490 J | 390 J | 360 J | 400 J | 300 J | 1200 | <410 | 4700 | <8.3 | <8.3 | 45000 | 540 J | 12000 | 450000 | 2000 |
| VS-1 | 3/6/1991 | 11 | 13 | <42000 | <15000 | <15000 | <15000 | <15000 | <15000 | 1500 | <15000 | 6400 | <42000 | 620000 | 19000 | <15000 | 9200 | 180000 | <1700 |
| VS-10D | 3/8/1994 | 8 | | <16000 | <10000 | <10000 | <10000 | <10000 | <10000 | 2800 | <10000 | 1100 | <16000 | 160000 | 18000 | <10000 | 7900 | 120000 | |
| VS-10S | 3/8/1994 | 3 | | <6.2 | 3000 | 3800 | 5000 | 1500 | 900 | <620 | <410 | 750 | <6.2 | <6.2 | 18000 | 2600 | 5700 | 360000 | |
| VS-11D | 3/8/1994 | 6.5 | | <5.4 | 4600 | 2800 | 3400 | 1300 | 1500 | <540 | <710 | 810 | <5.4 | <5.4 | 6800 | 3300 | 1400 | 19000 | |
| VS-11S | 3/8/1994 | 4 | | <6.2 | <410 | 430 | 880 | <410 | <410 | 720 | <410 | 11000 | <6.2 | <6.2 | 40000 | 440 | 20000 | 130000 | |
| VS-12D | 3/8/1994 | 6.5 | | <35 | 35000 | 24000 | 27000 | 9600 | 12000 | 1900 | <4600 | 1800 | <35 | <35 | 15000 | 26000 | 7400 | 370000 | |
| VS-12M | 3/8/1994 | 4 | | <35 | 1700 | 1800 | 2300 | 580 | <460 | 2600 | <460 | 5400 | <35 | <35 | 26000 | 1500 | 9600 | 2400000 | |
| VS-12S | 3/8/1994 | 2.5 | | <6 | 16000 | 13000 | 16000 | 8500 | 6900 | <600 | <3900 | 4400 | <6 | <6 | 24000 | 15000 | 5300 | 130000 | |
| VS-2 | 3/7/1991 | 7 | 9 | <6.3 | <12000 | <12000 | <12000 | <12000 | <12000 | 590 | <12000 | 8300 | 8.4 | <6.3 | 8000 | <12000 | 4700 | 44000 | <1300 |
| VS-3 | 3/8/1991 | 9 | 11 | <6.8 | 2100 | 1800 | 1600 | <450 | 1500 | 900 | <450 | 4300 | 12 | <6.8 | 14000 | <2100 | 7900 | 36000 | <1400 |
| VS-4 | 3/8/1991 | 9 | 11 | <33 | <12000 | <12000 | <12000 | <12000 | <12000 | 870 | <12000 | 5000 | <33 | <33 | 48000 | <12000 | 9900 | 66000 | <1400 |
| VS-5D | 3/8/1994 | 6 | | <6.9 | 150000 | 88000 | 100000 | 32000 | 47000 | 1500 | <23000 | 1900 | <6.9 | <6.9 | 14000 | 110000 | 5700 | 47000 | |
| VS-5M | 3/8/1994 | 4 | | <7.2 | 2000 | 1600 | 2000 | 580 | 730 | 940 | <480 | 1300 | <7.2 | <7.2 | 16000 | 1700 | 5000 | 51000 | |
| VS-5S | 3/8/1994 | 2 | | <6.2 | 6100 | 4000 | 4600 | 1500 | 2300 | 910 | <820 | 6700 | <6.2 | <6.2 | 270000 | 4300 | 11000 | 210000 | |
| VS-6D | 3/8/1994 | 6 | | <5.8 | 9400 | 6000 | 7000 | 2200 | 3400 | <580 | <1900 | 980 | <5.8 | <5.8 | 9200 | 7000 | 1800 | 30000 | |
| VS-6S | 3/8/1994 | 3.5 | | <5.4 | <350 | <350 | <350 | <350 | <350 | <540 | <350 | 1100 | <5.4 | <5.4 | 12000 | <350 | 6800 | 43000 | |
| VS-7D | 3/8/1994 | 7 | | <3200 | 2200 | 1400 | 1800 | 590 | 800 | <650 | <430 | <650 | <3200 | 10000 | 13000 | 1600 | 9500 | 31000 | |
| VS-7M | 3/8/1994 | 4 | | <6.2 | <20000 | <20000 | <20000 | <20000 | <20000 | <620 | <20000 | 6800 | <6.2 | 15 | 42000 | <20000 | 5300 | 540000 | |
| VS-7S | 3/8/1994 | 3 | | <7.7 | 43000 | 24000 | 30000 | 10000 | 15000 | 2700 | <5100 | 3800 | <7.7 | <7.7 | 43000 | 34000 | 13000 | 370000 | |
| VS-8D | 3/8/1994 | 8 | | <14000 | <8900 | <8900 | <8900 | <8900 | <8900 | 760 | <8900 | <680 | <14000 | 80000 | 16000 | <8900 | 9100 | 26000 | |
| VS-8S | 3/8/1994 | 3 | | <960 | 3200 | 3100 | 4100 | 1400 | 1300 | 3100 | <510 | 4200 | <960 | 9000 | 24000 | 2700 | 11000 | 100000 | |
| VS-9D | 3/8/1994 | 7 | | <35000 | <9300 | <9300 | <9300 | <9300 | <9300 | 950 | <9300 | 8500 | <35000 | 1400000 | 24000 | <9300 | 13000 | 510000 | |
| VS-9M | 3/8/1994 | 5 | | <180000 | <9300 | <9300 | <9300 | <9300 | <9300 | 2000 | <9300 | 1500 | <180000 | 1500000 | 15000 | <9300 | 7500 | 410000 | |
| VS-9S | 3/8/1994 | 4 | | <30000 | <3900 | <3900 | <3900 | <3900 | <3900 | <590 | <3900 | 3300 | <30000 | 750000 | 21000 | <3900 | 4900 | 180000 | |
| FBCSA04-01-10 | 6/14/2004 | 10 | | 7700 | | | | | | | | | <530 | 150000 | | | | | |
| FBCSA04-01-5 | 6/14/2004 | 5 | | 2300 | | | | | | | | | <800 | 190000 | | | | | |
| FBCSA04-01-5-DUP | 6/14/2004 | 5 | | 25000 | | | | | | | | | <650 | 340000 | | | | | |
| FBCSA04-02-10 | 6/14/2004 | 10 | | 690 J | | | | | | | | | <1300 | 15000 | | | | | |
| FBCSA04-02-5 | 6/14/2004 | 5 | | 2000 | | | | | | | | | <580 | 68000 | | | | | |
| FBCSA04-03-11 | 6/14/2004 | 11 | | 5600 J | | | | | | | | | <12000 | 72000 | | | | | |
| FBCSA04-03-9 | 6/14/2004 | 9 | | 20000 | | | | | | | | | <13000 | 340000 | | | | | |
| FBCSA04-04-4 | 6/14/2004 | 4 | | 2 J | | | | | | | | | <6.2 | 13 | | | | | |
| FBCSA04-04-8 | 6/14/2004 | 8 | | 2500 J | | | | | | | | | <4300 | 170000 | | | | | |
| FBCSA04-05-5 | 6/14/2004 | 5 | | 5700 | | | | | | | | | <300 | 22000 | | | | | |
| FBCSA04-05-9 | 6/14/2004 | 9 | | 3000 J | | | | | | | | | <14000 | 74000 | | | | | |
| FBCSA06-01-2-3 | 4/17/2006 | 2 | 3 | | 5700 | 5500 | 5100 | 2800 | 5000 | | | | | | | 6000 | | | |
| FBCSA06-01-2-3-D | 4/17/2006 | 2 | 3 | | 5200 | 4900 | 4800 | 2400 | 4300 | | | | | | | 5700 | | | |
| FBCSA06-02-2-3 | 4/17/2006 | 2 | 3 | | 930 | 1100 | 1200 | 560 | 1100 | | | | | | | 1200 | | | |
| FBCSA06-03-2-3 | 4/17/2006 | 2 | 3 | | 37 | 37 | 37 | 23 | 33 | | | | | | | 46 | | | |
| FBCSA06-04-2-3 | 4/17/2006 | 2 | 3 | | 12000 | 7000 | 7100 | 2500 | 6900 | | | | | | | 11000 | | | |
| FBCSA06-05-2-3 | 4/17/2006 | 2 | 3 | | 320 | 300 | 290 | 160 | 240 | | | | | | | 350 | | | |
| FBCSA06-06-2-3 | 4/17/2006 | 2 | 3 | | 330 | 390 | 490 | 280 | 350 | | | | | | | 400 | | | |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface

## Table 2-3(R)
## Soil Analytical Data Showing Constituents with At Least One Detection
## Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Depth (ft bgs) | | Dibenzo(a,h)anthracene | Dibenzofuran | Ethyl methacrylate | Ethylbenzene | Fluoranthene | Fluorene | Indeno-(1,2,3-cd)pyrene | Iodomethane | Iron | Lead | Mercuric oxide | Mercury | Methylene chloride | Naphthalene | Nickel |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-D (18-20') | 6/19/2000 | 18 | 20 | <360 | <360 | <240 | <240 | <360 | <360 | <360 | <240 | 4100000 | 8100 | | <22 | <240 | 30 J | 7400 |
| SB-E (0-2') | 6/19/2000 | 0 | 2 | 120 J | 43 J | <8.3 | <8.3 | 1100 | 73 J | 250 J | <8.3 | 87000000 | 830000 | | 750 | <8.3 | <410 | 39000 |
| VS-1 | 3/6/1991 | 11 | 13 | <15000 | <15000 | 57000 | <42000 | 24000 | <15000 | <15000 | 49000 | | 1200000 | | 950 | <42000 | 40000 | 27000 |
| VS-10D | 3/8/1994 | 8 | | <10000 | <10000 | <16000 | <16000 | <10000 | <10000 | <10000 | <16000 | | 440000 | 34 | | <16000 | <10000 | 30000 |
| VS-10S | 3/8/1994 | 3 | | 420 | <410 | <6.2 | <6.2 | 5000 | <410 | 1600 | <6.2 | | 58000 | 250 | | <6.2 | <410 | 16000 |
| VS-11D | 3/8/1994 | 6.5 | | <710 | <710 | <5.4 | <5.4 | 7000 | <710 | 1300 | <5.4 | | 82000 | 160 | | <5.4 | <710 | 19000 |
| VS-11S | 3/8/1994 | 4 | | <410 | <410 | <6.2 | <6.2 | 1100 | <410 | <410 | <6.2 | | 280000 | 1800 | | <6.2 | <410 | 24000 |
| VS-12D | 3/8/1994 | 6.5 | | <4600 | <4600 | <35 | <35 | 49000 | <4600 | 9800 | <35 | | 280000 | 91 | | <35 | <4600 | 61000 |
| VS-12M | 3/8/1994 | 4 | | <460 | <460 | <35 | <35 | 3300 | <460 | 720 | <35 | | 590000 | 540 | | <35 | <460 | 32000 |
| VS-12S | 3/8/1994 | 2.5 | | <3900 | <3900 | <6 | <6 | 34000 | <3900 | 7700 | <6 | | 400000 | 900 | | 6.9 | <3900 | 16000 |
| VS-2 | 3/7/1991 | 7 | 9 | <12000 | <12000 | <6.3 | <6.3 | 15000 | <12000 | <12000 | <6.3 | | 230000 | | 390 | 7.4 | <12000 | 17000 |
| VS-3 | 3/8/1991 | 9 | 11 | <450 | <450 | <6.8 | <6.8 | 5200 | 450 | 1100 | <6.8 | | 170000 | | 370 | 8.2 | <450 | 23000 |
| VS-4 | 3/8/1991 | 9 | 11 | <12000 | <12000 | <33 | <33 | <12000 | <12000 | <12000 | <33 | | 170000 | | 1500 | <33 | <12000 | 32000 |
| VS-5D | 3/8/1994 | 6 | | <23000 | 43000 | <6.9 | <6.9 | 230000 | 63000 | 35000 | <6.9 | | 290000 | 340 | | <6.9 | 43000 | 25000 |
| VS-5M | 3/8/1994 | 4 | | <480 | <480 | <7.2 | <7.2 | 3000 | <480 | 640 | <7.2 | | 240000 | 220 | | <7.2 | <480 | 13000 |
| VS-5S | 3/8/1994 | 2 | | <820 | <820 | <6.2 | <6.2 | 8300 | 1600 | 1500 | <6.2 | | 1100000 | 10000 | | <6.2 | <820 | 37000 |
| VS-6D | 3/8/1994 | 6 | | <1900 | <1900 | <5.8 | <5.8 | 14000 | 2400 | 2300 | <5.8 | | 150000 | 420 | | 16 | <1900 | 7600 |
| VS-6S | 3/8/1994 | 3.5 | | <350 | <350 | <5.4 | <5.4 | <350 | <350 | <350 | <5.4 | | 91000 | 220 | | <5.4 | <350 | 16000 |
| VS-7D | 3/8/1994 | 7 | | <430 | <430 | <3200 | <3200 | 2900 | <430 | 620 | <3200 | | 14000 | 56 | | <3200 | 950 | 22000 |
| VS-7M | 3/8/1994 | 4 | | <20000 | 74000 | <6.2 | <6.2 | 21000 | 50000 | <20000 | <6.2 | | 1100000 | 1200 | | <6.2 | 250000 | 92000 |
| VS-7S | 3/8/1994 | 3 | | <5100 | <5100 | <7.7 | <7.7 | 58000 | 8400 | 10000 | <7.7 | | 5800000 | 800 | | <7.7 | <5100 | 67000 |
| VS-8D | 3/8/1994 | 8 | | <8900 | <8900 | <14000 | <14000 | <8900 | <8900 | <8900 | <14000 | | 34000 | 61 | | <14000 | <8900 | 26000 |
| VS-8S | 3/8/1994 | 3 | | <510 | <510 | <960 | <960 | 6900 | 620 | 1500 | <960 | | 6000000 | 220 | | <960 | <510 | 38000 |
| VS-9D | 3/8/1994 | 7 | | <9300 | <9300 | <35000 | <35000 | <9300 | <9300 | <9300 | <35000 | | 1800000 | 140 | | <35000 | 10000 | 22000 |
| VS-9M | 3/8/1994 | 5 | | <9300 | <9300 | <180000 | <180000 | <9300 | <9300 | <9300 | <180000 | | 85000 | 53 | | <180000 | <9300 | 25000 |
| VS-9S | 3/8/1994 | 4 | | <3900 | <3900 | <30000 | <30000 | <3900 | <3900 | <3900 | <30000 | | 470000 | 510 | | <30000 | <3900 | 17000 |
| FBCSA04-01-10 | 6/14/2004 | 10 | | | | <530 | 490 J | | | | <530 | | | | | <530 | | |
| FBCSA04-01-5 | 6/14/2004 | 5 | | | | <800 | 620 J | | | | <800 | | | | | <800 | | |
| FBCSA04-01-5-DUP | 6/14/2004 | 5 | | | | <650 | 2400 | | | | <650 | | | | | <650 | | |
| FBCSA04-02-10 | 6/14/2004 | 10 | | | | <1300 | 550 J | | | | <1300 | | | | | <1300 | | |
| FBCSA04-02-5 | 6/14/2004 | 5 | | | | <580 | 1200 | | | | <580 | | | | | <580 | | |
| FBCSA04-03-11 | 6/14/2004 | 11 | | | | <12000 | <12000 | | | | <12000 | | | | | <12000 | | |
| FBCSA04-03-9 | 6/14/2004 | 9 | | | | <13000 | <13000 | | | | <13000 | | | | | <13000 | | |
| FBCSA04-04-4 | 6/14/2004 | 4 | | | | <6.2 | 2.3 J | | | | <6.2 | | | | | <6.2 | | |
| FBCSA04-04-8 | 6/14/2004 | 8 | | | | <4300 | <4300 | | | | <4300 | | | | | <4300 | | |
| FBCSA04-05-5 | 6/14/2004 | 5 | | | | <300 | 540 | | | | <300 | | | | | <300 | | |
| FBCSA04-05-9 | 6/14/2004 | 9 | | | | <14000 | <14000 | | | | <14000 | | | | | <14000 | | |
| FBCSA06-01-2-3 | 4/17/2006 | 2 | 3 | 1300 | | | | 14000 | 550 | 2600 | | | 650000 | | | | 250 | |
| FBCSA06-01-2-3-D | 4/17/2006 | 2 | 3 | 1000 | | | | 13000 | 420 | 2200 | | | 690000 | | | | 240 | |
| FBCSA06-02-2-3 | 4/17/2006 | 2 | 3 | <590 | | | | 1600 | <590 | 510 | | | 1900000 J | | | | <590 | |
| FBCSA06-03-2-3 | 4/17/2006 | 2 | 3 | <40 | | | | 82 | <40 | 19 | | | 210000 | | | | 8 | |
| FBCSA06-04-2-3 | 4/17/2006 | 2 | 3 | <4400 | | | | 73000 | 85000 | 2600 | | | 540000 | | | | 730000 | |
| FBCSA06-05-2-3 | 4/17/2006 | 2 | 3 | 71 | | | | 770 | 36 | 210 | | | 880000 | | | | 66 | |
| FBCSA06-06-2-3 | 4/17/2006 | 2 | 3 | 120 | | | | 630 | 31 | 270 | | | 2800000 | | | | 75 | |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface

Table 2-3(R)
**Soil Analytical Data Showing Constituents with At Least One Detection**
**Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | Nitrobenzene | Pentachlorophenol | Phenanthrene | Phenol | Pyrene | Selenium | Silver | Tetrachloroethene | Thallium | Tin | Toluene | Vanadium | Xylene | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-D (18-20') | 6/19/2000 | 18 | 20 | <360 | <1900 | 22 J | <360 | <360 | <1100 | <1100 | <240 | <1100 | <5500 | <240 | 6400 J | 150 J | 16000 |
| SB-E (0-2') | 6/19/2000 | 0 | 2 | <410 | 2100 J | 880 | 410 J | 1400 J | 1900 | 650 | <8.3 | 1200 | 800000 | <8.3 | 35000 | <17 | 1500000 |
| VS-1 | 3/6/1991 | 11 | 13 | <15000 | <77000 | <15000 | <15000 | <15000 | <2900 | <15000 | <42000 | <1400 | 100000 | <42000 | 23000 | <42000 | 1800000 |
| VS-10D | 3/8/1994 | 8 | | <10000 | | <10000 | <12000 | <10000 | <1600 | <1600 | <16000 | <1600 | 21000 | <16000 | 45000 | <16000 | 220000 |
| VS-10S | 3/8/1994 | 3 | | <410 | | 2400 | | 5000 | <2500 | <1200 | <6.2 | <1200 | <6200 | <6.2 | 33000 | <6.2 | 71000 |
| VS-11D | 3/8/1994 | 6.5 | | <710 | | 5800 | | 7600 | <1100 | <1100 | <5.4 | <1100 | <5400 | <5.4 | 6000 | <5.4 | 74000 |
| VS-11S | 3/8/1994 | 4 | | 620 | | 620 | | 500 | <1200 | <1200 | <6.2 | <1200 | 40000 | <6.2 | 27000 | <6.2 | 2000000 |
| VS-12D | 3/8/1994 | 6.5 | | <4600 | | 28000 | | 55000 | <1400 | <1400 | <35 | <1400 | 34000 | <35 | 29000 | <35 | 330000 |
| VS-12M | 3/8/1994 | 4 | | <460 | | 2100 | | 3200 | <1400 | <1400 | <35 | <1400 | 130000 | <35 | 49000 | <35 | 880000 |
| VS-12S | 3/8/1994 | 2.5 | | <3900 | | 31000 | | 30000 | <1200 | <1200 | <6 | <1200 | 45000 | <6 | 20000 | <6 | 400000 |
| VS-2 | 3/7/1991 | 7 | 9 | <12000 | <60000 | 13000 | | 14000 | <2200 | <11000 | <6.3 | <2200 | 7400 | 14 | 16000 | <6.3 | 180000 |
| VS-3 | 3/8/1991 | 9 | 11 | <450 | <2200 | 3800 | <450 | 5300 | <2400 | <5900 | <6.8 | <1200 | 23000 | 13 | 29000 | <6.8 | 180000 |
| VS-4 | 3/8/1991 | 9 | 11 | <12000 | <60000 | <12000 | <12000 | <12000 | <23000 | <11000 | <33 | <1000 | <5700 | <33 | 27000 | <33 | 910000 |
| VS-5D | 3/8/1994 | 6 | | <23000 | | 240000 | | 230000 | <1400 | <1400 | <6.9 | <1400 | 25000 | <6.9 | 29000 | <6.9 | 590000 |
| VS-5M | 3/8/1994 | 4 | | <480 | | 2700 | | 3200 | <1400 | <1400 | <7.2 | <1400 | <7200 | <7.2 | 19000 | <7.2 | 320000 |
| VS-5S | 3/8/1994 | 2 | | <820 | | 7300 | | 8600 | <1200 | <1200 | <6.2 | <1200 | 120000 | <6.2 | 38000 | <6.2 | 1300000 |
| VS-6D | 3/8/1994 | 6 | | <1900 | | 12000 | | 14000 | <2300 | <1200 | 10 | <1200 | 19000 | <5.8 | 15000 | <5.8 | 120000 |
| VS-6S | 3/8/1994 | 3.5 | | <350 | | <350 | | <350 | <2200 | <1100 | <5.4 | <1100 | <5400 | <5.4 | 20000 | <5.4 | 240000 |
| VS-7D | 3/8/1994 | 7 | | <430 | | 2100 | | 3200 | <1300 | <1300 | <3200 | <1300 | <6500 | <3200 | 31000 | <3200 | 63000 |
| VS-7M | 3/8/1994 | 4 | | <20000 | | 71000 | | <20000 | <1200 | <1200 | 6.4 | <1200 | 170000 | <6.2 | 13000 | <6.2 | 1200000 |
| VS-7S | 3/8/1994 | 3 | | <5100 | | 53000 | | 64000 | <1500 | 2900 | 7.7 | 6600 | 94000 | <7.7 | 59000 | <7.7 | 1000000 |
| VS-8D | 3/8/1994 | 8 | | <8900 | | <8900 | | <8900 | <1400 | <1400 | <14000 | <1400 | <6800 | <14000 | 33000 | <14000 | 66000 |
| VS-8S | 3/8/1994 | 3 | | <510 | | 5400 | | 5200 | <1500 | <1500 | <960 | <1500 | 21000 | <960 | 42000 | <960 | 500000 |
| VS-9D | 3/8/1994 | 7 | | <9300 | | <9300 | | <9300 | <1400 | <1400 | <35000 | <1400 | 1800000 | <35000 | 25000 | <35000 | 850000 |
| VS-9M | 3/8/1994 | 5 | | <9300 | | <9300 | | <9300 | <1400 | <1400 | <180000 | <1400 | 110000 | <180000 | 41000 | <180000 | 210000 |
| VS-9S | 3/8/1994 | 4 | | <3900 | | <3900 | | <3900 | <2400 | <1200 | <30000 | <1200 | 38000 | <30000 | 17000 | <30000 | 360000 |
| FBCSA04-01-10 | 6/14/2004 | 10 | | | | | | | | | <530 | | | 160 J | | 880 J | |
| FBCSA04-01-5 | 6/14/2004 | 5 | | | | | | | | | <800 | | | <800 | | 790 J | |
| FBCSA04-01-5-DUP | 6/14/2004 | 5 | | | | | | | | | <650 | | | 500 J | | 3200 | |
| FBCSA04-02-10 | 6/14/2004 | 10 | | | | | | | | | <1300 | | | 740 J | | 2600 | |
| FBCSA04-02-5 | 6/14/2004 | 5 | | | | | | | | | <580 | | | 2100 | | 9400 | |
| FBCSA04-03-11 | 6/14/2004 | 11 | | | | | | | | | <12000 | | | <12000 | | <24000 | |
| FBCSA04-03-9 | 6/14/2004 | 9 | | | | | | | | | <13000 | | | <13000 | | <26000 | |
| FBCSA04-04-4 | 6/14/2004 | 4 | | | | | | | | | 11 | | | 26 | | 11 J | |
| FBCSA04-04-8 | 6/14/2004 | 8 | | | | | | | | | <4300 | | | <4300 | | <8700 | |
| FBCSA04-05-5 | 6/14/2004 | 5 | | | | | | | | | <300 | | | 310 | | 2200 | |
| FBCSA04-05-9 | 6/14/2004 | 9 | | | | | | | | | <14000 | | | <14000 | | <28000 | |
| FBCSA06-01-2-3 | 4/17/2006 | 2 | 3 | | | 7400 | | 11000 | | | | | | | | | |
| FBCSA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | 6900 | | 11000 | | | | | | | | | |
| FBCSA06-02-2-3 | 4/17/2006 | 2 | 3 | | | 820 | | 1400 | | | | | | | | | |
| FBCSA06-03-2-3 | 4/17/2006 | 2 | 3 | | | 51 | | 75 | | | | | | | | | |
| FBCSA06-04-2-3 | 4/17/2006 | 2 | 3 | | | 230000 | | 41000 | | | | | | | | | |
| FBCSA06-05-2-3 | 4/17/2006 | 2 | 3 | | | 550 | | 580 | | | | | | | | | |
| FBCSA06-06-2-3 | 4/17/2006 | 2 | 3 | | | 360 | | 650 | | | | | | | | | |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface

Table 2-4(R)

**Groundwater Analytical Data Showing Constituents with At Least One Detection**

**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | 1,1,1-Trichloroethane | 1,2-Dichloroethane | 2,4-Dimethylphenol | 2-Butanone (MEK) | 2-Chlorophenol | 2-Methyl naphthalene | 4-Methyl-2-pentanone (MIBK) | Acenaphthene | Acetone | Anthracene | Antimony | Antimony Dissolved | Arsenic | Arsenic Dissolved | Barium | Barium Dissolved | Benzene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Beryllium | Bis(2-ethylhexyl)phthalate | Bromodichloromethane | Bromoform | Butylbenzylphthalate | Cadmium | Cadmium Dissolved | Carbon disulfide |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fill Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VW-1 | 7/26/2000 | <5 | <5 | <10 | <25 | 9.9 J | 4 J | <25 | 3 J | <50 | 1.1 J | <20 | | 15 | | 830 | | 15000 | 1.8 J | 1.2 J | 1.5 J | <10 | 1.8 J | 1.2 | 4.5 J | <5 | <5 | 1.2 J | 2.9 | | <5 |
| VW-1F | 7/26/2000 | | | | | | | | | | | | <20 | | 5.9 | | 290 | | | | | | | | | | | | | <5 | |
| VW-1 Dup | 7/26/2000 | <5 | <5 | <10 | <25 | 10 | 3.8 J | <25 | 2.7 J | <50 | 1.1 J | <20 | | 4.4 | | 510 | | 15000 | 1.4 J | 1.1 J | 0.98 J | <10 | 1.4 J | <4 | 3.9 J | <5 | <5 | 0.6 J | <5 | | <5 |
| VW-1 DupF | 7/26/2000 | | | | | | | | | | | | <20 | | <10 | | 280 | | | | | | | | | | | | | <5 | |
| VW-1 | 9/20/2001 | <500 | <500 | | <2500 | | | <2500 | | <5000 | | | | | | | | 16000 | | | | | | | | <500 | <500 | | | | <500 |
| VW-1 | 4/27/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | | | | 380 | | | | | | | | <25 | <25 | | | | <25 |
| VW-1 | 8/23/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | | | | 210 | | | | | | | | <25 | <25 | | | | <25 |
| VW-2 | 6/6/1991 | <250 | <250 | <10 | <5000 | 16 | <10 | <2500 | <10 | <5000 | <10 | <50 | <50 | 13 | <10 | 810 | 410 | 1900 | <10 | <10 | <10 | <10 | <10 | <5 | <10 | <250 | <250 | <10 | <5 | <5 | <250 |
| VW-2 | 10/29/1991 | <500 | <500 | <1000 | <10000 | <1000 | <1000 | <5000 | <1000 | <10000 | <1000 | <50 | <50 | 15 | <10 | 1200 | 480 | 1300 | <1000 | <1000 | <1000 | <1000 | <1000 | <5 | <1000 | <500 | <500 | <1000 | <5 | <5 | <500 |
| VW-2 | 8/1/2000 | <5 | <5 | <10 | <25 | 1.7 J | 0.49 J | <25 | 0.72 J | <12 | <10 | 57 | | 31 | | 2700 | | 35 J | 2.8 J | 2.7 J | 2.6 J | 2.4 J | 3.2 J | 1.8 | 14 | <5 | <5 | <10 | 4.8 | | <5 |
| VW-2F | 8/1/2000 | | | | | | | | | | | | <20 | | 5.5 | | 140 | | | | | | | | | | | | | <5 | |
| VW-2 | 9/20/2001 | | 20 | | 100 | | | 100 | | | | | | | | | | 100 | | | | | | | | | 20 | | | | |
| VW-2 | 4/27/2004 | <10 | <10 | | <100 | | | <100 | | <250 | | | | | | | | 25 | | | | | | | | <10 | <10 | | | | 7.9 J |
| VW-2 | 8/20/2004 | <10 | <10 | | <100 | | | <100 | | <250 | | | | | | | | 6 J | | | | | | | | <10 | <10 | | | | <10 |
| VW-2A | 11/12/1993 | <250 | <250 | | <5000 | | | <2500 | | <5000 | | | | | | | | <250 | | | | | | | | <250 | <250 | | | | <250 |
| **Silty Clay Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-24A | 7/24/2000 | <5 | <5 | 6.2 J | <25 | 36 | <10 | <25 | <10 | <50 | <10 | <20 | | 350 | | 420 | | 83 | <0.34 | <0.55 | <0.35 | 1.2 J | <10 | <4 | <2.6 | <5 | <5 | <10 | <5 | | <5 |
| MW-24AF | 7/24/2000 | | | | | | | | | | | | <20 | | 26 | | 610 | | | | | | | | | | | | | 0.95 | |
| MW-24A | 9/20/2001 | 620 | 620 | | 3100 | | | 3100 | | 6200 | | | | | | | | 18000 | | | | | | | | 620 | 620 | | | | 620 |
| MW-24A | 4/28/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | | | | 11000 | | | | | | | | <100 | <100 | | | | <100 |
| MW-24A-DUP | 4/28/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | | | | 12000 | | | | | | | | <100 | <100 | | | | <100 |
| MW-24A | 8/23/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | | | | 8000 | | | | | | | | <100 | <100 | | | | <100 |
| MW-24A-D | 8/23/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | | | | 7700 | | | | | | | | <100 | <100 | | | | <100 |
| MW-24A | 4/18/2006 | <10 | <10 | | <100 | | | <100 | | 130 | | | | | | | | 7100 | | | | | | | | <10 | <10 | | | | <20 |
| MW-25A | 7/11/2000 | <50 | <50 | <10 | <250 | 2.5 J | 53 | <250 | 0.75 J | <500 | 0.37 J | <20 | | 310 | | 5300 | | 160 | 0.82 J | 0.71 J | 0.61 J | 0.7 J | <10 | 17 | 8.7 J | <50 | <50 | 0.6 J | 8 | | <50 |
| MW-25AF | 7/11/2000 | | | | | | | | | | | | <20 | | 140 | | 420 | | | | | | | | | | | | | <5 | |
| MW-25A | 9/21/2001 | <120 | <120 | | <620 | | | <620 | | <1200 | | | | | | | | 300 | | | | | | | | <120 | <120 | | | | <120 |
| MW-25A | 4/29/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | | | | 210 | | | | | | | | <25 | <25 | | | | <25 |
| MW-25A | 8/23/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | | | | 530 | | | | | | | | <25 | <25 | | | | <25 |
| **Sand Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-24B | 7/11/2000 | <500 | <500 | <10 | <2500 | 24 | 44 | <2500 | 1.4 J | <5000 | 0.4 J | <20 | | 19 | | 110 | | 6200 | 0.65 J | 0.92 J | 0.71 J | 1.4 J | | <4 | 7.9 J | <500 | <500 | 0.76 J | <5 | | <500 |
| MW-24BF | 7/11/2000 | | | | | | | | | | | | <20 | | 17 | | 28 | | | | | | | | | | | | | <5 | |
| MW-24B | 9/20/2001 | <500 | <500 | | <2500 | | | <2500 | | <5000 | | | | | | | | 7800 | | | | | | | | <500 | <500 | | | | <500 |
| MW-24B DUP | 9/20/2001 | <6200 | <6200 | | <31000 | | | <31000 | | <62000 | | | | | | | | 8100 | | | | | | | | <6200 | <6200 | | | | <6200 |
| MW-24B | 4/26/2004 | <1000 | <1000 | | <10000 | | | <10000 | | <25000 | | | | | | | | 18000 | | | | | | | | <1000 | <1000 | | | | <1000 |
| MW-24B | 8/19/2004 | <1000 | <1000 | | <10000 | | | <10000 | | <25000 | | | | | | | | 29000 | | | | | | | | <1000 | <1000 | | | | <1000 |
| MW-25B | 7/10/2000 | <5 | <5 | <10 | 26 | 3.9 J | <10 | <25 | <10 | 32 J | <10 | <20 | | 9.8 | | 200 J | | 3.4 J | <10 | <10 | <10 | <10 | <10 | <4 | <1.9 | <5 | <5 | <10 | <5 | | <5 |
| MW-25BF | 7/10/2000 | | | | | | | | | | | | 5.2 | | 7.1 | | 160 | | | | | | | | | | | | | <5 | |
| MW-25B | 9/21/2001 | <5 | <5 | | <25 | | | <25 | | 13 J | | | | | | | | 35 | | | | | | | | <5 | <5 | | | | <5 |
| MW-25B | 4/27/2004 | <5 | <5 | | <50 | | | <50 | | <120 | | | | | | | | 80 | | | | | | | | <5 | <5 | | | | <5 |
| MW-25B | 8/23/2004 | <5 | <5 | | <50 | | | <50 | | <120 | | | | | | | | 12 | | | | | | | | <5 | <5 | | | | <5 |
| MW-35B | 8/18/2004 | <5 | <5 | | <50 | | | <50 | | <120 | | | | | | | | <5 | | | | | | | | <5 | <5 | | | | <5 |
| VW-2B | 6/6/1991 | <50 | <50 | <10 | <1000 | <10 | <10 | <500 | <10 | <1000 | <10 | <50 | <50 | 53 | 16 | 190 | 96 | <50 | <10 | <10 | <10 | <10 | <10 | <5 | <10 | <50 | <50 | <10 | <5 | <5 | <50 |
| VW-2B | 11/1/1991 | <500 | <500 | | <10000 | | | <5000 | | <10000 | | <50 | <50 | 36 | <10 | 130 | 110 | <500 | | | | | | <5 | | <500 | <500 | | <5 | <5 | <500 |
| VW-2B | 7/25/2000 | <5 | <5 | <10 | <25 | <10 | <10 | <25 | <10 | <15 | <10 | <20 | | 24 | | 80 | | <5 | <1.6 | <1.7 | <1.4 | <3 | <2.3 | <4 | 26 J | <5 | <5 | 1.9 J | 0.73 | | <5 |
| VW-2BF | 7/25/2000 | | | | | | | | | | | | <20 | | <10 | | 44 | | | | | | | | | | | | | <5 | |
| VW-2B | 9/20/2001 | 5 | 5 | | 25 | | | 25 | | 50 | | | | | | | | 2.8 | | | | | | | | 5 | 5 | | | | 5 |
| VW-2B | 4/26/2004 | <2 | <2 | | <20 | | | <20 | | <50 | | | | | | | | 3.3 | | | | | | | | <2 | <2 | | | | 1.6 J |
| VW-2B | 8/19/2004 | <2 | <2 | | <20 | | | <20 | | <50 | | | | | | | | 3.4 | | | | | | | | <2 | <2 | | | | <2 |

Note:
All conc. in ug/L (micrograms/liter)
F: Filtered sample
DUP: Duplicate sample

**Table 2-4(R)**
**Groundwater Analytical Data Showing Constituents with At Least One Detection**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Carbon tetrachloride | Chlorobenzene | Chloroform | Chloromethane | Chromium | Chromium Dissolved | Chrysene | cis-1,2-Dichloroethene | Cobalt | Cobalt Dissolved | Copper | Copper Dissolved | Cyanide, Total | Dibenzo(a,h)anthracene | Dibenzofuran | Dibromochloromethane | Diethylphthalate | Dimethyl phthalate | Di-n-butylphthalate | Di-n-octylphthalate | Ethyl methacrylate | Ethylbenzene | Fluoranthene | Fluorene | Indeno-(1,2,3-cd)pyrene | Iodomethane |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fill Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VW-1 | 7/26/2000 | <5 | 4800 | <5 | 6.8 J | 40 | | 2.1 J | <5 | 14 | | 71 | | <10 | <10 | 1.1 J | <5 | <10 | | <10 | 0.94 J | <5 | 8 | 4.2 J | 3.1 J | 0.83 J | <5 |
| VW-1F | 7/26/2000 | | | | | | <10 | | | | <10 | | <20 | | | | | | | | | | | | | | |
| VW-1 Dup | 7/26/2000 | <5 | 4800 | <5 | 5.5 J | 6.7 | | 1.6 J | <5 | 2.4 | | 19 | | <10 | <10 | 1.1 J | <5 | <10 | | <10 | <10 | <5 | 6.4 | 3.8 J | 3.2 J | 0.64 J | <5 |
| VW-1 DupF | 7/26/2000 | | | | | | <10 | | | | <10 | | | | | | | | | | | | | | | | |
| VW-1 | 9/20/2001 | <500 | 3400 | <500 | <1000 | | | | <500 | | | | | | | | <500 | | | | | <500 | <500 | | | | <500 |
| VW-1 | 4/27/2004 | <25 | 2200 | <25 | <25 | | | | <25 | | | | | | | | <25 | | | | | <25 | <25 | | | | <25 |
| VW-1 | 8/23/2004 | <25 | 2100 | <25 | <25 | | | | <25 | | | | | | | | <25 | | | | | <25 | <25 | | | | <25 |
| VW-2 | 6/6/1991 | <250 | 7500 | <250 | <500 | <10 | <10 | <10 | | <10 | <10 | 27 | | <10 | <10 | <10 | <250 | <10 | <10 | <10 | 23 | <250 | <250 | <10 | <10 | <10 | <250 |
| VW-2 | 10/29/1991 | <500 | 8000 | <500 | <1000 | 16 | <10 | <1000 | | 24 | <10 | 95 | | 10 | <1000 | <1000 | <500 | <1000 | <1000 | <1000 | <1000 | <500 | <500 | <1000 | <1000 | <1000 | <500 |
| VW-2 | 8/1/2000 | <5 | 970 | <5 | <10 | 49 | | 3.2 J | <5 | 32 | | 250 | | <10 | 0.97 J | <10 | <5 | 0.69 J | | <10 | 0.74 J | <5 | <5 | 6.1 J | <10 | 2.1 J | <5 |
| VW-2F | 8/1/2000 | | | | | | <10 | | | | 1.9 | | 12 | | | | | | | | | | | | | | |
| VW-2 | 9/20/2001 | 20 | | 20 | | | | | | | | | | | | | | | | | | 20 | | | | | 20 |
| VW-2 | 4/27/2004 | <10 | 1300 | <10 | <10 | | | | <10 | | | | | | | | <10 | | | | | <10 | <10 | | | | <10 |
| VW-2 | 8/20/2004 | <10 | 1400 | <10 | <10 | | | | <10 | | | | | | | | <10 | | | | | <10 | <10 | | | | <10 |
| VW-2A | 11/12/1993 | <250 | 3500 | <250 | <500 | | <10 | | <250 | | | | | | | | <250 | | | | | <250 | <250 | | | | <250 |
| **Silty Clay Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-24A | 7/24/2000 | <5 | 21 | <5 | <10 | <10 | | <10 | 46 | 2 | | <20 | | <10 | <10 | <10 | <5 | <10 | | 0.34 J | 0.48 J | <5 | <5 | <10 | <10 | <1 | <5 |
| MW-24AF | 7/24/2000 | | | | | | 14 | | | | 6.6 | | 17 | | | | | | | | | | | | | | |
| MW-24A | 9/20/2001 | 620 | 17000 | 620 | 1200 | | | | 620 | | | | | | | | 620 | | | | | 620 | 1400 | | | | 620 |
| MW-24A | 4/28/2004 | <100 | 2700 | <100 | <100 | | | | <100 | | | | | | | | <100 | | | | | <100 | 900 | | | | <100 |
| MW-24A-DUP | 4/28/2004 | <100 | 2600 | <100 | <100 | | | | <100 | | | | | | | | <100 | | | | | <100 | 920 | | | | <100 |
| MW-24A | 8/23/2004 | <100 | 1600 | <100 | <100 | | | | <100 | | | | | | | | <100 | | | | | <100 | 810 | | | | <100 |
| MW-24A-D | 8/23/2004 | <100 | 1500 | <100 | <100 | | | | <100 | | | | | | | | <100 | | | | | <100 | 810 | | | | <100 |
| MW-24A | 4/18/2006 | <10 | 1900 | <10 | <10 | | | | <10 | | | | | | | | <10 | | | | | <10 | 950 | | | | <50 |
| MW-25A | 7/11/2000 | <50 | 950 | <50 | <100 | 460 | | 0.92 J | <50 | 160 | | 580 | | <10 | <10 | 0.37 J | <50 | | <10 | 0.75 J | 0.84 J | <50 | 160 | 0.94 J | 0.7 J | 0.61 J | <50 |
| MW-25AF | 7/11/2000 | | | | | | <10 | | | | <10 | | <2.2 | | | | | | | | | | | | | | |
| MW-25A | 9/21/2001 | <120 | 3400 | <120 | <250 | | | | <120 | | | | | | | | <120 | | | | | <120 | 25 J | | | | <120 |
| MW-25A | 4/29/2004 | <25 | 2800 | <25 | <25 | | | | <25 | | | | | | | | <25 | | | | | <25 | <25 | | | | <25 |
| MW-25A | 8/23/2004 | <25 | 2400 | <25 | <25 | | | | <25 | | | | | | | | <25 | | | | | <25 | 55 | | | | <25 |
| **Sand Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-24B | 7/11/2000 | <500 | 15000 | <500 | <1000 | 2.5 | | 0.8 J | <500 | <10 | | 9.3 | | <10 | 1.1 J | 0.58 J | <500 | <10 | | 0.74 J | 2.3 J | <500 | <500 | 0.66 J | 1.6 J | 1.3 J | <500 |
| MW-24BF | 7/11/2000 | | | | | | <10 | | | | | | <4.5 | | | | | | | | | | | | | | |
| MW-24B | 9/20/2001 | <500 | 160000 | <500 | <1000 | | | | <500 | | | | | | | | <500 | | | | | <500 | 220 J | | | | <500 |
| MW-24B DUP | 9/20/2001 | <6200 | 160000 | <6200 | <12000 | | | | <6200 | | | | | | | | <6200 | | | | | <6200 | <6200 | | | | <6200 |
| MW-24B | 4/26/2004 | <1000 | 130000 | <1000 | <1000 | | | | <1000 | | | | | | | | <1000 | | | | | <1000 | <1000 | | | | <1000 |
| MW-24B | 8/19/2004 | <1000 | 190000 | <1000 | <1000 | | | | <1000 | | | | | | | | <1000 | | | | | <1000 | <1000 | | | | <1000 |
| MW-25B | 7/10/2000 | <5 | 63 | 2.8 J | <10 | 2.3 | | <10 | 5.6 | <10 | | 9.6 | | <10 | <10 | <10 | <5 | <10 | | 0.43 J | 0.56 J | <5 | 1.4 J | <10 | <10 | <10 | <5 |
| MW-25BF | 7/10/2000 | | | | | | <10 | | | | <10 | | 3.3 | | | | | | | | | | | | | | |
| MW-25B | 9/21/2001 | <5 | 240 | <5 | <10 | | | | 20 | | | | | | | | <5 | | | | | <5 | 9.4 | | | | <5 |
| MW-25B | 4/27/2004 | <5 | 330 | <5 | <5 | | | | <5 | | | | | | | | <5 | | | | | <5 | <5 | | | | <5 |
| MW-25B | 8/23/2004 | <5 | 260 | <5 | <5 | | | | 3 J | | | | | | | | <5 | | | | | <5 | <5 | | | | <5 |
| MW-35B | 8/18/2004 | <5 | <5 | <5 | <5 | | | | 220 | | | | | | | | <5 | | | | | <5 | <5 | | | | <5 |
| VW-2B | 6/6/1991 | <50 | <50 | <50 | <100 | 10 | <10 | <10 | | 10 | <10 | <25 | | <10000 | <10 | <10 | <50 | <10 | <10 | <10 | <10 | <50 | <50 | <10 | <10 | <10 | <50 |
| VW-2B | 11/1/1991 | <500 | 1800 | <500 | <1000 | <10 | <10 | | | <10 | <10 | <25 | | <10 | | | <500 | | | | | <500 | <500 | | | | <500 |
| VW-2B | 7/25/2000 | <5 | <5 | <5 | <10 | <10 | | <2 | 230 | 2.9 | | 10 | | <8 | 2.4 J | <10 | <5 | | 1.3 J | 1.2 J | 2 J | <5 | <5 | 0.51 J | <10 | <3 | <5 |
| VW-2BF | 7/25/2000 | | | | | | <10 | | | | 2.4 | | 3.8 | | | | | | | | | | | | | | |
| VW-2B | 9/20/2001 | 5 | 170 | 5 | 4.5 | | | | 230 | | | | | | | | 5 | | | | | 5 | 5 | | | | 5 |
| VW-2B | 4/26/2004 | <2 | 20 | <2 | <2 | | | | 13 | | | | | | | | <2 | | | | | <2 | <2 | | | | <2 |
| VW-2B | 8/19/2004 | <2 | 38 | <2 | <2 | | | | 7.7 | | | | | | | | <2 | | | | | <2 | <2 | | | | <2 |

Note:
All conc. in ug/L (micrograms/liter)
F: Filtered sample
DUP: Duplicate sample

Table 2-4(R)
**Groundwater Analytical Data Showing Constituents with At Least One Detection**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Iron | Iron Dissolved | Lead | Lead Dissolved | Mercury | Methylene chloride | Naphthalene | Nickel | Nickel Dissolved | p-chloroaniline | Phenanthrene | Phenol | Pyrene | Selenium | Silver | Tetrachloroethene | Thallium | Tin | Toluene | Trichloroethene | Vanadium | Vanadium Dissolved | Vinyl chloride | Xylene | Zinc | Zinc Dissolved |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fill Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VW-1 | 7/26/2000 | 41000 J | | 370 J | | 0.37 | <5 | 53 | 28 | | 51 J | 4 J | 110 | 3.9 J | <10 | <10 | <5 | <10 | 70 | 5.4 | <5 | 38 | | <0.5 | 24 | 410 J | |
| VW-1F | 7/26/2000 | | 100 | | <5 | | | | | <40 | | | | | | | | | | | | | <10 | | | | <20 |
| VW-1 Dup | 7/26/2000 | 13000 J | | 66 J | | <0.2 | <5 | 47 | 4.9 | | 47 J | 3.7 J | 120 | 3.7 J | <10 | <10 | <5 | <10 | <50 | 4.3 J | <5 | 7.9 | | <0.5 | 19 | 77 J | |
| VW-1 DupF | 7/26/2000 | | 58 | | <5 | | | | | <40 | | | | | | | | | | | | | <10 | | | | <20 |
| VW-1 | 9/20/2001 | | | | | | <500 | | | | | | | | | | <500 | | | <500 | <500 | | | <50 | <1000 | | |
| VW-1 | 4/27/2004 | | | | | | <120 | | | | | | | | | | <25 | | | <25 | <25 | | | <25 | <50 | | |
| VW-1 | 8/23/2004 | | | | | | <120 | | | | | | | | | | <25 | | | <25 | <25 | | | <25 | <50 | | |
| VW-2 | 6/6/1991 | | | 70 | <5 | <0.2 | <250 | <10 | <40 | <40 | <20 | <10 | <10 | <10 | <10 | <10 | <250 | <25 | <50 | <250 | <250 | 20 | 11 | <500 | <250 | 110 | 40 |
| VW-2 | 10/29/1991 | | | 230 | 5.4 | <0.2 | <500 | <1000 | 56 | <40 | <2000 | <1000 | <1000 | <1000 | <10 | <10 | <500 | <10 | <50 | <500 | <500 | 35 | <10 | <1000 | <500 | 300 | 39 |
| VW-2 | 8/1/2000 | 54000 | | 780 | | 0.59 | <2.2 | 0.71 J | 130 | | 2.1 J | <10 | <10 | 6.3 J | <10 | <10 | <5 | <10 | 62 | 1.9 J | 0.7 J | 64 | | <0.5 | <10 | 1000 | |
| VW-2F | 8/1/2000 | | 810 | | 94 | | | | | 9.4 | | | | | | | | | | | | | 11 | | | | 110 |
| VW-2 | 9/20/2001 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VW-2 | 4/27/2004 | | | | | | <50 | | | | | | | | | | <10 | | | <10 | <10 | | | <10 | <20 | | |
| VW-2 | 8/20/2004 | | | | | | <50 | | | | | | | | | | <10 | | | <10 | <10 | | | <10 | <20 | | |
| VW-2A | 11/12/1993 | | | | | | <250 | | | | | | | | | | <250 | | | <250 | 470 | | | <500 | <250 | | |
| **Silty Clay Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-24A | 7/24/2000 | 11000 | | 2.3 | | <0.2 | <5 | 12 | 44 | | 97 | <10 | 140 | <10 | <10 | <10 | <5 | <10 | <50 | 0.85 J | 2.5 J | <10 | | <0.5 | 14 | 56 | |
| MW-24AF | 7/24/2000 | | 26000 | | 17 | | | | | 18 | | | | | | | | | | | | | 27 | | | | 20 |
| MW-24A | 9/20/2001 | | | | | | 620 | | | | | | | | | | 620 | | | 620 | 620 | | | 62 | 4500 | | |
| MW-24A | 4/28/2004 | | | | | | <500 | | | | | | | | | | <100 | | | 140 | <100 | | | <100 | 3000 | | |
| MW-24A-DUP | 4/28/2004 | | | | | | <500 | | | | | | | | | | <100 | | | 140 | <100 | | | <100 | 3000 | | |
| MW-24A | 8/23/2004 | | | | | | <500 | | | | | | | | | | <100 | | | 120 | <100 | | | <100 | 2400 | | |
| MW-24A-D | 8/23/2004 | | | | | | <500 | | | | | | | | | | <100 | | | 120 | <100 | | | <100 | 2400 | | |
| MW-24A | 4/18/2006 | | | | | | <50 | | | | | | | | | | <10 | | | 180 | <10 | | | <10 | 2300 | | |
| MW-25A | 7/11/2000 | 460000 | | 600 | | 0.98 | <15 | 35 | 0.47 | | <20 | 1.8 J | <10 | 0.9 J | 13 | <10 | <50 | 9.9 | 2.3 | 16 J | <50 | 830 | | <5 | 370 | 1500 | |
| MW-25AF | 7/11/2000 | | 19000 | | <5 | | | | | <40 | | | | | | | | | | | | | <10 | | | | <20 |
| MW-25A | 9/21/2001 | | | | | | <120 | | | | | | | | | | <120 | | | 30 J | <120 | | | <12 | 66 J | | |
| MW-25A | 4/29/2004 | | | | | | <120 | | | | | | | | | | <25 | | | <25 | <25 | | | <25 | 40 J | | |
| MW-25A | 8/23/2004 | | | | | | <120 | | | | | | | | | | <25 | | | <25 | <25 | | | <25 | 43 J | | |
| **Sand Unit** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MW-24B | 7/11/2000 | 2400 | | 27 | | <0.2 | 180 J | 64 | 9.6 | | 94 | 1.6 J | 49 | 0.63 J | <10 | <10 | <500 | <10 | <50 | 110 J | <500 | 21 | | <50 | <1000 | 36 | |
| MW-24BF | 7/11/2000 | | 260 | | 6.6 | | | | | 6.4 | | | | | | | | | | | | | 18 | | | | <20 |
| MW-24B | 9/20/2001 | | | | | | <500 | | | | | | | | | | <500 | | | 1200 | <500 | | | <50 | 490 J | | |
| MW-24B DUP | 9/20/2001 | | | | | | 710 J | | | | | | | | | | <6200 | | | 1900 J | <6200 | | | <620 | <12000 | | |
| MW-24B | 4/26/2004 | | | | | | <5000 | | | | | | | | | | <1000 | | | 1600 | <1000 | | | <1000 | 640 J | | |
| MW-24B | 8/19/2004 | | | | | | <5000 | | | | | | | | | | <1000 | | | 2500 | <1000 | | | <1000 | 1400 J | | |
| MW-25B | 7/10/2000 | 2100 | | 27 | | <0.2 | 0.74 J | <10 | 4.8 | | <20 | <10 | <10 | <10 | <10 | <10 | <5 | <10 | <50 | 0.93 J | <5 | 9 | | 14 | 41 | 31 | |
| MW-25BF | 7/10/2000 | | 66 | | 2.2 | | | | | <40 | | | | | | | | | | | | | 5.5 | | | | 9.1 |
| MW-25B | 9/21/2001 | | | | | | <5 | | | | | | | | | | <5 | | | 1.6 J | <5 | | | 12 | <10 | | |
| MW-25B | 4/27/2004 | | | | | | <25 | | | | | | | | | | <5 | | | <5 | <5 | | | <5 | <10 | | |
| MW-25B | 8/23/2004 | | | | | | <25 | | | | | | | | | | <5 | | | <5 | <5 | | | <5 | <10 | | |
| MW-35B | 8/18/2004 | | | | | | <25 | | | | | | | | | | <5 | | | <5 | <5 | | | 250 | <10 | | |
| VW-2B | 6/6/1991 | | | 15 | <5 | <0.2 | <50 | <10 | <40 | <40 | <20 | <10 | <10 | <10 | <10 | 11 | <50 | <10 | <50 | <50 | <50 | 20 | <10 | <100 | <50 | 52 | 48 |
| VW-2B | 11/1/1991 | | | 8 | <5000 | <0.2 | <500 | | <40 | <40 | | | | | <50 | <10 | <500 | <10 | <50 | <500 | <500 | <10 | <10 | <1000 | <500 | 46 | 31 |
| VW-2B | 7/25/2000 | 11000 | | 4.1 | | <0.2 | <2.8 | <10 | 6.6 | | <20 | 0.38 J | <10 | 0.7 J | <10 | <10 | <5 | <10 | <50 | <5 | <5 | <10 | | 21 | <10 | 89 | |
| VW-2BF | 7/25/2000 | | 150 | | <5 | | | | | <40 | | | | | | | | | | | | | <10 | | | | 36 |
| VW-2B | 9/20/2001 | | | | | | 5 | | | | | | | | | | 5 | | | 1.4 | 5 | | | 34 | 10 | | |
| VW-2B | 4/26/2004 | | | | | | <10 | | | | | | | | | | <2 | | | <2 | <2 | | | 180 | <4 | | |
| VW-2B | 8/19/2004 | | | | | | <10 | | | | | | | | | | <2 | | | <2 | <2 | | | 230 | <4 | | |

Note:
All conc. in ug/L (micrograms/liter)
F: Filtered sample
DUP: Duplicate sample

**Table 2-6(R)**
**Free Product Analytical Results**
**Former Bulk Chemical Storage Area, Solutia - J. F. Queeny Plant, St. Louis, Missouri**

| Constituent | PZ-5 (LNAPL) (ug/L) | Concentration Used | Weight Fraction (WF) | Solubility (mg/L) | Assigned Solubility (ug/L) |
|---|---|---|---|---|---|
| Acetone | 150,000 J | 150,000 | 0.0281 | 1.00E+06 | 28,076,743 |
| Benzene | 580,000 | 580,000 | 0.1086 | 1.75E+03 | 189,986 |
| Bromodichloromethane | <125,000 | 62,500 | 0.0117 | 6.74E+03 | 78,849 |
| Bromoform | <125,000 | 62,500 | 0.0117 | 3.10E+03 | 36,266 |
| 2-Butanone (MEK) | <125,000 | 62,500 | 0.0117 | 2.23E+05 | 2,608,797 |
| Carbon tetrachloride | <125,000 | 62,500 | 0.0117 | 7.93E+02 | 9,277 |
| Carbon disulfide | <250,000 | 125,000 | 0.0234 | 1.19E+03 | 27,843 |
| Chlorobenzene | 3100000 | 3,100,000 | 0.5803 | 4.72E+02 | 273,879 |
| Chloroform | <125,000 | 62,500 | 0.0117 | 7.92E+03 | 92,653 |
| Chloromethane | <250,000 | 125,000 | 0.0234 | 8.20E+03 | 191,858 |
| Dibromochloromethane | <125,000 | 62,500 | 0.0117 | 2.60E+03 | 30,416 |
| 1,2-Dichloroethane | <125,000 | 62,500 | 0.0117 | 8.50E+03 | 99,438 |
| cis-1,2-Dichloroethene | <125,000 | 62,500 | 0.0117 | 3.50E+03 | 40,945 |
| trans-1,2-Dichloroethene | <125,000 | 62,500 | 0.0117 | 6.30E+03 | 73,701 |
| Ethyl methacrylate | <125,000 | 62,500 | 0.0117 | 2.00E+01 | 234 |
| Ethylbenzene | 75,000 J | 75,000 | 0.0140 | 1.69E+02 | 2,372 |
| Iodomethane | <125,000 | 62,500 | 0.0117 | 1.39E+04 | 162,611 |
| 4-Methyl-2-pentanone (MIBK) | <250,000 | 125,000 | 0.0234 | 1.90E+04 | 444,548 |
| Methylene chloride | 170,000 JB | NC | NC | NC | NC |
| Tetrachloroethene | <125,000 | 62,500 | 0.0117 | 2.00E+02 | 2,340 |
| Toluene | <125,000 | 62,500 | 0.0117 | 5.26E+02 | 6,153 |
| 1,1,1-Trichloroethane | <125,000 | 62,500 | 0.0117 | 1.33E+03 | 15,559 |
| Trichloroethene | <125,000 | 62,500 | 0.0117 | 1.10E+03 | 12,869 |
| Vinyl chloride | <125,000 | 62,500 | 0.0117 | 2.76E+03 | 32,288 |
| Xylene | <125,000 | 62,500 | 0.0117 | 1.61E+02 | 1,883 |
| **Total** | | **5,342,500** | **1.0** | | |

Notes:
All concentrations are in ug/L (micrograms per liter).
J denotes estimated value below sample reporting limit.
B denotes analyte also present in method blank.
NA: Not analyzed
NC: Not of concern becausse constituent was never detected in groundwater sample or was detected in blank sample.
< Less than detection limit
Weight fraction = Concentration of each constituent/sum of concentration of all constituents
Assigned solubility = Solubility of pure constituent * weight fraction

## Table 4-2(a)(R)
## Representative Concentration of Surficial Soil by a Future On-site Non-residential Worker
## Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Depth (ft bgs) | | 2,4,6-Trichlorophenol | 2,4-Dichlorophenol | 2,4-Dimethylphenol | 2-Chlorophenol | 1-Methylnaphthalene | 2-Methylnaphthalene | 2-Nitrophenol | 4,6-Dinitro-2-methylphenol | 4-Chloro-3-methylphenol | Acenaphthene | Acetone | Anthracene | Antimony | Arsenic | Barium | Benzo(a)anthracene | Benzo(a)pyrene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-E (0-2') | 6/19/2000 | 0 | 2 | 410 J | 410 J | 410 J | 410 J | | | 410 J | 2100 J | 410 J | 89 J | <83 | 180 J | 11000 J | 34000 | 1000000 | 490 J | 390 J |
| VS-12S | 3/8/1994 | 2.5 | | | | | | | 63400 | | | | <3900 | 81 | 8100 | <6000 | 20000 | 420000 | 16000 | 13000 |
| VS-5S | 3/8/1994 | 2 | | | | | | | | | | | 1600 | <62 | 3500 | 7300 | 42000 | 540000 | 6100 | 4000 |
| FBCSA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | 170 | 150 | | | | 580 | | 1900 | | 16000 | | 5700 | 5500 |
| FBCSA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | <820 | 130 | | | | 610 | | 1900 | | 15000 | | 5200 | 4900 |
| FBCSA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | <590 | <590 | | | | <590 | | 180 | | 39000 | | 930 | 1100 |
| FBCSA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | <40 | <40 | | | | <40 | | 13 | | 12000 | | 37 | 37 |
| FBCSA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | 87000 | 200000 | | | | 210000 | | 45000 | | 16000 | | 12000 | 7000 |
| FBCSA06-05-2-3 | 4/17/2006 | 2 | 3 | | | | | 27 | 37 | | | | 51 | | 100 | | 12000 | | 320 | 300 |
| FBCSA06-06-2-3 | 4/17/2006 | 2 | 3 | | | | | 41 | 65 | | | | 39 | | 84 | | 27000 | | 330 | 390 |
| **Representative Concentration** | | | | 410 | 410 | 410 | 410 | 12566 | 28671 | 410 | 2100 | 410 | 21523 | 51 | 6096 | 7100 | 23300 | 653333 | 4711 | 3662 |
| **Maximum Detected Concentration** | | | | 410 | 410 | 410 | 410 | 87000 | 200000 | 410 | 2100 | 410 | 210000 | 81 | 45000 | 11000 | 42000 | 1000000 | 16000 | 13000 |
| **Concentration Ratio (Max./Rep.)** | | | | 1.0 | 1.0 | 1.0 | 1.0 | 6.9 | 7.0 | 1.0 | 1.0 | 1.0 | 9.8 | 1.6 | 7.4 | 1.5 | 1.8 | 1.5 | 3.4 | 3.6 |
| **Background Concentration** | | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3150 | 6133 | 200000 | NA | NA |
| **Exceed/Not Exceed (Rep./Background)** | | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | Exceed | Exceed | Exceed | NA | NA |

Notes:
All conc. in ug/kg (micrograms per kilogram).
NA: Not available
N/A: Not applicable
**Constituents in Bold and Underlined** were not considered in risk calculation.

## Table 4-2(a)(R)
## Representative Concentration of Surficial Soil by a Future On-site Non-residential Worker
## Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Depth (ft bgs) | | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | **Beryllium** | Cadmium | Chromium | Chrysene | Cobalt | Copper | Cyanide, Total | Dibenzo(a,h)anthracene | Dibenzofuran | Fluoranthene | Fluorene | Indeno-(1,2,3-cd)pyrene | **Iron** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-E (0-2') | 6/19/2000 | 0 | 2 | 360 J | 400 J | 300 J | 1200 | 4700 | 45000 | 540 J | 12000 | 450000 | 2000 | 120 J | 43 J | 1100 | 73 J | 250 J | 87000000 |
| VS-12S | 3/8/1994 | 2.5 | | 16000 | 8500 | 6900 | <600 | 4400 | 24000 | 15000 | 5300 | 130000 | | <3900 | <3900 | 34000 | <3900 | 7700 | |
| VS-5S | 3/8/1994 | 2 | | 4600 | 1500 | 2300 | 910 | 6700 | 270000 | 4300 | 11000 | 210000 | | <820 | <820 | 8300 | 1600 | 1500 | |
| FBCSA06-01-2-3 | 4/17/2006 | 2 | 3 | 5100 | 2800 | 5000 | | | | 6000 | | | | 1300 | | 14000 | 550 | 2600 | |
| FBCSA06-01-2-3-D | 4/17/2006 | 2 | 3 | 4800 | 2400 | 4300 | | | | 5700 | | | | 1000 | | 13000 | 420 | 2200 | |
| FBCSA06-02-2-3 | 4/17/2006 | 2 | 3 | 1200 | 560 | 1100 | | | | 1200 | | | | <590 | | 1600 | <590 | 510 | |
| FBCSA06-03-2-3 | 4/17/2006 | 2 | 3 | 37 | 23 | 33 | | | | 46 | | | | <40 | | 82 | <40 | 19 | |
| FBCSA06-04-2-3 | 4/17/2006 | 2 | 3 | 7100 | 2500 | 6900 | | | | 11000 | | | | <4400 | | 73000 | 85000 | 2600 | |
| FBCSA06-05-2-3 | 4/17/2006 | 2 | 3 | 290 | 160 | 240 | | | | 350 | | | | 71 | | 770 | 36 | 210 | |
| FBCSA06-06-2-3 | 4/17/2006 | 2 | 3 | 490 | 280 | 350 | | | | 400 | | | | 120 | | 630 | 31 | 270 | |
| **Representative Concentration** | | | | 3998 | 1912 | 2742 | 803 | 5267 | 113000 | 4454 | 9433 | 263333 | 2000 | 749 | 801 | 14648 | 8998 | 1786 | 87000000 |
| **Maximum Detected Concentration** | | | | 16000 | 8500 | 6900 | 1200 | 6700 | 270000 | 15000 | 12000 | 450000 | 2000 | 1300 | 43 | 73000 | 85000 | 7700 | 87000000 |
| **Concentration Ratio (Max./Rep.)** | | | | 4.0 | 4.4 | 2.5 | N/A | 1.3 | 2.4 | 3.4 | 1.3 | 1.7 | 1.0 | 1.7 | 0.1 | 5.0 | 9.4 | 4.3 | N/A |
| **Background Concentration** | | | | NA | NA | NA | 867 | 520 | 11100 | NA | 4967 | 21667 | NA | NA | NA | NA | NA | NA | NA |
| **Exceed/Not Exceed (Rep./Background)** | | | | NA | NA | NA | Not Exceed | Exceed | Exceed | NA | Exceed | Exceed | NA | NA | NA | NA | NA | NA | NA |

Notes:
All conc. in ug/kg (micrograms per kilogram).
NA: Not available
N/A: Not applicable
**Constituents in Bold and Underlined** were not considered in risk calculation.

## Table 4-2(a)(R)
## Representative Concentration of Surficial Soil by a Future On-site Non-residential Worker
## Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Depth (ft bgs) | | **Lead** | **Mercuric oxide** | **Mercury** | **Naphthalene** | **Nickel** | **Pentachlorophenol** | **Phenanthrene** | **Phenol** | **Pyrene** | **Selenium** | **Silver** | **Thallium** | **Tin** | **Vanadium** | **Zinc** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-E (0-2') | 6/19/2000 | 0 | 2 | 830000 | | 750 | | 39000 | 2100 J | 880 | 410 J | 1400 J | 1900 | 650 | 1200 | 800000 | 35000 | 1500000 |
| VS-12S | 3/8/1994 | 2.5 | | 400000 | 900 | | | 16000 | | 31000 | | 30000 | <1200 | <1200 | <1200 | 45000 | 20000 | 400000 |
| VS-5S | 3/8/1994 | 2 | | 1100000 | 10000 | | | 37000 | | 7300 | | 8600 | <1200 | <1200 | <1200 | 120000 | 38000 | 1300000 |
| FBCSA06-01-2-3 | 4/17/2006 | 2 | 3 | 650000 | | | 250 | | | 7400 | | 11000 | | | | | | |
| FBCSA06-01-2-3-D | 4/17/2006 | 2 | 3 | 690000 | | | 240 | | | 6900 | | 11000 | | | | | | |
| FBCSA06-02-2-3 | 4/17/2006 | 2 | 3 | 1900000 J | | | <590 | | | 820 | | 1400 | | | | | | |
| FBCSA06-03-2-3 | 4/17/2006 | 2 | 3 | 210000 | | | 8 | | | 51 | | 75 | | | | | | |
| FBCSA06-04-2-3 | 4/17/2006 | 2 | 3 | 540000 | | | 730000 | | | 230000 | | 41000 | | | | | | |
| FBCSA06-05-2-3 | 4/17/2006 | 2 | 3 | 880000 | | | 66 | | | 550 | | 580 | | | | | | |
| FBCSA06-06-2-3 | 4/17/2006 | 2 | 3 | 2800000 | | | 75 | | | 360 | | 650 | | | | | | |
| **Representative Concentration** | | | | 1000000 | 5450 | 750 | 104419 | 30667 | 2100 | 28526 | 410 | 10571 | 1033 | 617 | 800 | 321667 | 31000 | 1066667 |
| **Maximum Detected Concentration** | | | | 2800000 | 10000 | 750 | 730000 | 39000 | 2100 | 230000 | 410 | 41000 | 1900 | 650 | 1200 | 800000 | 38000 | 1500000 |
| **Concentration Ratio (Max./Rep.)** | | | | N/A | N/A | 1.0 | 7.0 | 1.3 | 1.0 | 8.1 | 1.0 | 3.9 | 1.8 | N/A | 1.5 | 2.5 | 1.2 | 1.4 |
| **Background Concentration** | | | | 152333 | 394 | NA | NA | 16333 | NA | NA | NA | NA | 633 | 867 | 633 | 7267 | 18667 | 143333 |
| **Exceed/Not Exceed (Rep./Background)** | | | | NA | NA | NA | NA | Exceed | NA | NA | NA | NA | Exceed | Not Exceed | Exceed | Exceed | Exceed | Exceed |

Notes:
All conc. in ug/kg (micrograms per kilogram).
NA: Not available
N/A: Not applicable
**Constituents in Bold and Underlined** were not considered in risk calculation.

## Table 4-2(c)(R)
## Representative Concentration of Groundwater for a Future On-site Non-residential and Construction Workers
## Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | 1,1,1-Trichloroethane | 1,2-Dichloroethane | 2,4-Dimethylphenol | 2-Butanone (MEK) | 2-Chlorophenol | 2-Methyl naphthalene | 4-Methyl-2-pentanone (MIBK) | Acenaphthene | Acetone | Anthracene | Antimony | Arsenic | Barium | Benzene | Benzo(a)anthracene | Benzo(a)pyrene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-24A | 7/24/2000 | <5 | <5 | 6.2 J | <25 | 36 | <10 | <25 | <10 | <50 | <10 | <20 | 350 | 420 | 83 | <0.34 | <0.55 |
| MW-24A | 9/20/2001 | 620 | 620 | | 3100 | | | 3100 | | 6200 | | | | | 18000 | | |
| MW-24A | 4/28/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | 11000 | | |
| MW-24A-DUP | 4/28/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | 12000 | | |
| MW-24A | 8/23/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | 8000 | | |
| MW-24A-D | 8/23/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | 7700 | | |
| MW-24A | 4/18/2006 | <10 | <10 | | <100 | | | <100 | | 130 | | | | | 7100 | | |
| **Average (MW-24A)** | | **118** | **118** | **6.2** | **738** | **36** | **5.0** | **738** | **5.0** | **1622** | **5.0** | **10** | **350** | **420** | **9126** | **0.17** | **0.28** |
| MW-25A | 7/11/2000 | <50 | <50 | <10 | <250 | 2.5 J | 53 | <250 | 0.75 J | <500 | 0.37 J | <20 | 310 | 5300 | 160 | 0.82 J | 0.71 J |
| MW-25A | 9/21/2001 | <120 | <120 | | <620 | | | <620 | | <1200 | | | | | 300 | | |
| MW-25A | 4/29/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | 210 | | |
| MW-25A | 8/23/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | 530 | | |
| **Average (MW-25A)** | | **28** | **28** | **5.0** | **171** | **2.5** | **53** | **171** | **0.8** | **368** | **0.4** | **10** | **310** | **5300** | **300** | **0.8** | **0.7** |
| VW-1 | 7/26/2000 | <5 | <5 | <10 | <25 | 9.9 J | 4 J | <25 | 3 J | <50 | 1.1 J | <20 | 15 | 830 | 15000 | 1.8 J | 1.2 J |
| VW-1 Dup | 7/26/2000 | <5 | <5 | <10 | <25 | 10 | 3.8 J | <25 | 2.7 J | <50 | 1.1 J | <20 | 4.4 | 510 | 15000 | 1.4 J | 1.1 J |
| VW-1 | 9/20/2001 | <500 | <500 | | <2500 | | | <2500 | | <5000 | | | | | 16000 | | |
| VW-1 | 4/27/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | 380 | | |
| VW-1 | 8/23/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | 210 | | |
| **Average (VW-1)** | | **56** | **56** | **5.0** | **305** | **10** | **3.9** | **305** | **2.9** | **634** | **1.1** | **10** | **9.7** | **670** | **9318** | **1.6** | **1.2** |
| VW-2 | 8/1/2000 | <5 | <5 | <10 | <25 | 1.7 J | 0.49 J | <25 | 0.72 J | <12 | <10 | 57 | 31 | 2700 | 35 J | 2.8 J | 2.7 J |
| VW-2 | 9/20/2001 | | 20 | | 100 | | | 100 | | | | | | | 100 | | |
| VW-2 | 4/27/2004 | <10 | <10 | | <100 | | | <100 | | <250 | | | | | 25 | | |
| VW-2 | 8/20/2004 | <10 | <10 | | <100 | | | <100 | | <250 | | | | | 6 J | | |
| **Average (VW-2)** | | **4** | **8** | **5** | **53** | **1.7** | **0.49** | **53** | **0.72** | **85** | **5** | **57** | **31** | **2700** | **53** | **2.8** | **2.7** |
| **PZ-5** | | **15,559** | **99,438** | | **2,608,797** | | | **444,548** | | **28,076,743** | | | | | **189,986** | | |
| **Representative Concentration** | | 3,153 | 19,930 | 5.3 | 522,013 | 13 | 16 | 89,163 | 2.3 | 5,615,890 | 2.9 | 22 | 175 | 2,273 | 41,757 | 1.3 | 1.2 |
| **Maximum Detected Concentration** | | 15,559 | 99,438 | 6.2 | 2,608,797 | 36 | 53 | 444,548 | 3.0 | 28,076,743 | 1.1 | 57 | 350 | 5,300 | 189,986 | 2.8 | 2.7 |
| **Concentration Ratio (Max./Rep.)** | | 4.9 | 5.0 | N/A | 5.0 | 2.9 | 3.4 | 5.0 | 1.3 | 5.0 | N/A | N/A | N/A | N/A | 4.5 | N/A | N/A |

Note:
N/A: Not applicable
All conc. in ug/L (micrograms/liter)
**Constituents in Bold and Underlined** were not considered in risk calculation.

## Table 4-2(c)(R)
## Representative Concentration of Groundwater for a Future On-site Non-residential and Construction Workers
## Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Beryllium | Bis(2-ethylhexyl)phthalate | Bromodichloromethane | Bromoform | Butylbenzylphthalate | Cadmium | Carbon disulfide | Carbon tetrachloride | Chlorobenzene | Chloroform | Chloromethane | Chromium | Chrysene | cis-1,2-Dichloroethene | Cobalt | Copper | Dibenzo(a,h)anthracene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-24A | 7/24/2000 | <0.35 | 1.2 J | <10 | <4 | <2.6 | <5 | <5 | <10 | <5 | <5 | <5 | 21 | <5 | <10 | <10 | <10 | 46 | 2 | <20 | <10 |
| MW-24A | 9/20/2001 | | | | | | 620 | 620 | | | 620 | 620 | 17000 | 620 | 1200 | | | 620 | | | |
| MW-24A | 4/28/2004 | | | | | | <100 | <100 | | | <100 | <100 | 2700 | <100 | <100 | | | <100 | | | |
| MW-24A-DUP | 4/28/2004 | | | | | | <100 | <100 | | | <100 | <100 | 2600 | <100 | <100 | | | <100 | | | |
| MW-24A | 8/23/2004 | | | | | | <100 | <100 | | | <100 | <100 | 1600 | <100 | <100 | | | <100 | | | |
| MW-24A-D | 8/23/2004 | | | | | | <100 | <100 | | | <100 | <100 | 1500 | <100 | <100 | | | <100 | | | |
| MW-24A | 4/18/2006 | | | | | | <10 | <10 | | | <20 | <10 | 1900 | <10 | <10 | | | <10 | | | |
| **Average (MW-24A)** | | **0.18** | **1.2** | **5.0** | **2.0** | **1.3** | **118** | **118** | **5.0** | **2.5** | **119** | **118** | **3903** | **118** | **201** | **5.0** | **5.0** | **124** | **2.0** | **10** | **5.0** |
| MW-25A | 7/11/2000 | 0.61 J | 0.7 J | <10 | 17 | 8.7 J | <50 | <50 | 0.6 J | 8 | <50 | <50 | 950 | <50 | <100 | 460 | 0.92 J | <50 | 160 | 580 | <10 |
| MW-25A | 9/21/2001 | | | | | | <120 | <120 | | | <120 | <120 | 3400 | <120 | <250 | | | <120 | | | |
| MW-25A | 4/29/2004 | | | | | | <25 | <25 | | | <25 | <25 | 2800 | <25 | <25 | | | <25 | | | |
| MW-25A | 8/23/2004 | | | | | | <25 | <25 | | | <25 | <25 | 2400 | <25 | <25 | | | <25 | | | |
| **Average (MW-25A)** | | **0.6** | **0.7** | **5.0** | **17.0** | **8.7** | **28** | **28** | **0.6** | **8.0** | **28** | **28** | **2388** | **28** | **50** | **460** | **0.9** | **28** | **160** | **580** | **5.0** |
| VW-1 | 7/26/2000 | 1.5 J | <10 | 1.8 J | 1.2 | 4.5 J | <5 | <5 | 1.2 J | 2.9 | <5 | <5 | 4800 | <5 | 6.8 J | 40 | 2.1 J | <5 | 14 | 71 | <10 |
| VW-1 Dup | 7/26/2000 | 0.98 J | <10 | 1.4 J | <4 | 3.9 J | <5 | <5 | 0.6 J | <5 | <5 | <5 | 4800 | <5 | 5.5 J | 6.7 | 1.6 J | <5 | 2.4 | 19 | <10 |
| VW-1 | 9/20/2001 | | | | | | <500 | <500 | | | <500 | <500 | 3400 | <500 | <1000 | | | <500 | | | |
| VW-1 | 4/27/2004 | | | | | | <25 | <25 | | | <25 | <25 | 2200 | <25 | <25 | | | <25 | | | |
| VW-1 | 8/23/2004 | | | | | | <25 | <25 | | | <25 | <25 | 2100 | <25 | <25 | | | <25 | | | |
| **Average (VW-1)** | | **1.2** | **5.0** | **1.6** | **1.6** | **4.2** | **56** | **56** | **0.9** | **2.7** | **56** | **56** | **3460** | **56** | **175** | **23** | **1.9** | **56** | **8.2** | **45** | **5.0** |
| VW-2 | 8/1/2000 | 2.6 J | 2.4 J | 3.2 J | 1.8 | 14 | <5 | <5 | <10 | 4.8 | <5 | <5 | 970 | <5 | <10 | 49 | 3.2 J | <5 | 32 | 250 | 0.97 J |
| VW-2 | 9/20/2001 | | | | | | | 20 | | | | 20 | | 20 | | | | | | | |
| VW-2 | 4/27/2004 | | | | | | <10 | <10 | | | 7.9 J | <10 | 1300 | <10 | <10 | | | <10 | | | |
| VW-2 | 8/20/2004 | | | | | | <10 | <10 | | | <10 | <10 | 1400 | <10 | <10 | | | <10 | | | |
| **Average (VW-2)** | | **2.6** | **2.4** | **3.2** | **1.8** | **14** | **4.2** | **8.1** | **5** | **4.8** | **3.8** | **8.1** | **1223** | **8.1** | **5** | **49** | **3.2** | **4.2** | **32** | **250** | **0.97** |
| **PZ-5** | | | | | | | **78,849** | **36,266** | | | **27,843** | **9,277** | **273,879** | **92,653** | **191,858** | | | **40,945** | | | |
| **Representative Concentration** | | 1.2 | 2.3 | 3.7 | 5.6 | 7.1 | 15,811 | 7,295 | 2.9 | 4.5 | 5,610 | 1,897 | 56,971 | 18,573 | 38,458 | 134 | 2.7 | 8,231 | 51 | 221 | 4.0 |
| **Maximum Detected Concentration** | | 2.6 | 2.4 | 3.2 | 17 | 9 | 78,849 | 36,266 | 1.2 | 8 | 27,843 | 9,277 | 273,879 | 92,653 | 191,858 | 460 | 3.2 | 40,945 | 160 | 580 | 1.0 |
| **Concentration Ratio (Max./Rep.)** | | 2.2 | N/A | N/A | N/A | N/A | 5.0 | 5.0 | N/A | N/A | 5.0 | 4.9 | 4.8 | 5.0 | 5.0 | N/A | 1.2 | 5.0 | N/A | N/A | N/A |

Note:
N/A: Not applicable
All conc. in ug/L (micrograms/liter)
**Constituents in Bold and Underlined** were not considered in risk calculation.

## Table 4-2(c)(R)
## Representative Concentration of Groundwater for a Future On-site Non-residential and Construction Workers
## Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Dibenzofuran | Dibromochloromethane | Diethylphthalate | Di-n-butylphthalate | Di-n-octylphthalate | Ethyl methacrylate | Ethylbenzene | Fluoranthene | Fluorene | Indeno-(1,2,3-cd)pyrene | Iodomethane | Iron | Lead | Methylene chloride | Naphthalene | Nickel | p-Chloroaniline | Phenanthrene | Phenol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-24A | 7/24/2000 | <10 | <5 | <10 | 0.34 J | 0.48 J | <5 | <5 | <10 | <10 | <1 | <5 | 11000 | 2.3 | <5 | 12 | 44 | 97 | <10 | 140 |
| MW-24A | 9/20/2001 | | 620 | | | | 620 | 1400 | | | | 620 | | | 620 | | | | | |
| MW-24A | 4/28/2004 | | <100 | | | | <100 | 900 | | | | <100 | | | <500 | | | | | |
| MW-24A-DUP | 4/28/2004 | | <100 | | | | <100 | 920 | | | | <100 | | | <500 | | | | | |
| MW-24A | 8/23/2004 | | <100 | | | | <100 | 810 | | | | <100 | | | <500 | | | | | |
| MW-24A-D | 8/23/2004 | | <100 | | | | <100 | 810 | | | | <100 | | | <500 | | | | | |
| MW-24A | 4/18/2006 | | <10 | | | | <10 | 950 | | | | <50 | | | <50 | | | | | |
| **Average (MW-24A)** | | **5.0** | **118** | **5.0** | **0.3** | **0.5** | **118** | **828** | **5.0** | **5.0** | **0.5** | **121** | **11000** | **2** | **235** | **12.0** | **44** | **97** | **5.0** | **140** |
| MW-25A | 7/11/2000 | 0.37 J | <50 | | 0.75 J | 0.84 J | <50 | 160 | 0.94 J | 0.7 J | 0.61 J | <50 | 460000 | 600 | <15 | 35 | 0.47 | <20 | 1.8 J | <10 |
| MW-25A | 9/21/2001 | | <120 | | | | <120 | 25 J | | | | <120 | | | <120 | | | | | |
| MW-25A | 4/29/2004 | | <25 | | | | <25 | <25 | | | | <25 | | | <120 | | | | | |
| MW-25A | 8/23/2004 | | <25 | | | | <25 | 55 | | | | <25 | | | <120 | | | | | |
| **Average (MW-25A)** | | **0.4** | **28** | **--** | **0.8** | **0.8** | **28** | **63** | **0.9** | **0.7** | **0.6** | **28** | **460000** | **600** | **47** | **35** | **0.47** | **10** | **1.8** | **5.0** |
| VW-1 | 7/26/2000 | 1.1 J | <5 | <10 | <10 | 0.94 J | <5 | 8 | 4.2 J | 3.1 J | 0.83 J | <5 | 41000 J | 370 J | <5 | 53 | 28 | 51 J | 4 J | 110 |
| VW-1 Dup | 7/26/2000 | 1.1 J | <5 | <10 | <10 | <10 | <5 | 6.4 | 3.8 J | 3.2 J | 0.64 J | <5 | 13000 J | 66 J | <5 | 47 | 4.9 | 47 J | 3.7 J | 120 |
| VW-1 | 9/20/2001 | | <500 | | | | <500 | <500 | | | | <500 | | | <500 | | | | | |
| VW-1 | 4/27/2004 | | <25 | | | | <25 | <25 | | | | <25 | | | <120 | | | | | |
| VW-1 | 8/23/2004 | | <25 | | | | <25 | <25 | | | | <25 | | | <120 | | | | | |
| **Average (VW-1)** | | **1.1** | **56** | **5.0** | **5.0** | **3.0** | **56** | **58** | **4.0** | **3.2** | **0.7** | **56** | **27000** | **218** | **75** | **50** | **16** | **49** | **3.9** | **115** |
| VW-2 | 8/1/2000 | <10 | <5 | 0.69 J | <10 | 0.74 J | <5 | <5 | 6.1 J | <10 | 2.1 J | <5 | 54000 | 780 | <2.2 | 0.71 J | 130 | 2.1 J | <10 | <10 |
| VW-2 | 9/20/2001 | | | | | | 20 | | | | | 20 | | | | | | | | |
| VW-2 | 4/27/2004 | | <10 | | | | <10 | <10 | | | | <10 | | | <50 | | | | | |
| VW-2 | 8/20/2004 | | <10 | | | | <10 | <10 | | | | <10 | | | <50 | | | | | |
| **Average (VW-2)** | | **5** | **4** | **0.69** | **5** | **0.74** | **8.1** | **4.2** | **6.1** | **5** | **2.1** | **8.1** | **54000** | **780** | **17** | **0.71** | **130** | **2.1** | **5** | **5** |
| PZ-5 | | | **30,416** | | | | **234** | **2,372** | | | | **162,611** | | | | | | | | |
| **Representative Concentration** | | 2.9 | 6,124 | 3.6 | 2.8 | 1.3 | 89 | 665 | 4.0 | 3.5 | 1.0 | 32,565 | 138,000 | 400 | 94 | 24 | 48 | 40 | 3.9 | 66 |
| **Maximum Detected Concentration** | | 1.1 | 30,416 | 0.69 | 0.75 | 0.94 | 620 | 2,372 | 6.1 | 3.2 | 2.1 | 162,611 | 460,000 | 780 | 620 | 53 | 130 | 97 | 4.0 | 140 |
| **Concentration Ratio (Max./Rep.)** | | 0.4 | 5.0 | N/A | N/A | N/A | 7.0 | 3.6 | N/A | 0.9 | N/A | 5.0 | N/A | N/A | 6.6 | 2.2 | N/A | N/A | 1.0 | N/A |

Note:
N/A: Not applicable
All conc. in ug/L (micrograms/liter)
**Constituents in Bold and Underlined** were not considered in risk calculation.

## Table 4-2(c)(R)
## Representative Concentration of Groundwater for a Future On-site Non-residential and Construction Workers
## Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Pyrene | Selenium | Tetrachloroethene | Thallium | Tin | Toluene | Trichloroethene | Vanadium | Vinyl chloride | Xylene | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-24A | 7/24/2000 | <10 | <10 | <5 | <10 | <50 | 0.85 J | 2.5 J | <10 | <0.5 | 14 | 56 |
| MW-24A | 9/20/2001 | | | 620 | | | 620 | 620 | | 62 | 4500 | |
| MW-24A | 4/28/2004 | | | <100 | | | 140 | <100 | | <100 | 3000 | |
| MW-24A-DUP | 4/28/2004 | | | <100 | | | 140 | <100 | | <100 | 3000 | |
| MW-24A | 8/23/2004 | | | <100 | | | 120 | <100 | | <100 | 2400 | |
| MW-24A-D | 8/23/2004 | | | <100 | | | 120 | <100 | | <100 | 2400 | |
| MW-24A | 4/18/2006 | | | <10 | | | 180 | <10 | | <10 | 2300 | |
| **Average (MW-24A)** | | **5.0** | **5.0** | **118** | **5.0** | **25.0** | **189** | **118** | **5** | **38** | **2516** | **56** |
| MW-25A | 7/11/2000 | 0.9 J | 13 | <50 | 9.9 | 2.3 | 16 J | <50 | 830 | <5 | 370 | 1500 |
| MW-25A | 9/21/2001 | | | <120 | | | 30 J | <120 | | <12 | 66 J | |
| MW-25A | 4/29/2004 | | | <25 | | | <25 | <25 | | <25 | 40 J | |
| MW-25A | 8/23/2004 | | | <25 | | | <25 | <25 | | <25 | 43 J | |
| **Average (MW-25A)** | | **0.9** | **13.0** | **28** | **9.9** | **2** | **14** | **28** | **830** | **8.4** | **130** | **1500** |
| VW-1 | 7/26/2000 | 3.9 J | <10 | <5 | <10 | 70 | 5.4 | <5 | 38 | <0.5 | 24 | 410 J |
| VW-1 Dup | 7/26/2000 | 3.7 J | <10 | <5 | <10 | <50 | 4.3 J | <5 | 7.9 | <0.5 | 19 | 77 J |
| VW-1 | 9/20/2001 | | | <500 | | | <500 | <500 | | <50 | <1000 | |
| VW-1 | 4/27/2004 | | | <25 | | | <25 | <25 | | <25 | <50 | |
| VW-1 | 8/23/2004 | | | <25 | | | <25 | <25 | | <25 | <50 | |
| **Average (VW-1)** | | **3.8** | **5.0** | **56** | **5.0** | **48** | **57** | **56** | **23** | **10** | **119** | **244** |
| VW-2 | 8/1/2000 | 6.3 J | <10 | <5 | <10 | 62 | 1.9 J | 0.7 J | 64 | <0.5 | <10 | 1000 |
| VW-2 | 9/20/2001 | | | | | | | | | | | |
| VW-2 | 4/27/2004 | | | <10 | | | <10 | <10 | | <10 | <20 | |
| VW-2 | 8/20/2004 | | | <10 | | | <10 | <10 | | <10 | <20 | |
| **Average (VW-2)** | | **6.3** | **5** | **4.2** | **5** | **62** | **4.0** | **3.6** | **64** | **3.4** | **8.3** | **1000** |
| PZ-5 | | | | **2,340** | | | **6,153** | **12,869** | | **32,288** | **1,883** | |
| **Representative Concentration** | | 4.0 | 7.0 | 509 | 6.2 | 34 | 1,283 | 2,615 | 230 | 6,470 | 931 | 700 |
| **Maximum Detected Concentration** | | 6.3 | 13 | 2,340 | 10 | 70 | 6,153 | 12,869 | 830 | 32,288 | 4,500 | 1,500 |
| **Concentration Ratio (Max./Rep.)** | | 1.6 | N/A | 4.6 | N/A | N/A | 4.8 | 4.9 | N/A | 5.0 | 4.8 | N/A |

Note:
N/A: Not applicable
All conc. in ug/L (micrograms/liter)
**Constituents in Bold and Underlined**
were not considered in risk
calculation.

**Table 4-2(d)(R)**
**Representative Concentration of Soil by a Future On-site Construction Worker**
**Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | 1,2,4-Trichlorobenzene | 2,4,6-Trichlorophenol | 2,4-Dichlorophenol | 2,4-Dimethylphenol | 2-Chlorophenol | 1-Methylnaphthalene | 2-Methyl naphthalene | 2-Nitrophenol | 4,6-Dinitro-2-methylphenol | 4-Chloro-3-methylphenol | 4-Methyl-2-pentanone (MIBK) | Acenaphthene | Acetone | Anthracene | Antimony | Arsenic | Barium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-E (0-2') | 6/19/2000 | 0 | 2 | <410 | 410 J | 410 J | 410 J | 410 J | | <410 | 410 J | 2100 J | 410 J | <42 | 89 J | <83 | 180 J | 11000 J | 34000 | 1000000 |
| VS-1 | 3/6/1991 | 10.5 | 12.5 | <15000 | <15000 | <15000 | <15000 | <15000 | | 41000 | <15000 | <77000 | <15000 | <420000 | <15000 | <850000 | <15000 | <7400 | 20000 | 580000 |
| VS-10D | 3/8/1994 | 8 | | <10000 | | | | | | <10000 | | | | <160000 | <10000 | <160000 | <10000 | <7900 | 9300 | 380000 |
| VS-10S | 3/8/1994 | 3 | | <410 | | | | | | 870 | | | | <62 | <410 | <62 | 560 | <6200 | 5300 | 150000 |
| VS-11D | 3/8/1994 | 6.5 | | <710 | | | | | | <710 | | | | <54 | <710 | <54 | 1700 | <5400 | 5100 | 73000 |
| VS-11S | 3/8/1994 | 4 | | <410 | | | | | | <410 | | | | <62 | <410 | 170 | <410 | 11000 | 4000 | 400000 |
| VS-12D | 3/8/1994 | 6.5 | | <4600 | | | | | | <4600 | | | | 380 | <4600 | <350 | 4900 | <6900 | 13000 | 3400000 |
| VS-12M | 3/8/1994 | 4 | | <410 | | | | | | <460 | | | | <350 | <460 | 540 | 860 | <6900 | 12000 | 770000 |
| VS-12S | 3/8/1994 | 2.5 | | <3900 | | | | | | <3900 | | | | <60 | <3900 | 81 | 8100 | <6000 | 20000 | 420000 |
| VS-2 | 3/7/1991 | 7 | 9 | <12000 | <12000 | <12000 | <12000 | <12000 | | <12000 | <12000 | <60000 | <12000 | <63 | <12000 | 29 | <12000 | <5400 | 7600 | 290000 |
| VS-3 | 3/8/1991 | 9 | 11 | <450 | <450 | <450 | <450 | <450 | | <450 | <450 | <2200 | <450 | <68 | <450 | <140 | 970 | <5900 | 8000 | 490000 |
| VS-4 | 3/8/1991 | 9 | 11 | <12000 | <12000 | <12000 | <12000 | <12000 | | <12000 | <12000 | <60000 | <12000 | <330 | <12000 | 280 | <12000 | <5700 | 8000 | 1600000 |
| VS-5D | 3/8/1994 | 6 | | <23000 | | | | | | <23000 | | | | <69 | 43000 | <69 | 110000 | <6900 | 7100 | 670000 |
| VS-5M | 3/8/1994 | 4 | | <480 | | | | | | <480 | | | | <72 | <480 | <72 | 820 | <7200 | 5900 | 340000 |
| VS-5S | 3/8/1994 | 2 | | <820 | | | | | | <820 | | | | <62 | 1600 | <62 | 3500 | 7300 | 42000 | 540000 |
| VS-6D | 3/8/1994 | 6 | | <1900 | | | | | | <1900 | | | | <58 | <1900 | 200 | 5100 | <5800 | 4600 | 470000 |
| VS-6S | 3/8/1994 | 3.5 | | 900 | | | | | | <350 | | | | <54 | <350 | <54 | <350 | <5400 | 5700 | 440000 |
| VS-7D | 3/8/1994 | 7 | | <430 | | | | | | <430 | | | | <32000 | <430 | <32000 | 580 | <6500 | 8900 | 130000 |
| VS-7M | 3/8/1994 | 4 | | <20000 | | | | | | 75000 | | | | <62 | 74000 | 210 | <20000 | 7900 | 15000 | 1600000 |
| VS-7S | 3/8/1994 | 3 | | <5100 | | | | | | <5100 | | | | <77 | 6400 | 170 | 18000 | 25000 | 16000 | 1700000 |
| VS-8D | 3/8/1994 | 8 | | <8900 | | | | | | <8900 | | | | <140000 | <8900 | <140000 | <8900 | <6800 | 14000 | 260000 |
| VS-8S | 3/8/1994 | 3 | | <510 | | | | | | <510 | | | | <9600 | <510 | <9600 | 1700 | 45000 | 20000 | 320000 |
| VS-9D | 3/8/1994 | 7 | | <9300 | | | | | | <9300 | | | | <350000 | <9300 | <350000 | <9300 | <7000 | 9200 | 1400000 |
| VS-9M | 3/8/1994 | 5 | | <9300 | | | | | | <9300 | | | | <1800000 | <9300 | <1800000 | <9300 | <7000 | 5500 | 210000 |
| VS-9S | 3/8/1994 | 4 | | <3900 | | | | | | <3900 | | | | <300000 | <3900 | <300000 | <3900 | 6400 | 6900 | 250000 |
| FBCSA04-01-10 | 6/14/2004 | 10 | | | | | | | | | | | | <2600 | | <5300 | | | | |
| FBCSA04-01-5 | 6/14/2004 | 5 | | | | | | | | | | | | <4000 | | <8000 | | | | |
| FBCSA04-01-5-DUP | 6/14/2004 | 5 | | | | | | | | | | | | <3200 | | <6500 | | | | |
| FBCSA04-02-10 | 6/14/2004 | 10 | | | | | | | | | | | | <6300 | | <13000 | | | | |
| FBCSA04-02-5 | 6/14/2004 | 5 | | | | | | | | | | | | <2900 | | <5800 | | | | |
| FBCSA04-03-11 | 6/14/2004 | 11 | | | | | | | | | | | | <60000 | | <120000 | | | | |
| FBCSA04-03-9 | 6/14/2004 | 9 | | | | | | | | | | | | <66000 | | <130000 | | | | |
| FBCSA04-04-4 | 6/14/2004 | 4 | | | | | | | | | | | | <31 | | <62 | | | | |
| FBCSA04-04-8 | 6/14/2004 | 8 | | | | | | | | | | | | <22000 | | <43000 | | | | |
| FBCSA04-05-5 | 6/14/2004 | 5 | | | | | | | | | | | | <1500 | | <3000 | | | | |
| FBCSA04-05-9 | 6/14/2004 | 9 | | | | | | | | | | | | <71000 | | <140000 | | | | |
| FBCSA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | 170 | 150 | | | | | 580 | | 1900 | | 16000 | |
| FBCSA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | <820 | 130 | | | | | 610 | | 1900 | | 15000 | |
| FBCSA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | <590 | <590 | | | | | <590 | | 180 | | 39000 | |
| FBCSA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | <40 | <40 | | | | | <40 | | 13 | | 12000 | |
| FBCSA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | 87000 | 200000 | | | | | 210000 | | 45000 | | 16000 | |
| FBCSA06-05-2-3 | 4/17/2006 | 2 | 3 | | | | | | 27 | 37 | | | | | 51 | | 100 | | 12000 | |
| FBCSA06-06-2-3 | 4/17/2006 | 2 | 3 | | | | | | 41 | 65 | | | | | 39 | | 84 | | 27000 | |
| **Representative Concentration** | | | | 2915 | 4027 | 4027 | 4027 | 4027 | 12566 | 11626 | 4027 | 20340 | 4027 | 47964 | 12006 | 57230 | 8023 | 6870 | 13878 | 715320 |
| **Maximum Detected Concentration** | | | | 900 | 410 | 410 | 410 | 410 | 410 | 200000 | 410 | 2100 | 410 | 380 | 210000 | 540 | 110000 | 45000 | 42000 | 3400000 |
| **Concentration Ratio (Max./Rep.)** | | | | 0.3 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | **17** | 0.1 | 0.1 | 0.1 | 0.0079 | **17** | 0.009 | **14** | 6.6 | 3.0 | 4.8 |
| **Background Concentration** | | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3150 | 6133 | 200000 |
| **Exceed/Not Exceed (Rep./Background)** | | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | Exceed | Exceed | Exceed |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface
NA: Not available
N/A: Not applicable
**Constituents in Bold and Underlined** were not considered in risk calculation.

Table 4-2(d)(R)
Representative Concentration of Soil by a Future On-site Construction Worker
Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Depth (ft bgs) | | Benzene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Beryllium | Cadmium | Carbon disulfide | Chlorobenzene | Chromium | Chrysene | Cobalt | Copper | Cyanide, Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-E (0-2') | 6/19/2000 | 0 | 2 | <8.3 | 490 J | 390 J | 360 J | 400 J | 300 J | 1200 | 4700 | <8.3 | <8.3 | 45000 | 540 J | 12000 | 450000 | 2000 |
| VS-1 | 3/6/1991 | 10.5 | 12.5 | <42000 | <15000 | <15000 | <15000 | <15000 | <15000 | 1500 | 6400 | <42000 | 620000 | 19000 | <15000 | 9200 | 180000 | <1700 |
| VS-10D | 3/8/1994 | 8 | | <16000 | <10000 | <10000 | <10000 | <10000 | <10000 | 2800 | 1100 | <16000 | 160000 | 18000 | <10000 | 7900 | 120000 | |
| VS-10S | 3/8/1994 | 3 | | <6.2 | 3000 | 3800 | 5000 | 1500 | 900 | <620 | 750 | <6.2 | <6.2 | 18000 | 2600 | 5700 | 360000 | |
| VS-11D | 3/8/1994 | 6.5 | | <5.4 | 4600 | 2800 | 3400 | 1300 | 1500 | <540 | 810 | <5.4 | <5.4 | 6800 | 3300 | 1400 | 19000 | |
| VS-11S | 3/8/1994 | 4 | | <6.2 | <410 | 430 | 880 | <410 | <410 | 720 | 11000 | <6.2 | <6.2 | 40000 | 440 | 20000 | 130000 | |
| VS-12D | 3/8/1994 | 6.5 | | <35 | 35000 | 24000 | 27000 | 9600 | 12000 | 1900 | 1800 | <35 | <35 | 15000 | 26000 | 7400 | 370000 | |
| VS-12M | 3/8/1994 | 4 | | <35 | 1700 | 1800 | 2300 | 580 | <460 | 2600 | 5400 | <35 | <35 | 26000 | 1500 | 9600 | 2400000 | |
| VS-12S | 3/8/1994 | 2.5 | | <6 | 16000 | 13000 | 16000 | 8500 | 6900 | <600 | 4400 | <6 | <6 | 24000 | 15000 | 5300 | 130000 | |
| VS-2 | 3/7/1991 | 7 | 9 | <6.3 | <12000 | <12000 | <12000 | <12000 | <12000 | 590 | 8300 | 8.4 | <6.3 | 8000 | <12000 | 4700 | 44000 | <1300 |
| VS-3 | 3/8/1991 | 9 | 11 | <6.8 | 2100 | 1800 | 1600 | <450 | 1500 | 900 | 4300 | 12 | <6.8 | 14000 | <2100 | 7900 | 36000 | <1400 |
| VS-4 | 3/8/1991 | 9 | 11 | <33 | <12000 | <12000 | <12000 | <12000 | <12000 | 870 | 5000 | <33 | <33 | 48000 | <12000 | 9900 | 66000 | <1400 |
| VS-5D | 3/8/1994 | 6 | | <6.9 | 150000 | 88000 | 100000 | 32000 | 47000 | 1500 | 1900 | <6.9 | <6.9 | 14000 | 110000 | 5700 | 47000 | |
| VS-5M | 3/8/1994 | 4 | | <7.2 | 2000 | 1600 | 2000 | 580 | 730 | 940 | 1300 | <7.2 | <7.2 | 16000 | 1700 | 5000 | 51000 | |
| VS-5S | 3/8/1994 | 2 | | <6.2 | 6100 | 4000 | 4600 | 1500 | 2300 | 910 | 6700 | <6.2 | <6.2 | 270000 | 4300 | 11000 | 210000 | |
| VS-6D | 3/8/1994 | 6 | | <5.8 | 9400 | 6000 | 7000 | 2200 | 3400 | <580 | 980 | <5.8 | <5.8 | 9200 | 7000 | 1800 | 30000 | |
| VS-6S | 3/8/1994 | 3.5 | | <5.4 | <350 | <350 | <350 | <350 | <350 | <540 | 1100 | <5.4 | <5.4 | 12000 | <350 | 6800 | 43000 | |
| VS-7D | 3/8/1994 | 7 | | <3200 | 2200 | 1400 | 1800 | 590 | 800 | <650 | <650 | <3200 | 10000 | 13000 | 1600 | 9500 | 31000 | |
| VS-7M | 3/8/1994 | 4 | | <6.2 | <20000 | <20000 | <20000 | <20000 | <20000 | <620 | 6800 | <6.2 | 15 | 42000 | <20000 | 5300 | 540000 | |
| VS-7S | 3/8/1994 | 3 | | <7.7 | 43000 | 24000 | 30000 | 10000 | 15000 | 2700 | 3800 | <7.7 | <7.7 | 43000 | 34000 | 13000 | 370000 | |
| VS-8D | 3/8/1994 | 8 | | <14000 | <8900 | <8900 | <8900 | <8900 | <8900 | 760 | <680 | <14000 | 80000 | 16000 | <8900 | 9100 | 26000 | |
| VS-8S | 3/8/1994 | 3 | | <960 | 3200 | 3100 | 4100 | 1400 | 1300 | 3100 | 4200 | <960 | 9000 | 24000 | 2700 | 11000 | 100000 | |
| VS-9D | 3/8/1994 | 7 | | <35000 | <9300 | <9300 | <9300 | <9300 | <9300 | 950 | 8500 | <35000 | 1400000 | 24000 | <9300 | 13000 | 510000 | |
| VS-9M | 3/8/1994 | 5 | | <180000 | <9300 | <9300 | <9300 | <9300 | <9300 | 2000 | 1500 | <180000 | 1500000 | 15000 | <9300 | 7500 | 410000 | |
| VS-9S | 3/8/1994 | 4 | | <30000 | <3900 | <3900 | <3900 | <3900 | <3900 | <590 | 3300 | <30000 | 750000 | 21000 | <3900 | 4900 | 180000 | |
| FBCSA04-01-10 | 6/14/2004 | 10 | | 7700 | | | | | | | | <530 | 150000 | | | | | |
| FBCSA04-01-5 | 6/14/2004 | 5 | | 2300 | | | | | | | | <800 | 190000 | | | | | |
| FBCSA04-01-5-DUP | 6/14/2004 | 5 | | 25000 | | | | | | | | <650 | 340000 | | | | | |
| FBCSA04-02-10 | 6/14/2004 | 10 | | 690 J | | | | | | | | <1300 | 15000 | | | | | |
| FBCSA04-02-5 | 6/14/2004 | 5 | | 2000 | | | | | | | | <580 | 68000 | | | | | |
| FBCSA04-03-11 | 6/14/2004 | 11 | | 5600 J | | | | | | | | <12000 | 72000 | | | | | |
| FBCSA04-03-9 | 6/14/2004 | 9 | | 20000 | | | | | | | | <13000 | 340000 | | | | | |
| FBCSA04-04-4 | 6/14/2004 | 4 | | 2 J | | | | | | | | <6.2 | 13 | | | | | |
| FBCSA04-04-8 | 6/14/2004 | 8 | | 2500 J | | | | | | | | <4300 | 170000 | | | | | |
| FBCSA04-05-5 | 6/14/2004 | 5 | | 5700 | | | | | | | | <300 | 22000 | | | | | |
| FBCSA04-05-9 | 6/14/2004 | 9 | | 3000 J | | | | | | | | <14000 | 74000 | | | | | |
| FBCSA06-01-2-3 | 4/17/2006 | 2 | 3 | | 5700 | 5500 | 5100 | 2800 | 5000 | | | | | | 6000 | | | |
| FBCSA06-01-2-3-D | 4/17/2006 | 2 | 3 | | 5200 | 4900 | 4800 | 2400 | 4300 | | | | | | 5700 | | | |
| FBCSA06-02-2-3 | 4/17/2006 | 2 | 3 | | 930 | 1100 | 1200 | 560 | 1100 | | | | | | 1200 | | | |
| FBCSA06-03-2-3 | 4/17/2006 | 2 | 3 | | 37 | 37 | 37 | 23 | 33 | | | | | | 46 | | | |
| FBCSA06-04-2-3 | 4/17/2006 | 2 | 3 | | 12000 | 7000 | 7100 | 2500 | 6900 | | | | | | 11000 | | | |
| FBCSA06-05-2-3 | 4/17/2006 | 2 | 3 | | 320 | 300 | 290 | 160 | 240 | | | | | | 350 | | | |
| FBCSA06-06-2-3 | 4/17/2006 | 2 | 3 | | 330 | 390 | 490 | 280 | 350 | | | | | | 400 | | | |
| **Representative Concentration** | | | | 6532 | 11059 | 7679 | 8607 | 4052 | 5074 | 1132 | 3788 | 5123 | 165837 | 32040 | 8963 | 8184 | 274120 | 980 |
| **Maximum Detected Concentration** | | | | 25000 | 150000 | 88000 | 100000 | 32000 | 47000 | 3100 | 11000 | 12 | 1500000 | 270000 | 110000 | 20000 | 2400000 | 2000 |
| **Concentration Ratio (Max./Rep.)** | | | | 3.8 | **14** | 11.5 | 11.6 | 7.9 | 9.3 | 2.7 | 2.9 | 0.0023 | 9.0 | 8.4 | 12 | 2.4 | 8.8 | 2.0 |
| **Background Concentration** | | | | NA | NA | NA | NA | NA | NA | 867 | 520 | NA | NA | 11100 | NA | 4967 | 21667 | NA |
| **Exceed/Not Exceed (Rep./Background)** | | | | NA | NA | NA | NA | NA | NA | Exceed | Exceed | NA | NA | Exceed | NA | Exceed | Exceed | NA |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface
NA: Not available
N/A: Not applicable
**Constituents in Bold and Unerlined** were not considered in risk calculation.

**Table 4-2(d)(R)**
**Representative Concentration of Soil by a Future On-site Construction Worker**
**Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | Dibenzo(a,h)anthracene | Dibenzofuran | Ethyl methacrylate | Ethylbenzene | Fluoranthene | Fluorene | Indeno-(1,2,3-cd)pyrene | Iodomethane | Iron | Lead | Mercuric oxide | Mercury | Methylene chloride | Naphthalene | Nickel | Nitrobenzene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-E (0-2') | 6/19/2000 | 0 | 2 | 120 J | 43 J | <8.3 | <8.3 | 1100 | 73 J | 250 J | <8.3 | 87000000 | 830000 | | 750 | <8.3 | <410 | 39000 | <410 |
| VS-1 | 3/6/1991 | 10.5 | 12.5 | <15000 | <15000 | 57000 | <42000 | 24000 | <15000 | <15000 | 49000 | | 1200000 | | 950 | <42000 | 40000 | 27000 | <15000 |
| VS-10D | 3/8/1994 | 8 | | <10000 | <10000 | <16000 | <16000 | <10000 | <10000 | <10000 | <16000 | | 440000 | 34 | | <16000 | <10000 | 30000 | <10000 |
| VS-10S | 3/8/1994 | 3 | | 420 | <410 | <6.2 | <6.2 | 5000 | <410 | 1600 | <6.2 | | 58000 | 250 | | <6.2 | <410 | 16000 | <410 |
| VS-11D | 3/8/1994 | 6.5 | | <710 | <710 | <5.4 | <5.4 | 7000 | <710 | 1300 | <5.4 | | 82000 | 160 | | <5.4 | <710 | 19000 | <710 |
| VS-11S | 3/8/1994 | 4 | | <410 | <410 | <6.2 | <6.2 | 1100 | <410 | <410 | <6.2 | | 280000 | 1800 | | <6.2 | <410 | 24000 | 620 |
| VS-12D | 3/8/1994 | 6.5 | | <4600 | <4600 | <35 | <35 | 49000 | <4600 | 9800 | <35 | | 280000 | 91 | | <35 | <4600 | 61000 | <4600 |
| VS-12M | 3/8/1994 | 4 | | <460 | <460 | <35 | <35 | 3300 | <460 | 720 | <35 | | 590000 | 540 | | <35 | <460 | 32000 | <460 |
| VS-12S | 3/8/1994 | 2.5 | | <3900 | <3900 | <6 | <6 | 34000 | <3900 | 7700 | <6 | | 400000 | 900 | | 6.9 | <3900 | 16000 | <3900 |
| VS-2 | 3/7/1991 | 7 | 9 | <12000 | <12000 | <6.3 | <6.3 | 15000 | <12000 | <12000 | <6.3 | | 230000 | | 390 | 7.4 | <12000 | 17000 | <12000 |
| VS-3 | 3/8/1991 | 9 | 11 | <450 | <450 | <6.8 | <6.8 | 5200 | 450 | 1100 | <6.8 | | 170000 | | 370 | 8.2 | <450 | 23000 | <450 |
| VS-4 | 3/8/1991 | 9 | 11 | <12000 | <12000 | <33 | <33 | <12000 | <12000 | <12000 | <33 | | 170000 | | 1500 | <33 | <12000 | 32000 | <12000 |
| VS-5D | 3/8/1994 | 6 | | <23000 | 43000 | <6.9 | <6.9 | 230000 | 63000 | 35000 | <6.9 | | 290000 | 340 | | <6.9 | 43000 | 25000 | <23000 |
| VS-5M | 3/8/1994 | 4 | | <480 | <480 | <7.2 | <7.2 | 3000 | <480 | 640 | <7.2 | | 240000 | 220 | | <7.2 | <480 | 13000 | <480 |
| VS-5S | 3/8/1994 | 2 | | <820 | <820 | <6.2 | <6.2 | 8300 | 1600 | 1500 | <6.2 | | 1100000 | 10000 | | <6.2 | <820 | 37000 | <820 |
| VS-6D | 3/8/1994 | 6 | | <1900 | <1900 | <5.8 | <5.8 | 14000 | 2400 | 2300 | <5.8 | | 150000 | 420 | | 16 | <1900 | 7600 | <1900 |
| VS-6S | 3/8/1994 | 3.5 | | <350 | <350 | <5.4 | <5.4 | <350 | <350 | <350 | <5.4 | | 91000 | 220 | | <5.4 | <350 | 16000 | <350 |
| VS-7D | 3/8/1994 | 7 | | <430 | <430 | <3200 | <3200 | 2900 | <430 | 620 | <3200 | | 14000 | 56 | | <3200 | 950 | 22000 | <430 |
| VS-7M | 3/8/1994 | 4 | | <20000 | 74000 | <6.2 | <6.2 | 21000 | 50000 | <20000 | <6.2 | | 1100000 | 1200 | | <6.2 | 250000 | 92000 | <20000 |
| VS-7S | 3/8/1994 | 3 | | <5100 | <5100 | <7.7 | <7.7 | 58000 | 8400 | 10000 | <7.7 | | 5800000 | 800 | | <7.7 | <5100 | 67000 | <5100 |
| VS-8D | 3/8/1994 | 8 | | <8900 | <8900 | <14000 | <14000 | <8900 | <8900 | <8900 | <14000 | | 34000 | 61 | | <14000 | <8900 | 26000 | <8900 |
| VS-8S | 3/8/1994 | 3 | | <510 | <510 | <960 | <960 | 6900 | 620 | 1500 | <960 | | 6000000 | 220 | | <960 | <510 | 38000 | <510 |
| VS-9D | 3/8/1994 | 7 | | <9300 | <9300 | <35000 | <35000 | <9300 | <9300 | <9300 | <35000 | | 1800000 | 140 | | <35000 | 10000 | 22000 | <9300 |
| VS-9M | 3/8/1994 | 5 | | <9300 | <9300 | <180000 | <180000 | <9300 | <9300 | <9300 | <180000 | | 85000 | 53 | | <180000 | <9300 | 25000 | <9300 |
| VS-9S | 3/8/1994 | 4 | | <3900 | <3900 | <30000 | <30000 | <3900 | <3900 | <3900 | <30000 | | 470000 | 510 | | <30000 | <3900 | 17000 | <3900 |
| FBCSA04-01-10 | 6/14/2004 | 10 | | | | <530 | 490 J | | | | <530 | | | | | <530 | | | |
| FBCSA04-01-5 | 6/14/2004 | 5 | | | | <800 | 620 J | | | | <800 | | | | | <800 | | | |
| FBCSA04-01-5-DUP | 6/14/2004 | 5 | | | | <650 | 2400 | | | | <650 | | | | | <650 | | | |
| FBCSA04-02-10 | 6/14/2004 | 10 | | | | <1300 | 550 J | | | | <1300 | | | | | <1300 | | | |
| FBCSA04-02-5 | 6/14/2004 | 5 | | | | <580 | 1200 | | | | <580 | | | | | <580 | | | |
| FBCSA04-03-11 | 6/14/2004 | 11 | | | | <12000 | <12000 | | | | <12000 | | | | | <12000 | | | |
| FBCSA04-03-9 | 6/14/2004 | 9 | | | | <13000 | <13000 | | | | <13000 | | | | | <13000 | | | |
| FBCSA04-04-4 | 6/14/2004 | 4 | | | | <6.2 | 2.3 J | | | | <6.2 | | | | | <6.2 | | | |
| FBCSA04-04-8 | 6/14/2004 | 8 | | | | <4300 | <4300 | | | | <4300 | | | | | <4300 | | | |
| FBCSA04-05-5 | 6/14/2004 | 5 | | | | <300 | 540 | | | | <300 | | | | | <300 | | | |
| FBCSA04-05-9 | 6/14/2004 | 9 | | | | <14000 | <14000 | | | | <14000 | | | | | <14000 | | | |
| FBCSA06-01-2-3 | 4/17/2006 | 2 | 3 | 1300 | | | | 14000 | 550 | 2600 | | | 650000 | | | | 250 | | |
| FBCSA06-01-2-3-D | 4/17/2006 | 2 | 3 | 1000 | | | | 13000 | 420 | 2200 | | | 690000 | | | | 240 | | |
| FBCSA06-02-2-3 | 4/17/2006 | 2 | 3 | <590 | | | | 1600 | <590 | 510 | | | 1900000 J | | | | <590 | | |
| FBCSA06-03-2-3 | 4/17/2006 | 2 | 3 | <40 | | | | 82 | <40 | 19 | | | 210000 | | | | 8 | | |
| FBCSA06-04-2-3 | 4/17/2006 | 2 | 3 | <4400 | | | | 73000 | 85000 | 2600 | | | 540000 | | | | 730000 | | |
| FBCSA06-05-2-3 | 4/17/2006 | 2 | 3 | 71 | | | | 770 | 36 | 210 | | | 880000 | | | | 66 | | |
| FBCSA06-06-2-3 | 4/17/2006 | 2 | 3 | 120 | | | | 630 | 31 | 270 | | | 2800000 | | | | 75 | | |
| **Representative Concentration** | | | | 2416 | 6700 | 6122 | 5226 | 19336 | 8093 | 4157 | 5900 | 87000000 | 924188 | 901 | 792 | 5123 | 34787 | 29744 | 2903 |
| **Maximum Detected Concentration** | | | | 1300 | 74000 | 57000 | 2400 | 230000 | 85000 | 35000 | 49000 | 87000000 | 6000000 | 10000 | 1500 | 16 | 730000 | 92000 | 620 |
| **Concentration Ratio (Max./Rep.)** | | | | 0.54 | **11** | 9.3 | 0.46 | **12** | 10.5 | 8.4 | 8.3 | N/A | N/A | N/A | 1.9 | 0.0031 | **21** | 3.1 | 0.21 |
| **Background Concentration** | | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 394 | NA | NA | NA | 16333 | NA |
| **Exceed/Not Exceed (Rep./Background)** | | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | Exceed | NA |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface
NA: Not available
N/A: Not applicable
**Constituents in Bold and Underlined** were not considered in risk calculation.

**Table 4-2(d)(R)**
**Representative Concentration of Soil by a Future On-site Construction Worker**
**Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | Pentachlorophenol | Phenanthrene | Phenol | Pyrene | Selenium | Silver | Tetrachloroethene | Thallium | Tin | Toluene | Vanadium | Xylene | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-E (0-2') | 6/19/2000 | 0 | 2 | 2100 J | 880 | 410 J | 1400 J | 1900 | 650 | <8.3 | 1200 | 800000 | <8.3 | 35000 | <17 | 1500000 |
| VS-1 | 3/6/1991 | 10.5 | 12.5 | <77000 | <15000 | <15000 | <15000 | <2900 | <15000 | <42000 | <1400 | 100000 | <42000 | 23000 | <42000 | 1800000 |
| VS-10D | 3/8/1994 | 8 | | | <10000 | <12000 | <10000 | <1600 | <1600 | <16000 | <1600 | 21000 | <16000 | 45000 | <16000 | 220000 |
| VS-10S | 3/8/1994 | 3 | | | 2400 | | 5000 | <2500 | <1200 | <6.2 | <1200 | <6200 | <6.2 | 33000 | <6.2 | 71000 |
| VS-11D | 3/8/1994 | 6.5 | | | 5800 | | 7600 | <1100 | <1100 | <5.4 | <1100 | <5400 | <5.4 | 6000 | <5.4 | 74000 |
| VS-11S | 3/8/1994 | 4 | | | 620 | | 500 | <1200 | <1200 | <6.2 | <1200 | 40000 | <6.2 | 27000 | <6.2 | 2000000 |
| VS-12D | 3/8/1994 | 6.5 | | | 28000 | | 55000 | <1400 | <1400 | <35 | <1400 | 34000 | <35 | 29000 | <35 | 330000 |
| VS-12M | 3/8/1994 | 4 | | | 2100 | | 3200 | <1400 | <1400 | <35 | <1400 | 130000 | <35 | 49000 | <35 | 880000 |
| VS-12S | 3/8/1994 | 2.5 | | | 31000 | | 30000 | <1200 | <1200 | <6 | <1200 | 45000 | <6 | 20000 | <6 | 400000 |
| VS-2 | 3/7/1991 | 7 | 9 | <60000 | 13000 | | 14000 | <2200 | <11000 | <6.3 | <2200 | 7400 | 14 | 16000 | <6.3 | 180000 |
| VS-3 | 3/8/1991 | 9 | 11 | <2200 | 3800 | <450 | 5300 | <2400 | <5900 | <6.8 | <1200 | 23000 | 13 | 29000 | <6.8 | 180000 |
| VS-4 | 3/8/1991 | 9 | 11 | <60000 | <12000 | <12000 | <12000 | <23000 | <11000 | <33 | <1000 | <5700 | <33 | 27000 | <33 | 910000 |
| VS-5D | 3/8/1994 | 6 | | | 240000 | | 230000 | <1400 | <1400 | <6.9 | <1400 | 25000 | <6.9 | 29000 | <6.9 | 590000 |
| VS-5M | 3/8/1994 | 4 | | | 2700 | | 3200 | <1400 | <1400 | <7.2 | <1400 | <7200 | <7.2 | 19000 | <7.2 | 320000 |
| VS-5S | 3/8/1994 | 2 | | | 7300 | | 8600 | <1200 | <1200 | <6.2 | <1200 | 120000 | <6.2 | 38000 | <6.2 | 1300000 |
| VS-6D | 3/8/1994 | 6 | | | 12000 | | 14000 | <2300 | <1200 | 10 | <1200 | 19000 | <5.8 | 15000 | <5.8 | 120000 |
| VS-6S | 3/8/1994 | 3.5 | | | <350 | | <350 | <2200 | <1100 | <5.4 | <1100 | <5400 | <5.4 | 20000 | <5.4 | 240000 |
| VS-7D | 3/8/1994 | 7 | | | 2100 | | 3200 | <1300 | <1300 | <3200 | <1300 | <6500 | <3200 | 31000 | <3200 | 63000 |
| VS-7M | 3/8/1994 | 4 | | | 71000 | | <20000 | <1200 | <1200 | 6.4 | <1200 | 170000 | <6.2 | 13000 | <6.2 | 1200000 |
| VS-7S | 3/8/1994 | 3 | | | 53000 | | 64000 | <1500 | 2900 | 7.7 | 6600 | 94000 | <7.7 | 59000 | <7.7 | 1000000 |
| VS-8D | 3/8/1994 | 8 | | | <8900 | | <8900 | <1400 | <1400 | <14000 | <1400 | <6800 | <14000 | 33000 | <14000 | 66000 |
| VS-8S | 3/8/1994 | 3 | | | 5400 | | 5200 | <1500 | <1500 | <960 | <1500 | 21000 | <960 | 42000 | <960 | 500000 |
| VS-9D | 3/8/1994 | 7 | | | <9300 | | <9300 | <1400 | <1400 | <35000 | <1400 | 1800000 | <35000 | 25000 | <35000 | 850000 |
| VS-9M | 3/8/1994 | 5 | | | <9300 | | <9300 | <1400 | <1400 | <180000 | <1400 | 110000 | <180000 | 41000 | <180000 | 210000 |
| VS-9S | 3/8/1994 | 4 | | | <3900 | | <3900 | <2400 | <1200 | <30000 | <1200 | 38000 | <30000 | 17000 | <30000 | 360000 |
| FBCSA04-01-10 | 6/14/2004 | 10 | | | | | | | | <530 | | | 160 J | | 880 J | |
| FBCSA04-01-5 | 6/14/2004 | 5 | | | | | | | | <800 | | | <800 | | 790 J | |
| FBCSA04-01-5-DUP | 6/14/2004 | 5 | | | | | | | | <650 | | | 500 J | | 3200 | |
| FBCSA04-02-10 | 6/14/2004 | 10 | | | | | | | | <1300 | | | 740 J | | 2600 | |
| FBCSA04-02-5 | 6/14/2004 | 5 | | | | | | | | <580 | | | 2100 | | 9400 | |
| FBCSA04-03-11 | 6/14/2004 | 11 | | | | | | | | <12000 | | | <12000 | | <24000 | |
| FBCSA04-03-9 | 6/14/2004 | 9 | | | | | | | | <13000 | | | <13000 | | <26000 | |
| FBCSA04-04-4 | 6/14/2004 | 4 | | | | | | | | 11 | | | 26 | | 11 J | |
| FBCSA04-04-8 | 6/14/2004 | 8 | | | | | | | | <4300 | | | <4300 | | <8700 | |
| FBCSA04-05-5 | 6/14/2004 | 5 | | | | | | | | <300 | | | 310 | | 2200 | |
| FBCSA04-05-9 | 6/14/2004 | 9 | | | | | | | | <14000 | | | <14000 | | <28000 | |
| FBCSA06-01-2-3 | 4/17/2006 | 2 | 3 | | 7400 | | 11000 | | | | | | | | | |
| FBCSA06-01-2-3-D | 4/17/2006 | 2 | 3 | | 6900 | | 11000 | | | | | | | | | |
| FBCSA06-02-2-3 | 4/17/2006 | 2 | 3 | | 820 | | 1400 | | | | | | | | | |
| FBCSA06-03-2-3 | 4/17/2006 | 2 | 3 | | 51 | | 75 | | | | | | | | | |
| FBCSA06-04-2-3 | 4/17/2006 | 2 | 3 | | 230000 | | 41000 | | | | | | | | | |
| FBCSA06-05-2-3 | 4/17/2006 | 2 | 3 | | 550 | | 580 | | | | | | | | | |
| FBCSA06-06-2-3 | 4/17/2006 | 2 | 3 | | 360 | | 650 | | | | | | | | | |
| **Representative Concentration** | | | | 20340 | 23799 | 4027 | 17509 | 1306 | 1496 | 5123 | 924 | 144760 | 5183 | 28840 | 6198 | 614560 |
| **Maximum Detected Concentration** | | | | 2100 | 240000 | 410 | 230000 | 1900 | 2900 | 11 | 6600 | 1800000 | 2100 | 59000 | 9400 | 2000000 |
| **Concentration Ratio (Max./Rep.)** | | | | 0.10 | **10** | 0.10 | **13** | N/A | 1.9 | 0.0021 | 7.1 | N/A | 0.4 | N/A | 1.5 | N/A |
| **Background Concentration** | | | | NA | NA | NA | NA | 633 | 867 | NA | 633 | 7267 | NA | 18667 | NA | 143333 |
| **Exceed/Not Exceed (Rep./Background)** | | | | NA | NA | NA | NA | Not Exceed | Exceed | NA | Exceed | Not Exceed | NA | Not Exceed | NA | Not Exceed |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface
NA: Not available
N/A: Not applicable
**Constituents in Bold and Underlined** were not considered in risk calculation.

**Table 4-3(R)**
**Physical and Chemical Properties of Constituents**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Constituents | CAS # | MCL (mg/L) | Molecular Weight, MW (g/mol) | Water Solubility, S (mg/L) | Henry's Law Constant, H (L-water/L-air) | Organic Carbon Adsorption Coefficient, $K_{oc}$ ($cm^3/g$) | Soil-Water Partition Coefficient, $K_d$ (L/kg) | Diffusion Coefficient in Air, $D_i$ ($cm^2/s$) | Diffusion Coefficient in Water, $D_w$ ($cm^2/s$) | Vapor Pressure, P (mmHg) | Octanol-Water Partition Coefficient, $K_{ow}$ ($cm^3/g$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VOCs | | | | | | | | | | | |
| Acetone | 67-64-1 | | 58 | 1.00E+06 | 1.59E-03 | 5.75E-01 | NA | 1.24E-01 | 1.14E-05 | 2.27E+02 | 5.80E-01 |
| Benzene | 71-43-2 | 0.005 | 78 | 1.75E+03 | 2.28E-01 | 5.89E+01 | NA | 8.80E-02 | 9.80E-06 | 9.50E+01 | 9.84E+01 |
| Bromodichloromethane | 75-27-4 | 0.08 | 164 | 6.74E+03 | 6.56E-02 | 5.50E+01 | NA | 2.98E-02 | 1.06E-05 | 5.84E+01 | 4.07E+01 |
| Bromoform | 75-25-2 | 0.08 | 253 | 3.10E+03 | 2.19E-02 | 8.71E+01 | NA | 1.49E-02 | 1.03E-05 | 5.60E+00 | 6.17E+01 |
| Carbon disulfide | 75-15-0 | | 76 | 1.19E+03 | 1.24E+00 | 4.57E+01 | NA | 1.04E-01 | 1.00E-05 | 3.40E+02 | 8.71E+01 |
| Carbon tetrachloride | 56-23-5 | 0.005 | 154 | 7.93E+02 | 1.25E+00 | 1.74E+02 | NA | 7.80E-02 | 8.80E-06 | 1.12E+02 | 2.75E+02 |
| Chlorobenzene | 108-90-7 | | 113 | 4.72E+02 | 1.52E-01 | 2.19E+02 | NA | 7.30E-02 | 8.70E-06 | 1.21E+01 | 4.37E+02 |
| Chloroform | 67-66-3 | 0.08 | 119 | 7.92E+03 | 1.52E-01 | 3.98E+01 | NA | 1.04E-01 | 1.00E-05 | 1.98E+02 | 3.31E+01 |
| Chloromethane | 74-87-3 | | 51 | 8.20E+03 | 9.80E-01 | 3.50E+01 | NA | 1.10E-01 | 6.50E-06 | 3.77E+03 | 1.23E+01 |
| 2-Chlorophenol | 95-57-8 | | 129 | 2.20E+04 | 1.60E-02 | 3.88E+02 | NA | 5.01E-02 | 9.46E-06 | 1.42E+00 | 1.45E+02 |
| Dibromochloromethane | 124-48-1 | 0.08 | 208 | 2.60E+03 | 3.21E-02 | 6.31E+01 | NA | 1.96E-02 | 1.05E-05 | 1.50E+01 | 5.01E+01 |
| 1,2-Dichloroethane | 107-06-2 | | 99 | 8.50E+03 | 4.00E-02 | 3.80E+01 | | 1.00E-01 | 6.50E-04 | 8.13E+01 | 6.67E+01 |
| cis-1,2-Dichloroethylene | 156-59-2 | 0.07 | 97 | 3.50E+03 | 1.67E-01 | 3.55E+01 | NA | 7.36E-02 | 1.13E-05 | 1.75E+02 | 7.24E+01 |
| Ethylbenzene | 100-41-4 | 0.7 | 106 | 1.69E+02 | 3.23E-01 | 3.63E+02 | NA | 7.50E-02 | 7.80E-06 | 9.60E+00 | 1.07E+03 |
| Methyl ethyl ketone | 78-93-3 | | 72 | 2.23E+05 | 2.33E-03 | 4.50E+00 | NA | 8.95E-02 | 9.80E-06 | 9.10E+01 | 1.80E+00 |
| Methylene chloride | 75-09-2 | 0.005 | 85 | 1.30E+04 | 8.98E-02 | 1.17E+01 | NA | 1.01E-01 | 1.17E-05 | 4.55E+02 | 2.19E+01 |
| Methyl iodide (Iodomethane) | 74-88-4 | | 142 | 1.39E+04 | 2.16E-01 | 1.58E+02 | NA | 1.02E-01 | 1.17E-05 | 3.79E+02 | 3.55E+01 |
| Methyl isobutyl ketone | 108-10-1 | | 100 | 1.90E+04 | 5.66E-03 | 1.34E+02 | NA | 7.50E-02 | 7.80E-06 | 1.45E+02 | 1.45E+01 |
| Nitrobenzene | 98-95-3 | | 123 | 2.09E+03 | 9.84E-04 | 6.46E+01 | NA | 7.60E-02 | 8.60E-06 | 2.44E-01 | 6.46E+01 |
| Tetrachloroethylene | 127-18-4 | 0.005 | 166 | 2.00E+02 | 7.54E-01 | 1.55E+02 | NA | 7.20E-02 | 8.20E-06 | 1.84E+01 | 9.23E+02 |
| Toluene | 108-88-3 | 1 | 92 | 5.26E+02 | 2.72E-01 | 1.82E+02 | NA | 8.70E-02 | 8.60E-06 | 2.82E+01 | 3.47E+02 |
| 1,2,4-Trichlorobenzene | 120-82-1 | 0.07 | 181 | 3.00E+02 | 5.80E-02 | 1.78E+03 | NA | 3.00E-02 | 8.20E-06 | 3.36E+01 | 8.44E+03 |
| 1,1,1-Trichloroethane | 71-55-6 | 0.2 | 133 | 1.33E+03 | 7.05E-01 | 1.10E+02 | NA | 7.80E-02 | 8.80E-06 | 1.24E+02 | 4.79E+02 |
| Trichloroethylene | 79-01-6 | 0.005 | 131 | 1.10E+03 | 4.22E-01 | 1.66E+02 | NA | 7.90E-02 | 9.10E-06 | 7.20E+01 | 2.95E+02 |
| Vinyl chloride | 75-01-4 | 0.002 | 63 | 2.76E+03 | 1.11E+00 | 1.86E+01 | NA | 1.06E-01 | 1.23E-06 | 2.80E+03 | 4.17E+01 |
| Xylenes (total) | 1330-20-7 | 10 | 106 | 1.61E+02 | 3.01E-01 | 4.07E+02 | NA | 7.00E-02 | 7.80E-06 | 8.06E+00 | 1.23E+03 |
| SVOCs | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | | 154 | 4.24E+00 | 6.36E-03 | 7.08E+03 | NA | 4.21E-02 | 7.69E-06 | 3.75E-03 | 1.42E+04 |
| Anthracene | 120-12-7 | | 178 | 4.34E-02 | 2.95E-02 | 2.95E+04 | NA | 3.24E-02 | 7.74E-06 | 2.55E-05 | 2.21E+04 |
| Benzo(a)anthracene | 56-55-3 | | 228 | 9.40E-03 | 1.37E-04 | 3.98E+05 | NA | 5.10E-02 | 9.00E-06 | 1.50E-07 | 3.31E+05 |
| Benzo(a)pyrene | 50-32-8 | 0.0002 | 252 | 1.62E-03 | 4.63E-05 | 1.02E+06 | NA | 4.30E-02 | 9.00E-06 | 4.89E-09 | 1.29E+06 |
| Benzo(b)fluoranthene | 205-99-2 | | 252 | 1.50E-03 | 4.55E-03 | 1.23E+06 | NA | 2.26E-02 | 5.56E-06 | 8.06E-08 | 1.29E+06 |
| Benzo(g,h,i)perylene | 191-24-2 | | 276 | 2.60E-04 | 5.82E-06 | 1.58E+06 | NA | 4.90E-02 | 5.65E-05 | 1.00E-10 | 5.01E+06 |
| Benzo(k)fluoranthene | 207-08-9 | | 252 | 8.00E-04 | 3.40E-05 | 1.23E+06 | NA | 2.26E-02 | 5.56E-06 | 9.59E-11 | 1.29E+06 |
| 4-Chloro-3-methylphenol | 59-50-7 | | 143 | 5.43E+03 | 1.40E-05 | 8.71E+02 | NA | 6.46E-02 | 8.60E-06 | 9.75E-03 | 9.77E+02 |
| Chrysene | 218-01-9 | | 228 | 1.60E-03 | 3.88E-03 | 3.98E+05 | NA | 2.48E-02 | 6.21E-06 | 2.80E-09 | 3.32E+05 |
| Dibenzo(a,h)anthracene | 53-70-3 | | 278 | 2.49E-03 | 6.03E-07 | 3.80E+06 | NA | 2.02E-02 | 5.18E-06 | 2.10E-13 | 4.98E+06 |
| Dibenzofuran | 132-64-9 | | 168 | 4.22E+00 | 8.73E-03 | 7.76E+03 | NA | 6.01E-02 | 1.00E-05 | 1.64E-03 | 9.92E+03 |
| 2,4-Dichlorophenol | 120-83-2 | | 163 | 4.50E+03 | 1.30E-04 | 1.47E+02 | NA | 3.46E-02 | 8.77E-06 | 7.15E-02 | 6.31E+02 |

**Table 4-3(R)**
**Physical and Chemical Properties of Constituents**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Constituents | CAS # | MCL (mg/L) | Molecular Weight, MW (g/mol) | Water Solubility, S (mg/L) | Henry's Law Constant, H (L-water/L-air) | Organic Carbon Adsorption Coefficient, $K_{oc}$ ($cm^3/g$) | Soil-Water Partition Coefficient, $K_d$ (L/kg) | Diffusion Coefficient in Air, $D_i$ ($cm^2/s$) | Diffusion Coefficient in Water, $D_w$ ($cm^2/s$) | Vapor Pressure, P (mmHg) | Octanol-Water Partition Coefficient, $K_{ow}$ ($cm^3/g$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-Dimethylphenol | 105-67-9 | | **122** | **7.87E+03** | **8.20E-05** | **2.09E+02** | NA | **5.84E-02** | **8.69E-06** | *1.26E-01* | *4.07E+02* |
| Ethyl methacrylate | 97-63-2 | | *114* | ***2.00E+01*** | ***1.00E+01*** | ***8.40E+02*** | NA | ***9.10E-02*** | ***8.60E-06*** | *1.75E+01* | *1.77E+00* |
| Fluoranthene | 206-44-0 | | 202 | 2.06E-01 | 6.60E-04 | 1.07E+05 | NA | 3.02E-02 | 6.35E-06 | 8.13E-06 | *8.57E+04* |
| Fluorene | 86-73-7 | | 166 | 1.98E+00 | 2.61E-03 | 1.38E+04 | NA | 3.63E-02 | 7.88E-06 | 3.24E-03 | *1.04E+04* |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | | **276** | **2.20E-05** | **6.56E-05** | **3.47E+06** | NA | **1.90E-02** | **5.66E-06** | *1.40E-10* | *4.98E+06* |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | | *198* | *3.00E+03* | *1.07E-07* | *3.16E-02* | NA | *5.31E-02* | *7.27E-06* | *2.87E-05* | *1.17E+02* |
| 1-Methylnaphthalene | 90-12-0 | | *142* | *2.80E+01* | *1.64E-02* | *2.29E+03* | | *6.31E-02* | *7.13E-06* | *6.62E-02* | *5.25E+03* |
| 2-Methylnaphthalene | 91-57-6 | | *142* | *2.54E+01* | *1.85E-02* | *4.32E+03* | NA | *6.29E-02* | *7.20E-06* | *6.57E-02* | *5.20E+03* |
| Naphthalene | 91-20-3 | | 128 | 3.10E+01 | 1.98E-02 | 2.00E+03 | NA | 5.90E-02 | 7.50E-06 | 8.89E-02 | *1.48E+03* |
| 2-Nitrophenol | 88-75-5 | | *139* | *1.73E+04* | *2.21E-05* | *2.09E+01* | NA | *6.87E-02* | *8.47E-06* | *5.03E-02* | *2.23E+02* |
| Pentachlorophenol | 87-86-5 | 0.001 | **266** | **1.95E+03** | **1.00E-06** | **5.92E+02** | NA | **5.60E-02** | **6.10E-06** | *1.70E-05* | *5.50E+04* |
| Phenanthrene | 85-01-8 | | *178* | *9.94E-01* | *5.40E-03* | *1.41E+04* | NA | *3.33E-02* | *7.47E-06* | *6.80E-04* | *2.24E+04* |
| Phenol | 108-95-2 | | **94** | **8.28E+04** | **1.63E-05** | **2.88E+01** | NA | **8.20E-02** | **9.10E-06** | *4.63E-01* | *3.24E+01* |
| Pyrene | 129-00-0 | | 202 | 1.35E-01 | 4.51E-04 | 1.05E+05 | NA | 2.72E-02 | 7.24E-06 | 4.25E-06 | *8.51E+04* |
| 2,4,6-Trichlorophenol | 88-06-2 | | **197** | **8.00E+02** | **3.19E-04** | **3.81E+02** | NA | **3.18E-02** | **6.25E-06** | *1.18E-02* | *2.79E+03* |
| Metals | | | | | | | | | | | |
| Antimony | 7440-36-0 | 0.006 | **122** | NA | NA | NA | *4.47E+01* | NA | NA | NA | *1.00E+00* |
| Arsenic | 7440-38-2 | 0.01 | 75 | NA | NA | NA | 2.51E+01 | NA | NA | NA | *4.78E+00* |
| Barium | 7440-39-3 | 2 | 137 | NA | NA | NA | 1.10E+01 | NA | NA | NA | 1.00E+00 |
| Beryllium | 7440-41-7 | 0.004 | *9* | NA | NA | NA | *2.29E+01* | NA | NA | NA | *3.72E+00* |
| Cadmium | 7440-43-9 | 0.005 | 112 | NA | NA | NA | 1.51E+01 | NA | NA | NA | *8.49E-01* |
| Chromium (III) total chromium | 7440-47-3 | | 52 | NA | NA | NA | 1.20E+03 | NA | NA | NA | 1.00E+00 |
| Cobalt | 7440-48-4 | | *79* | NA | NA | NA | *4.47E+01* | NA | NA | NA | NA |
| Copper | 7440-50-8 | | *64* | NA | NA | NA | *3.98E+01* | NA | NA | NA | *2.69E-01* |
| Mercury | 7439-97-6 | | **401** | *3.00E-02* | **4.67E-01** | NA | *4.00E-02* | **3.07E-02** | **6.30E-06** | *1.30E-03* | *3.38E-01* |
| Nickel | 7440-02-0 | | **59** | NA | NA | NA | *1.59E+01* | NA | NA | NA | *2.69E-01* |
| Selenium | 7782-49-2 | | 79 | NA | NA | NA | 2.20E+00 | NA | NA | NA | *1.73E+00* |
| Silver | 7440-22-4 | | **108** | NA | NA | NA | *1.00E+00* | NA | NA | NA | 1.00E+00 |
| Thallium chloride | 7791-12-0 | | *240* | *2.90E+03* | NA | NA | *4.37E+01* | NA | NA | NA | NA |
| Tin | 7440-31-5 | | *119* | NA | NA | NA | *1.25E+02* | NA | NA | NA | *1.94E+01* |
| Vanadium | 7440-62-2 | | *51* | NA | NA | NA | *1.00E+03* | NA | NA | NA | 1.00E+00 |
| Zinc | 7440-66-6 | | **65** | NA | NA | NA | *1.59E+01* | NA | NA | NA | *3.38E-01* |
| Inorganics | | | | | | | | | | | |
| Cyanide | 57-12-5 | | *26* | *1.00E+05* | NA | NA | *9.90E+00* | *5.21E-01* | *2.28E-05* | *1.38E+01* | *2.03E-01* |

Sources:

Regular underlined font: Properties kept from MDNR UST-RBCA Guidance.
**Bold font:** CALM (1998) as revised in 2001, Table A4.
***Bold and italic font:*** EPA Region IX, PRGs InterCalc Tables: Phys-Chem Data (10/01/02).
*Italic font:* Texas Comission on Environmental Quality's TRRP Chemical/Physical Properties Table; March, 2004.
Regular font: Idaho Risk Based Decision-Making for Remedial Action Guidance Document, Appendix G, 2003.
MCLs: (Maximum Contaminant Leve USEPA (Winter 2004) Edition of Drinking Water Standards and Health Advisories.

Table 4-4(R)
Toxicity Values of Constituents
Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Constituents | CAS # | Slope Factor | | | | | Reference Dose | | | | | Absorption Factor | | | Permeability Constant, $K_p$ (cm/hr) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Oral, $SF_o$ $(mg/kg\text{-}day)^{-1}$ | | Inhalation, $SF_i$ $(mg/kg\text{-}day)^{-1}$ | | Dermal, $SF_d$ $(mg/kg\text{-}day)^{-1}$ | Oral, $RfD_o$ (mg/kg-day) | | Inhalation, $RfD_i$ (mg/kg-day) | | Dermal, (mg/kg-day) | Dermal, $RAF_d$ (unitless) | | Oral, $RAF_o$ (unitless) | | |
| **VOC's** | | | | | | | | | | | | | | | | |
| Acetone | 67-64-1 | | | | | | 9.0E-01 | i | 9.0E-01 | r | 9.0E-01 | 0.1 | RA | 1.0 | 5.23E-04 | e |
| Benzene | 71-43-2 | 2.9E-02 | u | 2.9E-02 | u | | 3.0E-03 | u | 1.7E-03 | u | | 0.3 | u | 1.0 | 1.65E-02 | u |
| Bromodichloromethane | 75-27-4 | 6.2E-02 | i | 1.3E-01 | c | 6.2E-02 | 2.0E-02 | i | 2.0E-02 | r | 2.0E-02 | 0.1 | RA | 1.0 | 4.60E-03 | RE |
| Bromoform | 75-25-2 | 7.9E-03 | i | 3.9E-03 | i | 7.9E-03 | 2.0E-02 | i | 2.0E-02 | r | 2.0E-02 | 0.1 | RA | 1.0 | 2.20E-03 | RE |
| Carbon disulfide | 75-15-0 | | | | | | 1.0E-01 | i | 2.0E-01 | i | 1.0E-01 | 0.1 | RA | 1.0 | 1.70E-02 | RE |
| Carbon tetrachloride | 56-23-5 | 1.3E-01 | i | 5.3E-02 | i | 1.3E-01 | 7.0E-04 | i | 1.1E-02 | c | 7.0E-04 | 0.1 | RA | 1.0 | 1.60E-02 | RE |
| Chlorobenzene | 108-90-7 | | | | | | 2.0E-02 | i | 1.7E-02 | n | 2.0E-02 | 0.1 | RA | 1.0 | 2.80E-02 | RE |
| Chloroform | 67-66-3 | 3.1E-02 | c | 8.1E-02 | i | 3.1E-02 | 1.0E-02 | i | 8.6E-04 | n | 1.0E-02 | 0.1 | RA | 1.0 | 6.80E-03 | RE |
| Chloromethane | 74-87-3 | 1.3E-02 | h | 6.3E-03 | h | 1.3E-02 | 2.6E-02 | r | 2.6E-02 | i | 2.6E-02 | 0.1 | RA | 1.0 | 3.30E-03 | RE |
| 2-Chlorophenol | 95-57-8 | | | | | | 5.0E-03 | i | 5.0E-03 | r | 5.0E-03 | 0.1 | RA | 1.0 | 8.00E-03 | RE |
| Dibromochloromethane | 124-48-1 | 8.4E-02 | i | 9.5E-02 | c | 8.4E-02 | 2.0E-02 | i | 2.0E-02 | r | 2.0E-02 | 0.1 | RA | 1.0 | 3.20E-03 | RE |
| 1,2-Dichloroethane | 107-06-2 | 9.1E-02 | u | 9.1E-02 | u | 9.1E-02 | 3.0E-02 | u | 1.4E-03 | u | 3.0E-02 | 0.1 | u | 1.0 | 9.54E-03 | u |
| cis-1,2-Dichloroethylene | 156-59-2 | | | | | | 1.0E-02 | p | 1.0E-02 | r | 1.0E-02 | 0.1 | RA | 1.0 | 7.67E-03 | e |
| Ethylbenzene | 100-41-4 | NA | u | NA | u | | 1.0E-01 | u | 2.9E-01 | u | | 0.3 | u | 0.9 | 6.09E-02 | u |
| Methyl ethyl ketone | 78-93-3 | | | | | | 6.0E-01 | i | 1.4E+00 | i | 6.0E-01 | 0.1 | RA | 1.0 | 9.60E-04 | RE |
| Methyl isobutyl ketone | 108-10-1 | | | | | | 8.0E-02 | h | 8.6E-01 | i | 8.0E-02 | 0.1 | RA | 1.0 | 2.70E-03 | RE |
| Methylene chloride | 75-09-2 | 7.5E-03 | i | 1.6E-03 | i | 7.5E-03 | 6.0E-02 | i | 1.1E-01 | c | 6.0E-02 | 0.1 | RA | 1.0 | 3.50E-03 | RE |
| Methyl iodide (Iodomethane) | 74-88-4 | | | | | | 1.4E-03 | t | 3.4E-03 | t | 1.4E-03 | 0.1 | RA | 1.0 | 2.50E-03 | RE |
| Nitrobenzene | 98-95-3 | | | | | | 5.0E-04 | i | 5.7E-04 | h | 5.0E-04 | 0.1 | RA | 1.0 | 5.07E-03 | e |
| Tetrachloroethylene | 127-18-4 | 5.2E-02 | n | 1.0E-02 | n | 5.2E-02 | 1.0E-02 | i | 1.7E-01 | n | 1.0E-02 | 0.1 | RA | 1.0 | 3.30E-02 | RE |
| Toluene | 108-88-3 | NA | u | NA | u | | 2.0E-01 | u | 1.1E-01 | u | | 0.03 | u | 1.0 | 3.32E-02 | u |
| 1,2,4-Trichlorobenzene | 120-82-1 | 3.6E-03 | c | 3.6E-03 | r | 3.6E-03 | 1.0E-02 | i | 1.1E-03 | p | 1.0E-02 | 0.1 | RA | 1.0 | 6.60E-02 | RE |
| 1,1,1-Trichloroethane | 71-55-6 | | | | | | 2.8E-01 | n | 6.3E-01 | p | 2.8E-01 | 0.1 | RA | 1.0 | 1.30E-02 | RE |
| Trichloroethylene | 79-01-6 | 1.3E-02 | c | 7.0E-03 | c | 1.3E-02 | 1.7E-01 | r | 1.7E-01 | c | 1.7E-01 | 0.1 | RA | 1.0 | 1.20E-02 | RE |
| Vinyl chloride | 75-01-4 | 7.2E-01 | i | 1.3E-03 | i | 7.2E-01 | 3.0E-03 | i | 2.9E-02 | i | 3.0E-03 | 0.1 | RA | 1.0 | 5.60E-03 | RE |
| Xylenes (total) | 1330-20-7 | NA | u | NA | u | | 2.0E+00 | u | 2.0E-01 | u | | 0.3 | u | 0.9 | 6.68E-02 | u |
| **SVOCs** | | | | | | | | | | | | | | | | |
| Acenaphthene | 83-32-9 | NA | u | NA | u | | 6.0E-02 | u | 6.0E-02 | u | | 0.3 | u | 1.0 | 1.93E-01 | u |
| Anthracene | 120-12-7 | NA | u | NA | u | | 3.0E-01 | u | 3.0E-01 | u | | 0.3 | u | 1.0 | 1.90E-01 | u |
| Benzo(a)anthracene | 56-55-3 | 7.3E-01 | u | 3.1E-01 | u | | NA | u | NA | u | | 0.13 | u | 1.0 | 6.42E-01 | u |
| Benzo(a)pyrene | 50-32-8 | 7.3E+00 | u | 6.1E+00 | u | | NA | u | NA | u | | 0.13 | u | 0.9 | 1.20E+00 | u |
| Benzo(b)fluoranthene | 205-99-2 | 7.3E-01 | u | 3.1E-01 | u | | NA | u | NA | u | | 0.13 | u | 1.0 | 1.20E+00 | u |
| Benzo(g,h,i)perylene | 191-24-2 | | | | | | 3.0E-02 | t | 3.0E-02 | r | 3.0E-02 | 0.13 | RE | 1.0 | 1.19E+00 | e |
| Benzo(k)fluoranthene | 207-08-9 | 7.3E-02 | u | 3.1E-02 | u | | NA | u | NA | u | | 0.13 | u | 1.0 | 1.20E+00 | u |
| 4-Chloro-3-methylphenol | 59-50-7 | | | | | | 5.0E+03 | t | 8.6E-03 | t | 5.0E+03 | 0.1 | RE | 1.0 | NA | e |
| Chrysene | 218-01-9 | 7.3E-03 | u | 3.1E-03 | u | | NA | u | NA | u | | 0.13 | u | 1.0 | 6.42E-01 | u |
| Dibenzo(a,h)anthracene | 53-70-3 | 7.3E+00 | u | 3.1E+00 | u | | NA | u | NA | u | | 0.13 | u | 1.0 | 2.17E+00 | u |
| Dibenzofuran | 132-64-9 | | | | | | 4.0E-03 | n | 4.0E-03 | r | 4.0E-03 | 0.03 | RE | 1.0 | 7.87E-02 | e |
| 2,4-Dichlorophenol | 120-83-2 | | | | | | 3.0E-03 | i | 3.0E-03 | r | 3.0E-03 | 0.1 | RE | 1.0 | 2.10E-02 | RE |
| 2,4-Dimethylphenol | 105-67-9 | | | | | | 2.0E-02 | i | 2.0E-02 | r | 2.0E-02 | 0.1 | RE | 1.0 | 1.10E-02 | RE |
| Ethyl methacrylate | 97-63-2 | | | | | | 9.0E-02 | h | 1.4E-01 | t | 9.0E-02 | 0.1 | RA | 1.0 | 5.31E-04 | e |
| Fluoranthene | 206-44-0 | NA | u | NA | u | | 4.0E-02 | u | 4.0E-02 | u | | 0.1 | u | 0.5 | 3.54E-01 | u |
| Fluorene | 86-73-7 | NA | u | NA | u | | 4.0E-02 | u | 4.0E-02 | u | | 0.3 | u | 1.0 | 1.31E-01 | u |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1.2E+00 | c | 3.9E-01 | c | 1.2E+00 | | | | | | 0.13 | RE | 1.0 | 1.00E+00 | RE |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | | | | | | 2.0E-03 | t | 8.6E-05 | t | 2.0E-03 | 0.1 | RE | 1.0 | 3.10E-03 | RE |
| 1-Methylnaphthalene | 90-12-0 | | | | | | 7.0E-02 | t | 7.0E-02 | r | 7.0E-02 | 0.13 | RE | 1.0 | 7.40E-02 | e |
| 2-Methylnaphthalene | 91-57-6 | | | | | | 4.0E-03 | i | 4.0E-03 | r | 4.0E-03 | 0.1 | RE | 1.0 | 7.20E-02 | e |
| Naphthalene | 91-20-3 | NA | u | NA | u | | 2.0E-02 | u | 8.6E-04 | u | | 0.3 | u | 1.0 | 5.60E-02 | u |
| 2-Nitrophenol | 88-75-5 | | | | | | 2.0E-03 | t | 1.1E-03 | t | 2.0E-03 | 0.1 | RE | 1.0 | 4.00E-03 | RE |
| Pentachlorophenol | 87-86-5 | 1.2E-01 | i | 1.8E-02 | c | 1.2E-01 | 3.0E-02 | i | 3.0E-02 | r | 3.0E-02 | 0.25 | RE | 1.0 | 3.90E-01 | RE |
| Phenanthrene | 85-01-8 | | | | | | 3.0E-02 | t | 3.0E-02 | r | 3.0E-02 | 0.1 | RE | 1.0 | 1.40E-01 | RE |
| Phenol | 108-95-2 | | | | | | 3.0E-01 | i | 5.7E-02 | c | 3.0E-01 | 0.1 | RE | 1.0 | 4.30E-03 | RE |

Table 4-4(R)
Toxicity Values of Constituents
Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Constituents | CAS # | Slope Factor | | | | | Reference Dose | | | | | Absorption Factor | | | Permeability | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Oral, $SF_o$ $(mg/kg\text{-}day)^{-1}$ | | Inhalation, $SF_i$ $(mg/kg\text{-}day)^{-1}$ | | Dermal, $SF_d$ $(mg/kg\text{-}day)^{-1}$ | Oral, $RfD_o$ (mg/kg-day) | | Inhalation, $RfD_i$ (mg/kg-day) | | Dermal, (mg/kg-day) | Dermal, $RAF_d$ (unitless) | | Oral, $RAF_o$ (unitless) | Constant, $K_p$ (cm/hr) | |
| Pyrene | 129-00-0 | NA | *u* | NA | *u* | | 3.0E-02 | *u* | 3.0E-02 | *u* | | 0.1 | *u* | 1.0 | 3.54E-01 | *u* |
| 2,4,6-Trichlorophenol | 88-06-2 | 1.1E-02 | *i* | 1.1E-02 | *i* | 1.1E-02 | 1.0E-04 | *n* | 1.0E-04 | *r* | 1.0E-04 | 0.1 | *RE* | 1.0 | 3.50E-02 | *RE* |
| **Metals** | | | | | | | | | | | | | | | | |
| Antimony | 7440-36-0 | | | | | | 4.0E-04 | *i* | 1.4E-05 | *t* | 4.0E-04 | 0.01 | *RA* | 1.0 | 1.00E-03 | *e* |
| Arsenic | 7440-38-2 | 1.5E+00 | *u* | 1.5E+01 | *u* | | 3.0E-04 | *u* | NA | *u* | | 0.001 | *u* | 1.0 | NA | *u* |
| Barium | 7440-39-3 | NA | *u* | NA | *u* | | 7.0E-02 | *u* | 1.4E-04 | *u* | | 0.01 | *u* | 1.0 | NA | *u* |
| Beryllium | 7440-41-7 | 8.4E+00 | *r* | 8.4E+00 | *i* | 8.4E+00 | 2.0E-03 | *i* | 5.7E-06 | *i* | 2.0E-03 | 0.01 | *RA* | 1.0 | 1.00E-03 | *e* |
| Cadmium | 7440-43-9 | NA | *u* | 6.3E+00 | *u* | | 5.0E-04 | *u* | NA | *u* | | 0.01 | *u* | 1.0 | NA | *u* |
| Chromium (III) total chromium | 7440-47-3 | NA | *u* | NA | *u* | | 1.5E+00 | *u* | 2.9E-05 | *u* | | 0.1 | *u* | 1.0 | NA | *u* |
| Cobalt | 7440-48-4 | | | 9.8E+00 | *p* | | 2.0E-02 | *p* | 5.7E-06 | *p* | 2.0E-02 | 0.01 | *RA* | 1.0 | NA | *e* |
| Copper | 7440-50-8 | | | | | | 4.0E-02 | *h* | 2.9E-04 | *t* | 4.0E-02 | 0.01 | *RA* | 1.0 | 1.00E-03 | *e* |
| Mercury | 7439-97-6 | | | | | | | | 8.6E-05 | *i* | | 0.01 | *RA* | 1.0 | 1.00E-03 | *e* |
| Nickel | 7440-02-0 | | | 9.1E-01 | *c* | | 2.0E-02 | *i* | 2.6E-05 | *t* | 2.0E-02 | 0.01 | *RA* | 1.0 | 2.00E-04 | *e* |
| Selenium | 7782-49-2 | NA | *u* | NA | *u* | | 5.0E-03 | *u* | NA | *u* | | 0.1 | *u* | 0.8 | NA | *u* |
| Silver | 7440-22-4 | | | | | | 5.0E-03 | *i* | 2.9E-06 | *t* | 5.0E-03 | 0.01 | *RA* | 1.0 | 6.00E-04 | *e* |
| Thallium chloride | 7791-12-0 | | | | | | 8.0E-05 | *i* | 2.9E-05 | *t* | 8.0E-05 | 0.01 | *RA* | 1.0 | 1.00E-03 | *e* |
| Tin | 7440-31-5 | | | | | | 6.0E-01 | *t* | 5.7E-03 | *t* | 6.0E-01 | 0.01 | *RA* | 1.0 | NA | *e* |
| Vanadium | 7440-62-2 | | | | | | 7.0E-03 | *h* | 1.4E-05 | *t* | 7.0E-03 | 0.01 | *RA* | 1.0 | 1.00E-03 | *e* |
| Zinc | 7440-66-6 | | | | | | 3.0E-01 | *i* | | | 3.0E-01 | 0.01 | *RA* | 1.0 | 6.00E-04 | *e* |
| **Inorganics** | | | | | | | | | | | | | | | | |
| Cyanide | 57-12-5 | | | | | | 2.0E-02 | *i* | 1.4E-03 | *t* | 2.0E-02 | 0.1 | *RA* | 1.0 | 1.00E-03 | *e* |

Notes:
A - Human carcinogen
B - Probable human carcinogen
B1 - Limited human evidence
B2 - Sufficient evidence in animals and inadequate evidence in humans
C - Possible human carcinogen
D - Not classifiable as to human carcinogenicity
E - Evidence of noncarcinogenicity for humans
NA - Not available

The letters in the table represent following sources:
i - USEPA IRIS
p - USEPA PPRTV's
n - USEPA NCEA
c - CALEPA OEHHA
t - TCEQ's TRRP Tier 1 PCL Table
h - HEAST
r - Route-to route extrapolation was used.
m -MDNR/MDHHS Memo, August 12, 2004
u - Value provided by MDNR UST-RBCA Guidance
a - Values assigned based on the most conservative Aroclor values found in the tiered hierarchy

Dermal Absorption Factor Sources

| | |
|---|---|
| RAGS Part A | RA |
| RAGS Part E | RE |

Permealibity Constant Sources

| | |
|---|---|
| Table in RAGS Part E | RE |
| Estimated by RAGS Part E | e |

**Table 4-8(a)(R)**
**Calculation of Risks for a Future On-site Non-residential Worker**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| 1,1,1-Trichloroethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 3,153 | NA | 1.60E-05 | NA | 1.60E-05 |
| 1,2,4-Trichlorobenzene | --- | --- | --- | --- | --- | --- | --- | 2,991 | 1.04E-10 | 7.04E-05 | --- | --- | --- | 1.04E-10 | 7.04E-05 |
| 1,2-Dichloroethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 19,930 | 2.72E-07 | 5.98E-03 | 2.72E-07 | 5.98E-03 |
| 2,4,6-Trichlorophenol | 410 | 1.49E-09 | 3.78E-03 | 1.58E-09 | 4.01E-03 | 4.36E-10 | 1.12E-03 | --- | --- | --- | --- | --- | --- | 3.50E-09 | 8.92E-03 |
| 2,4-Dichlorophenol | 410 | NA | 1.26E-04 | NA | 1.34E-04 | NA | 6.59E-05 | --- | --- | --- | --- | --- | --- | NA | 3.26E-04 |
| 2,4-Dimethylphenol | 410 | NA | 1.89E-05 | NA | 2.01E-05 | NA | 8.56E-06 | --- | --- | --- | --- | --- | --- | NA | 4.75E-05 |
| 2-Butanone (MEK) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 522,013 | NA | 7.67E-05 | NA | 7.67E-05 |
| 2-Chlorophenol | 410 | NA | 7.56E-05 | NA | 8.02E-05 | NA | 3.03E-05 | --- | --- | --- | 13 | NA | 5.91E-07 | NA | 1.87E-04 |
| 1-Methylnaphthalene | 12,566 | NA | 2.15E-04 | NA | 1.76E-04 | NA | 2.65E-05 | --- | --- | --- | --- | --- | --- | NA | 4.17E-04 |
| 2-Methyl naphthalene | 28,671 | NA | 6.61E-03 | NA | 7.01E-03 | NA | 7.91E-04 | 6,084 | NA | 1.37E-05 | 16 | NA | 8.18E-07 | NA | 1.44E-02 |
| 2-Nitrophenol | 410 | NA | 1.89E-04 | NA | 2.01E-04 | NA | 2.89E-04 | --- | --- | --- | --- | --- | --- | NA | 6.79E-04 |
| 4,6-Dinitro-2-methylphenol | 2,100 | NA | 9.69E-04 | NA | 1.03E-03 | NA | 2.21E-02 | --- | --- | --- | --- | --- | --- | NA | 2.41E-02 |
| 4-Chloro-3-methylphenol | 410 | NA | 7.56E-11 | NA | 8.02E-11 | NA | 1.05E-05 | --- | --- | --- | --- | --- | --- | NA | 1.05E-05 |
| 4-Methyl-2-pentanone (MIBK) | --- | --- | --- | --- | --- | --- | --- | 47,956 | NA | 1.06E-05 | 89,163 | NA | 1.88E-05 | NA | 2.94E-05 |
| Acenaphthene | 21,523 | NA | 9.93E-04 | NA | 3.51E-04 | NA | 2.80E-05 | 7,688 | NA | 5.75E-07 | 2.3 | NA | 6.61E-09 | NA | 1.37E-03 |
| Acetone | 51 | NA | 5.24E-08 | NA | 5.56E-08 | NA | 6.54E-08 | 50,811 | NA | 5.57E-05 | 5,615,890 | NA | 1.51E-03 | NA | 1.56E-03 |
| Anthracene | 6,096 | NA | 5.62E-05 | NA | 1.99E-05 | NA | 8.68E-07 | --- | --- | --- | --- | --- | --- | NA | 7.70E-05 |
| Antimony | 7,100 | NA | 1.64E-03 | NA | 1.74E-02 | NA | 2.57E-04 | --- | --- | --- | --- | --- | --- | NA | 1.93E-02 |
| Arsenic | 23,300 | 1.15E-07 | 7.16E-04 | 1.16E-05 | 7.22E-02 | 6.50E-08 | NA | --- | --- | --- | --- | --- | --- | **1.18E-05** | 7.29E-02 |
| Barium | 653,333 | NA | 8.61E-04 | NA | 9.13E-03 | NA | 2.41E-03 | --- | --- | --- | --- | --- | --- | NA | 1.24E-02 |
| Benzene | --- | --- | --- | --- | --- | --- | --- | 6,728 | 1.61E-07 | 9.09E-03 | 41,757 | 5.62E-07 | 3.17E-02 | 7.24E-07 | 4.08E-02 |
| Benzo(a)anthracene | 4,711 | 1.47E-06 | NA | 1.20E-06 | NA | 5.87E-09 | NA | --- | --- | --- | --- | --- | --- | 2.68E-06 | NA |
| Benzo(a)pyrene | 3,662 | 1.14E-05 | NA | 7.94E-06 | NA | 5.75E-08 | NA | --- | --- | --- | --- | --- | --- | **1.94E-05** | NA |
| Benzo(b)fluoranthene | 3,998 | 1.25E-06 | NA | 1.02E-06 | NA | 2.40E-09 | NA | 10,855 | 2.17E-11 | NA | 1.2 | 1.51E-11 | NA | 2.27E-06 | NA |
| Benzo(g,h,i)perylene | 1,912 | NA | 7.64E-05 | NA | 6.24E-05 | NA | 8.92E-07 | --- | --- | --- | --- | --- | --- | NA | 1.40E-04 |
| Benzo(k)fluoranthene | 2,742 | 8.57E-08 | NA | 6.99E-08 | NA | 1.61E-10 | NA | --- | --- | --- | --- | --- | --- | 1.56E-07 | NA |
| Bromodichloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15,811 | 2.36E-07 | 2.55E-04 | 2.36E-07 | 2.55E-04 |
| Bromoform | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 7,295 | 2.27E-09 | 8.26E-05 | 2.27E-09 | 8.26E-05 |
| Cadmium | 5,267 | NA | 9.72E-04 | NA | 1.03E-02 | 6.13E-09 | NA | --- | --- | --- | --- | --- | --- | 6.13E-09 | 1.13E-02 |
| Carbon disulfide | --- | --- | --- | --- | --- | --- | --- | 5,078 | NA | 3.47E-04 | 5,610 | NA | 2.04E-04 | NA | 5.51E-04 |
| Carbon tetrachloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,897 | 1.95E-07 | 9.12E-04 | 1.95E-07 | 9.12E-04 |
| Chlorobenzene | --- | --- | --- | --- | --- | --- | --- | 170,262 | NA | 5.57E-03 | 56,971 | NA | 2.63E-03 | NA | 8.20E-03 |
| Chloroform | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 18,573 | 5.70E-07 | 2.31E-02 | 5.70E-07 | 2.31E-02 |
| Chloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 38,458 | 5.21E-07 | 9.01E-03 | 5.21E-07 | 9.01E-03 |
| Chromium | 113,000 | NA | 6.95E-05 | NA | 7.37E-05 | NA | 2.04E-03 | --- | --- | --- | --- | --- | --- | NA | 2.19E-03 |
| Chrysene | 4,454 | 1.39E-08 | NA | 1.14E-08 | NA | 4.74E-11 | NA | 11,179 | 7.64E-13 | NA | 2.7 | 3.98E-13 | NA | 2.53E-08 | NA |
| cis-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 8,231 | NA | 7.44E-04 | NA | 7.44E-04 |
| Cobalt | 9,433 | NA | 4.35E-05 | NA | 4.62E-04 | 1.71E-08 | 8.54E-04 | --- | --- | --- | --- | --- | --- | 1.71E-08 | 1.36E-03 |
| Copper | 263,333 | NA | 6.07E-04 | NA | 6.44E-03 | NA | 4.77E-04 | --- | --- | --- | --- | --- | --- | NA | 7.53E-03 |
| Cyanide, Total | 2,000 | NA | 9.23E-05 | NA | 9.78E-05 | NA | 7.24E-07 | --- | --- | --- | --- | --- | --- | NA | 1.91E-04 |
| Dibenzo(a,h)anthracene | 749 | 2.34E-06 | NA | 1.91E-06 | NA | 2.61E-09 | NA | --- | --- | --- | --- | --- | --- | 4.26E-06 | NA |
| Dibenzofuran | 801 | NA | 5.54E-05 | NA | 1.96E-04 | NA | 1.74E-05 | 7,505 | NA | 1.04E-05 | 2.9 | NA | 1.66E-07 | NA | 2.79E-04 |
| Dibromochloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 6,124 | 5.11E-08 | 7.57E-05 | 5.11E-08 | 7.57E-05 |
| Ethyl methacrylate | --- | --- | --- | --- | --- | --- | --- | --- | NA | NA | 89 | NA | 3.10E-05 | NA | 3.10E-05 |
| Ethylbenzene | --- | --- | --- | --- | --- | --- | --- | 5,197 | NA | 1.24E-05 | 665 | NA | 3.46E-06 | NA | 1.59E-05 |
| Fluoranthene | 14,648 | NA | 3.38E-04 | NA | 1.79E-04 | NA | 6.58E-06 | --- | --- | --- | --- | --- | --- | NA | 5.24E-04 |
| Fluorene | 8,998 | NA | 6.23E-04 | NA | 2.20E-04 | NA | 1.24E-05 | 7,690 | NA | 4.29E-07 | 3.5 | NA | 1.43E-08 | NA | 8.56E-04 |
| Indeno-(1,2,3-cd)pyrene | 1,786 | 9.18E-07 | NA | 7.49E-07 | NA | 8.46E-10 | NA | --- | --- | --- | --- | --- | --- | 1.67E-06 | NA |
| Iodomethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 32,565 | NA | 1.37E-02 | NA | 1.37E-02 |

**Table 4-8(a)(R)**
**Calculation of Risks for a Future On-site Non-residential Worker**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| Mercury | 750 | NA | NA | NA | NA | NA | 1.77E-02 | 753 | NA | 2.69E-02 | --- | --- | --- | NA | 4.46E-02 |
| Methylene chloride | --- | --- | --- | --- | --- | --- | --- | 5,078 | 7.15E-09 | 1.06E-04 | 94 | 4.06E-11 | 6.04E-07 | 7.19E-09 | 1.07E-04 |
| Naphthalene | 104,419 | NA | 1.44E-02 | NA | 5.11E-03 | NA | 1.98E-02 | 16,176 | NA | 3.73E-04 | 24 | NA | 6.14E-06 | NA | 3.98E-02 |
| Nickel | 30,667 | NA | 1.41E-04 | NA | 1.50E-03 | 5.16E-09 | 6.17E-04 | --- | --- | --- | --- | --- | --- | 5.16E-09 | 2.26E-03 |
| Nitrobenzene | --- | --- | --- | --- | --- | --- | --- | 2,977 | NA | 1.59E-03 | --- | --- | --- | NA | 1.59E-03 |
| Pentachlorophenol | 2,100 | 2.08E-07 | 1.61E-04 | 8.81E-08 | 6.85E-05 | 2.99E-09 | 1.55E-05 | --- | --- | --- | --- | --- | --- | 2.99E-07 | 2.45E-04 |
| Phenanthrene | 28,526 | NA | 8.77E-04 | NA | 9.30E-04 | NA | 5.13E-05 | 22,324 | NA | 1.59E-06 | 3.9 | NA | 2.10E-08 | NA | 1.86E-03 |
| Phenol | 410 | NA | 1.26E-06 | NA | 1.34E-06 | NA | 5.68E-06 | --- | --- | --- | --- | --- | --- | NA | 8.27E-06 |
| Pyrene | 10,571 | NA | 3.25E-04 | NA | 3.45E-04 | NA | 6.79E-06 | 21,289 | NA | 1.86E-07 | 4.0 | NA | 1.96E-08 | NA | 6.77E-04 |
| Selenium | 1,033 | NA | 1.91E-04 | NA | 1.62E-04 | NA | NA | --- | --- | --- | --- | --- | --- | NA | 3.52E-04 |
| Tetrachloroethene | --- | --- | --- | --- | --- | --- | --- | 5,078 | 5.22E-08 | 8.60E-05 | 509 | 5.70E-09 | 9.39E-06 | 5.79E-08 | 9.54E-05 |
| Thallium | 800 | NA | 9.23E-04 | NA | 9.78E-03 | NA | 1.45E-05 | --- | --- | --- | --- | --- | --- | NA | 1.07E-02 |
| Tin | 321,667 | NA | 4.95E-05 | NA | 5.25E-04 | NA | 2.91E-05 | --- | --- | --- | --- | --- | --- | NA | 6.03E-04 |
| Toluene | --- | --- | --- | --- | --- | --- | --- | 5,148 | NA | 5.45E-05 | 1,283 | NA | 1.65E-05 | NA | 7.10E-05 |
| Trichloroethene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2,615 | 1.31E-08 | 3.09E-05 | 1.31E-08 | 3.09E-05 |
| Vanadium | 31,000 | NA | 4.09E-04 | NA | 4.33E-03 | NA | 1.12E-03 | --- | --- | --- | --- | --- | --- | NA | 5.86E-03 |
| Vinyl chloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 6,470 | 1.87E-08 | 1.46E-03 | 1.87E-08 | 1.46E-03 |
| Xylene | --- | --- | --- | --- | --- | --- | --- | 6,132 | NA | 1.67E-05 | 931 | NA | 6.11E-06 | NA | 2.28E-05 |
| Zinc | 1,066,667 | NA | 3.28E-04 | NA | 3.48E-03 | NA | NA | --- | --- | --- | --- | --- | --- | NA | 3.81E-03 |
| CUMULATIVE RISK | | 1.79E-05 | 3.70E-02 | 2.46E-05 | 1.56E-01 | 1.66E-07 | 7.00E-02 | | 2.21E-07 | 4.43E-02 | | 2.45E-06 | 9.15E-02 | 4.53E-05 | 3.99E-01 |

Notes:
NA: Not available
---: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard quotient
HI: Hazard index
**Values in bold** exceed target risk.

**Table 4-8(b)(R)**
**Calculation of Risks for a Future On-site Construction Worker**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Conc. | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groudnwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| 1,1,1-Trichloroethane | --- | --- | --- | --- | --- | --- | --- | 3,153 | NA | 2.43E-03 | NA | 1.20E-07 | NA | 2.43E-03 |
| 1,2,4-Trichlorobenzene | 2,915 | 7.47E-11 | 1.45E-04 | 5.28E-11 | 1.03E-04 | 1.40E-10 | 2.39E-03 | --- | --- | --- | --- | --- | 2.68E-10 | 2.64E-03 |
| 1,2-Dichloroethane | --- | --- | --- | --- | --- | --- | --- | 19,930 | 4.10E-06 | 1.05E-01 | 1.06E-10 | 5.81E-05 | 4.10E-06 | 1.05E-01 |
| 2,4,6-Trichlorophenol | 4,027 | 3.15E-10 | 2.01E-02 | 2.23E-10 | 1.42E-02 | 8.43E-10 | 5.44E-02 | --- | --- | --- | --- | --- | 1.38E-09 | 8.86E-02 |
| 2,4-Dichlorophenol | 4,027 | NA | 6.69E-04 | NA | 4.73E-04 | NA | 3.19E-03 | --- | --- | --- | --- | --- | NA | 4.33E-03 |
| 2,4-Dimethylphenol | 4,027 | NA | 1.00E-04 | NA | 7.09E-05 | NA | 4.14E-04 | --- | --- | --- | --- | --- | NA | 5.86E-04 |
| 2-Butanone (MEK) | --- | --- | --- | --- | --- | --- | --- | 522,013 | NA | 1.39E-02 | NA | 8.25E-07 | NA | 1.39E-02 |
| 2-Chlorophenol | 4,027 | NA | 4.01E-04 | NA | 2.84E-04 | NA | 1.47E-03 | 13 | NA | 3.33E-04 | NA | 6.22E-09 | NA | 2.49E-03 |
| 1-Methylnaphthalene | 12,566 | NA | 1.16E-04 | NA | 6.32E-05 | NA | 1.30E-04 | --- | --- | --- | --- | --- | NA | 3.10E-04 |
| 2-Methyl naphthalene | 11,626 | NA | 1.45E-03 | NA | 1.02E-03 | NA | 1.58E-03 | 16 | NA | 4.66E-03 | NA | 8.42E-09 | NA | 8.71E-03 |
| 2-Nitrophenol | 4,027 | NA | 1.00E-03 | NA | 7.09E-04 | NA | 1.40E-02 | --- | --- | --- | --- | --- | NA | 1.57E-02 |
| 4,6-Dinitro-2-methylphenol | 20,340 | NA | 5.07E-03 | NA | 3.58E-03 | NA | 1.06E+00 | --- | --- | --- | --- | --- | NA | **1.07E+00** |
| 4-Chloro-3-methylphenol | 4,027 | NA | 4.01E-10 | NA | 2.84E-10 | NA | 5.07E-04 | --- | --- | --- | --- | --- | NA | 5.07E-04 |
| 4-Methyl-2-pentanone (MIBK) | 47,964 | NA | 2.99E-04 | NA | 2.11E-04 | NA | 1.39E-04 | 89,163 | NA | 5.00E-02 | NA | 2.01E-07 | NA | 5.06E-02 |
| Acenaphthene | 12,006 | NA | 2.99E-04 | NA | 7.05E-05 | NA | 7.66E-05 | 2.3 | NA | 1.24E-04 | NA | 7.09E-11 | NA | 5.71E-04 |
| Acetone | 57,230 | NA | 3.17E-05 | NA | 2.24E-05 | NA | 3.61E-04 | 5,615,890 | NA | 5.42E-02 | NA | 1.63E-05 | NA | 5.46E-02 |
| Anthracene | 8,023 | NA | 4.00E-05 | NA | 9.42E-06 | NA | 5.58E-06 | --- | --- | --- | --- | --- | NA | 5.50E-05 |
| Antimony | 6,870 | NA | 8.56E-04 | NA | 6.05E-03 | NA | 2.45E-04 | --- | --- | --- | --- | --- | NA | 7.15E-03 |
| Arsenic | 13,878 | 1.48E-09 | 2.30E-04 | 9.95E-08 | 1.55E-02 | 1.53E-09 | NA | --- | --- | --- | --- | --- | 1.03E-07 | 1.57E-02 |
| Barium | 715,320 | NA | 5.09E-04 | NA | 3.60E-03 | NA | 2.61E-03 | --- | --- | --- | --- | --- | NA | 6.72E-03 |
| Benzene | 6,532 | 4.04E-09 | 3.25E-03 | 9.53E-10 | 7.67E-04 | 2.35E-08 | 3.31E-02 | 41,757 | 4.74E-06 | 3.81E+00 | 1.85E-10 | 2.61E-04 | 4.77E-06 | **3.85E+00** |
| Benzo(a)anthracene | 11,059 | 7.47E-08 | NA | 4.06E-08 | NA | 2.62E-09 | NA | --- | --- | --- | --- | --- | 1.18E-07 | NA |
| Benzo(a)pyrene | 7,679 | 5.19E-07 | NA | 2.40E-07 | NA | 2.24E-08 | NA | --- | --- | --- | --- | --- | 7.81E-07 | NA |
| Benzo(b)fluoranthene | 8,607 | 5.81E-08 | NA | 3.16E-08 | NA | 9.43E-10 | NA | 1.2 | 2.49E-07 | NA | 6.77E-15 | NA | 3.40E-07 | NA |
| Benzo(g,h,i)perylene | 4,052 | NA | 8.75E-05 | NA | 4.76E-05 | NA | 9.06E-06 | --- | --- | --- | --- | --- | NA | 1.44E-04 |
| Benzo(k)fluoranthene | 5,074 | 3.43E-09 | NA | 1.86E-09 | NA | 5.43E-11 | NA | --- | --- | --- | --- | --- | 5.34E-09 | NA |
| Beryllium | 1,132 | 6.77E-09 | 2.82E-05 | 4.79E-08 | 1.99E-04 | 6.94E-11 | 1.01E-04 | --- | --- | --- | --- | --- | 5.47E-08 | 3.29E-04 |
| Bromodichloromethane | --- | --- | --- | --- | --- | --- | --- | 15,811 | 1.07E-06 | 6.04E-02 | 9.64E-11 | 2.61E-06 | 1.07E-06 | 6.04E-02 |
| Bromoform | --- | --- | --- | --- | --- | --- | --- | 7,295 | 3.01E-08 | 1.33E-02 | 9.75E-13 | 8.86E-07 | 3.01E-08 | 1.33E-02 |
| Cadmium | 3,788 | NA | 3.77E-04 | NA | 2.67E-03 | 1.74E-10 | NA | --- | --- | --- | --- | --- | 1.74E-10 | 3.05E-03 |
| Carbon disulfide | 5,123 | NA | 2.55E-05 | NA | 1.80E-05 | NA | 5.40E-04 | 5,610 | NA | 1.58E-02 | NA | 1.48E-06 | NA | 1.64E-02 |
| Carbon tetrachloride | --- | --- | --- | --- | --- | --- | --- | 1,897 | 9.36E-07 | 7.20E-01 | 5.72E-11 | 6.67E-06 | 9.36E-07 | 7.20E-01 |
| Chlorobenzene | 165,837 | NA | 4.13E-03 | NA | 2.92E-03 | NA | 4.15E-02 | 56,971 | NA | 1.32E+00 | NA | 2.27E-05 | NA | **1.37E+00** |
| Chloroform | --- | --- | --- | --- | --- | --- | --- | 18,573 | 9.29E-07 | 2.10E-01 | 1.93E-10 | 1.95E-04 | 9.29E-07 | 2.10E-01 |
| Chloromethane | --- | --- | --- | --- | --- | --- | --- | 38,458 | 3.91E-07 | 8.20E-02 | 1.50E-10 | 6.50E-05 | 3.92E-07 | 8.20E-02 |
| Chromium | 32,040 | NA | 1.06E-05 | NA | 7.52E-06 | NA | 5.72E-04 | --- | --- | --- | --- | --- | NA | 5.90E-04 |
| Chrysene | 8,963 | 6.05E-10 | NA | 3.29E-10 | NA | 1.80E-11 | NA | 2.7 | 3.05E-09 | NA | 1.72E-16 | NA | 4.00E-09 | NA |
| cis-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | 8,231 | NA | 1.05E-01 | NA | 6.56E-06 | NA | 1.05E-01 |
| Cobalt | 8,184 | NA | 2.04E-05 | NA | 1.44E-04 | 5.85E-10 | 7.31E-04 | --- | --- | --- | --- | --- | 5.85E-10 | 8.96E-04 |
| Copper | 274,120 | NA | 3.41E-04 | NA | 2.41E-03 | NA | 4.90E-04 | --- | --- | --- | --- | --- | NA | 3.25E-03 |
| Cyanide total | 980 | NA | 2.44E-05 | NA | 1.73E-05 | NA | 3.50E-07 | --- | --- | --- | --- | --- | NA | 4.20E-05 |
| Dibenzo(a,h)anthracene | 2,416 | 1.63E-07 | NA | 8.88E-08 | NA | 1.44E-09 | NA | --- | --- | --- | --- | --- | 2.53E-07 | NA |
| Dibenzofuran | 6,700 | NA | 2.50E-04 | NA | 5.90E-04 | NA | 7.14E-04 | 2.9 | NA | 9.36E-04 | NA | 1.77E-09 | NA | 2.49E-03 |
| Dibromochloromethane | --- | --- | --- | --- | --- | --- | --- | 6,124 | 3.90E-07 | 1.63E-02 | 2.17E-11 | 8.04E-07 | 3.91E-07 | 1.63E-02 |
| Ethyl methacrylate | 6,122 | NA | 3.39E-05 | NA | 2.40E-05 | NA | 7.64E-04 | 89 | NA | 8.72E-06 | NA | 2.19E-07 | NA | 8.31E-04 |
| Ethylbenzene | 5,226 | NA | 7.81E-05 | NA | 1.69E-05 | NA | 8.61E-05 | 665 | NA | 6.72E-03 | NA | 2.74E-08 | NA | 6.91E-03 |
| Fluoranthene | 19,336 | NA | 2.41E-04 | NA | 8.51E-05 | NA | 4.18E-05 | --- | --- | --- | --- | --- | NA | 3.68E-04 |
| Fluorene | 8,093 | NA | 3.02E-04 | NA | 7.13E-05 | NA | 5.47E-05 | 3.5 | NA | 1.90E-04 | NA | 1.56E-10 | NA | 6.19E-04 |

**Table 4-8(b)(R)**
**Calculation of Risks for a Future On-site Construction Worker**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Conc. | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groudnwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| Indeno-(1,2,3-cd)pyrene | 4,157 | 4.61E-08 | NA | 2.51E-08 | NA | 3.41E-10 | NA | --- | --- | --- | --- | --- | 7.16E-08 | NA |
| Iodomethane | 5,900 | NA | 2.10E-03 | NA | 1.48E-03 | NA | 1.13E-02 | 32,565 | NA | 9.66E-01 | NA | 1.14E-04 | NA | 9.81E-01 |
| Mercury | 792 | NA | NA | NA | NA | NA | 9.21E-02 | --- | --- | --- | --- | --- | NA | 9.21E-02 |
| Methylene chloride | 5,123 | 2.73E-10 | 4.25E-05 | 1.93E-10 | 3.01E-05 | 1.06E-09 | 3.96E-04 | 94 | 5.85E-10 | 9.11E-05 | 1.48E-14 | 5.52E-09 | 2.11E-09 | 5.59E-04 |
| Naphthalene | 34,787 | NA | 2.60E-03 | NA | 6.13E-04 | NA | 3.25E-02 | 24 | NA | 1.14E-03 | NA | 6.33E-08 | NA | 3.69E-02 |
| Nickel | 29,744 | NA | 7.41E-05 | NA | 5.24E-04 | 1.97E-10 | 5.90E-04 | --- | --- | --- | --- | --- | 1.97E-10 | 1.19E-03 |
| Nitrobenzene | 2,903 | NA | 2.89E-03 | NA | 2.05E-03 | NA | 1.60E-02 | --- | --- | --- | --- | --- | NA | 2.10E-02 |
| Pentachlorophenol | 20,340 | 4.34E-08 | 8.44E-04 | 1.23E-08 | 2.39E-04 | 5.70E-09 | 7.38E-04 | --- | --- | --- | --- | --- | 6.14E-08 | 1.82E-03 |
| Phenanthrene | 23,799 | NA | 3.95E-04 | NA | 2.79E-04 | NA | 2.10E-04 | 3.9 | NA | 3.03E-04 | NA | 2.26E-10 | NA | 1.19E-03 |
| Phenol | 4,027 | NA | 6.69E-06 | NA | 4.73E-06 | NA | 2.75E-04 | --- | --- | --- | --- | --- | NA | 2.86E-04 |
| Pyrene | 17,509 | NA | 2.91E-04 | NA | 2.06E-04 | NA | 5.43E-05 | 4.0 | NA | 7.84E-04 | NA | 2.13E-10 | NA | 1.33E-03 |
| Silver | 1,496 | NA | 1.49E-05 | NA | 1.05E-04 | NA | 2.67E-04 | --- | --- | --- | --- | --- | NA | 3.88E-04 |
| Tetrachloroethene | 5,123 | 1.90E-09 | 2.55E-04 | 1.34E-09 | 1.80E-04 | 7.07E-09 | 2.91E-04 | 509 | 2.07E-07 | 2.79E-02 | 1.71E-12 | 7.04E-08 | 2.18E-07 | 2.86E-02 |
| Thallium | 924 | NA | 5.75E-04 | NA | 4.07E-03 | NA | 1.65E-05 | --- | --- | --- | --- | --- | NA | 4.66E-03 |
| Toluene | 5,183 | NA | 3.87E-06 | NA | 9.13E-06 | NA | 2.84E-04 | 1,283 | NA | 3.54E-03 | NA | 1.32E-07 | NA | 3.83E-03 |
| Trichloroethene | --- | --- | --- | --- | --- | --- | --- | 2,615 | 9.68E-08 | 3.07E-03 | 4.10E-12 | 2.41E-07 | 9.68E-08 | 3.07E-03 |
| Vinyl chloride | --- | --- | --- | --- | --- | --- | --- | 6,470 | 1.20E-05 | 2.01E-01 | 1.29E-10 | 1.03E-05 | **1.20E-05** | 2.01E-01 |
| Xylene | 6,198 | NA | 4.63E-06 | NA | 1.00E-06 | NA | 1.30E-04 | 931 | NA | 5.16E-04 | NA | 4.89E-08 | NA | 6.52E-04 |
| CUMULATIVE RISK | | 9.23E-07 | 5.06E-02 | 5.91E-07 | 6.57E-02 | 6.87E-08 | 1.37E+00 | | 2.52E-05 | 7.80E+00 | 9.46E-10 | 7.63E-04 | 2.68E-05 | **9.29E+00** |

Notes:
NA: Not available
---: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard quotient
HI: Hazard index
**Values in bold** exceed target risk.

**Table 5-1(a)(R)**
**Calculated Risks and Cleanup Goals for a Future On-site Non-residential Worker (Ground Surface Pavement)**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| 1,1,1-Trichloroethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 3,153 | NA | 1.60E-05 | NA | 1.60E-05 |
| 1,2,4-Trichlorobenzene | --- | --- | --- | --- | --- | --- | --- | 2,991 | 1.04E-10 | 7.04E-05 | --- | --- | --- | 1.04E-10 | 7.04E-05 |
| 1,2-Dichloroethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 19,930 | 2.73E-06 | 6.00E-02 | 2.73E-06 | 6.00E-02 |
| 2,4,6-Trichlorophenol | 410 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| 2,4-Dichlorophenol | 410 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| 2,4-Dimethylphenol | 410 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| 2-Butanone (MEK) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 522,013 | NA | 7.67E-05 | NA | 7.67E-05 |
| 2-Chlorophenol | 410 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | 13 | NA | 5.91E-07 | NA | 5.91E-07 |
| 1-Methylnaphthalene | 12,566 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| 2-Methyl naphthalene | 28,671 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6,084 | NA | 1.37E-05 | 16 | NA | 8.18E-07 | NA | 1.45E-05 |
| 2-Nitrophenol | 410 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| 4,6-Dinitro-2-methylphenol | 2,100 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| 4-Chloro-3-methylphenol | 410 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| 4-Methyl-2-pentanone (MIBK) | --- | --- | --- | --- | --- | --- | --- | 47,956 | NA | 1.06E-05 | 89,163 | NA | 1.88E-05 | NA | 2.94E-05 |
| Acenaphthene | 21,523 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7,688 | NA | 5.75E-07 | 2.3 | NA | 6.61E-09 | NA | 5.81E-07 |
| Acetone | 51 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 50,811 | NA | 5.57E-05 | 5,615,890 | NA | 1.51E-03 | NA | 1.56E-03 |
| Anthracene | 6,096 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Antimony | 7,100 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Arsenic | 23,300 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Barium | 653,333 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Benzene | --- | --- | --- | --- | --- | --- | --- | 6,728 | 1.61E-07 | 9.09E-03 | 41,757 | 5.62E-07 | 3.17E-02 | 7.24E-07 | 4.08E-02 |
| Benzo(a)anthracene | 4,711 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Benzo(a)pyrene | 3,662 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Benzo(b)fluoranthene | 3,998 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 10,855 | 2.17E-11 | NA | 1.2 | 1.51E-11 | NA | 3.68E-11 | NA |
| Benzo(g,h,i)perylene | 1,912 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Benzo(k)fluoranthene | 2,742 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Bromodichloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15,811 | 2.36E-07 | 2.55E-04 | 2.36E-07 | 2.55E-04 |
| Bromoform | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 7,295 | 2.27E-09 | 8.26E-05 | 2.27E-09 | 8.26E-05 |
| Cadmium | 5,267 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Carbon disulfide | --- | --- | --- | --- | --- | --- | --- | 5,078 | NA | 3.47E-04 | 5,610 | NA | 2.04E-04 | NA | 5.51E-04 |
| Carbon tetrachloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,897 | 1.95E-07 | 9.12E-04 | 1.95E-07 | 9.12E-04 |
| Chlorobenzene | --- | --- | --- | --- | --- | --- | --- | 170,262 | NA | 5.57E-03 | 56,971 | NA | 2.63E-03 | NA | 8.20E-03 |
| Chloroform | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 18,573 | 5.70E-07 | 2.31E-02 | 5.70E-07 | 2.31E-02 |
| Chloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 38,458 | 5.21E-07 | 9.01E-03 | 5.21E-07 | 9.01E-03 |
| Chromium | 113,000 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Chrysene | 4,454 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 11,179 | 7.64E-13 | NA | 2.7 | 3.98E-13 | NA | 1.16E-12 | NA |
| cis-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 8,231 | NA | 7.44E-04 | NA | 7.44E-04 |
| Cobalt | 9,433 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Copper | 263,333 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Cyanide, Total | 2,000 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Dibenzo(a,h)anthracene | 749 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Dibenzofuran | 801 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7,505 | NA | 1.04E-05 | 2.9 | NA | 1.66E-07 | NA | 1.06E-05 |
| Dibromochloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 6,124 | 5.11E-08 | 7.57E-05 | 5.11E-08 | 7.57E-05 |
| Ethyl methacrylate | --- | --- | --- | --- | --- | --- | --- | --- | NA | NA | 89 | NA | 3.10E-05 | NA | 3.10E-05 |
| Ethylbenzene | --- | --- | --- | --- | --- | --- | --- | 5,197 | NA | 1.24E-05 | 665 | NA | 3.46E-06 | NA | 1.59E-05 |
| Fluoranthene | 14,648 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Fluorene | 8,998 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7,690 | NA | 4.29E-07 | 3.5 | NA | 1.43E-08 | NA | 4.43E-07 |
| Indeno-(1,2,3-cd)pyrene | 1,786 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Iodomethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 32,565 | NA | 1.37E-02 | NA | 1.37E-02 |

**Table 5-1(a)(R)**
**Calculated Risks and Cleanup Goals for a Future On-site Non-residential Worker (Ground Surface Pavement)**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| Mercury | 750 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 753 | NA | 2.69E-02 | --- | --- | --- | NA | 2.69E-02 |
| Methylene chloride | --- | --- | --- | --- | --- | --- | --- | 5,078 | 7.15E-09 | 1.06E-04 | 94 | 4.06E-11 | 6.04E-07 | 7.19E-09 | 1.07E-04 |
| Naphthalene | 104,419 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 16,176 | NA | 3.73E-04 | 24 | NA | 6.14E-06 | NA | 3.79E-04 |
| Nickel | 30,667 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Nitrobenzene | --- | --- | --- | --- | --- | --- | --- | 2,977 | NA | 1.59E-03 | --- | --- | --- | NA | 1.59E-03 |
| Pentachlorophenol | 2,100 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Phenanthrene | 28,526 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 22,324 | NA | 1.59E-06 | 3.9 | NA | 2.10E-08 | NA | 1.61E-06 |
| Phenol | 410 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Pyrene | 10,571 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 21,289 | NA | 1.86E-07 | 4.0 | NA | 1.96E-08 | NA | 2.06E-07 |
| Selenium | 1,033 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Tetrachloroethene | --- | --- | --- | --- | --- | --- | --- | 5,078 | 5.22E-08 | 8.60E-05 | 509 | 5.70E-09 | 9.39E-06 | 5.79E-08 | 9.54E-05 |
| Thallium | 800 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Tin | 321,667 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Toluene | --- | --- | --- | --- | --- | --- | --- | 5,148 | NA | 5.45E-05 | 1,283 | NA | 1.65E-05 | NA | 7.10E-05 |
| Trichloroethene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2,615 | 1.31E-08 | 3.09E-05 | 1.31E-08 | 3.09E-05 |
| Vanadium | 31,000 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| Vinyl chloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 6,470 | 1.87E-08 | 1.46E-03 | 1.87E-08 | 1.46E-03 |
| Xylene | --- | --- | --- | --- | --- | --- | --- | 6,132 | NA | 1.67E-05 | 931 | NA | 6.11E-06 | NA | 2.28E-05 |
| Zinc | 1,066,667 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | --- | --- | --- | --- | --- | --- | NA | NA |
| CUMULATIVE RISK | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 2.21E-07 | 4.43E-02 | | 4.91E-06 | 1.46E-01 | 5.13E-06 | 1.90E-01 |

Notes:
NA: Not available
---: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard Quotient
HI: Hazard index
Highlighted pathway: Incomplete due to institutional control

**Table 5-1(b)(R)**
**Calculated Risks and Cleanup Goals for a Future On-site Non-residential Worker (Reduction of Surficial Soil Concentration)**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Cleanup Goals | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| 1,1,1-Trichloroethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 3,153 | NA | 1.60E-05 | NA | 1.60E-05 |
| 1,2,4-Trichlorobenzene | --- | --- | --- | --- | --- | --- | --- | 2,991 | 1.04E-10 | 7.04E-05 | --- | --- | --- | 1.04E-10 | 7.04E-05 |
| 1,2-Dichloroethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 19,930 | 2.73E-06 | 6.00E-02 | 2.73E-06 | 6.00E-02 |
| 2,4,6-Trichlorophenol | 410 | 1.49E-09 | 3.78E-03 | 1.58E-09 | 4.01E-03 | 4.36E-10 | 1.12E-03 | --- | --- | --- | --- | --- | --- | 3.50E-09 | 8.92E-03 |
| 2,4-Dichlorophenol | 410 | NA | 1.26E-04 | NA | 1.34E-04 | NA | 6.59E-05 | --- | --- | --- | --- | --- | --- | NA | 3.26E-04 |
| 2,4-Dimethylphenol | 410 | NA | 1.89E-05 | NA | 2.01E-05 | NA | 8.56E-06 | --- | --- | --- | --- | --- | --- | NA | 4.75E-05 |
| 2-Butanone (MEK) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 522,013 | NA | 7.67E-05 | NA | 7.67E-05 |
| 2-Chlorophenol | 410 | NA | 7.56E-05 | NA | 8.02E-05 | NA | 3.03E-05 | --- | --- | --- | 13 | NA | 5.91E-07 | NA | 1.87E-04 |
| 1-Methylnaphthalene | 12,566 | NA | 2.15E-04 | NA | 1.76E-04 | NA | 2.65E-05 | --- | --- | --- | --- | --- | --- | NA | 4.17E-04 |
| 2-Methyl naphthalene | 28,671 | NA | 6.61E-03 | NA | 7.01E-03 | NA | 7.91E-04 | 6,084 | NA | 1.37E-05 | 16 | NA | 8.18E-07 | NA | 1.44E-02 |
| 2-Nitrophenol | 410 | NA | 1.89E-04 | NA | 2.01E-04 | NA | 2.89E-04 | --- | --- | --- | --- | --- | --- | NA | 6.79E-04 |
| 4,6-Dinitro-2-methylphenol | 2,100 | NA | 9.69E-04 | NA | 1.03E-03 | NA | 2.21E-02 | --- | --- | --- | --- | --- | --- | NA | 2.41E-02 |
| 4-Chloro-3-methylphenol | 410 | NA | 7.56E-11 | NA | 8.02E-11 | NA | 1.05E-05 | --- | --- | --- | --- | --- | --- | NA | 1.05E-05 |
| 4-Methyl-2-pentanone (MIBK) | --- | --- | --- | --- | --- | --- | --- | 47,956 | NA | 1.06E-05 | 89,163 | NA | 1.88E-05 | NA | 2.94E-05 |
| Acenaphthene | 21,523 | NA | 9.93E-04 | NA | 3.51E-04 | NA | 2.80E-05 | 7,688 | NA | 5.75E-07 | 2.3 | NA | 6.61E-09 | NA | 1.37E-03 |
| Acetone | 51 | NA | 5.24E-08 | NA | 5.56E-08 | NA | 6.54E-08 | 50,811 | NA | 5.57E-05 | 5,615,890 | NA | 1.51E-03 | NA | 1.56E-03 |
| Anthracene | 6,096 | NA | 5.62E-05 | NA | 1.99E-05 | NA | 8.68E-07 | --- | --- | --- | --- | --- | --- | NA | 7.70E-05 |
| Antimony | 7,100 | NA | 1.64E-03 | NA | 1.74E-02 | NA | 2.57E-04 | --- | --- | --- | --- | --- | --- | NA | 1.93E-02 |
| Arsenic | 19,746 | 9.76E-08 | 6.07E-04 | 9.83E-06 | 6.12E-02 | 5.51E-08 | NA | --- | --- | --- | --- | --- | --- | 9.99E-06 | 6.18E-02 |
| Barium | 653,333 | NA | 8.61E-04 | NA | 9.13E-03 | NA | 2.41E-03 | --- | --- | --- | --- | --- | --- | NA | 1.24E-02 |
| Benzene | --- | --- | --- | --- | --- | --- | --- | 6,728 | 1.61E-07 | 9.09E-03 | 41,757 | 5.62E-07 | 3.17E-02 | 7.24E-07 | 4.08E-02 |
| Benzo(a)anthracene | 4,711 | 1.47E-06 | NA | 1.20E-06 | NA | 5.87E-09 | NA | --- | --- | --- | --- | --- | --- | 2.68E-06 | NA |
| Benzo(a)pyrene | 1,868 | 5.84E-06 | NA | 4.05E-06 | NA | 2.93E-08 | NA | --- | --- | --- | --- | --- | --- | 9.92E-06 | NA |
| Benzo(b)fluoranthene | 3,998 | 1.25E-06 | NA | 1.02E-06 | NA | 2.40E-09 | NA | 10,855 | 2.17E-11 | NA | 1.2 | 1.51E-11 | NA | 2.27E-06 | NA |
| Benzo(g,h,i)perylene | 1,912 | NA | 7.64E-05 | NA | 6.24E-05 | NA | 8.92E-07 | --- | --- | --- | --- | --- | --- | NA | 1.40E-04 |
| Benzo(k)fluoranthene | 2,742 | 8.57E-08 | NA | 6.99E-08 | NA | 1.61E-10 | NA | --- | --- | --- | --- | --- | --- | 1.56E-07 | NA |
| Bromodichloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15,811 | 2.36E-07 | 2.55E-04 | 2.36E-07 | 2.55E-04 |
| Bromoform | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 7,295 | 2.27E-09 | 8.26E-05 | 2.27E-09 | 8.26E-05 |
| Cadmium | 5,267 | NA | 9.72E-04 | NA | 1.03E-02 | 6.13E-09 | NA | --- | --- | --- | --- | --- | --- | 6.13E-09 | 1.13E-02 |
| Carbon disulfide | --- | --- | --- | --- | --- | --- | --- | 5,078 | NA | 3.47E-04 | 5,610 | NA | 2.04E-04 | NA | 5.51E-04 |
| Carbon tetrachloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,897 | 1.95E-07 | 9.12E-04 | 1.95E-07 | 9.12E-04 |
| Chlorobenzene | --- | --- | --- | --- | --- | --- | --- | 170,262 | NA | 5.57E-03 | 56,971 | NA | 2.63E-03 | NA | 8.20E-03 |
| Chloroform | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 18,573 | 5.70E-07 | 2.31E-02 | 5.70E-07 | 2.31E-02 |
| Chloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 38,458 | 5.21E-07 | 9.01E-03 | 5.21E-07 | 9.01E-03 |
| Chromium | 113,000 | NA | 6.95E-05 | NA | 7.37E-05 | NA | 2.04E-03 | --- | --- | --- | --- | --- | --- | NA | 2.19E-03 |
| Chrysene | 4,454 | 1.39E-08 | NA | 1.14E-08 | NA | 4.74E-11 | NA | 11,179 | 7.64E-13 | NA | 2.7 | 3.98E-13 | NA | 2.53E-08 | NA |
| cis-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 8,231 | NA | 7.44E-04 | NA | 7.44E-04 |
| Cobalt | 9,433 | NA | 4.35E-05 | NA | 4.62E-04 | 1.71E-08 | 8.54E-04 | --- | --- | --- | --- | --- | --- | 1.71E-08 | 1.36E-03 |
| Copper | 263,333 | NA | 6.07E-04 | NA | 6.44E-03 | NA | 4.77E-04 | --- | --- | --- | --- | --- | --- | NA | 7.53E-03 |
| Cyanide, Total | 2,000 | NA | 9.23E-05 | NA | 9.78E-05 | NA | 7.24E-07 | --- | --- | --- | --- | --- | --- | NA | 1.91E-04 |
| Dibenzo(a,h)anthracene | 749 | 2.34E-06 | NA | 1.91E-06 | NA | 2.61E-09 | NA | --- | --- | --- | --- | --- | --- | 4.26E-06 | NA |
| Dibenzofuran | 801 | NA | 5.54E-05 | NA | 1.96E-04 | NA | 1.74E-05 | 7,505 | NA | 1.04E-05 | 2.9 | NA | 1.66E-07 | NA | 2.79E-04 |
| Dibromochloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 6,124 | 5.11E-08 | 7.57E-05 | 5.11E-08 | 7.57E-05 |
| Ethyl methacrylate | --- | --- | --- | --- | --- | --- | --- | --- | NA | NA | 89 | NA | 3.10E-05 | NA | 3.10E-05 |
| Ethylbenzene | --- | --- | --- | --- | --- | --- | --- | 5,197 | NA | 1.24E-05 | 665 | NA | 3.46E-06 | NA | 1.59E-05 |
| Fluoranthene | 14,648 | NA | 3.38E-04 | NA | 1.79E-04 | NA | 6.58E-06 | --- | --- | --- | --- | --- | --- | NA | 5.24E-04 |
| Fluorene | 8,998 | NA | 6.23E-04 | NA | 2.20E-04 | NA | 1.24E-05 | 7,690 | NA | 4.29E-07 | 3.5 | NA | 1.43E-08 | NA | 8.56E-04 |
| Indeno-(1,2,3-cd)pyrene | 1,786 | 9.18E-07 | NA | 7.49E-07 | NA | 8.46E-10 | NA | --- | --- | --- | --- | --- | --- | 1.67E-06 | NA |
| Iodomethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 32,565 | NA | 1.37E-02 | NA | 1.37E-02 |

**Table 5-1(b)(R)**
**Calculated Risks and Cleanup Goals for a Future On-site Non-residential Worker (Reduction of Surficial Soil Concentration)**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Cleanup Goals | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| Mercury | 750 | NA | NA | NA | NA | NA | 1.77E-02 | 753 | NA | 2.69E-02 | --- | --- | --- | NA | 4.46E-02 |
| Methylene chloride | --- | --- | --- | --- | --- | --- | --- | 5,078 | 7.15E-09 | 1.06E-04 | 94 | 4.06E-11 | 6.04E-07 | 7.19E-09 | 1.07E-04 |
| Naphthalene | 104,419 | NA | 1.44E-02 | NA | 5.11E-03 | NA | 1.98E-02 | 16,176 | NA | 3.73E-04 | 24 | NA | 6.14E-06 | NA | 3.98E-02 |
| Nickel | 30,667 | NA | 1.41E-04 | NA | 1.50E-03 | 5.16E-09 | 6.17E-04 | --- | --- | --- | --- | --- | --- | 5.16E-09 | 2.26E-03 |
| Nitrobenzene | --- | --- | --- | --- | --- | --- | --- | 2,977 | NA | 1.59E-03 | --- | --- | --- | NA | 1.59E-03 |
| Pentachlorophenol | 2,100 | 2.08E-07 | 1.61E-04 | 8.81E-08 | 6.85E-05 | 2.99E-09 | 1.55E-05 | --- | --- | --- | --- | --- | --- | 2.99E-07 | 2.45E-04 |
| Phenanthrene | 28,526 | NA | 8.77E-04 | NA | 9.30E-04 | NA | 5.13E-05 | 22,324 | NA | 1.59E-06 | 3.9 | NA | 2.10E-08 | NA | 1.86E-03 |
| Phenol | 410 | NA | 1.26E-06 | NA | 1.34E-06 | NA | 5.68E-06 | --- | --- | --- | --- | --- | --- | NA | 8.27E-06 |
| Pyrene | 10,571 | NA | 3.25E-04 | NA | 3.45E-04 | NA | 6.79E-06 | 21,289 | NA | 1.86E-07 | 4.0 | NA | 1.96E-08 | NA | 6.77E-04 |
| Selenium | 1,033 | NA | 1.91E-04 | NA | 1.62E-04 | NA | NA | --- | --- | --- | --- | --- | --- | NA | 3.52E-04 |
| Tetrachloroethene | --- | --- | --- | --- | --- | --- | --- | 5,078 | 5.22E-08 | 8.60E-05 | 509 | 5.70E-09 | 9.39E-06 | 5.79E-08 | 9.54E-05 |
| Thallium | 800 | NA | 9.23E-04 | NA | 9.78E-03 | NA | 1.45E-05 | --- | --- | --- | --- | --- | --- | NA | 1.07E-02 |
| Tin | 321,667 | NA | 4.95E-05 | NA | 5.25E-04 | NA | 2.91E-05 | --- | --- | --- | --- | --- | --- | NA | 6.03E-04 |
| Toluene | --- | --- | --- | --- | --- | --- | --- | 5,148 | NA | 5.45E-05 | 1,283 | NA | 1.65E-05 | NA | 7.10E-05 |
| Trichloroethene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2,615 | 1.31E-08 | 3.09E-05 | 1.31E-08 | 3.09E-05 |
| Vanadium | 31,000 | NA | 4.09E-04 | NA | 4.33E-03 | NA | 1.12E-03 | --- | --- | --- | --- | --- | --- | NA | 5.86E-03 |
| Vinyl chloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 6,470 | 1.87E-08 | 1.46E-03 | 1.87E-08 | 1.46E-03 |
| Xylene | --- | --- | --- | --- | --- | --- | --- | 6,132 | NA | 1.67E-05 | 931 | NA | 6.11E-06 | NA | 2.28E-05 |
| Zinc | 1,066,667 | NA | 3.28E-04 | NA | 3.48E-03 | NA | NA | --- | --- | --- | --- | --- | --- | NA | 3.81E-03 |
| CUMULATIVE RISK | | 1.22E-05 | 3.69E-02 | 1.89E-05 | 1.45E-01 | 1.28E-07 | 7.00E-02 | | 2.21E-07 | 4.43E-02 | | 4.91E-06 | 1.46E-01 | 3.64E-05 | 4.42E-01 |

Notes:
NA: Not available
—: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard Quotient
HI: Hazard index

**Table 5-2(R)**
**Calculated Risks and Cleanup Goals for a Future On-site Construction Worker (Reduction of Groundwater Concentration)**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Cleanup Goals | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groudnwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| 1,1,1-Trichloroethane | --- | --- | --- | --- | --- | --- | --- | 3,157 | NA | 2.43E-03 | NA | 1.20E-07 | NA | 2.43E-03 |
| 1,2,4-Trichlorobenzene | 2,915 | 7.47E-11 | 1.45E-04 | 5.28E-11 | 1.03E-04 | 1.40E-10 | 2.39E-03 | --- | --- | --- | --- | --- | 2.68E-10 | 2.64E-03 |
| 1,2-Dichloroethane | --- | --- | --- | --- | --- | --- | --- | 586 | 1.21E-07 | 3.10E-03 | 3.11E-12 | 1.71E-06 | 1.21E-07 | 3.10E-03 |
| 2,4,6-Trichlorophenol | 4,027 | 3.15E-10 | 2.01E-02 | 2.23E-10 | 1.42E-02 | 8.43E-10 | 5.44E-02 | --- | --- | --- | --- | --- | 1.38E-09 | 8.86E-02 |
| 2,4-Dichlorophenol | 4,027 | NA | 6.69E-04 | NA | 4.73E-04 | NA | 3.19E-03 | --- | --- | --- | --- | --- | NA | 4.33E-03 |
| 2,4-Dimethylphenol | 4,027 | NA | 1.00E-04 | NA | 7.09E-05 | NA | 4.14E-04 | --- | --- | --- | --- | --- | NA | 5.86E-04 |
| 2-Butanone (MEK) | --- | --- | --- | --- | --- | --- | --- | 522,036 | NA | 1.39E-02 | NA | 8.26E-07 | NA | 1.39E-02 |
| 2-Chlorophenol | 4,027 | NA | 4.01E-04 | NA | 2.84E-04 | NA | 1.47E-03 | 13 | NA | 3.33E-04 | NA | 6.22E-09 | NA | 2.49E-03 |
| 1-Methylnaphthalene | 12,566 | NA | 1.16E-04 | NA | 6.32E-05 | NA | 1.30E-04 | --- | --- | --- | --- | --- | NA | 3.10E-04 |
| 2-Methyl naphthalene | 11,626 | NA | 1.45E-03 | NA | 1.02E-03 | NA | 1.58E-03 | 16 | NA | 4.66E-03 | NA | 8.42E-09 | NA | 8.71E-03 |
| 2-Nitrophenol | 4,027 | NA | 1.00E-03 | NA | 7.09E-04 | NA | 1.40E-02 | --- | --- | --- | --- | --- | NA | 1.57E-02 |
| 4-Chloro-3-methylphenol | 4,027 | NA | 4.01E-10 | NA | 2.84E-10 | NA | 5.07E-04 | --- | --- | --- | --- | --- | NA | 5.07E-04 |
| 4-Methyl-2-pentanone (MIBK) | 47,964 | NA | 2.99E-04 | NA | 2.11E-04 | NA | 1.39E-04 | 89,186 | NA | 5.00E-02 | NA | 2.01E-07 | NA | 5.06E-02 |
| Acenaphthene | 12,006 | NA | 2.99E-04 | NA | 7.05E-05 | NA | 7.66E-05 | 2.3 | NA | 1.24E-04 | NA | 7.09E-11 | NA | 5.71E-04 |
| Acetone | 57,230 | NA | 3.17E-05 | NA | 2.24E-05 | NA | 3.61E-04 | 5,615,940 | NA | 5.42E-02 | NA | 1.63E-05 | NA | 5.46E-02 |
| Anthracene | 8,023 | NA | 4.00E-05 | NA | 9.42E-06 | NA | 5.58E-06 | --- | --- | --- | --- | --- | NA | 5.50E-05 |
| Antimony | 6,870 | NA | 8.56E-04 | NA | 6.05E-03 | NA | 2.45E-04 | --- | --- | --- | --- | --- | NA | 7.15E-03 |
| Arsenic | 13,878 | 1.48E-09 | 2.30E-04 | 9.95E-08 | 1.55E-02 | 1.53E-09 | NA | --- | --- | --- | --- | --- | 1.03E-07 | 1.57E-02 |
| Barium | 715,320 | NA | 5.09E-04 | NA | 3.60E-03 | NA | 2.61E-03 | --- | --- | --- | --- | --- | NA | 6.72E-03 |
| Benzene | 6,532 | 4.04E-09 | 3.25E-03 | 9.53E-10 | 7.67E-04 | 2.35E-08 | 3.31E-02 | 1,230 | 1.40E-07 | 1.12E-01 | 5.46E-12 | 7.69E-06 | 1.68E-07 | 1.49E-01 |
| Benzo(a)anthracene | 11,059 | 7.47E-08 | NA | 4.06E-08 | NA | 2.62E-09 | NA | --- | --- | --- | --- | --- | 1.18E-07 | NA |
| Benzo(a)pyrene | 7,679 | 5.19E-07 | NA | 2.40E-07 | NA | 2.24E-08 | NA | --- | --- | --- | --- | --- | 7.81E-07 | NA |
| Benzo(b)fluoranthene | 8,607 | 5.81E-08 | NA | 3.16E-08 | NA | 9.43E-10 | NA | 1.2 | 2.40E-07 | NA | 6.52E-15 | NA | 3.31E-07 | NA |
| Benzo(g,h,i)perylene | 4,052 | NA | 8.75E-05 | NA | 4.76E-05 | NA | 9.06E-06 | --- | --- | --- | --- | --- | NA | 1.44E-04 |
| Benzo(k)fluoranthene | 5,074 | 3.43E-09 | NA | 1.86E-09 | NA | 5.43E-11 | NA | --- | --- | --- | --- | --- | 5.34E-09 | NA |
| Beryllium | 1,132 | 6.77E-09 | 2.82E-05 | 4.79E-08 | 1.99E-04 | 6.94E-11 | 1.01E-04 | --- | --- | --- | --- | --- | 5.47E-08 | 3.29E-04 |
| Bromodichloromethane | --- | --- | --- | --- | --- | --- | --- | 15,815 | 1.07E-06 | 6.04E-02 | 9.64E-11 | 2.61E-06 | 1.07E-06 | 6.04E-02 |
| Bromoform | --- | --- | --- | --- | --- | --- | --- | 7,299 | 3.01E-08 | 1.33E-02 | 9.75E-13 | 8.86E-07 | 3.01E-08 | 1.33E-02 |
| Cadmium | 3,788 | NA | 3.77E-04 | NA | 2.67E-03 | 1.74E-10 | NA | --- | --- | --- | --- | --- | 1.74E-10 | 3.05E-03 |
| Carbon disulfide | 5,123 | NA | 2.55E-05 | NA | 1.80E-05 | NA | 5.40E-04 | 5,613 | NA | 1.58E-02 | NA | 1.48E-06 | NA | 1.64E-02 |
| Carbon tetrachloride | --- | --- | --- | --- | --- | --- | --- | 56 | 2.76E-08 | 2.12E-02 | 1.68E-12 | 1.97E-07 | 2.76E-08 | 2.12E-02 |
| Chlorobenzene | 165,837 | NA | 4.13E-03 | NA | 2.92E-03 | NA | 4.15E-02 | 1,678 | NA | 3.90E-02 | NA | 6.70E-07 | NA | 8.75E-02 |
| Chloroform | --- | --- | --- | --- | --- | --- | --- | 546 | 2.73E-08 | 6.17E-03 | 5.68E-12 | 5.74E-06 | 2.73E-08 | 6.17E-03 |
| Chloromethane | --- | --- | --- | --- | --- | --- | --- | 38,464 | 3.91E-07 | 8.20E-02 | 1.50E-10 | 6.50E-05 | 3.92E-07 | 8.20E-02 |
| Chromium | 32,040 | NA | 1.06E-05 | NA | 7.52E-06 | NA | 5.72E-04 | --- | --- | --- | --- | --- | NA | 5.90E-04 |
| Chrysene | 8,963 | 6.05E-10 | NA | 3.29E-10 | NA | 1.80E-11 | NA | 2.7 | 3.05E-09 | NA | 1.72E-16 | NA | 4.00E-09 | NA |
| cis-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | 242 | NA | 3.08E-03 | NA | 1.93E-07 | NA | 3.08E-03 |
| Cobalt | 8,184 | NA | 2.04E-05 | NA | 1.44E-04 | 5.85E-10 | 7.31E-04 | --- | --- | --- | --- | --- | 5.85E-10 | 8.96E-04 |
| Copper | 274,120 | NA | 3.41E-04 | NA | 2.41E-03 | NA | 4.90E-04 | --- | --- | --- | --- | --- | NA | 3.25E-03 |
| Cyanide total | 980 | NA | 2.44E-05 | NA | 1.73E-05 | NA | 3.50E-07 | --- | --- | --- | --- | --- | NA | 4.20E-05 |
| Dibenzo(a,h)anthracene | 2,416 | 1.63E-07 | NA | 8.88E-08 | NA | 1.44E-09 | NA | --- | --- | --- | --- | --- | 2.53E-07 | NA |
| Dibenzofuran | 6,700 | NA | 2.50E-04 | NA | 5.90E-04 | NA | 7.14E-04 | 2.9 | NA | 9.36E-04 | NA | 1.77E-09 | NA | 2.49E-03 |
| Dibromochloromethane | --- | --- | --- | --- | --- | --- | --- | 6,128 | 3.91E-07 | 1.63E-02 | 2.17E-11 | 8.05E-07 | 3.91E-07 | 1.63E-02 |
| Ethyl methacrylate | 6,122 | NA | 3.39E-05 | NA | 2.40E-05 | NA | 7.64E-04 | 93 | NA | 9.07E-06 | NA | 2.27E-07 | NA | 8.32E-04 |
| Ethylbenzene | 5,226 | NA | 7.81E-05 | NA | 1.69E-05 | NA | 8.61E-05 | 661 | NA | 6.68E-03 | NA | 2.72E-08 | NA | 6.87E-03 |
| Fluoranthene | 19,336 | NA | 2.41E-04 | NA | 8.51E-05 | NA | 4.18E-05 | --- | --- | --- | --- | --- | NA | 3.68E-04 |
| Fluorene | 8,093 | NA | 3.02E-04 | NA | 7.13E-05 | NA | 5.47E-05 | 3.5 | NA | 1.88E-04 | NA | 1.54E-10 | NA | 6.17E-04 |

**Table 5-2(R)**
**Calculated Risks and Cleanup Goals for a Future On-site Construction Worker (Reduction of Groundwater Concentration)**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Cleanup Goals | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groudnwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| Indeno-(1,2,3-cd)pyrene | 4,157 | 4.61E-08 | NA | 2.51E-08 | NA | 3.41E-10 | NA | --- | --- | --- | --- | --- | 7.16E-08 | NA |
| Iodomethane | 5,900 | NA | 2.10E-03 | NA | 1.48E-03 | NA | 1.13E-02 | 958 | NA | 2.84E-02 | NA | 3.35E-06 | NA | 4.33E-02 |
| Mercury | 792 | NA | NA | NA | NA | NA | 9.21E-02 | --- | --- | --- | --- | --- | NA | 9.21E-02 |
| Methylene chloride | 5,123 | 2.73E-10 | 4.25E-05 | 1.93E-10 | 3.01E-05 | 1.06E-09 | 3.96E-04 | 102 | 6.37E-10 | 9.91E-05 | 1.61E-14 | 6.01E-09 | 2.17E-09 | 5.67E-04 |
| Naphthalene | 34,787 | NA | 2.60E-03 | NA | 6.13E-04 | NA | 3.25E-02 | 24 | NA | 1.14E-03 | NA | 6.33E-08 | NA | 3.69E-02 |
| Nickel | 29,744 | NA | 7.41E-05 | NA | 5.24E-04 | 1.97E-10 | 5.90E-04 | --- | --- | --- | --- | --- | 1.97E-10 | 1.19E-03 |
| Nitrobenzene | 2,903 | NA | 2.89E-03 | NA | 2.05E-03 | NA | 1.60E-02 | --- | --- | --- | --- | --- | NA | 2.10E-02 |
| Pentachlorophenol | 20,340 | 4.34E-08 | 8.44E-04 | 1.23E-08 | 2.39E-04 | 5.70E-09 | 7.38E-04 | --- | --- | --- | --- | --- | 6.14E-08 | 1.82E-03 |
| Phenanthrene | 23,799 | NA | 3.95E-04 | NA | 2.79E-04 | NA | 2.10E-04 | 3.9 | NA | 3.03E-04 | NA | 2.26E-10 | NA | 1.19E-03 |
| Phenol | 4,027 | NA | 6.69E-06 | NA | 4.73E-06 | NA | 2.75E-04 | --- | --- | --- | --- | --- | NA | 2.86E-04 |
| Pyrene | 17,509 | NA | 2.91E-04 | NA | 2.06E-04 | NA | 5.43E-05 | 4.0 | NA | 7.84E-04 | NA | 2.13E-10 | NA | 1.33E-03 |
| Silver | 1,496 | NA | 1.49E-05 | NA | 1.05E-04 | NA | 2.67E-04 | --- | --- | --- | --- | --- | NA | 3.88E-04 |
| Tetrachloroethene | 5,123 | 1.90E-09 | 2.55E-04 | 1.34E-09 | 1.80E-04 | 7.07E-09 | 2.91E-04 | 513 | 2.09E-07 | 2.81E-02 | 1.72E-12 | 7.09E-08 | 2.19E-07 | 2.88E-02 |
| Thallium | 924 | NA | 5.75E-04 | NA | 4.07E-03 | NA | 1.65E-05 | --- | --- | --- | --- | --- | NA | 4.66E-03 |
| Toluene | 5,183 | NA | 3.87E-06 | NA | 9.13E-06 | NA | 2.84E-04 | 1,284 | NA | 3.54E-03 | NA | 1.32E-07 | NA | 3.84E-03 |
| Trichloroethene | --- | --- | --- | --- | --- | --- | --- | 2,619 | 9.69E-08 | 3.07E-03 | 4.11E-12 | 2.42E-07 | 9.69E-08 | 3.07E-03 |
| Vinyl chloride | --- | --- | --- | --- | --- | --- | --- | 190 | 3.54E-07 | 5.90E-03 | 3.80E-12 | 3.02E-07 | 3.54E-07 | 5.90E-03 |
| Xylene | 6,198 | NA | 4.63E-06 | NA | 1.00E-06 | NA | 1.30E-04 | 938 | NA | 5.21E-04 | NA | 4.93E-08 | NA | 6.57E-04 |
| CUMULATIVE RISK | | 9.23E-07 | 5.06E-02 | 5.91E-07 | 6.57E-02 | 6.87E-08 | 1.37E+00 | | | | | | 4.68E-06 | 9.99E-01 |

Notes:
NA: Not available
—: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard quotient
HI: Hazard index

## Table 4-2(c)(R) - Without Free Product
## Representative Concentration of Groundwater for a Future On-site Non-residential and Construction Workers
## Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | 1,1,1-Trichloroethane | 1,2-Dichloroethane | 2,4-Dimethylphenol | 2-Butanone (MEK) | 2-Chlorophenol | 2-Methyl naphthalene | 4-Methyl-2-pentanone (MIBK) | Acenaphthene | Acetone | Anthracene | Antimony | Arsenic | Barium | Benzene | Benzo(a)anthracene | Benzo(a)pyrene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-24A | 7/24/2000 | <5 | <5 | 6.2 J | <25 | 36 | <10 | <25 | <10 | <50 | <10 | <20 | 350 | 420 | 83 | <0.34 | <0.55 |
| MW-24A | 9/20/2001 | 620 | 620 | | 3100 | | | 3100 | | 6200 | | | | | 18000 | | |
| MW-24A | 4/28/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | 11000 | | |
| MW-24A-DUP | 4/28/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | 12000 | | |
| MW-24A | 8/23/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | 8000 | | |
| MW-24A-D | 8/23/2004 | <100 | <100 | | <1000 | | | <1000 | | <2500 | | | | | 7700 | | |
| MW-24A | 4/18/2006 | <10 | <10 | | <100 | | | <100 | | 130 | | | | | 7100 | | |
| **Average (MW-24A)** | | **118** | **118** | **6.2** | **738** | **36** | **5.0** | **738** | **5.0** | **1622** | **5.0** | **10** | **350** | **420** | **9126** | **0.17** | **0.28** |
| MW-25A | 7/11/2000 | <50 | <50 | <10 | <250 | 2.5 J | 53 | <250 | 0.75 J | <500 | 0.37 J | <20 | 310 | 5300 | 160 | 0.82 J | 0.71 J |
| MW-25A | 9/21/2001 | <120 | <120 | | <620 | | | <620 | | <1200 | | | | | 300 | | |
| MW-25A | 4/29/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | 210 | | |
| MW-25A | 8/23/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | 530 | | |
| **Average (MW-25A)** | | **28** | **28** | **5.0** | **171** | **2.5** | **53** | **171** | **0.8** | **368** | **0.4** | **10** | **310** | **5300** | **300** | **0.8** | **0.7** |
| VW-1 | 7/26/2000 | <5 | <5 | <10 | <25 | 9.9 J | 4 J | <25 | 3 J | <50 | 1.1 J | <20 | 15 | 830 | 15000 | 1.8 J | 1.2 J |
| VW-1 Dup | 7/26/2000 | <5 | <5 | <10 | <25 | 10 | 3.8 J | <25 | 2.7 J | <50 | 1.1 J | <20 | 4.4 | 510 | 15000 | 1.4 J | 1.1 J |
| VW-1 | 9/20/2001 | <500 | <500 | | <2500 | | | <2500 | | <5000 | | | | | 16000 | | |
| VW-1 | 4/27/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | 380 | | |
| VW-1 | 8/23/2004 | <25 | <25 | | <250 | | | <250 | | <620 | | | | | 210 | | |
| **Average (VW-1)** | | **56** | **56** | **5.0** | **305** | **10** | **3.9** | **305** | **2.9** | **634** | **1.1** | **10** | **9.7** | **670** | **9318** | **1.6** | **1.2** |
| VW-2 | 8/1/2000 | <5 | <5 | <10 | <25 | 1.7 J | 0.49 J | <25 | 0.72 J | <12 | <10 | 57 | 31 | 2700 | 35 J | 2.8 J | 2.7 J |
| VW-2 | 9/20/2001 | | 20 | | 100 | | | 100 | | | | | | | 100 | | |
| VW-2 | 4/27/2004 | <10 | <10 | | <100 | | | <100 | | <250 | | | | | 25 | | |
| VW-2 | 8/20/2004 | <10 | <10 | | <100 | | | <100 | | <250 | | | | | 6 J | | |
| **Average (VW-2)** | | **4** | **8** | **5** | **53** | **1.7** | **0.49** | **53** | **0.72** | **85** | **5** | **57** | **31** | **2700** | **53** | **2.8** | **2.7** |
| **Representative Concentration** | | 51 | 52 | 5.3 | 317 | 13 | 16 | 317 | 2.3 | 677 | 2.9 | 22 | 175 | 2,273 | 4,699 | 1.3 | 1.2 |
| **Maximum Detected Concentration** | | 620 | 620 | 6.2 | 3,100 | 36 | 53 | 3,100 | 3.0 | 6,200 | 1.1 | 57 | 350 | 5,300 | 18,000 | 2.8 | 2.7 |
| **Concentration Ratio (Max./Rep.)** | | 12.0 | 11.8 | N/A | 9.8 | 2.9 | 3.4 | 9.8 | 1.3 | 9.2 | N/A | N/A | N/A | N/A | 3.8 | N/A | N/A |

Note:
N/A: Not applicable
All conc. in ug/L (micrograms/liter)
**Constituents in Bold and Underlined** were not considered in risk calculation.

## Table 4-2(c)(R) - Without Free Product
## Representative Concentration of Groundwater for a Future On-site Non-residential and Construction Workers
## Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| Sample ID | Sample Date | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Beryllium | Bis(2-ethylhexyl)phthalate | Bromodichloromethane | Bromoform | Butylbenzylphthalate | Cadmium | Carbon disulfide | Carbon tetrachloride | Chlorobenzene | Chloroform | Chloromethane | Chromium | Chrysene | cis-1,2-Dichloroethene | Cobalt | Copper | Dibenzo(a,h)anthracene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-24A | 7/24/2000 | <0.35 | 1.2 J | <10 | <4 | <2.6 | <5 | <5 | <10 | <5 | <5 | <5 | 21 | <5 | <10 | <10 | <10 | 46 | 2 | <20 | <10 |
| MW-24A | 9/20/2001 | | | | | | 620 | 620 | | | 620 | 620 | 17000 | 620 | 1200 | | | 620 | | | |
| MW-24A | 4/28/2004 | | | | | | <100 | <100 | | | <100 | <100 | 2700 | <100 | <100 | | | <100 | | | |
| MW-24A-DUP | 4/28/2004 | | | | | | <100 | <100 | | | <100 | <100 | 2600 | <100 | <100 | | | <100 | | | |
| MW-24A | 8/23/2004 | | | | | | <100 | <100 | | | <100 | <100 | 1600 | <100 | <100 | | | <100 | | | |
| MW-24A-D | 8/23/2004 | | | | | | <100 | <100 | | | <100 | <100 | 1500 | <100 | <100 | | | <100 | | | |
| MW-24A | 4/18/2006 | | | | | | <10 | <10 | | | <20 | <10 | 1900 | <10 | <10 | | | <10 | | | |
| **Average (MW-24A)** | | **0.18** | **1.2** | **5.0** | **2.0** | **1.3** | **118** | **118** | **5.0** | **2.5** | **119** | **118** | **3903** | **118** | **201** | **5.0** | **5.0** | **124** | **2.0** | **10** | **5.0** |
| MW-25A | 7/11/2000 | 0.61 J | 0.7 J | <10 | 17 | 8.7 J | <50 | <50 | 0.6 J | 8 | <50 | <50 | 950 | <50 | <100 | 460 | 0.92 J | <50 | 160 | 580 | <10 |
| MW-25A | 9/21/2001 | | | | | | <120 | <120 | | | <120 | <120 | 3400 | <120 | <250 | | | <120 | | | |
| MW-25A | 4/29/2004 | | | | | | <25 | <25 | | | <25 | <25 | 2800 | <25 | <25 | | | <25 | | | |
| MW-25A | 8/23/2004 | | | | | | <25 | <25 | | | <25 | <25 | 2400 | <25 | <25 | | | <25 | | | |
| **Average (MW-25A)** | | **0.6** | **0.7** | **5.0** | **17.0** | **8.7** | **28** | **28** | **0.6** | **8.0** | **28** | **28** | **2388** | **28** | **50** | **460** | **0.9** | **28** | **160** | **580** | **5.0** |
| VW-1 | 7/26/2000 | 1.5 J | <10 | 1.8 J | 1.2 | 4.5 J | <5 | <5 | 1.2 J | 2.9 | <5 | <5 | 4800 | <5 | 6.8 J | 40 | 2.1 J | <5 | 14 | 71 | <10 |
| VW-1 Dup | 7/26/2000 | 0.98 J | <10 | 1.4 J | <4 | 3.9 J | <5 | <5 | 0.6 J | <5 | <5 | <5 | 4800 | <5 | 5.5 J | 6.7 | 1.6 J | <5 | 2.4 | 19 | <10 |
| VW-1 | 9/20/2001 | | | | | | <500 | <500 | | | <500 | <500 | 3400 | <500 | <1000 | | | <500 | | | |
| VW-1 | 4/27/2004 | | | | | | <25 | <25 | | | <25 | <25 | 2200 | <25 | <25 | | | <25 | | | |
| VW-1 | 8/23/2004 | | | | | | <25 | <25 | | | <25 | <25 | 2100 | <25 | <25 | | | <25 | | | |
| **Average (VW-1)** | | **1.2** | **5.0** | **1.6** | **1.6** | **4.2** | **56** | **56** | **0.9** | **2.7** | **56** | **56** | **3460** | **56** | **175** | **23** | **1.9** | **56** | **8.2** | **45** | **5.0** |
| VW-2 | 8/1/2000 | 2.6 J | 2.4 J | 3.2 J | 1.8 | 14 | <5 | <5 | <10 | 4.8 | <5 | <5 | 970 | <5 | <10 | 49 | 3.2 J | <5 | 32 | 250 | 0.97 J |
| VW-2 | 9/20/2001 | | | | | | | 20 | | | | 20 | | 20 | | | | | | | |
| VW-2 | 4/27/2004 | | | | | | <10 | <10 | | | 7.9 J | <10 | 1300 | <10 | <10 | | | <10 | | | |
| VW-2 | 8/20/2004 | | | | | | <10 | <10 | | | <10 | <10 | 1400 | <10 | <10 | | | <10 | | | |
| **Average (VW-2)** | | **2.6** | **2.4** | **3.2** | **1.8** | **14** | **4.2** | **8.1** | **5** | **4.8** | **3.8** | **8.1** | **1223** | **8.1** | **5** | **49** | **3.2** | **4.2** | **32** | **250** | **0.97** |
| **Representative Concentration** | | 1.2 | 2.3 | 3.7 | 5.6 | 7.1 | 51 | 52 | 2.9 | 4.5 | 52 | 52 | 2,743 | 52 | 108 | 134 | 2.7 | 53 | 51 | 221 | 4.0 |
| **Maximum Detected Concentration** | | 2.6 | 2.4 | 3.2 | 17 | 9 | 620 | 620 | 1.2 | 8 | 620 | 620 | 17,000 | 620 | 1,200 | 460 | 3.2 | 620 | 160 | 580 | 1.0 |
| **Concentration Ratio (Max./Rep.)** | | 2.2 | N/A | N/A | N/A | N/A | 12.0 | 11.8 | N/A | N/A | 12.0 | 11.8 | 6.2 | 11.8 | 11.1 | N/A | 1.2 | 11.7 | N/A | N/A | N/A |

Note:
N/A: Not applicable
All conc. in ug/L (micrograms/liter)
**Constituents in Bold and Underlined** were not considered in risk calculation.

**Table 4-2(c)(R) - Without Free Product**
**Representative Concentration of Groundwater for a Future On-site Non-residential and Construction Workers**
**Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Dibenzofuran | Dibromochloromethane | Diethylphthalate | Di-n-butylphthalate | Di-n-octylphthalate | Ethyl methacrylate | Ethylbenzene | Fluoranthene | Fluorene | Indeno-(1,2,3-cd)pyrene | Iodomethane | Iron | Lead | Methylene chloride | Naphthalene | Nickel | p-Chloroaniline | Phenanthrene | Phenol |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-24A | 7/24/2000 | <10 | <5 | <10 | 0.34 J | 0.48 J | <5 | <5 | <10 | <10 | <1 | <5 | 11000 | 2.3 | <5 | 12 | 44 | 97 | <10 | 140 |
| MW-24A | 9/20/2001 | | 620 | | | | 620 | 1400 | | | | 620 | | | 620 | | | | | |
| MW-24A | 4/28/2004 | | <100 | | | | <100 | 900 | | | | <100 | | | <500 | | | | | |
| MW-24A-DUP | 4/28/2004 | | <100 | | | | <100 | 920 | | | | <100 | | | <500 | | | | | |
| MW-24A | 8/23/2004 | | <100 | | | | <100 | 810 | | | | <100 | | | <500 | | | | | |
| MW-24A-D | 8/23/2004 | | <100 | | | | <100 | 810 | | | | <100 | | | <500 | | | | | |
| MW-24A | 4/18/2006 | | <10 | | | | <10 | 950 | | | | <50 | | | <50 | | | | | |
| **Average (MW-24A)** | | **5.0** | **118** | **5.0** | **0.3** | **0.5** | **118** | **828** | **5.0** | **5.0** | **0.5** | **121** | **11000** | **2** | **235** | **12.0** | **44** | **97** | **5.0** | **140** |
| MW-25A | 7/11/2000 | 0.37 J | <50 | | 0.75 J | 0.84 J | <50 | 160 | 0.94 J | 0.7 J | 0.61 J | <50 | 460000 | 600 | <15 | 35 | 0.47 | <20 | 1.8 J | <10 |
| MW-25A | 9/21/2001 | | <120 | | | | <120 | 25 J | | | | <120 | | | <120 | | | | | |
| MW-25A | 4/29/2004 | | <25 | | | | <25 | <25 | | | | <25 | | | <120 | | | | | |
| MW-25A | 8/23/2004 | | <25 | | | | <25 | 55 | | | | <25 | | | <120 | | | | | |
| **Average (MW-25A)** | | **0.4** | **28** | **--** | **0.8** | **0.8** | **28** | **63** | **0.9** | **0.7** | **0.6** | **28** | **460000** | **600** | **47** | **35** | **0.47** | **10** | **1.8** | **5.0** |
| VW-1 | 7/26/2000 | 1.1 J | <5 | <10 | <10 | 0.94 J | <5 | 8 | 4.2 J | 3.1 J | 0.83 J | <5 | 41000 J | 370 J | <5 | 53 | 28 | 51 J | 4 J | 110 |
| VW-1 Dup | 7/26/2000 | 1.1 J | <5 | <10 | <10 | <10 | <5 | 6.4 | 3.8 J | 3.2 J | 0.64 J | <5 | 13000 J | 66 J | <5 | 47 | 4.9 | 47 J | 3.7 J | 120 |
| VW-1 | 9/20/2001 | | <500 | | | | <500 | <500 | | | | <500 | | | <500 | | | | | |
| VW-1 | 4/27/2004 | | <25 | | | | <25 | <25 | | | | <25 | | | <120 | | | | | |
| VW-1 | 8/23/2004 | | <25 | | | | <25 | <25 | | | | <25 | | | <120 | | | | | |
| **Average (VW-1)** | | **1.1** | **56** | **5.0** | **5.0** | **3.0** | **56** | **58** | **4.0** | **3.2** | **0.7** | **56** | **27000** | **218** | **75** | **50** | **16** | **49** | **3.9** | **115** |
| VW-2 | 8/1/2000 | <10 | <5 | 0.69 J | <10 | 0.74 J | <5 | <5 | 6.1 J | <10 | 2.1 J | <5 | 54000 | 780 | <2.2 | 0.71 J | 130 | 2.1 J | <10 | <10 |
| VW-2 | 9/20/2001 | | | | | | 20 | | | | | 20 | | | | | | | | |
| VW-2 | 4/27/2004 | | <10 | | | | <10 | <10 | | | | <10 | | | <50 | | | | | |
| VW-2 | 8/20/2004 | | <10 | | | | <10 | <10 | | | | <10 | | | <50 | | | | | |
| **Average (VW-2)** | | **5** | **4** | **0.69** | **5** | **0.74** | **8.1** | **4.2** | **6.1** | **5** | **2.1** | **8.1** | **54000** | **780** | **17** | **0.71** | **130** | **2.1** | **5** | **5** |
| **Representative Concentration** | | 2.9 | 51 | 3.6 | 2.8 | 1.3 | 52 | 238 | 4.0 | 3.5 | 1.0 | 53 | 138,000 | 400 | 94 | 24 | 48 | 40 | 3.9 | 66 |
| **Maximum Detected Concentration** | | 1.1 | 620 | 0.69 | 0.75 | 0.94 | 620 | 1,400 | 6.1 | 3.2 | 2.1 | 620 | 460,000 | 780 | 620 | 53 | 130 | 97 | 4.0 | 140 |
| **Concentration Ratio (Max./Rep.)** | | 0.4 | 12.0 | N/A | N/A | N/A | 11.8 | 5.9 | N/A | 0.9 | N/A | 11.7 | N/A | N/A | 6.6 | 2.2 | N/A | N/A | 1.0 | N/A |

Note:
N/A: Not applicable
All conc. in ug/L (micrograms/liter)
**Constituents in Bold and Underlined** were not considered in risk calculation.

**Table 4-2(c)(R) - Without Free Product**
**Representative Concentration of Groundwater for a Future On-site Non-residential and Construction Workers**
**Fomer Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Pyrene | Selenium | Tetrachloroethene | Thallium | Tin | Toluene | Trichloroethene | Vanadium | Vinyl chloride | Xylene | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-24A | 7/24/2000 | <10 | <10 | <5 | <10 | <50 | 0.85 J | 2.5 J | <10 | <0.5 | 14 | 56 |
| MW-24A | 9/20/2001 | | | 620 | | | 620 | 620 | | 62 | 4500 | |
| MW-24A | 4/28/2004 | | | <100 | | | 140 | <100 | | <100 | 3000 | |
| MW-24A-DUP | 4/28/2004 | | | <100 | | | 140 | <100 | | <100 | 3000 | |
| MW-24A | 8/23/2004 | | | <100 | | | 120 | <100 | | <100 | 2400 | |
| MW-24A-D | 8/23/2004 | | | <100 | | | 120 | <100 | | <100 | 2400 | |
| MW-24A | 4/18/2006 | | | <10 | | | 180 | <10 | | <10 | 2300 | |
| **Average (MW-24A)** | | **5.0** | **5.0** | **118** | **5.0** | **25.0** | **189** | **118** | **5** | **38** | **2516** | **56** |
| MW-25A | 7/11/2000 | 0.9 J | 13 | <50 | 9.9 | 2.3 | 16 J | <50 | 830 | <5 | 370 | 1500 |
| MW-25A | 9/21/2001 | | | <120 | | | 30 J | <120 | | <12 | 66 J | |
| MW-25A | 4/29/2004 | | | <25 | | | <25 | <25 | | <25 | 40 J | |
| MW-25A | 8/23/2004 | | | <25 | | | <25 | <25 | | <25 | 43 J | |
| **Average (MW-25A)** | | **0.9** | **13.0** | **28** | **9.9** | **2** | **14** | **28** | **830** | **8.4** | **130** | **1500** |
| VW-1 | 7/26/2000 | 3.9 J | <10 | <5 | <10 | 70 | 5.4 | <5 | 38 | <0.5 | 24 | 410 J |
| VW-1 Dup | 7/26/2000 | 3.7 J | <10 | <5 | <10 | <50 | 4.3 J | <5 | 7.9 | <0.5 | 19 | 77 J |
| VW-1 | 9/20/2001 | | | <500 | | | <500 | <500 | | <50 | <1000 | |
| VW-1 | 4/27/2004 | | | <25 | | | <25 | <25 | | <25 | <50 | |
| VW-1 | 8/23/2004 | | | <25 | | | <25 | <25 | | <25 | <50 | |
| **Average (VW-1)** | | **3.8** | **5.0** | **56** | **5.0** | **48** | **57** | **56** | **23** | **10** | **119** | **244** |
| VW-2 | 8/1/2000 | 6.3 J | <10 | <5 | <10 | 62 | 1.9 J | 0.7 J | 64 | <0.5 | <10 | 1000 |
| VW-2 | 9/20/2001 | | | | | | | | | | | |
| VW-2 | 4/27/2004 | | | <10 | | | <10 | <10 | | <10 | <20 | |
| VW-2 | 8/20/2004 | | | <10 | | | <10 | <10 | | <10 | <20 | |
| **Average (VW-2)** | | **6.3** | **5** | **4.2** | **5** | **62** | **4.0** | **3.6** | **64** | **3.4** | **8.3** | **1000** |
| **Representative Concentration** | | 4.0 | 7.0 | 51 | 6.2 | 34 | 66 | 51 | 230 | 15 | 693 | 700 |
| **Maximum Detected Concentration** | | 6.3 | 13 | 620 | 10 | 70 | 620 | 620 | 830 | 62 | 4,500 | 1,500 |
| **Concentration Ratio (Max./Rep.)** | | 1.6 | N/A | 12.0 | N/A | N/A | 9.4 | 12.1 | N/A | 4.1 | 6.5 | N/A |

Note:
N/A: Not applicable
All conc. in ug/L (micrograms/liter)
**Constituents in Bold and Underlined** were not considered in risk calculation.

**Table 4-8(a)(R) - Without Free Product**
**Calculation of Risks for a Future On-site Non-residential Worker**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| 1,1,1-Trichloroethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 51 | NA | 2.61E-07 | NA | 2.61E-07 |
| 1,2,4-Trichlorobenzene | --- | --- | --- | --- | --- | --- | --- | 2,991 | 1.04E-10 | 7.04E-05 | --- | --- | --- | 1.04E-10 | 7.04E-05 |
| 1,2-Dichloroethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 52 | 7.17E-10 | 1.57E-05 | 7.17E-10 | 1.57E-05 |
| 2,4,6-Trichlorophenol | 410 | 1.49E-09 | 3.78E-03 | 1.58E-09 | 4.01E-03 | 4.36E-10 | 1.12E-03 | --- | --- | --- | --- | --- | --- | 3.50E-09 | 8.92E-03 |
| 2,4-Dichlorophenol | 410 | NA | 1.26E-04 | NA | 1.34E-04 | NA | 6.59E-05 | --- | --- | --- | --- | --- | --- | NA | 3.26E-04 |
| 2,4-Dimethylphenol | 410 | NA | 1.89E-05 | NA | 2.01E-05 | NA | 8.56E-06 | --- | --- | --- | --- | --- | --- | NA | 4.75E-05 |
| 2-Butanone (MEK) | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 317 | NA | 4.65E-08 | NA | 4.65E-08 |
| 2-Chlorophenol | 410 | NA | 7.56E-05 | NA | 8.02E-05 | NA | 3.03E-05 | --- | --- | --- | 13 | NA | 5.91E-07 | NA | 1.87E-04 |
| 1-Methylnaphthalene | 12,566 | NA | 2.15E-04 | NA | 1.76E-04 | NA | 2.65E-05 | --- | --- | --- | --- | --- | --- | NA | 4.17E-04 |
| 2-Methyl naphthalene | 28,671 | NA | 6.61E-03 | NA | 7.01E-03 | NA | 7.91E-04 | 6,084 | NA | 1.37E-05 | 16 | NA | 8.18E-07 | NA | 1.44E-02 |
| 2-Nitrophenol | 410 | NA | 1.89E-04 | NA | 2.01E-04 | NA | 2.89E-04 | --- | --- | --- | --- | --- | --- | NA | 6.79E-04 |
| 4,6-Dinitro-2-methylphenol | 2,100 | NA | 9.69E-04 | NA | 1.03E-03 | NA | 2.21E-02 | --- | --- | --- | --- | --- | --- | NA | 2.41E-02 |
| 4-Chloro-3-methylphenol | 410 | NA | 7.56E-11 | NA | 8.02E-11 | NA | 1.05E-05 | --- | --- | --- | --- | --- | --- | NA | 1.05E-05 |
| 4-Methyl-2-pentanone (MIBK) | --- | --- | --- | --- | --- | --- | --- | 47,956 | NA | 1.06E-05 | 317 | NA | 6.70E-08 | NA | 1.07E-05 |
| Acenaphthene | 21,523 | NA | 9.93E-04 | NA | 3.51E-04 | NA | 2.80E-05 | 7,688 | NA | 5.75E-07 | 2.3 | NA | 6.61E-09 | NA | 1.37E-03 |
| Acetone | 51 | NA | 5.24E-08 | NA | 5.56E-08 | NA | 6.54E-08 | 50,811 | NA | 5.57E-05 | 677 | NA | 1.82E-07 | NA | 5.60E-05 |
| Anthracene | 6,096 | NA | 5.62E-05 | NA | 1.99E-05 | NA | 8.68E-07 | --- | --- | --- | --- | --- | --- | NA | 7.70E-05 |
| Antimony | 7,100 | NA | 1.64E-03 | NA | 1.74E-02 | NA | 2.57E-04 | --- | --- | --- | --- | --- | --- | NA | 1.93E-02 |
| Arsenic | 23,300 | 1.15E-07 | 7.16E-04 | 1.16E-05 | 7.22E-02 | 6.50E-08 | NA | --- | --- | --- | --- | --- | --- | **1.18E-05** | 7.29E-02 |
| Barium | 653,333 | NA | 8.61E-04 | NA | 9.13E-03 | NA | 2.41E-03 | --- | --- | --- | --- | --- | --- | NA | 1.24E-02 |
| Benzene | --- | --- | --- | --- | --- | --- | --- | 6,728 | 1.61E-07 | 9.09E-03 | 4,699 | 6.33E-08 | 3.57E-03 | 2.25E-07 | 1.27E-02 |
| Benzo(a)anthracene | 4,711 | 1.47E-06 | NA | 1.20E-06 | NA | 5.87E-09 | NA | --- | --- | --- | --- | --- | --- | 2.68E-06 | NA |
| Benzo(a)pyrene | 3,662 | 1.14E-05 | NA | 7.94E-06 | NA | 5.75E-08 | NA | --- | --- | --- | --- | --- | --- | **1.94E-05** | NA |
| Benzo(b)fluoranthene | 3,998 | 1.25E-06 | NA | 1.02E-06 | NA | 2.40E-09 | NA | 10,855 | 2.17E-11 | NA | 1.2 | 1.51E-11 | NA | 2.27E-06 | NA |
| Benzo(g,h,i)perylene | 1,912 | NA | 7.64E-05 | NA | 6.24E-05 | NA | 8.92E-07 | --- | --- | --- | --- | --- | --- | NA | 1.40E-04 |
| Benzo(k)fluoranthene | 2,742 | 8.57E-08 | NA | 6.99E-08 | NA | 1.61E-10 | NA | --- | --- | --- | --- | --- | --- | 1.56E-07 | NA |
| Bromodichloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 51 | 7.67E-10 | 8.29E-07 | 7.67E-10 | 8.29E-07 |
| Bromoform | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 52 | 1.63E-11 | 5.94E-07 | 1.63E-11 | 5.94E-07 |
| Cadmium | 5,267 | NA | 9.72E-04 | NA | 1.03E-02 | 6.13E-09 | NA | --- | --- | --- | --- | --- | --- | 6.13E-09 | 1.13E-02 |
| Carbon disulfide | --- | --- | --- | --- | --- | --- | --- | 5,078 | NA | 3.47E-04 | 52 | NA | 1.87E-06 | NA | 3.49E-04 |
| Carbon tetrachloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 52 | 5.40E-09 | 2.52E-05 | 5.40E-09 | 2.52E-05 |
| Chlorobenzene | --- | --- | --- | --- | --- | --- | --- | 170,262 | NA | 5.57E-03 | 2,743 | NA | 1.26E-04 | NA | 5.70E-03 |
| Chloroform | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 52 | 1.61E-09 | 6.51E-05 | 1.61E-09 | 6.51E-05 |
| Chloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 108 | 1.46E-09 | 2.53E-05 | 1.46E-09 | 2.53E-05 |
| Chromium | 113,000 | NA | 6.95E-05 | NA | 7.37E-05 | NA | 2.04E-03 | --- | --- | --- | --- | --- | --- | NA | 2.19E-03 |
| Chrysene | 4,454 | 1.39E-08 | NA | 1.14E-08 | NA | 4.74E-11 | NA | 11,179 | 7.64E-13 | NA | 2.7 | 3.98E-13 | NA | 2.53E-08 | NA |
| cis-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 53 | NA | 4.80E-06 | NA | 4.80E-06 |
| Cobalt | 9,433 | NA | 4.35E-05 | NA | 4.62E-04 | 1.71E-08 | 8.54E-04 | --- | --- | --- | --- | --- | --- | 1.71E-08 | 1.36E-03 |
| Copper | 263,333 | NA | 6.07E-04 | NA | 6.44E-03 | NA | 4.77E-04 | --- | --- | --- | --- | --- | --- | NA | 7.53E-03 |
| Cyanide, Total | 2,000 | NA | 9.23E-05 | NA | 9.78E-05 | NA | 7.24E-07 | --- | --- | --- | --- | --- | --- | NA | 1.91E-04 |
| Dibenzo(a,h)anthracene | 749 | 2.34E-06 | NA | 1.91E-06 | NA | 2.61E-09 | NA | --- | --- | --- | --- | --- | --- | 4.26E-06 | NA |
| Dibenzofuran | 801 | NA | 5.54E-05 | NA | 1.96E-04 | NA | 1.74E-05 | 7,505 | NA | 1.04E-05 | 2.9 | NA | 1.66E-07 | NA | 2.79E-04 |
| Dibromochloromethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 51 | 4.29E-10 | 6.36E-07 | 4.29E-10 | 6.36E-07 |
| Ethyl methacrylate | --- | --- | --- | --- | --- | --- | --- | --- | NA | NA | 52 | NA | 1.83E-05 | NA | 1.83E-05 |
| Ethylbenzene | --- | --- | --- | --- | --- | --- | --- | 5,197 | NA | 1.24E-05 | 238 | NA | 1.24E-06 | NA | 1.37E-05 |
| Fluoranthene | 14,648 | NA | 3.38E-04 | NA | 1.79E-04 | NA | 6.58E-06 | --- | --- | --- | --- | --- | --- | NA | 5.24E-04 |
| Fluorene | 8,998 | NA | 6.23E-04 | NA | 2.20E-04 | NA | 1.24E-05 | 7,690 | NA | 4.29E-07 | 3.5 | NA | 1.43E-08 | NA | 8.56E-04 |
| Indeno-(1,2,3-cd)pyrene | 1,786 | 9.18E-07 | NA | 7.49E-07 | NA | 8.46E-10 | NA | --- | --- | --- | --- | --- | --- | 1.67E-06 | NA |
| Iodomethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 53 | NA | 2.24E-05 | NA | 2.24E-05 |

**Table 4-8(a)(R) - Without Free Product**
**Calculation of Risks for a Future On-site Non-residential Worker**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| Mercury | 750 | NA | NA | NA | NA | NA | 1.77E-02 | 753 | NA | 2.69E-02 | --- | --- | --- | NA | 4.46E-02 |
| Methylene chloride | --- | --- | --- | --- | --- | --- | --- | 5,078 | 7.15E-09 | 1.06E-04 | 94 | 4.06E-11 | 6.04E-07 | 7.19E-09 | 1.07E-04 |
| Naphthalene | 104,419 | NA | 1.44E-02 | NA | 5.11E-03 | NA | 1.98E-02 | 16,176 | NA | 3.73E-04 | 24 | NA | 6.14E-06 | NA | 3.98E-02 |
| Nickel | 30,667 | NA | 1.41E-04 | NA | 1.50E-03 | 5.16E-09 | 6.17E-04 | --- | --- | --- | --- | --- | --- | 5.16E-09 | 2.26E-03 |
| Nitrobenzene | --- | --- | --- | --- | --- | --- | --- | 2,977 | NA | 1.59E-03 | --- | --- | --- | NA | 1.59E-03 |
| Pentachlorophenol | 2,100 | 2.08E-07 | 1.61E-04 | 8.81E-08 | 6.85E-05 | 2.99E-09 | 1.55E-05 | --- | --- | --- | --- | --- | --- | 2.99E-07 | 2.45E-04 |
| Phenanthrene | 28,526 | NA | 8.77E-04 | NA | 9.30E-04 | NA | 5.13E-05 | 22,324 | NA | 1.59E-06 | 3.9 | NA | 2.10E-08 | NA | 1.86E-03 |
| Phenol | 410 | NA | 1.26E-06 | NA | 1.34E-06 | NA | 5.68E-06 | --- | --- | --- | --- | --- | --- | NA | 8.27E-06 |
| Pyrene | 10,571 | NA | 3.25E-04 | NA | 3.45E-04 | NA | 6.79E-06 | 21,289 | NA | 1.86E-07 | 4.0 | NA | 1.96E-08 | NA | 6.77E-04 |
| Selenium | 1,033 | NA | 1.91E-04 | NA | 1.62E-04 | NA | NA | --- | --- | --- | --- | --- | --- | NA | 3.52E-04 |
| Tetrachloroethene | --- | --- | --- | --- | --- | --- | --- | 5,078 | 5.22E-08 | 8.60E-05 | 51 | 5.77E-10 | 9.50E-07 | 5.28E-08 | 8.70E-05 |
| Thallium | 800 | NA | 9.23E-04 | NA | 9.78E-03 | NA | 1.45E-05 | --- | --- | --- | --- | --- | --- | NA | 1.07E-02 |
| Tin | 321,667 | NA | 4.95E-05 | NA | 5.25E-04 | NA | 2.91E-05 | --- | --- | --- | --- | --- | --- | NA | 6.03E-04 |
| Toluene | --- | --- | --- | --- | --- | --- | --- | 5,148 | NA | 5.45E-05 | 66 | NA | 8.47E-07 | NA | 5.54E-05 |
| Trichloroethene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 51 | 2.58E-10 | 6.07E-07 | 2.58E-10 | 6.07E-07 |
| Vanadium | 31,000 | NA | 4.09E-04 | NA | 4.33E-03 | NA | 1.12E-03 | --- | --- | --- | --- | --- | --- | NA | 5.86E-03 |
| Vinyl chloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15 | 4.34E-11 | 3.38E-06 | 4.34E-11 | 3.38E-06 |
| Xylene | --- | --- | --- | --- | --- | --- | --- | 6,132 | NA | 1.67E-05 | 693 | NA | 4.55E-06 | NA | 2.13E-05 |
| Zinc | 1,066,667 | NA | 3.28E-04 | NA | 3.48E-03 | NA | NA | --- | --- | --- | --- | --- | --- | NA | 3.81E-03 |
| CUMULATIVE RISK | | 1.79E-05 | 3.70E-02 | 2.46E-05 | 1.56E-01 | 1.66E-07 | 7.00E-02 | | 2.21E-07 | 4.43E-02 | | 7.46E-08 | 3.89E-03 | 4.29E-05 | 3.11E-01 |

Notes:
NA: Not available
---: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard quotient
HI: Hazard index
**Values in bold** exceed target risk.

**Table 4-8(b)(R) - Without Free Product**
**Calculation of Risks for a Future On-site Construction Worker**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Conc. | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| 1,1,1-Trichloroethane | --- | --- | --- | --- | --- | --- | --- | 51 | NA | 3.97E-05 | NA | 1.96E-09 | NA | 3.97E-05 |
| 1,2,4-Trichlorobenzene | 2,915 | 7.47E-11 | 1.45E-04 | 5.28E-11 | 1.03E-04 | 1.40E-10 | 2.39E-03 | --- | --- | --- | --- | --- | 2.68E-10 | 2.64E-03 |
| 1,2-Dichloroethane | --- | --- | --- | --- | --- | --- | --- | 52 | 1.08E-08 | 2.77E-04 | 2.78E-13 | 1.53E-07 | 1.08E-08 | 2.77E-04 |
| 2,4,6-Trichlorophenol | 4,027 | 3.15E-10 | 2.01E-02 | 2.23E-10 | 1.42E-02 | 8.43E-10 | 5.44E-02 | --- | --- | --- | --- | --- | 1.38E-09 | 8.86E-02 |
| 2,4-Dichlorophenol | 4,027 | NA | 6.69E-04 | NA | 4.73E-04 | NA | 3.19E-03 | --- | --- | --- | --- | --- | NA | 4.33E-03 |
| 2,4-Dimethylphenol | 4,027 | NA | 1.00E-04 | NA | 7.09E-05 | NA | 4.14E-04 | --- | --- | --- | --- | --- | NA | 5.86E-04 |
| 2-Butanone (MEK) | --- | --- | --- | --- | --- | --- | --- | 317 | NA | 8.41E-06 | NA | 5.01E-10 | NA | 8.42E-06 |
| 2-Chlorophenol | 4,027 | NA | 4.01E-04 | NA | 2.84E-04 | NA | 1.47E-03 | 13 | NA | 3.33E-04 | NA | 6.22E-09 | NA | 2.49E-03 |
| 1-Methylnaphthalene | 12,566 | NA | 1.16E-04 | NA | 6.32E-05 | NA | 1.30E-04 | --- | --- | --- | --- | --- | NA | 3.10E-04 |
| 2-Methyl naphthalene | 11,626 | NA | 1.45E-03 | NA | 1.02E-03 | NA | 1.58E-03 | 16 | NA | 4.66E-03 | NA | 8.42E-09 | NA | 8.71E-03 |
| 2-Nitrophenol | 4,027 | NA | 1.00E-03 | NA | 7.09E-04 | NA | 1.40E-02 | --- | --- | --- | --- | --- | NA | 1.57E-02 |
| 4,6-Dinitro-2-methylphenol | 20,340 | NA | 5.07E-03 | NA | 3.58E-03 | NA | 1.06E+00 | --- | --- | --- | --- | --- | NA | 1.07E+00 |
| 4-Chloro-3-methylphenol | 4,027 | NA | 4.01E-10 | NA | 2.84E-10 | NA | 5.07E-04 | --- | --- | --- | --- | --- | NA | 5.07E-04 |
| 4-Methyl-2-pentanone (MIBK) | 47,964 | NA | 2.99E-04 | NA | 2.11E-04 | NA | 1.39E-04 | 317 | NA | 1.77E-04 | NA | 7.13E-10 | NA | 8.26E-04 |
| Acenaphthene | 12,006 | NA | 2.99E-04 | NA | 7.05E-05 | NA | 7.66E-05 | 2.3 | NA | 1.24E-04 | NA | 7.09E-11 | NA | 5.71E-04 |
| Acetone | 57,230 | NA | 3.17E-05 | NA | 2.24E-05 | NA | 3.61E-04 | 677 | NA | 6.54E-06 | NA | 1.96E-09 | NA | 4.21E-04 |
| Anthracene | 8,023 | NA | 4.00E-05 | NA | 9.42E-06 | NA | 5.58E-06 | --- | --- | --- | --- | --- | NA | 5.50E-05 |
| Antimony | 6,870 | NA | 8.56E-04 | NA | 6.05E-03 | NA | 2.45E-04 | --- | --- | --- | --- | --- | NA | 7.15E-03 |
| Arsenic | 13,878 | 1.48E-09 | 2.30E-04 | 9.95E-08 | 1.55E-02 | 1.53E-09 | NA | --- | --- | --- | --- | --- | 1.03E-07 | 1.57E-02 |
| Barium | 715,320 | NA | 5.09E-04 | NA | 3.60E-03 | NA | 2.61E-03 | --- | --- | --- | --- | --- | NA | 6.72E-03 |
| Benzene | 6,532 | 4.04E-09 | 3.25E-03 | 9.53E-10 | 7.67E-04 | 2.35E-08 | 3.31E-02 | 4,699 | 5.33E-07 | 4.29E-01 | 2.08E-11 | 2.94E-05 | 5.62E-07 | 4.66E-01 |
| Benzo(a)anthracene | 11,059 | 7.47E-08 | NA | 4.06E-08 | NA | 2.62E-09 | NA | --- | --- | --- | --- | --- | 1.18E-07 | NA |
| Benzo(a)pyrene | 7,679 | 5.19E-07 | NA | 2.40E-07 | NA | 2.24E-08 | NA | --- | --- | --- | --- | --- | 7.81E-07 | NA |
| Benzo(b)fluoranthene | 8,607 | 5.81E-08 | NA | 3.16E-08 | NA | 9.43E-10 | NA | 1.2 | 2.40E-07 | NA | 6.52E-15 | NA | 3.31E-07 | NA |
| Benzo(g,h,i)perylene | 4,052 | NA | 8.75E-05 | NA | 4.76E-05 | NA | 9.06E-06 | --- | --- | --- | --- | --- | NA | 1.44E-04 |
| Benzo(k)fluoranthene | 5,074 | 3.43E-09 | NA | 1.86E-09 | NA | 5.43E-11 | NA | --- | --- | --- | --- | --- | 5.34E-09 | NA |
| Beryllium | 1,132 | 6.77E-09 | 2.82E-05 | 4.79E-08 | 1.99E-04 | 6.94E-11 | 1.01E-04 | --- | --- | --- | --- | --- | 5.47E-08 | 3.29E-04 |
| Bromodichloromethane | --- | --- | --- | --- | --- | --- | --- | 51 | 3.48E-09 | 1.97E-04 | 3.14E-13 | 8.48E-09 | 3.48E-09 | 1.97E-04 |
| Bromoform | --- | --- | --- | --- | --- | --- | --- | 52 | 2.16E-10 | 9.58E-05 | 7.01E-15 | 6.37E-09 | 2.16E-10 | 9.58E-05 |
| Cadmium | 3,788 | NA | 3.77E-04 | NA | 2.67E-03 | 1.74E-10 | NA | --- | --- | --- | --- | --- | 1.74E-10 | 3.05E-03 |
| Carbon disulfide | 5,123 | NA | 2.55E-05 | NA | 1.80E-05 | NA | 5.40E-04 | 52 | NA | 1.46E-04 | NA | 1.36E-08 | NA | 7.29E-04 |
| Carbon tetrachloride | --- | --- | --- | --- | --- | --- | --- | 52 | 2.59E-08 | 1.99E-02 | 1.58E-12 | 1.84E-07 | 2.59E-08 | 1.99E-02 |
| Chlorobenzene | 165,837 | NA | 4.13E-03 | NA | 2.92E-03 | NA | 4.15E-02 | 2,743 | NA | 6.38E-02 | NA | 1.10E-06 | NA | 1.12E-01 |
| Chloroform | --- | --- | --- | --- | --- | --- | --- | 52 | 2.62E-09 | 5.92E-04 | 5.45E-13 | 5.51E-07 | 2.62E-09 | 5.93E-04 |
| Chloromethane | --- | --- | --- | --- | --- | --- | --- | 108 | 1.10E-09 | 2.30E-04 | 4.22E-13 | 1.82E-07 | 1.10E-09 | 2.30E-04 |
| Chromium | 32,040 | NA | 1.06E-05 | NA | 7.52E-06 | NA | 5.72E-04 | --- | --- | --- | --- | --- | NA | 5.90E-04 |
| Chrysene | 8,963 | 6.05E-10 | NA | 3.29E-10 | NA | 1.80E-11 | NA | 2.7 | 3.05E-09 | NA | 1.72E-16 | NA | 4.00E-09 | NA |
| cis-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | 53 | NA | 6.75E-04 | NA | 4.22E-08 | NA | 6.75E-04 |
| Cobalt | 8,184 | NA | 2.04E-05 | NA | 1.44E-04 | 5.85E-10 | 7.31E-04 | --- | --- | --- | --- | --- | 5.85E-10 | 8.96E-04 |
| Copper | 274,120 | NA | 3.41E-04 | NA | 2.41E-03 | NA | 4.90E-04 | --- | --- | --- | --- | --- | NA | 3.25E-03 |
| Cyanide total | 980 | NA | 2.44E-05 | NA | 1.73E-05 | NA | 3.50E-07 | --- | --- | --- | --- | --- | NA | 4.20E-05 |
| Dibenzo(a,h)anthracene | 2,416 | 1.63E-07 | NA | 8.88E-08 | NA | 1.44E-09 | NA | --- | --- | --- | --- | --- | 2.53E-07 | NA |
| Dibenzofuran | 6,700 | NA | 2.50E-04 | NA | 5.90E-04 | NA | 7.14E-04 | 2.9 | NA | 9.36E-04 | NA | 1.77E-09 | NA | 2.49E-03 |
| Dibromochloromethane | --- | --- | --- | --- | --- | --- | --- | 51 | 3.28E-09 | 1.37E-04 | 1.82E-13 | 6.76E-09 | 3.28E-09 | 1.37E-04 |
| Ethyl methacrylate | 6,122 | NA | 3.39E-05 | NA | 2.40E-05 | NA | 7.64E-04 | 52 | NA | 5.14E-06 | NA | 1.29E-07 | NA | 8.28E-04 |
| Ethylbenzene | 5,226 | NA | 7.81E-05 | NA | 1.69E-05 | NA | 8.61E-05 | 238 | NA | 2.41E-03 | NA | 9.80E-09 | NA | 2.59E-03 |
| Fluoranthene | 19,336 | NA | 2.41E-04 | NA | 8.51E-05 | NA | 4.18E-05 | --- | --- | --- | --- | --- | NA | 3.68E-04 |
| Fluorene | 8,093 | NA | 3.02E-04 | NA | 7.13E-05 | NA | 5.47E-05 | 3.5 | NA | 1.88E-04 | NA | 1.54E-10 | NA | 6.17E-04 |

**Table 4-8(b)(R) - Without Free Product**
**Calculation of Risks for a Future On-site Construction Worker**
**Former Bulk Chemical Storage Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Conc. | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groudnwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| Indeno-(1,2,3-cd)pyrene | 4,157 | 4.61E-08 | NA | 2.51E-08 | NA | 3.41E-10 | NA | --- | --- | --- | --- | --- | 7.16E-08 | NA |
| Iodomethane | 5,900 | NA | 2.10E-03 | NA | 1.48E-03 | NA | 1.13E-02 | 53 | NA | 1.58E-03 | NA | 1.86E-07 | NA | 1.65E-02 |
| Mercury | 792 | NA | NA | NA | NA | NA | 9.21E-02 | --- | --- | --- | --- | --- | NA | 9.21E-02 |
| Methylene chloride | 5,123 | 2.73E-10 | 4.25E-05 | 1.93E-10 | 3.01E-05 | 1.06E-09 | 3.96E-04 | 94 | 5.85E-10 | 9.11E-05 | 1.48E-14 | 5.52E-09 | 2.11E-09 | 5.59E-04 |
| Naphthalene | 34,787 | NA | 2.60E-03 | NA | 6.13E-04 | NA | 3.25E-02 | 24 | NA | 1.14E-03 | NA | 6.33E-08 | NA | 3.69E-02 |
| Nickel | 29,744 | NA | 7.41E-05 | NA | 5.24E-04 | 1.97E-10 | 5.90E-04 | --- | --- | --- | --- | --- | 1.97E-10 | 1.19E-03 |
| Nitrobenzene | 2,903 | NA | 2.89E-03 | NA | 2.05E-03 | NA | 1.60E-02 | --- | --- | --- | --- | --- | NA | 2.10E-02 |
| Pentachlorophenol | 20,340 | 4.34E-08 | 8.44E-04 | 1.23E-08 | 2.39E-04 | 5.70E-09 | 7.38E-04 | --- | --- | --- | --- | --- | 6.14E-08 | 1.82E-03 |
| Phenanthrene | 23,799 | NA | 3.95E-04 | NA | 2.79E-04 | NA | 2.10E-04 | 3.9 | NA | 3.03E-04 | NA | 2.26E-10 | NA | 1.19E-03 |
| Phenol | 4,027 | NA | 6.69E-06 | NA | 4.73E-06 | NA | 2.75E-04 | --- | --- | --- | --- | --- | NA | 2.86E-04 |
| Pyrene | 17,509 | NA | 2.91E-04 | NA | 2.06E-04 | NA | 5.43E-05 | 4.0 | NA | 7.84E-04 | NA | 2.13E-10 | NA | 1.33E-03 |
| Silver | 1,496 | NA | 1.49E-05 | NA | 1.05E-04 | NA | 2.67E-04 | --- | --- | --- | --- | --- | NA | 3.88E-04 |
| Tetrachloroethene | 5,123 | 1.90E-09 | 2.55E-04 | 1.34E-09 | 1.80E-04 | 7.07E-09 | 2.91E-04 | 51 | 2.10E-08 | 2.82E-03 | 1.73E-13 | 7.12E-09 | 3.13E-08 | 3.55E-03 |
| Thallium | 924 | NA | 5.75E-04 | NA | 4.07E-03 | NA | 1.65E-05 | --- | --- | --- | --- | --- | NA | 4.66E-03 |
| Toluene | 5,183 | NA | 3.87E-06 | NA | 9.13E-06 | NA | 2.84E-04 | 66 | NA | 1.81E-04 | NA | 6.78E-09 | NA | 4.79E-04 |
| Trichloroethene | --- | --- | --- | --- | --- | --- | --- | 51 | 1.90E-09 | 6.02E-05 | 8.05E-14 | 4.74E-09 | 1.90E-09 | 6.02E-05 |
| Vinyl chloride | --- | --- | --- | --- | --- | --- | --- | 15 | 2.79E-08 | 4.65E-04 | 3.00E-13 | 2.38E-08 | 2.79E-08 | 4.66E-04 |
| Xylene | 6,198 | NA | 4.63E-06 | NA | 1.00E-06 | NA | 1.30E-04 | 693 | NA | 3.84E-04 | NA | 3.64E-08 | NA | 5.21E-04 |
| CUMULATIVE RISK | | 9.23E-07 | 5.06E-02 | 5.91E-07 | 6.57E-02 | 6.87E-08 | 1.37E+00 | | 8.75E-07 | 5.32E-01 | 2.47E-11 | 3.21E-05 | 2.46E-06 | **2.02E+00** |

Notes:
NA: Not available
---: Risk was not calculated as chemical was not detected.
IELCR: Individual excess lifetime cancer risk.
HQ: Hazard quotient
HI: Hazard index
**Values in bold** exceed target risk.
Constituent is not site related. Therefore, if 4,6-Dinitro-2-methylphenol is not considered, site-wide cumulative non-carcinogenic risk will be 0.96 which is acceptable.

# APPENDIX D
# UPDATE OF 2005 RISK ASSESSMENT FOR FORMER ACETANILIDES PRODUCTION AREA


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| Table 5-1(a)(R) | Calculated Risks and Cleanup Goals for a Current On-site Non-residential Worker (Reduction of Surficial Soil Concentration) – "Not Required in Updated 2005 RA" |
| Table 5-1(b)(R) | Calculated Risks and Cleanup Goals for a Future On-site Non-residential Worker (Reduction of Surficial Soil Concentration) – "Not Required in Updated 2005 RA" |
| Table 5-1(c)(R) | Calculated Risks and Cleanup Goals for a Future On-site Construction Worker (Reduction of Soil and Groundwater Concentrations) |


***Several tables in the 2005 RA (RAM Group, Inc. and URS, September 2005) were revised. The revised tables are distinguished with an (R) in the table number. Note that Tables 5-1(a) and 5-1(b) in the 2005 RA are not required in the Updated 2005 RA since the risks by the current and future on-site non-residential worker are acceptable.***

## D.1 INTRODUCTION

The 2005 risk assessment (RA) for Former Acetanilides Production Area (APA) presented in the *Updated Risk Assessment and Development of Site-Specific Media Cleanup Goals for Former Acetanilides Production Area in Solutia – J.F. Queeny Plant* (RAM Group, Inc. and URS, September 2005) concluded that site-wide cumulative non-carcinogenic risk to the current and future on-site non-residential worker exceeded the acceptable target risk. The primary exposure pathway for this exceedence was outdoor inhalation of mercury in surficial soil. Only two surficial soil samples for mercury collected in June 2000 were available to estimate the risk for the non-residential worker. Therefore, one of risk management alternatives to manage this exceedence was to collect additional surficial soil samples and to update the risk.

## D.2 ADDITIONAL SAMPLES

In April 2006, five soil borings (APA06-01 to APA06-05) were advanced to a depth of approximately 3 ft in corners of a square, centered on the former soil boring SB-A. Locations were approximately 20 ft apart from the center. Four soil borings (APA06-07 to APA07-10) were advanced to a depth of approximately 3 ft in the APA area. One surficial soil sample was collected from each soil boring and analyzed for mercury. One test sample was collected from soil boring APA06-06 for mercury. The location of soil borings are presented in Figure 2 of Appendix A. Additional details of the sampling and analytical procedures are included in Appendix A.

## D.3 UPDATE OF 2005 RISK ASSESSMENT

### D.3.1 STEP 1: UPDATE OF REPRESENTATIVE CONCENTRATIONS

Additional soil data were added to Table 2-3 (Soil Analytical Data Showing Constituents with At Least One Detection) in the 2005 RA. The corresponding Table 2-3(R) is included. Using these additional soil data, representative concentrations were recalculated for mercury for the following media – receptor combinations:

- Surficial soil for a current on-site non-residential worker,
- Surficial soil for a future on-site non-residential worker, and
- Soil for a future on-site construction worker.

The revised tables for representative concentrations are presented in Tables 4-2(a)(R) and 4-2(f)(R).

### D.3.2 STEP 2: UPDATE OF RISKS

Using the recalculated representative concentrations, risks were updated for the following receptors of concern:

- Current on-site non-residential workers,

- Future on-site non-residential workers, and
- Future on-site construction workers.

In updating the representative concentrations and risks, the same assumptions and parameters as used in the 2005 RA were used.

The recalculated risks are presented in Tables 4-7(a)(R) to 4-7(c)(R) for current on-site non-residential worker, future on-site non-residential worker, and future on-site construction worker, respectively. Based on these tables, following are the key observations.

### D.3.2.1 Current On-site Non-residential Worker

*Carcinogenic Risk:*

As indicated in Table 4-7(a)(R), the site-wide cumulative individual excess lifetime cancer risk (IELCR) is $9.6 \times 10^{-6}$, which is well below the acceptable target risk level of $1 \times 10^{-4}$. In addition, the cumulative risk for each constituent of concern (COC) is less than $1 \times 10^{-5}$ – the acceptable target risk level.

*Non-carcinogenic Risk:*

As shown in Table 4-7(a)(R), the site-wide cumulative hazard index (HI) is 0.65, which is below the acceptable target risk level of 1.0. In addition, the cumulative risk for each COC is less than 1.0 – the acceptable target risk level.

***Risks for the current on-site non-residential worker did not exceed the target risk levels and does not need further evaluation or risk management.***

### D.3.2.2 Future On-site Non-residential Worker

*Carcinogenic Risk:*

As indicated in Table 4-7(b)(R), the site-wide cumulative IELCR is $1.0 \times 10^{-5}$, which is below the acceptable target risk level of $1 \times 10^{-4}$. In addition, the cumulative risk for each COC is less than $1 \times 10^{-5}$ – the acceptable target risk level.

*Non-carcinogenic Risk:*

As shown in Table 4-7(b)(R), the site-wide cumulative HI is 0.62, which is below the acceptable target risk level of 1.0. In addition, the cumulative risk for each COC is less than 1.0 – the acceptable target risk level.

***Risks for the future on-site non-residential worker did not exceed the target risk levels and does not need further evaluation or risk management.***

### D.3.2.3 Future On-site Construction Worker

*Carcinogenic Risk:*

As indicated in Table 4-7(c)(R), the site-wide cumulative IELCR is $3.8 \times 10^{-5}$ which is below the acceptable target risk level of $1 \times 10^{-4}$. However, further examination of the table indicates that the cumulative risk for alachlor is $1.8 \times 10^{-5}$ and dibenzo(a,h)anthracene is $1.1 \times 10^{-5}$ which are above the acceptable target risk for each COC of $1 \times 10^{-5}$. The primary exposure pathway for the exceedence of alachlor and dibenzo(a,h)anthracene is dermal contact with groundwater.

*Non-carcinogenic Risk:*

As shown in Table 4-7(c)(R), the site-wide cumulative HI is 4.2, which is above the acceptable target risk level of 1.0. The table indicates that constituents contributed most to this exceedence were alachlor, chlorobenzene, and mercury. The primary exposure pathway for alachlor and chlorobenzene is dermal contact with groundwater and the primary exposure pathway for elemental mercury is outdoor inhalation of vapors and particulates from surficial soil.

***Risks to the potential future on-site construction worker exceeded the target risk levels and will be addressed in the CMS.***

### D.3.3 STEP 3: UPDATE OF RISK MANAGEMENT ALTERNATIVES

The Updated 2005 RA indicates that:

- Risks for the current and potential future non-residential worker did not exceed the target risk level and does not need further evaluation or risk management.

- Total carcinogenic risk for alachlor and dibenzo(a,h)anthracene to the potential future on-site construction worker exceeded the acceptable target risk. The primary exposure pathway for this exceedence is dermal contact with groundwater.

- Site-wide cumulative non-carcinogenic risk to the potential future on-site construction worker exceeded the acceptable target risk. The constituents that contributed most to this exceedence were alachlor, chlorobenzene, and mercury. The primary exposure pathway for alachlor and chlorobenzene is dermal contact with groundwater and the primary exposure pathway for mercury is outdoor inhalation of vapors and particulates from soil.

- Free product was once observed in one piezometer (APA-PZ-3) and free product appears to be limited to a small area.

- Representative concentrations of lead in soil did not exceed the acceptable target

levels.

Unacceptable risks to the potential future construction worker can be managed by:

(i) Imposing institutional controls, e.g., requiring personnel protective equipment during construction.

(ii) Reducing the representative soil concentration for mercury to 370 µg/kg (refer Table 5-1(c)(R)).

(iii) Reducing the representative groundwater concentration to the following:

- Alachlor 20,210 µg/L
- Chlorobenzene 4,860 µg/L
- Dibenzo(a,h)anthracene 3 µg/L

Refer Table 5-1(c)(R).

(iv) Solutia intends to evaluate the options available to manage risks and the occurrence of non-aqueous phase liquid in this area during the corrective measures study (CMS).

***Since the target risks, as per the Missouri Risk-Based Corrective Action process, are based on the total risk and not on individual constituents and individual exposure pathways, the cleanup goals developed are not unique and several other combinations of cleanup goals are possible.***

**Table 2-3(R)**
**Soil Analytical Data Showing Constituents with At Least One Detection**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | 1,1,1-Trichloroethane | 1,2-Dichloroethane | 2-Butanone (MEK) | 2-Methylnaphthalene | Acenaphthene | Acetone | Alachlor | Anthracene | Antimony | Arsenic | Barium | Benzene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-10D | 3/9/1994 | 4.5 | 5.5 | | | | | | | 10 | | | | | | | | |
| AC-10M | 3/9/1994 | 3 | 4 | | | | | | | <8.2 | | | | | | | | |
| AC-10S | 3/9/1994 | 1 | 2 | | | | | | | <7.7 | | | | | | | | |
| AC-11S | 3/9/1994 | 3 | 4 | | | | | | | <8.6 | | | | | | | | |
| AC-12D | 3/9/1994 | 2 | 4 | | | | | | | 140 | | | | | | | | |
| AC-12S | 3/9/1994 | 1 | 2 | | | | | | | 2200 | | | | | | | | |
| AC-13D | 3/9/1994 | 11 | 12 | | | | | | | 17000 | | | | | | | | |
| AC-13M | 3/9/1994 | 6 | 7 | | | | | | | 26000 | | | | | | | | |
| AC-13S | 3/9/1994 | 2 | 4 | | | | | | | <8.2 | | | | | | | | |
| AC-14D | 3/9/1994 | 4 | 5 | | | | | | | <8.9 | | | | | | | | |
| AC-14S | 3/9/1994 | 2 | 3 | | | | | | | <9.8 | | | | | | | | |
| AC-15S | 3/9/1994 | 3 | 4 | | | | | | | 13000 | | | | | | | | |
| AC-16D | 3/9/1994 | 6 | 7.5 | | | | | | | 340 | | | | | | | | |
| AC-16M | 3/9/1994 | 4 | 5 | | | | | | | <8.5 | | | | | | | | |
| AC-16S | 3/9/1994 | 3 | 4 | | | | | | | <8.5 | | | | | | | | |
| AC-1D | 3/9/1994 | 2 | 4 | <6.1 | <6.1 | <61 | | | 150 | <8 | | | | | <6.1 | | | |
| AC-1S | 3/9/1994 | 1 | 2 | <5.7 | <5.7 | <57 | | | 140 | <7.6 | | | | | <5.7 | | | |
| AC-2D | 3/9/1994 | 3 | 4 | <5.2 | <5.2 | <52 | | | <52 | 43 | | | | | <5.2 | | | |
| AC-2S | 3/9/1994 | 1 | 2 | <6.2 | <6.2 | <62 | | | 310 | <8 | | | | | <6.2 | | | |
| AC-2S (DL) | 3/9/1994 | 1 | 2 | <31 | <31 | <310 | | | <310 | | | | | | <31 | | | |
| AC-3S | 3/9/1994 | 2 | 4.5 | <6.7 | <6.7 | <67 | | | <67 | 80000 | | | | | <6.7 | | | |
| AC-5S | 3/9/1994 | 1 | 3 | <5.6 | <5.6 | <56 | | | <56 | 190 | | | | | <5.6 | | | |
| AC-6D | 3/9/1994 | 6 | 8 | <6.1 | <6.1 | <61 | | | 94 | <8 | | | | | <6.1 | | | |
| AC-6M | 3/9/1994 | 4 | 6 | <6.5 | <6.5 | <65 | | | 160 | <8.6 | | | | | <6.5 | | | |
| AC-6S | 3/9/1994 | 1 | 3 | <5.6 | <5.6 | <56 | | | 78 | <36 | | | | | <5.6 | | | |
| AC-7S | 3/9/1994 | 3 | 5 | <6.6 | <6.6 | <66 | | | <66 | 18 | | | | | <6.6 | | | |
| AC-8D | 3/9/1994 | 5 | 7 | <6.3 | <6.3 | <63 | | | 160 | 1800 | | | | | <6.3 | | | |
| AC-8M | 3/9/1994 | 3 | 5 | <6.6 | <6.6 | <66 | | | 140 | <8.6 | | | | | <6.6 | | | |
| AC-8S | 3/9/1994 | 1 | 3 | <6.2 | <6.2 | <62 | | | 91 | <8.3 | | | | | <6.2 | | | |
| AC-9S | 3/9/1994 | 2 | 4 | <5.7 | <5.7 | <57 | | | 100 | 42 | | | | | <5.7 | | | |
| LS-1 | 2/4/1991 | 1.5 | 3.5 | <30 | <30 | <600 | | | <600 | | | | | | <30 | | | |
| LS-15 (Dup of LS-1) | 2/4/1991 | 1.5 | 3.5 | <31 | <31 | <630 | | | <630 | | | | | | <31 | | | |
| LS-1 | 2/4/1991 | 9.5 | 11.5 | <790 | <790 | <16000 | | | <16000 | | | | | | <790 | | | |
| LS-11 | 1/31/1991 | 2.5 | 4.5 | <30 | <30 | <610 | | | <610 | | | | | | <30 | | | |
| LS-11 | 1/31/1991 | 6.5 | 8.5 | 15 | <6.3 | <130 | | | <130 | | | | | | <6.3 | | | |
| LS-12 | 1/31/1991 | 0.5 | 2.5 | 29 | <5.7 | <110 | | | <110 | | | | | | <5.7 | | | |
| LS-12 | 1/31/1991 | 2.5 | 4.5 | <31 | <31 | <620 | | | <620 | | | | | | <31 | | | |
| LS-13A | 2/1/1991 | 1 | 3 | 26 | <5.7 | <110 | | | <110 | | | | | | <5.7 | | | |
| LS-14 | 1/31/1991 | 0.5 | 2.5 | 57 | <6 | <120 | | | <120 | | | | | | <6 | | | |
| LS-14 | 1/31/1991 | 2.5 | 4.5 | 25 | <6 | <120 | | | <120 | | | | | | <6 | | | |
| LS-2 | 2/1/1991 | 1 | 3 | <5.7 | <5.7 | <110 | | | <110 | | | | | | <5.7 | | | |
| LS-2 | 2/1/1991 | 9 | 11 | <790 | <790 | <16000 | | | <16000 | | | | | | <790 | | | |
| LS-6 | 2/4/1991 | 1 | 3 | <7600 | <7600 | 120000 | | | <150000 | | | | | | <7600 | | | |
| LS-6 | 2/4/1991 | 9 | 11 | <750 | <750 | <15000 | | | <15000 | | | | | | <750 | | | |
| LS-15 (Dup of LS-6) | 2/4/1991 | 9 | 11 | <1500 | <1500 | <30000 | | | <30000 | | | | | | <1500 | | | |
| LS-7 | 2/4/1991 | 1.5 | 3.5 | <740 | <740 | <15000 | | | <15000 | | | | | | <740 | | | |
| LS-7 | 2/4/1991 | 7.5 | 9.5 | <7800 | <7800 | 160000 | | | <160000 | | | | | | <7800 | | | |
| LS-8 | 2/1/1991 | 0.6 | 2.5 | <5.7 | <5.7 | <110 | | | <110 | | | | | | <5.7 | | | |
| LSS-1 | 10/8/1992 | 3 | 3.8 | <700 | <700 | | | <370 | | 1200 | <370 | <5600 | 2800 | | <700 | <370 | 370 | <370 |
| SB-A | 6/5/2000 | 0 | 2 | <5.6 | <5.6 | <28 | 54 J | 130 J | 16 J | 38 | 210 J | 730 B | 7500 | 81000 | <5.6 | 900 | 1100 | 720 |
| SB-B | 6/5/2000 | 0 | 2 | <4.6 | <4.6 | <23 | <370 | <370 | <46 | <37 | 44 J | <2200 | 4800 | 200000 | <4.6 | 380 | 500 | 480 |
| APA04-03-8-10 | 6/30/2004 | 8 | 10 | <4.5 | <4.5 | 18 J | | | 71 | <80 | | | | | 23 | | | |
| APA04-04-8-10 | 7/1/2004 | 8 | 10 | <4.4 | <4.4 | <22 | | | <31 | | | | | | 3.9 J | | | |
| APA04-05-9-11 | 6/30/2004 | 9 | 11 | <18000 | 7.2 J | <89000 | | | <180000 | 110000 | | | | | 9 J | | | |
| APA04-05-9-11-DUP | 6/30/2004 | 9 | 11 | <18000 | 11 J | <89000 | | | 11 J | 100000 | | | | | 11 J | | | |
| APA04-07-1-3 | 7/1/2004 | 1 | 3 | <4.8 | <4.8 | <24 | | | 8.3 J | <17000 | | | | | <4.8 | | | |
| APA04-11-10-12 | 7/1/2004 | 10 | 12 | <2200 | <2200 | <11000 | | | <22000 | 19000 | | | | | <2200 | | | |
| APA04-12-10-12 | 7/2/2004 | 10 | 12 | <4.4 | 25 | <22 | | | <44 | <80 | | | | | <4.4 | | | |
| APA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-05-0-1 | 4/17/2006 | 0 | 1 | | | | | | | | | | | | | | | |
| APA06-07-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-08-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-09-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-10-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |

Notes:
All conc. in ug/kg (micrograms/kilogram)
ft bgs: Feet below ground surface
DL: Diluted sample
Dup: Duplicate sample
B: Value less than the Contract Required Detection
Limit but greater than or equal to Instrument
J: Value estimated

**Table 2-3(R)**
**Soil Analytical Data Showing Constituents with At Least One Detection**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | Benzo(g,h,i) perylene | Benzo(k) fluoranthene | Beryllium | Bis(2-ethylhexyl) phthalate | Cadmium | Carbon disulfide | Chlorobenzene | Chloroform | Chromium | Chrysene | cis-1,2-Dichloroethene | Cobalt | Copper | Dibenzo(a,h) anthracene | Dibenzofuran |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-10D | 3/9/1994 | 4.5 | 5.5 | | | | | | | | | | | | | | | |
| AC-10M | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | |
| AC-10S | 3/9/1994 | 1 | 2 | | | | | | | | | | | | | | | |
| AC-11S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | |
| AC-12D | 3/9/1994 | 2 | 4 | | | | | | | | | | | | | | | |
| AC-12S | 3/9/1994 | 1 | 2 | | | | | | | | | | | | | | | |
| AC-13D | 3/9/1994 | 11 | 12 | | | | | | | | | | | | | | | |
| AC-13M | 3/9/1994 | 6 | 7 | | | | | | | | | | | | | | | |
| AC-13S | 3/9/1994 | 2 | 4 | | | | | | | | | | | | | | | |
| AC-14D | 3/9/1994 | 4 | 5 | | | | | | | | | | | | | | | |
| AC-14S | 3/9/1994 | 2 | 3 | | | | | | | | | | | | | | | |
| AC-15S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | |
| AC-16D | 3/9/1994 | 6 | 7.5 | | | | | | | | | | | | | | | |
| AC-16M | 3/9/1994 | 4 | 5 | | | | | | | | | | | | | | | |
| AC-16S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | |
| AC-1D | 3/9/1994 | 2 | 4 | | | | | | <6.1 | <6.1 | <6.1 | | | <6.1 | | | | |
| AC-1S | 3/9/1994 | 1 | 2 | | | | | | <5.7 | <5.7 | <5.7 | | | <5.7 | | | | |
| AC-2D | 3/9/1994 | 3 | 4 | | | | | | <5.2 | <5.2 | <5.2 | | | <5.2 | | | | |
| AC-2S | 3/9/1994 | 1 | 2 | | | | | | <6.2 | 7.1 | <6.2 | | | <6.2 | | | | |
| AC-2S (DL) | 3/9/1994 | 1 | 2 | | | | | | <31 | <31 | <31 | | | <31 | | | | |
| AC-3S | 3/9/1994 | 2 | 4.5 | | | | | | <6.7 | <6.7 | <6.7 | | | <6.7 | | | | |
| AC-5S | 3/9/1994 | 1 | 3 | | | | | | <5.6 | <5.6 | <5.6 | | | <5.6 | | | | |
| AC-6D | 3/9/1994 | 6 | 8 | | | | | | <6.1 | <6.1 | <6.1 | | | <6.1 | | | | |
| AC-6M | 3/9/1994 | 4 | 6 | | | | | | <6.5 | <6.5 | <6.5 | | | <6.5 | | | | |
| AC-6S | 3/9/1994 | 1 | 3 | | | | | | <5.6 | <5.6 | <5.6 | | | <5.6 | | | | |
| AC-7S | 3/9/1994 | 3 | 5 | | | | | | <6.6 | <6.6 | <6.6 | | | <6.6 | | | | |
| AC-8D | 3/9/1994 | 5 | 7 | | | | | | <6.3 | 25 | <6.3 | | | <6.3 | | | | |
| AC-8M | 3/9/1994 | 3 | 5 | | | | | | <6.6 | <6.6 | <6.6 | | | <6.6 | | | | |
| AC-8S | 3/9/1994 | 1 | 3 | | | | | | <6.2 | <6.2 | <6.2 | | | <6.2 | | | | |
| AC-9S | 3/9/1994 | 2 | 4 | | | | | | <5.7 | <5.7 | <5.7 | | | <5.7 | | | | |
| LS-1 | 2/4/1991 | 1.5 | 3.5 | | | | | | <30 | 1200 | <30 | | | | | | | |
| LS-15 (Dup of LS-1) | 2/4/1991 | 1.5 | 3.5 | | | | | | <31 | 680 | <31 | | | | | | | |
| LS-1 | 2/4/1991 | 9.5 | 11.5 | | | | | | <790 | 13000 | <790 | | | | | | | |
| LS-11 | 1/31/1991 | 2.5 | 4.5 | | | | | | <30 | 390 | <30 | | | | | | | |
| LS-11 | 1/31/1991 | 6.5 | 8.5 | | | | | | <6.3 | 48 | <6.3 | | | | | | | |
| LS-12 | 1/31/1991 | 0.5 | 2.5 | | | | | | 8.2 | <5.7 | <5.7 | | | | | | | |
| LS-12 | 1/31/1991 | 2.5 | 4.5 | | | | | | <31 | 920 | <31 | | | | | | | |
| LS-13A | 2/1/1991 | 1 | 3 | | | | | | <5.7 | <5.7 | <5.7 | | | | | | | |
| LS-14 | 1/31/1991 | 0.5 | 2.5 | | | | | | <6 | <6 | <6 | | | | | | | |
| LS-14 | 1/31/1991 | 2.5 | 4.5 | | | | | | <6 | 33 | <6 | | | | | | | |
| LS-2 | 2/1/1991 | 1 | 3 | | | | | | <5.7 | <5.7 | <5.7 | | | | | | | |
| LS-2 | 2/1/1991 | 9 | 11 | | | | | | <790 | 2300 | <790 | | | | | | | |
| LS-6 | 2/4/1991 | 1 | 3 | | | | | | <7600 | 59000 | <7600 | | | | | | | |
| LS-6 | 2/4/1991 | 9 | 11 | | | | | | <750 | 8200 | <750 | | | | | | | |
| LS-15 (Dup of LS-6) | 2/4/1991 | 9 | 11 | | | | | | <1500 | 23000 | <1500 | | | | | | | |
| LS-7 | 2/4/1991 | 1.5 | 3.5 | | | | | | <740 | 14000 | <740 | | | | | | | |
| LS-7 | 2/4/1991 | 7.5 | 9.5 | | | | | | <7800 | <7800 | <7800 | | | | | | | |
| LS-8 | 2/1/1991 | 0.6 | 2.5 | | | | | | <5.7 | 37 | <5.7 | | | | | | | |
| LSS-1 | 10/8/1992 | 3 | 3.8 | <370 | <370 | <560 | <370 | 680 | | 2100 | <700 | 11000 | <370 | | | 17000 | <370 | |
| SB-A | 6/5/2000 | 0 | 2 | 830 | 970 | 350 B | 230 J | 760 | <5.6 | <5.6 | <5.6 | 12000 | 980 | | 4600 | 41000 | 100 J | 98 J |
| SB-B | 6/5/2000 | 0 | 2 | 380 | 420 | 450 | 180 J | 880 | <4.6 | <4.6 | <4.6 | 13000 | 440 | | 6100 | 53000 | 110 J | <370 |
| APA04-03-8-10 | 6/30/2004 | 8 | 10 | | | | | | <40 | <1400 | <4.5 | | | <4.5 | | | | |
| APA04-04-8-10 | 7/1/2004 | 8 | 10 | | | | | | <4.4 | 4500 J | <4.4 | | | <4.4 | | | | |
| APA04-05-9-11 | 6/30/2004 | 9 | 11 | | | | | | 3.2 J | 290000 | <18000 | | | 12000 J | | | | |
| APA04-05-9-11-DUP | 6/30/2004 | 9 | 11 | | | | | | <18000 | 170000 | <18000 | | | 6500 J | | | | |
| APA04-07-1-3 | 7/1/2004 | 1 | 3 | | | | | | <4.8 | 75 | <4.8 | | | <4.8 | | | | |
| APA04-11-10-12 | 7/1/2004 | 10 | 12 | | | | | | <2200 | 360000 | <2200 | | | <2200 | | | | |
| APA04-12-10-12 | 7/2/2004 | 10 | 12 | | | | | | <4.4 | 70 | 1.1 J | | | <4.4 | | | | |
| APA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-05-0-1 | 4/17/2006 | 0 | 1 | | | | | | | | | | | | | | | |
| APA06-07-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-08-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-09-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-10-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |

Notes:
All conc. in ug/kg (micrograms/kilogram)
ft bgs: Feet below ground surface
DL: Diluted sample
Dup: Duplicate sample
B: Value less than the Contract Required Detection Limit but greater than or equal to Instrument
J: Value estimated

**Table 2-3(R)**
**Soil Analytical Data Showing Constituents with At Least One Detection**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | Di-n-butyl phthalate | Ethylbenzene | Fluoranthene | Fluorene | Indeno-(1,2,3-cd)pyrene | Iron | Lead | Mercury | Methylene chloride | Naphthalene | Nickel | Phenanthrene | Pyrene | Selenium | Tetrachloroethene | Tin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-10D | 3/9/1994 | 4.5 | 5.5 | | | | | | | | | | | | | | | | |
| AC-10M | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | | |
| AC-10S | 3/9/1994 | 1 | 2 | | | | | | | | | | | | | | | | |
| AC-11S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | | |
| AC-12D | 3/9/1994 | 2 | 4 | | | | | | | | | | | | | | | | |
| AC-12S | 3/9/1994 | 1 | 2 | | | | | | | | | | | | | | | | |
| AC-13D | 3/9/1994 | 11 | 12 | | | | | | | | | | | | | | | | |
| AC-13M | 3/9/1994 | 6 | 7 | | | | | | | | | | | | | | | | |
| AC-13S | 3/9/1994 | 2 | 4 | | | | | | | | | | | | | | | | |
| AC-14D | 3/9/1994 | 4 | 5 | | | | | | | | | | | | | | | | |
| AC-14S | 3/9/1994 | 2 | 3 | | | | | | | | | | | | | | | | |
| AC-15S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | | |
| AC-16D | 3/9/1994 | 6 | 7.5 | | | | | | | | | | | | | | | | |
| AC-16M | 3/9/1994 | 4 | 5 | | | | | | | | | | | | | | | | |
| AC-16S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | | |
| AC-1D | 3/9/1994 | 2 | 4 | | <6.1 | | | | | | | <6.1 | | | | | | 6.3 | |
| AC-1S | 3/9/1994 | 1 | 2 | | <5.7 | | | | | | | <5.7 | | | | | | 10 | |
| AC-2D | 3/9/1994 | 3 | 4 | | <5.2 | | | | | | | 9.8 | | | | | | <5.2 | |
| AC-2S | 3/9/1994 | 1 | 2 | | <6.2 | | | | | | | <6.2 | | | | | | 10 | |
| AC-2S (DL) | 3/9/1994 | 1 | 2 | | <31 | | | | | | | 48 | | | | | | <31 | |
| AC-3S | 3/9/1994 | 2 | 4.5 | | <6.7 | | | | | | | <6.7 | | | | | | <6.7 | |
| AC-5S | 3/9/1994 | 1 | 3 | | <5.6 | | | | | | | 9.4 | | | | | | <5.6 | |
| AC-6D | 3/9/1994 | 6 | 8 | | <6.1 | | | | | | | 8.8 | | | | | | <6.1 | |
| AC-6M | 3/9/1994 | 4 | 6 | | <6.5 | | | | | | | 11 | | | | | | <6.5 | |
| AC-6S | 3/9/1994 | 1 | 3 | | <5.6 | | | | | | | 8.4 | | | | | | <5.6 | |
| AC-7S | 3/9/1994 | 3 | 5 | | <6.6 | | | | | | | 11 | | | | | | <6.6 | |
| AC-8D | 3/9/1994 | 5 | 7 | | <6.3 | | | | | | | 13 | | | | | | <6.3 | |
| AC-8M | 3/9/1994 | 3 | 5 | | <6.6 | | | | | | | 8.6 | | | | | | <6.6 | |
| AC-8S | 3/9/1994 | 1 | 3 | | <6.2 | | | | | | | 12 | | | | | | <6.2 | |
| AC-9S | 3/9/1994 | 2 | 4 | | <5.7 | | | | | | | <5.7 | | | | | | <5.7 | |
| LS-1 | 2/4/1991 | 1.5 | 3.5 | | <30 | | | | | | | <30 | | | | | | <30 | |
| LS-15 (Dup of LS-1) | 2/4/1991 | 1.5 | 3.5 | | <31 | | | | | | | <31 | | | | | | <31 | |
| LS-1 | 2/4/1991 | 9.5 | 11.5 | | <790 | | | | | | | <790 | | | | | | <790 | |
| LS-11 | 1/31/1991 | 2.5 | 4.5 | | <30 | | | | | | | <30 | | | | | | <30 | |
| LS-11 | 1/31/1991 | 6.5 | 8.5 | | <6.3 | | | | | | | <6.3 | | | | | | <6.3 | |
| LS-12 | 1/31/1991 | 0.5 | 2.5 | | <5.7 | | | | | | | <5.7 | | | | | | <5.7 | |
| LS-12 | 1/31/1991 | 2.5 | 4.5 | | <31 | | | | | | | <31 | | | | | | <31 | |
| LS-13A | 2/1/1991 | 1 | 3 | | <5.7 | | | | | | | <5.7 | | | | | | <5.7 | |
| LS-14 | 1/31/1991 | 0.5 | 2.5 | | <6 | | | | | | | <6 | | | | | | <6 | |
| LS-14 | 1/31/1991 | 2.5 | 4.5 | | <6 | | | | | | | 6.5 | | | | | | <6 | |
| LS-2 | 2/1/1991 | 1 | 3 | | <5.7 | | | | | | | <5.7 | | | | | | <5.7 | |
| LS-2 | 2/1/1991 | 9 | 11 | | <790 | | | | | | | <790 | | | | | | <790 | |
| LS-6 | 2/4/1991 | 1 | 3 | | <7600 | | | | | | | <7600 | | | | | | <7600 | |
| LS-6 | 2/4/1991 | 9 | 11 | | <750 | | | | | | | <750 | | | | | | <750 | |
| LS-15 (Dup of LS-6) | 2/4/1991 | 9 | 11 | | <1500 | | | | | | | <1500 | | | | | | <1500 | |
| LS-7 | 2/4/1991 | 1.5 | 3.5 | | <740 | | | | | | | <740 | | | | | | <740 | |
| LS-7 | 2/4/1991 | 7.5 | 9.5 | | <7800 | | | | | | | <7800 | | | | | | <7800 | |
| LS-8 | 2/1/1991 | 0.6 | 2.5 | | <5.7 | | | | | | | <5.7 | | | | | | <5.7 | |
| LSS-1 | 10/8/1992 | 3 | 3.8 | <370 | <700 | <370 | <370 | <370 | | 32000 | 46 | <700 | <370 | 11000 | <370 | <370 | <11000 | <700 | |
| SB-A | 6/5/2000 | 0 | 2 | 68 J | <5.6 | 1900 | 110 J | 620 | 280000000 | 65000 | 7600 | <5.6 | 71 J | 15000 | 1400 | 2600 | 590 B | <5.6 | 5200 B |
| SB-B | 6/5/2000 | 0 | 2 | 85 J | <4.6 | 550 | <370 | 280 J | 14000000 | 80000 | 130 | <4.6 | <370 | 18000 | 230 J | 890 | <1100 | <4.6 | <5600 |
| APA04-03-8-10 | 6/30/2004 | 8 | 10 | | 3 J | | | | | | | <4.5 | | | | | | <4.5 | |
| APA04-04-8-10 | 7/1/2004 | 8 | 10 | | <4.4 | | | | | | | <4.4 | | | | | | <4.4 | |
| APA04-05-9-11 | 6/30/2004 | 9 | 11 | | 9.4 J | | | | | | | <18000 | | | | | | 29 J | |
| APA04-05-9-11-DUP | 6/30/2004 | 9 | 11 | | 4.1 J | | | | | | | <18000 | | | | | | 20 J | |
| APA04-07-1-3 | 7/1/2004 | 1 | 3 | | <4.8 | | | | | | | <4.8 | | | | | | <4.8 | |
| APA04-11-10-12 | 7/1/2004 | 10 | 12 | | <2200 | | | | | | | <2200 | | | | | | <2200 | |
| APA04-12-10-12 | 7/2/2004 | 10 | 12 | | <4.4 | | | | | | | 2.4 J | | | | | | <4.4 | |
| APA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | 300 | | | | | | | | |
| APA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | | | 620 | | | | | | | | |
| APA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | 17 J | | | | | | | | |
| APA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | 20 J | | | | | | | | |
| APA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | 54 | | | | | | | | |
| APA06-05-0-1 | 4/17/2006 | 0 | 1 | | | | | | | | 22 | | | | | | | | |
| APA06-07-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | 21 J | | | | | | | | |
| APA06-08-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | 600 | | | | | | | | |
| APA06-09-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | < 21 | | | | | | | | |
| APA06-10-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | 74 J | | | | | | | | |

Notes:
All conc. in ug/kg (micrograms/kilogram)
ft bgs: Feet below ground surface
DL: Diluted sample
Dup: Duplicate sample
B: Value less than the Contract Required Detection Limit but greater than or equal to Instrument
J: Value estimated

**Table 2-3(R)**
**Soil Analytical Data Showing Constituents with At Least One Detection**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | Toluene | Trichloroethene | Vanadium | Xylene | Zinc |
|---|---|---|---|---|---|---|---|---|
| AC-10D | 3/9/1994 | 4.5 | 5.5 | | | | | |
| AC-10M | 3/9/1994 | 3 | 4 | | | | | |
| AC-10S | 3/9/1994 | 1 | 2 | | | | | |
| AC-11S | 3/9/1994 | 3 | 4 | | | | | |
| AC-12D | 3/9/1994 | 2 | 4 | | | | | |
| AC-12S | 3/9/1994 | 1 | 2 | | | | | |
| AC-13D | 3/9/1994 | 11 | 12 | | | | | |
| AC-13M | 3/9/1994 | 6 | 7 | | | | | |
| AC-13S | 3/9/1994 | 2 | 4 | | | | | |
| AC-14D | 3/9/1994 | 4 | 5 | | | | | |
| AC-14S | 3/9/1994 | 2 | 3 | | | | | |
| AC-15S | 3/9/1994 | 3 | 4 | | | | | |
| AC-16D | 3/9/1994 | 6 | 7.5 | | | | | |
| AC-16M | 3/9/1994 | 4 | 5 | | | | | |
| AC-16S | 3/9/1994 | 3 | 4 | | | | | |
| AC-1D | 3/9/1994 | 2 | 4 | <6.1 | <6.1 | | <6.1 | |
| AC-1S | 3/9/1994 | 1 | 2 | <5.7 | <5.7 | | <5.7 | |
| AC-2D | 3/9/1994 | 3 | 4 | <5.2 | <5.2 | | <5.2 | |
| AC-2S | 3/9/1994 | 1 | 2 | 8.2 | <6.2 | | 34 | |
| AC-2S (DL) | 3/9/1994 | 1 | 2 | <31 | <31 | | <31 | |
| AC-3S | 3/9/1994 | 2 | 4.5 | <6.7 | <6.7 | | <6.7 | |
| AC-5S | 3/9/1994 | 1 | 3 | <5.6 | <5.6 | | <5.6 | |
| AC-6D | 3/9/1994 | 6 | 8 | <6.1 | <6.1 | | 53 | |
| AC-6M | 3/9/1994 | 4 | 6 | <6.5 | <6.5 | | <6.5 | |
| AC-6S | 3/9/1994 | 1 | 3 | <5.6 | <5.6 | | <5.6 | |
| AC-7S | 3/9/1994 | 3 | 5 | <6.6 | <6.6 | | <6.6 | |
| AC-8D | 3/9/1994 | 5 | 7 | <6.3 | <6.3 | | <6.3 | |
| AC-8M | 3/9/1994 | 3 | 5 | <6.6 | <6.6 | | <6.6 | |
| AC-8S | 3/9/1994 | 1 | 3 | <6.2 | <6.2 | | <6.2 | |
| AC-9S | 3/9/1994 | 2 | 4 | <5.7 | <5.7 | | <5.7 | |
| LS-1 | 2/4/1991 | 1.5 | 3.5 | <30 | <30 | | <30 | |
| LS-15 (Dup of LS-1) | 2/4/1991 | 1.5 | 3.5 | <31 | <31 | | <31 | |
| LS-1 | 2/4/1991 | 9.5 | 11.5 | <790 | 940 | | <790 | |
| LS-11 | 1/31/1991 | 2.5 | 4.5 | <30 | <30 | | <30 | |
| LS-11 | 1/31/1991 | 6.5 | 8.5 | <6.3 | <6.3 | | <6.3 | |
| LS-12 | 1/31/1991 | 0.5 | 2.5 | <5.7 | <5.7 | | <5.7 | |
| LS-12 | 1/31/1991 | 2.5 | 4.5 | <31 | <31 | | <31 | |
| LS-13A | 2/1/1991 | 1 | 3 | <5.7 | 8.9 | | 12 | |
| LS-14 | 1/31/1991 | 0.5 | 2.5 | <6 | <6 | | <6 | |
| LS-14 | 1/31/1991 | 2.5 | 4.5 | <6 | <6 | | <6 | |
| LS-2 | 2/1/1991 | 1 | 3 | <5.7 | <5.7 | | <5.7 | |
| LS-2 | 2/1/1991 | 9 | 11 | <790 | <790 | | <790 | |
| LS-6 | 2/4/1991 | 1 | 3 | <7600 | <7600 | | <7600 | |
| LS-6 | 2/4/1991 | 9 | 11 | <750 | <750 | | <750 | |
| LS-15 (Dup of LS-6) | 2/4/1991 | 9 | 11 | <1500 | <1500 | | <1500 | |
| LS-7 | 2/4/1991 | 1.5 | 3.5 | <740 | <740 | | <740 | |
| LS-7 | 2/4/1991 | 7.5 | 9.5 | <7800 | <7800 | | <7800 | |
| LS-8 | 2/1/1991 | 0.6 | 2.5 | <5.7 | <5.7 | | <5.7 | |
| LSS-1 | 10/8/1992 | 3 | 3.8 | <700 | <700 | | <700 | 93000 |
| SB-A | 6/5/2000 | 0 | 2 | <5.6 | <5.6 | 12000 | <11 | 94000 |
| SB-B | 6/5/2000 | 0 | 2 | <4.6 | <4.6 | 18000 | <9.2 | 95000 |
| APA04-03-8-10 | 6/30/2004 | 8 | 10 | 8.6 | <4.5 | | 10 | |
| APA04-04-8-10 | 7/1/2004 | 8 | 10 | <6.8 | <4.4 | | <8.8 | |
| APA04-05-9-11 | 6/30/2004 | 9 | 11 | 7 J | <18000 | | 76 J | |
| APA04-05-9-11-DUP | 6/30/2004 | 9 | 11 | 7.3 J | <18000 | | 42 J | |
| APA04-07-1-3 | 7/1/2004 | 1 | 3 | <4.8 | <4.8 | | <9.7 | |
| APA04-11-10-12 | 7/1/2004 | 10 | 12 | <2200 | <2200 | | <4400 | |
| APA04-12-10-12 | 7/2/2004 | 10 | 12 | 9 | 3 J | | <8.8 | |
| APA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | |
| APA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | |
| APA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | |
| APA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | |
| APA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | |
| APA06-05-0-1 | 4/17/2006 | 0 | 1 | | | | | |
| APA06-07-2-3 | 4/17/2006 | 2 | 3 | | | | | |
| APA06-08-2-3 | 4/17/2006 | 2 | 3 | | | | | |
| APA06-09-2-3 | 4/17/2006 | 2 | 3 | | | | | |
| APA06-10-2-3 | 4/17/2006 | 2 | 3 | | | | | |

Notes:
All conc. in ug/kg (micrograms/kilogram)
ft bgs: Feet below ground surface
DL: Diluted sample
Dup: Duplicate sample
B: Value less than the Contract Required Detection
Limit but greater than or equal to Instrument
J: Value estimated

**Table 4-2(a)(R)**
**Representative Concentrations in Surficial Soil for a Current and Future On-site Non-residential Worker**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | 1,1,1-Trichloroethane | 2-Butanone (MEK) | 2-Methyl naphthalene | Acenaphthene | Acetone | Alachlor | Anthracene | **Antimony** | Arsenic | **Barium** | Benzo(a) anthracene | Benzo(a)pyrene | Benzo(b) fluoranthene | Benzo(g,h,i) perylene | Benzo(k) fluoranthene | **Beryllium** | Bis(2-ethylhexyl) phthalate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-12D | 3/9/1994 | 2 | 4 | | | | | | 140 | | | | | | | | | | | |
| AC-12S | 3/9/1994 | 1 | 2 | | | | | | 2200 | | | | | | | | | | | |
| AC-14S | 3/9/1994 | 2 | 3 | | | | | | <9.8 | | | | | | | | | | | |
| AC-1D | 3/9/1994 | 2 | 4 | <6.1 | <61 | | | 150 | <8 | | | | | | | | | | | |
| AC-1S | 3/9/1994 | 1 | 2 | <5.7 | <57 | | | 140 | <7.6 | | | | | | | | | | | |
| AC-2S | 3/9/1994 | 1 | 2 | <6.2 | <62 | | | 310 | <8 | | | | | | | | | | | |
| AC-2S (DL) | 3/9/1994 | 1 | 2 | <31 | <310 | | | <310 | | | | | | | | | | | | |
| AC-5S | 3/9/1994 | 1 | 3 | <5.6 | <56 | | | <56 | 190 | | | | | | | | | | | |
| AC-6S | 3/9/1994 | 1 | 3 | <5.6 | <56 | | | 78 | <36 | | | | | | | | | | | |
| AC-8S | 3/9/1994 | 1 | 3 | <6.2 | <62 | | | 91 | <8.3 | | | | | | | | | | | |
| AC-9S | 3/9/1994 | 2 | 4 | <5.7 | <57 | | | 100 | 42 | | | | | | | | | | | |
| LS-1 | 2/4/1991 | 1.5 | 3.5 | <30 | <600 | | | <600 | | | | | | | | | | | | |
| LS-12 | 1/31/1991 | 0.5 | 2.5 | 29 | <110 | | | <110 | | | | | | | | | | | | |
| LS-13A | 2/1/1991 | 1 | 3 | 26 | <110 | | | <110 | | | | | | | | | | | | |
| LS-14 | 1/31/1991 | 0.5 | 2.5 | 57 | <120 | | | <120 | | | | | | | | | | | | |
| LS-15 (Dup of LS-1) | 2/4/1991 | 1.5 | 3.5 | <31 | <630 | | | <630 | | | | | | | | | | | | |
| LS-6 | 2/4/1991 | 1 | 3 | <7600 | 120000 | | | <150000 | | | | | | | | | | | | |
| LS-8 | 2/1/1991 | 0.6 | 2.5 | <5.7 | <110 | | | <110 | | | | | | | | | | | | |
| SB-A | 6/5/2000 | 0 | 2 | <5.6 | <28 | 54 J | 130 J | 16 J | 38 | 210 J | 730 B | 7500 | 81000 | 900 | 1100 | 720 | 830 | 970 | 350 B | 230 J |
| SB-B | 6/5/2000 | 0 | 2 | <4.6 | <23 | <370 | <370 | <46 | <37 | 44 J | <2200 | 4800 | 200000 | 380 | 500 | 480 | 380 | 420 | 450 | 180 J |
| APA04-07-1-3 | 7/1/2004 | 1 | 3 | <4.8 | <24 | | | 8.3 J | <17000 | | | | | | | | | | | |
| APA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | | |
| APA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | | |
| APA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | | |
| APA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | | |
| APA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | | |
| APA06-05-0-1 | 4/17/2006 | 0 | 1 | | | | | | | | | | | | | | | | | |
| APA06-07-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | | |
| APA06-08-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | | |
| APA06-09-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | | |
| APA06-10-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | | |
| **Representative Concentration (Rep.)** | | | | 222 | 6735 | 120 | 158 | 4274 | 859 | 127 | 915 | 6150 | 140500 | 640 | 800 | 600 | 605 | 695 | 400 | 205 |
| **Maximum Detected Concentration (Max.)** | | | | 57 | 120000 | 54 | 130 | 310 | 2200 | 210 | 730 | 7500 | 200000 | 900 | 1100 | 720 | 830 | 970 | 450 | 230 |
| **Concentration Ratio (Max./Rep.)** | | | | 0.3 | **17.8** | 0.5 | 0.8 | 0.07 | 2.6 | 1.7 | N/A | 1.2 | N/A | 1.4 | 1.4 | 1.2 | 1.4 | 1.4 | N/A | 1.1 |
| **Background Concentration** | | | | NA | NA | NA | NA | NA | NA | NA | 3150 | 6133 | 200000 | NA | NA | NA | NA | NA | 867 | NA |
| **Exceed/Not Exceed (Rep./Background)** | | | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Not Exceed | Exceed | Not Exceed | N/A | N/A | N/A | N/A | N/A | Not Exceed | N/A |

Notes:
All conc. in ug/kg (micrograms/kilogram)
ft bgs: Feet below ground surface
B: Value less than the Contract Required Detection Limit but greater than or equal to Instrument Detection
J: Value estimated
NA: Not available
N/A: Not applicable

**Constituents in Bold and Underlined** not considered in risk calculation based on backgound

**Table 4-2(a)(R)**
**Representative Concentrations in Surficial Soil for a Current and Future On-site Non-residential Worker**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | Cadmium | Carbon disulfide | Chlorobenzene | Chromium | Chrysene | Cobalt | Copper | Dibenzo(a,h) anthracene | Dibenzofuran | Di-n-butyl phthalate | Fluoranthene | Fluorene | Indeno-(1,2,3-cd)pyrene | Iron | Lead | Mercury | Methylene chloride |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-12D | 3/9/1994 | 2 | 4 | | | | | | | | | | | | | | | | | |
| AC-12S | 3/9/1994 | 1 | 2 | | | | | | | | | | | | | | | | | |
| AC-14S | 3/9/1994 | 2 | 3 | | | | | | | | | | | | | | | | | |
| AC-1D | 3/9/1994 | 2 | 4 | | <6.1 | <6.1 | | | | | | | | | | | | | | <6.1 |
| AC-1S | 3/9/1994 | 1 | 2 | | <5.7 | <5.7 | | | | | | | | | | | | | | <5.7 |
| AC-2S | 3/9/1994 | 1 | 2 | | <6.2 | 7.1 | | | | | | | | | | | | | | <6.2 |
| AC-2S (DL) | 3/9/1994 | 1 | 2 | | <31 | <31 | | | | | | | | | | | | | | 48 |
| AC-5S | 3/9/1994 | 1 | 3 | | <5.6 | <5.6 | | | | | | | | | | | | | | 9.4 |
| AC-6S | 3/9/1994 | 1 | 3 | | <5.6 | <5.6 | | | | | | | | | | | | | | 8.4 |
| AC-8S | 3/9/1994 | 1 | 3 | | <6.2 | <6.2 | | | | | | | | | | | | | | 12 |
| AC-9S | 3/9/1994 | 2 | 4 | | <5.7 | <5.7 | | | | | | | | | | | | | | <5.7 |
| LS-1 | 2/4/1991 | 1.5 | 3.5 | | <30 | 1200 | | | | | | | | | | | | | | <30 |
| LS-12 | 1/31/1991 | 0.5 | 2.5 | | 8.2 | <5.7 | | | | | | | | | | | | | | <5.7 |
| LS-13A | 2/1/1991 | 1 | 3 | | <5.7 | <5.7 | | | | | | | | | | | | | | <5.7 |
| LS-14 | 1/31/1991 | 0.5 | 2.5 | | <6 | <6 | | | | | | | | | | | | | | <6 |
| LS-15 (Dup of LS-1) | 2/4/1991 | 1.5 | 3.5 | | <31 | 680 | | | | | | | | | | | | | | <31 |
| LS-6 | 2/4/1991 | 1 | 3 | | <7600 | 59000 | | | | | | | | | | | | | | <7600 |
| LS-8 | 2/1/1991 | 0.6 | 2.5 | | <5.7 | 37 | | | | | | | | | | | | | | <5.7 |
| SB-A | 6/5/2000 | 0 | 2 | 760 | <5.6 | <5.6 | 12000 | 980 | 4600 | 41000 | 100 J | 98 J | 68 J | 1900 | 110 J | 620 | 280000000 | 65000 | 7600 | <5.6 |
| SB-B | 6/5/2000 | 0 | 2 | 880 | <4.6 | <4.6 | 13000 | 440 | 6100 | 53000 | 110 J | <370 | 85 J | 550 | <370 | 280 J | 14000000 | 80000 | 130 | <4.6 |
| APA04-07-1-3 | 7/1/2004 | 1 | 3 | | <4.8 | 75 | | | | | | | | | | | | | | <4.8 |
| APA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | 300 | |
| APA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | 620 | |
| APA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | 17 J | |
| APA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | 20 J | |
| APA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | 54 | |
| APA06-05-0-1 | 4/17/2006 | 0 | 1 | | | | | | | | | | | | | | | | 22 | |
| APA06-07-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | 21 J | |
| APA06-08-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | 600 | |
| APA06-09-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | < 21 | |
| APA06-10-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | | 74 J | |
| **Representative Concentration (Rep.)** | | | | 820 | 216 | 3391 | 12500 | 710 | 5350 | 47000 | 105 | 142 | 77 | 1225 | 148 | 450 | 147000000 | 72500 | 789 | 219 |
| **Maximum Detected Concentration (Max.)** | | | | 880 | 8.2 | 59000 | 13000 | 980 | 6100 | 53000 | 110 | 98 | 85 | 1900 | 110 | 620 | 280000000 | 80000 | 7600 | 48 |
| **Concentration Ratio (Max./Rep.)** | | | | 1.1 | 0.04 | **17.4** | 1.0 | 1.4 | 1.1 | 1.1 | 1.0 | 0.7 | 1.1 | 1.6 | 0.7 | 1.4 | N/A | N/A | 9.6 | 0.2 |
| **Background Concentration** | | | | 520 | NA | NA | 11100 | NA | 4967 | 21667 | NA | NA | NA | NA | NA | NA | NA | 152333 | NA | NA |
| **Exceed/Not Exceed (Rep./Background)** | | | | Exceed | N/A | N/A | Exceed | N/A | Exceed | Exceed | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Not Exceed | N/A | N/A |

Notes:
All conc. in ug/kg (micrograms/kilogram)
ft bgs: Feet below ground surface
B: Value less than the Contract Required Detection Limit but greater than or equal to Instrument Detection
J: Value estimated
NA: Not available
N/A: Not applicable

**Constituents in Bold and Underlined** not considered in risk calculation based on backgound

**Table 4-2(a)(R)**
**Representative Concentrations in Surficial Soil for a Current and Future On-site Non-residential Worker**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | Naphthalene | Nickel | Phenanthrene | Pyrene | Selenium | Tin | Tetrachloroethene | Toluene | Trichloroethene | Vanadium | Xylene | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-12D | 3/9/1994 | 2 | 4 | | | | | | | | | | | | |
| AC-12S | 3/9/1994 | 1 | 2 | | | | | | | | | | | | |
| AC-14S | 3/9/1994 | 2 | 3 | | | | | | | | | | | | |
| AC-1D | 3/9/1994 | 2 | 4 | | | | | | | 6.3 | <6.1 | <6.1 | | <6.1 | |
| AC-1S | 3/9/1994 | 1 | 2 | | | | | | | 10 | <5.7 | <5.7 | | <5.7 | |
| AC-2S | 3/9/1994 | 1 | 2 | | | | | | | 10 | 8.2 | <6.2 | | 34 | |
| AC-2S (DL) | 3/9/1994 | 1 | 2 | | | | | | | <31 | <31 | <31 | | <31 | |
| AC-5S | 3/9/1994 | 1 | 3 | | | | | | | <5.6 | <5.6 | <5.6 | | <5.6 | |
| AC-6S | 3/9/1994 | 1 | 3 | | | | | | | <5.6 | <5.6 | <5.6 | | <5.6 | |
| AC-8S | 3/9/1994 | 1 | 3 | | | | | | | <6.2 | <6.2 | <6.2 | | <6.2 | |
| AC-9S | 3/9/1994 | 2 | 4 | | | | | | | <5.7 | <5.7 | <5.7 | | <5.7 | |
| LS-1 | 2/4/1991 | 1.5 | 3.5 | | | | | | | <30 | <30 | <30 | | <30 | |
| LS-12 | 1/31/1991 | 0.5 | 2.5 | | | | | | | <5.7 | <5.7 | <5.7 | | <5.7 | |
| LS-13A | 2/1/1991 | 1 | 3 | | | | | | | <5.7 | <5.7 | 8.9 | | 12 | |
| LS-14 | 1/31/1991 | 0.5 | 2.5 | | | | | | | <6 | <6 | <6 | | <6 | |
| LS-15 (Dup of LS-1) | 2/4/1991 | 1.5 | 3.5 | | | | | | | <31 | <31 | <31 | | <31 | |
| LS-6 | 2/4/1991 | 1 | 3 | | | | | | | <7600 | <7600 | <7600 | | <7600 | |
| LS-8 | 2/1/1991 | 0.6 | 2.5 | | | | | | | <5.7 | <5.7 | <5.7 | | <5.7 | |
| SB-A | 6/5/2000 | 0 | 2 | 71 J | 15000 | 1400 | 2600 | 590 B | 5200 B | <5.6 | <5.6 | <5.6 | 12000 | <11 | 94000 |
| SB-B | 6/5/2000 | 0 | 2 | <370 | 18000 | 230 J | 890 | <1100 | <5600 | <4.6 | <4.6 | <4.6 | 18000 | <9.2 | 95000 |
| APA04-07-1-3 | 7/1/2004 | 1 | 3 | | | | | | | <4.8 | <4.8 | <4.8 | | <9.7 | |
| APA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | |
| APA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | | | | | | | |
| APA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | |
| APA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | |
| APA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | |
| APA06-05-0-1 | 4/17/2006 | 0 | 1 | | | | | | | | | | | | |
| APA06-07-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | |
| APA06-08-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | |
| APA06-09-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | |
| APA06-10-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | |
| **Representative Concentration (Rep.)** | | | | 128 | 16500 | 815 | 1745 | 570 | 4000 | 217 | 216 | 216 | 15000 | 219 | 94500 |
| **Maximum Detected Concentration (Max.)** | | | | 71 | 18000 | 1400 | 2600 | 590 | 5200 | 10 | 8.2 | 8.9 | 18000 | 34 | 95000 |
| **Concentration Ratio (Max./Rep.)** | | | | 0.6 | 1.1 | 1.7 | 1.5 | N/A | N/A | 0.05 | 0.04 | 0.04 | N/A | 0.2 | N/A |
| **Background Concentration** | | | | NA | 16333 | NA | NA | 633 | 7267 | NA | NA | NA | 18667 | NA | 143333 |
| **Exceed/Not Exceed (Rep./Background)** | | | | N/A | Exceed | N/A | N/A | Not Exceed | Not Exceed | N/A | N/A | N/A | Not Exceed | N/A | Not Exceed |

Notes:
All conc. in ug/kg (micrograms/kilogram)
ft bgs: Feet below ground surface
B: Value less than the Contract Required Detection Limit but greater than or equal to Instrument Detection
J: Value estimated
NA: Not available
N/A: Not applicable

**Constituents in Bold and Underlined** not considered in risk calculation based on backgound

**Table 4-2(f)(R)**
**Representative Concentration of Soil by a Future On-site Construction Worker**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | 1,1,1-Trichloroethane | 1,2-Dichloroethane | 2-Butanone (MEK) | 2-Methyl naphthalene | Acenaphthene | Acetone | Alachlor | Anthracene | Antimony | Arsenic | Barium | Benzene | Benzo(a) anthracene | Benzo(a)pyrene | Benzo(b) fluoranthene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-10D | 3/9/1994 | 4.5 | 5.5 | | | | | | | 10 | | | | | | | | |
| AC-10M | 3/9/1994 | 3 | 4 | | | | | | | <8.2 | | | | | | | | |
| AC-10S | 3/9/1994 | 1 | 2 | | | | | | | <7.7 | | | | | | | | |
| AC-11S | 3/9/1994 | 3 | 4 | | | | | | | <8.6 | | | | | | | | |
| AC-12D | 3/9/1994 | 2 | 4 | | | | | | | 140 | | | | | | | | |
| AC-12S | 3/9/1994 | 1 | 2 | | | | | | | 2200 | | | | | | | | |
| AC-13D | 3/9/1994 | 11 | 12 | | | | | | | 17000 | | | | | | | | |
| AC-13M | 3/9/1994 | 6 | 7 | | | | | | | 26000 | | | | | | | | |
| AC-13S | 3/9/1994 | 2 | 4 | | | | | | | <8.2 | | | | | | | | |
| AC-14D | 3/9/1994 | 4 | 5 | | | | | | | <8.9 | | | | | | | | |
| AC-14S | 3/9/1994 | 2 | 3 | | | | | | | <9.8 | | | | | | | | |
| AC-15S | 3/9/1994 | 3 | 4 | | | | | | | 13000 | | | | | | | | |
| AC-16D | 3/9/1994 | 6 | 7.5 | | | | | | | 340 | | | | | | | | |
| AC-16M | 3/9/1994 | 4 | 5 | | | | | | | <8.5 | | | | | | | | |
| AC-16S | 3/9/1994 | 3 | 4 | | | | | | | <8.5 | | | | | | | | |
| AC-1D | 3/9/1994 | 2 | 4 | <6.1 | <6.1 | <61 | | | 150 | <8 | | | | | <6.1 | | | |
| AC-1S | 3/9/1994 | 1 | 2 | <5.7 | <5.7 | <57 | | | 140 | <7.6 | | | | | <5.7 | | | |
| AC-2D | 3/9/1994 | 3 | 4 | <5.2 | <5.2 | <52 | | | <52 | 43 | | | | | <5.2 | | | |
| AC-2S | 3/9/1994 | 1 | 2 | <6.2 | <6.2 | <62 | | | 310 | <8 | | | | | <6.2 | | | |
| AC-2S (DL) | 3/9/1994 | 1 | 2 | <31 | <31 | <310 | | | <310 | | | | | | <31 | | | |
| AC-3S | 3/9/1994 | 2 | 4.5 | <6.7 | <6.7 | <67 | | | <67 | 80000 | | | | | <6.7 | | | |
| AC-5S | 3/9/1994 | 1 | 3 | <5.6 | <5.6 | <56 | | | <56 | 190 | | | | | <5.6 | | | |
| AC-6D | 3/9/1994 | 6 | 8 | <6.1 | <6.1 | <61 | | | 94 | <8 | | | | | <6.1 | | | |
| AC-6M | 3/9/1994 | 4 | 6 | <6.5 | <6.5 | <65 | | | 160 | <8.6 | | | | | <6.5 | | | |
| AC-6S | 3/9/1994 | 1 | 3 | <5.6 | <5.6 | <56 | | | 78 | <36 | | | | | <5.6 | | | |
| AC-7S | 3/9/1994 | 3 | 5 | <6.6 | <6.6 | <66 | | | <66 | 18 | | | | | <6.6 | | | |
| AC-8D | 3/9/1994 | 5 | 7 | <6.3 | <6.3 | <63 | | | 160 | 1800 | | | | | <6.3 | | | |
| AC-8M | 3/9/1994 | 3 | 5 | <6.6 | <6.6 | <66 | | | 140 | <8.6 | | | | | <6.6 | | | |
| AC-8S | 3/9/1994 | 1 | 3 | <6.2 | <6.2 | <62 | | | 91 | <8.3 | | | | | <6.2 | | | |
| AC-9S | 3/9/1994 | 2 | 4 | <5.7 | <5.7 | <57 | | | 100 | 42 | | | | | <5.7 | | | |
| LS-1 | 2/4/1991 | 1.5 | 3.5 | <30 | <30 | <600 | | | <600 | | | | | | <30 | | | |
| LS-15 (Dup of LS-1) | 2/4/1991 | 1.5 | 3.5 | <31 | <31 | <630 | | | <630 | | | | | | <31 | | | |
| LS-1 | 2/4/1991 | 9.5 | 11.5 | <790 | <790 | <16000 | | | <16000 | | | | | | <790 | | | |
| LS-11 | 1/31/1991 | 2.5 | 4.5 | <30 | <30 | <610 | | | <610 | | | | | | <30 | | | |
| LS-11 | 1/31/1991 | 6.5 | 8.5 | 15 | <6.3 | <130 | | | <130 | | | | | | <6.3 | | | |
| LS-12 | 1/31/1991 | 0.5 | 2.5 | 29 | <5.7 | <110 | | | <110 | | | | | | <5.7 | | | |
| LS-12 | 1/31/1991 | 2.5 | 4.5 | <31 | <31 | <620 | | | <620 | | | | | | <31 | | | |
| LS-13A | 2/1/1991 | 1 | 3 | 26 | <5.7 | <110 | | | <110 | | | | | | <5.7 | | | |
| LS-14 | 1/31/1991 | 0.5 | 2.5 | 57 | <6 | <120 | | | <120 | | | | | | <6 | | | |
| LS-14 | 1/31/1991 | 2.5 | 4.5 | 25 | <6 | <120 | | | <120 | | | | | | <6 | | | |
| LS-2 | 2/1/1991 | 1 | 3 | <5.7 | <5.7 | <110 | | | <110 | | | | | | <5.7 | | | |
| LS-2 | 2/1/1991 | 9 | 11 | <790 | <790 | <16000 | | | <16000 | | | | | | <790 | | | |
| LS-6 | 2/4/1991 | 1 | 3 | <7600 | <7600 | 120000 | | | <150000 | | | | | | <7600 | | | |
| LS-6 | 2/4/1991 | 9 | 11 | <750 | <750 | <15000 | | | <15000 | | | | | | <750 | | | |
| LS-15 (Dup of LS-6) | 2/4/1991 | 9 | 11 | <1500 | <1500 | <30000 | | | <30000 | | | | | | <1500 | | | |
| LS-7 | 2/4/1991 | 1.5 | 3.5 | <740 | <740 | <15000 | | | <15000 | | | | | | <740 | | | |
| LS-7 | 2/4/1991 | 7.5 | 9.5 | <7800 | <7800 | 160000 | | | <160000 | | | | | | <7800 | | | |
| LS-8 | 2/1/1991 | 0.6 | 2.5 | <5.7 | <5.7 | <110 | | | <110 | | | | | | <5.7 | | | |
| LSS-1 | 10/8/1992 | 3 | 3.8 | <700 | <700 | | | <370 | | 1200 | <370 | <5600 | 2800 | | <700 | <370 | 370 | <370 |
| SB-A | 6/5/2000 | 0 | 2 | <5.6 | <5.6 | <28 | 54 J | 130 J | 16 J | 38 | 210 J | 730 B | 7500 | 81000 | <5.6 | 900 | 1100 | 720 |
| SB-B | 6/5/2000 | 0 | 2 | <4.6 | <4.6 | <23 | <370 | <370 | <46 | <37 | 44 J | <2200 | 4800 | 200000 | <4.6 | 380 | 500 | 480 |
| APA04-03-8-10 | 6/30/2004 | 8 | 10 | <4.5 | <4.5 | 18 J | | | 71 | <80 | | | | | 23 | | | |
| APA04-04-8-10 | 7/1/2004 | 8 | 10 | <4.4 | <4.4 | <22 | | | <31 | | | | | | 3.9 J | | | |
| APA04-05-9-11 | 6/30/2004 | 9 | 11 | <18000 | 7.2 J | <89000 | | | <180000 | 110000 | | | | | 9 J | | | |
| APA04-05-9-11-DUP | 6/30/2004 | 9 | 11 | <18000 | 11 J | <89000 | | | 11 J | 100000 | | | | | 11 J | | | |
| APA04-07-1-3 | 7/1/2004 | 1 | 3 | <4.8 | <4.8 | <24 | | | 8.3 J | <17000 | | | | | <4.8 | | | |
| APA04-11-10-12 | 7/1/2004 | 10 | 12 | <2200 | <2200 | <11000 | | | <22000 | 19000 | | | | | <2200 | | | |
| APA04-12-10-12 | 7/2/2004 | 10 | 12 | <4.4 | 25 | <22 | | | <44 | <80 | | | | | <4.4 | | | |
| APA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-05-0-1 | 4/17/2006 | 0 | 1 | | | | | | | | | | | | | | | |
| APA06-07-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-08-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-09-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| APA06-10-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | | |
| **Representative Concentration (Rep.)** | | | | 691 | 270 | 10067 | 120 | 167 | 7274 | 9992 | 146 | 1543 | 5033 | 140500 | 270 | 488 | 657 | 462 |
| **Maximum Detected Concentration (Max.)** | | | | 57 | 25 | 160000 | 54 | 130 | 310 | 110000 | 210 | 730 | 7500 | 200000 | 23 | 900 | 1100 | 720 |
| **Concentration Ratio (Max./Rep.)** | | | | 0.1 | 0.1 | **15.9** | 0.5 | 0.8 | 0.04 | 11.0 | 1.4 | N/A | N/A | N/A | 0.1 | 1.8 | 1.7 | 1.6 |
| **Background Concentration** | | | | NA | NA | NA | NA | NA | NA | NA | NA | 3150 | 6133 | 200000 | NA | NA | NA | NA |
| **Exceed/Not Exceed (Rep./Background)** | | | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Not Exceed | Not Exceed | Not Exceed | N/A | N/A | N/A | N/A |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface
B: Value less than the Contract Required Detection Limit but greater than or equal to Instrument Detection Limit
J: Value estimated
NA: Not available
N/A: Not applicable

**Constituents in Bold and Underlined** considered in risk calculation based on background

**Table 4-2(f)(R)**
**Representative Concentration of Soil by a Future On-site Construction Worker**
**Fomer Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | Benzo(g,h,i) perylene | Benzo(k) fluoranthene | Beryllium | Bis(2-ethylhexyl) phthalate | Cadmium | Carbon disulfide | Chlorobenzene | Chloroform | Chromium | Chrysene | cis-1,2-Dichloroethene | Cobalt | Copper | Dibenzo(a,h) anthracene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-10D | 3/9/1994 | 4.5 | 5.5 | | | | | | | | | | | | | | |
| AC-10M | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | |
| AC-10S | 3/9/1994 | 1 | 2 | | | | | | | | | | | | | | |
| AC-11S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | |
| AC-12D | 3/9/1994 | 2 | 4 | | | | | | | | | | | | | | |
| AC-12S | 3/9/1994 | 1 | 2 | | | | | | | | | | | | | | |
| AC-13D | 3/9/1994 | 11 | 12 | | | | | | | | | | | | | | |
| AC-13M | 3/9/1994 | 6 | 7 | | | | | | | | | | | | | | |
| AC-13S | 3/9/1994 | 2 | 4 | | | | | | | | | | | | | | |
| AC-14D | 3/9/1994 | 4 | 5 | | | | | | | | | | | | | | |
| AC-14S | 3/9/1994 | 2 | 3 | | | | | | | | | | | | | | |
| AC-15S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | |
| AC-16D | 3/9/1994 | 6 | 7.5 | | | | | | | | | | | | | | |
| AC-16M | 3/9/1994 | 4 | 5 | | | | | | | | | | | | | | |
| AC-16S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | |
| AC-1D | 3/9/1994 | 2 | 4 | | | | | | <6.1 | <6.1 | <6.1 | | | <6.1 | | | |
| AC-1S | 3/9/1994 | 1 | 2 | | | | | | <5.7 | <5.7 | <5.7 | | | <5.7 | | | |
| AC-2D | 3/9/1994 | 3 | 4 | | | | | | <5.2 | <5.2 | <5.2 | | | <5.2 | | | |
| AC-2S | 3/9/1994 | 1 | 2 | | | | | | <6.2 | 7.1 | <6.2 | | | <6.2 | | | |
| AC-2S (DL) | 3/9/1994 | 1 | 2 | | | | | | <31 | <31 | <31 | | | <31 | | | |
| AC-3S | 3/9/1994 | 2 | 4.5 | | | | | | <6.7 | <6.7 | <6.7 | | | <6.7 | | | |
| AC-5S | 3/9/1994 | 1 | 3 | | | | | | <5.6 | <5.6 | <5.6 | | | <5.6 | | | |
| AC-6D | 3/9/1994 | 6 | 8 | | | | | | <6.1 | <6.1 | <6.1 | | | <6.1 | | | |
| AC-6M | 3/9/1994 | 4 | 6 | | | | | | <6.5 | <6.5 | <6.5 | | | <6.5 | | | |
| AC-6S | 3/9/1994 | 1 | 3 | | | | | | <5.6 | <5.6 | <5.6 | | | <5.6 | | | |
| AC-7S | 3/9/1994 | 3 | 5 | | | | | | <6.6 | <6.6 | <6.6 | | | <6.6 | | | |
| AC-8D | 3/9/1994 | 5 | 7 | | | | | | <6.3 | 25 | <6.3 | | | <6.3 | | | |
| AC-8M | 3/9/1994 | 3 | 5 | | | | | | <6.6 | <6.6 | <6.6 | | | <6.6 | | | |
| AC-8S | 3/9/1994 | 1 | 3 | | | | | | <6.2 | <6.2 | <6.2 | | | <6.2 | | | |
| AC-9S | 3/9/1994 | 2 | 4 | | | | | | <5.7 | <5.7 | <5.7 | | | <5.7 | | | |
| LS-1 | 2/4/1991 | 1.5 | 3.5 | | | | | | <30 | 1200 | <30 | | | | | | |
| LS-15 (Dup of LS-1) | 2/4/1991 | 1.5 | 3.5 | | | | | | <31 | 680 | <31 | | | | | | |
| LS-1 | 2/4/1991 | 9.5 | 11.5 | | | | | | <790 | 13000 | <790 | | | | | | |
| LS-11 | 1/31/1991 | 2.5 | 4.5 | | | | | | <30 | 390 | <30 | | | | | | |
| LS-11 | 1/31/1991 | 6.5 | 8.5 | | | | | | <6.3 | 48 | <6.3 | | | | | | |
| LS-12 | 1/31/1991 | 0.5 | 2.5 | | | | | | 8.2 | <5.7 | <5.7 | | | | | | |
| LS-12 | 1/31/1991 | 2.5 | 4.5 | | | | | | <31 | 920 | <31 | | | | | | |
| LS-13A | 2/1/1991 | 1 | 3 | | | | | | <5.7 | <5.7 | <5.7 | | | | | | |
| LS-14 | 1/31/1991 | 0.5 | 2.5 | | | | | | <6 | <6 | <6 | | | | | | |
| LS-14 | 1/31/1991 | 2.5 | 4.5 | | | | | | <6 | 33 | <6 | | | | | | |
| LS-2 | 2/1/1991 | 1 | 3 | | | | | | <5.7 | <5.7 | <5.7 | | | | | | |
| LS-2 | 2/1/1991 | 9 | 11 | | | | | | <790 | 2300 | <790 | | | | | | |
| LS-6 | 2/4/1991 | 1 | 3 | | | | | | <7600 | 59000 | <7600 | | | | | | |
| LS-6 | 2/4/1991 | 9 | 11 | | | | | | <750 | 8200 | <750 | | | | | | |
| LS-15 (Dup of LS-6) | 2/4/1991 | 9 | 11 | | | | | | <1500 | 23000 | <1500 | | | | | | |
| LS-7 | 2/4/1991 | 1.5 | 3.5 | | | | | | <740 | 14000 | <740 | | | | | | |
| LS-7 | 2/4/1991 | 7.5 | 9.5 | | | | | | <7800 | <7800 | <7800 | | | | | | |
| LS-8 | 2/1/1991 | 0.6 | 2.5 | | | | | | <5.7 | 37 | <5.7 | | | | | | |
| LSS-1 | 10/8/1992 | 3 | 3.8 | <370 | <370 | <560 | <370 | 680 | | 2100 | <700 | 11000 | <370 | | | 17000 | <370 |
| SB-A | 6/5/2000 | 0 | 2 | 830 | 970 | 350 B | 230 J | 760 | <5.6 | <5.6 | <5.6 | 12000 | 980 | | 4600 | 41000 | 100 J |
| SB-B | 6/5/2000 | 0 | 2 | 380 | 420 | 450 | 180 J | 880 | <4.6 | <4.6 | <4.6 | 13000 | 440 | | 6100 | 53000 | 110 J |
| APA04-03-8-10 | 6/30/2004 | 8 | 10 | | | | | | <40 | <1400 | <4.5 | | | <4.5 | | | |
| APA04-04-8-10 | 7/1/2004 | 8 | 10 | | | | | | <4.4 | 4500 J | <4.4 | | | <4.4 | | | |
| APA04-05-9-11 | 6/30/2004 | 9 | 11 | | | | | | 3.2 J | 290000 | <18000 | | | 12000 J | | | |
| APA04-05-9-11-DUP | 6/30/2004 | 9 | 11 | | | | | | <18000 | 170000 | <18000 | | | 6500 J | | | |
| APA04-07-1-3 | 7/1/2004 | 1 | 3 | | | | | | <4.8 | 75 | <4.8 | | | <4.8 | | | |
| APA04-11-10-12 | 7/1/2004 | 10 | 12 | | | | | | <2200 | 360000 | <2200 | | | <2200 | | | |
| APA04-12-10-12 | 7/2/2004 | 10 | 12 | | | | | | <4.4 | 70 | 1.1 J | | | <4.4 | | | |
| APA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | |
| APA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | |
| APA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | |
| APA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | |
| APA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | |
| APA06-05-0-1 | 4/17/2006 | 0 | 1 | | | | | | | | | | | | | | |
| APA06-07-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | |
| APA06-08-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | |
| APA06-09-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | |
| APA06-10-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | | | | | | |
| **Representative Concentration (Rep.)** | | | | 465 | 525 | 360 | 198 | 773 | 483 | 22192 | 688 | 12000 | 535 | 894 | 5350 | 37000 | 132 |
| **Maximum Detected Concentration (Max.)** | | | | 830 | 970 | 450 | 230 | 880 | 8.2 | 360000 | 1.1 | 13000 | 980 | 12000 | 6100 | 53000 | 110 |
| **Concentration Ratio (Max./Rep.)** | | | | 1.8 | 1.8 | N/A | 1.2 | 1.1 | 0.02 | 16.2 | 0.002 | 1.1 | 1.8 | 13.4 | 1.1 | 1.4 | 0.8 |
| **Background Concentration** | | | | NA | NA | 867 | NA | 520 | NA | NA | NA | 11100 | NA | NA | 4967 | 21667 | NA |
| **Exceed/Not Exceed (Rep./Background)** | | | | N/A | N/A | Not Exceed | N/A | Exceed | N/A | N/A | N/A | Exceed | N/A | N/A | Exceed | Exceed | N/A |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface
B: Value less than the Contract Required Detection Limit but greater than or equal to Instrument Detection Limit
J: Value estimated
NA: Not available
N/A: Not applicable

**Constituents in Bold and Underlined** considered in risk calculation based on background

**Table 4-2(f)(R)**
**Representative Concentration of Soil by a Future On-site Construction Worker**
**Fomer Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | Dibenzofuran | Di-n-butyl phthalate | Ethylbenzene | Fluoranthene | Fluorene | Indeno-(1,2,3-cd)pyrene | Iron | Lead | Mercury | Methylene chloride | Naphthalene | Nickel | Phenanthrene | Pyrene | Selenium | Tetrachloroethene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC-10D | 3/9/1994 | 4.5 | 5.5 | | | | | | | | | | | | | | | | |
| AC-10M | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | | |
| AC-10S | 3/9/1994 | 1 | 2 | | | | | | | | | | | | | | | | |
| AC-11S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | | |
| AC-12D | 3/9/1994 | 2 | 4 | | | | | | | | | | | | | | | | |
| AC-12S | 3/9/1994 | 1 | 2 | | | | | | | | | | | | | | | | |
| AC-13D | 3/9/1994 | 11 | 12 | | | | | | | | | | | | | | | | |
| AC-13M | 3/9/1994 | 6 | 7 | | | | | | | | | | | | | | | | |
| AC-13S | 3/9/1994 | 2 | 4 | | | | | | | | | | | | | | | | |
| AC-14D | 3/9/1994 | 4 | 5 | | | | | | | | | | | | | | | | |
| AC-14S | 3/9/1994 | 2 | 3 | | | | | | | | | | | | | | | | |
| AC-15S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | | |
| AC-16D | 3/9/1994 | 6 | 7.5 | | | | | | | | | | | | | | | | |
| AC-16M | 3/9/1994 | 4 | 5 | | | | | | | | | | | | | | | | |
| AC-16S | 3/9/1994 | 3 | 4 | | | | | | | | | | | | | | | | |
| AC-1D | 3/9/1994 | 2 | 4 | | | <6.1 | | | | | | | <6.1 | | | | | | 6.3 |
| AC-1S | 3/9/1994 | 1 | 2 | | | <5.7 | | | | | | | <5.7 | | | | | | 10 |
| AC-2D | 3/9/1994 | 3 | 4 | | | <5.2 | | | | | | | 9.8 | | | | | | <5.2 |
| AC-2S | 3/9/1994 | 1 | 2 | | | <6.2 | | | | | | | <6.2 | | | | | | 10 |
| AC-2S (DL) | 3/9/1994 | 1 | 2 | | | <31 | | | | | | | 48 | | | | | | <31 |
| AC-3S | 3/9/1994 | 2 | 4.5 | | | <6.7 | | | | | | | <6.7 | | | | | | <6.7 |
| AC-5S | 3/9/1994 | 1 | 3 | | | <5.6 | | | | | | | 9.4 | | | | | | <5.6 |
| AC-6D | 3/9/1994 | 6 | 8 | | | <6.1 | | | | | | | 8.8 | | | | | | <6.1 |
| AC-6M | 3/9/1994 | 4 | 6 | | | <6.5 | | | | | | | 11 | | | | | | <6.5 |
| AC-6S | 3/9/1994 | 1 | 3 | | | <5.6 | | | | | | | 8.4 | | | | | | <5.6 |
| AC-7S | 3/9/1994 | 3 | 5 | | | <6.6 | | | | | | | 11 | | | | | | <6.6 |
| AC-8D | 3/9/1994 | 5 | 7 | | | <6.3 | | | | | | | 13 | | | | | | <6.3 |
| AC-8M | 3/9/1994 | 3 | 5 | | | <6.6 | | | | | | | 8.6 | | | | | | <6.6 |
| AC-8S | 3/9/1994 | 1 | 3 | | | <6.2 | | | | | | | 12 | | | | | | <6.2 |
| AC-9S | 3/9/1994 | 2 | 4 | | | <5.7 | | | | | | | <5.7 | | | | | | <5.7 |
| LS-1 | 2/4/1991 | 1.5 | 3.5 | | | <30 | | | | | | | <30 | | | | | | <30 |
| LS-15 (Dup of LS-1) | 2/4/1991 | 1.5 | 3.5 | | | <31 | | | | | | | <31 | | | | | | <31 |
| LS-1 | 2/4/1991 | 9.5 | 11.5 | | | <790 | | | | | | | <790 | | | | | | <790 |
| LS-11 | 1/31/1991 | 2.5 | 4.5 | | | <30 | | | | | | | <30 | | | | | | <30 |
| LS-11 | 1/31/1991 | 6.5 | 8.5 | | | <6.3 | | | | | | | <6.3 | | | | | | <6.3 |
| LS-12 | 1/31/1991 | 0.5 | 2.5 | | | <5.7 | | | | | | | <5.7 | | | | | | <5.7 |
| LS-12 | 1/31/1991 | 2.5 | 4.5 | | | <31 | | | | | | | <31 | | | | | | <31 |
| LS-13A | 2/1/1991 | 1 | 3 | | | <5.7 | | | | | | | <5.7 | | | | | | <5.7 |
| LS-14 | 1/31/1991 | 0.5 | 2.5 | | | <6 | | | | | | | <6 | | | | | | <6 |
| LS-14 | 1/31/1991 | 2.5 | 4.5 | | | <6 | | | | | | | 6.5 | | | | | | <6 |
| LS-2 | 2/1/1991 | 1 | 3 | | | <5.7 | | | | | | | <5.7 | | | | | | <5.7 |
| LS-2 | 2/1/1991 | 9 | 11 | | | <790 | | | | | | | <790 | | | | | | <790 |
| LS-6 | 2/4/1991 | 1 | 3 | | | <7600 | | | | | | | <7600 | | | | | | <7600 |
| LS-6 | 2/4/1991 | 9 | 11 | | | <750 | | | | | | | <750 | | | | | | <750 |
| LS-15 (Dup of LS-6) | 2/4/1991 | 9 | 11 | | | <1500 | | | | | | | <1500 | | | | | | <1500 |
| LS-7 | 2/4/1991 | 1.5 | 3.5 | | | <740 | | | | | | | <740 | | | | | | <740 |
| LS-7 | 2/4/1991 | 7.5 | 9.5 | | | <7800 | | | | | | | <7800 | | | | | | <7800 |
| LS-8 | 2/1/1991 | 0.6 | 2.5 | | | <5.7 | | | | | | | <5.7 | | | | | | <5.7 |
| LSS-1 | 10/8/1992 | 3 | 3.8 | | <370 | <700 | <370 | <370 | <370 | | 32000 | 46 | <700 | <370 | 11000 | <370 | <370 | <11000 | <700 |
| SB-A | 6/5/2000 | 0 | 2 | 98 J | 68 J | <5.6 | 1900 | 110 J | 620 | 280000000 | 65000 | 7600 | <5.6 | 71 J | 15000 | 1400 | 2600 | 590 B | <5.6 |
| SB-B | 6/5/2000 | 0 | 2 | <370 | 85 J | <4.6 | 550 | <370 | 280 J | 14000000 | 80000 | 130 | <4.6 | <370 | 18000 | 230 J | 890 | <1100 | <4.6 |
| APA04-03-8-10 | 6/30/2004 | 8 | 10 | | | 3 J | | | | | | | <4.5 | | | | | | <4.5 |
| APA04-04-8-10 | 7/1/2004 | 8 | 10 | | | <4.4 | | | | | | | <4.4 | | | | | | <4.4 |
| APA04-05-9-11 | 6/30/2004 | 9 | 11 | | | 9.4 J | | | | | | | <18000 | | | | | | 29 J |
| APA04-05-9-11-DUP | 6/30/2004 | 9 | 11 | | | 4.1 J | | | | | | | <18000 | | | | | | 20 J |
| APA04-07-1-3 | 7/1/2004 | 1 | 3 | | | <4.8 | | | | | | | <4.8 | | | | | | <4.8 |
| APA04-11-10-12 | 7/1/2004 | 10 | 12 | | | <2200 | | | | | | | <2200 | | | | | | <2200 |
| APA04-12-10-12 | 7/2/2004 | 10 | 12 | | | <4.4 | | | | | | | 2.4 J | | | | | | <4.4 |
| APA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | 300 | | | | | | | |
| APA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | | | | 620 | | | | | | | |
| APA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | 17 J | | | | | | | |
| APA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | 20 J | | | | | | | |
| APA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | 54 | | | | | | | |
| APA06-05-0-1 | 4/17/2006 | 0 | 1 | | | | | | | | | 22 | | | | | | | |
| APA06-07-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | 21 J | | | | | | | |
| APA06-08-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | 600 | | | | | | | |
| APA06-09-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | < 21 | | | | | | | |
| APA06-10-2-3 | 4/17/2006 | 2 | 3 | | | | | | | | | 74 J | | | | | | | |
| **Representative Concentration (Rep.)** | | | | 142 | 113 | 270 | 878 | 160 | 362 | 147000000 | 59000 | 732 | 690 | 147 | 14667 | 605 | 1225 | 2213 | 271 |
| **Maximum Detected Concentration (Max.)** | | | | 98 | 85 | 9.4 | 1900 | 110 | 620 | 280000000 | 80000 | 7600 | 48 | 71 | 18000 | 1400 | 2600 | 590 | 10 |
| **Concentration Ratio (Max./Rep.)** | | | | 0.7 | 0.8 | 0.03 | 2.2 | 0.7 | 1.7 | N/A | N/A | 10.4 | 0.1 | 0.5 | N/A | 2.3 | 2.1 | 0.3 | 0.0 |
| **Background Concentration** | | | | NA | NA | NA | NA | NA | NA | NA | 152333 | NA | NA | NA | 16333 | NA | NA | 633 | NA |
| **Exceed/Not Exceed (Rep./Background)** | | | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Not Exceed | N/A | N/A | N/A | Not Exceed | N/A | N/A | Exceed | N/A |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface
B: Value less than the Contract Required Detection Limit but greater than or equal to Instrument Detection Limit
J: Value estimated
NA: Not available
N/A: Not applicable

**Constituents in Bold and Underlined** considered in risk calculation based on background

**Table 4-2(f)(R)**
**Representative Concentration of Soil by a Future On-site Construction Worker**
**Fomer Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| Sample ID | Sample Date | Depth (ft bgs) | | Tin | Toluene | Trichloroethene | Vanadium | Xylene | Zinc |
|---|---|---|---|---|---|---|---|---|---|
| AC-10D | 3/9/1994 | 4.5 | 5.5 | | | | | | |
| AC-10M | 3/9/1994 | 3 | 4 | | | | | | |
| AC-10S | 3/9/1994 | 1 | 2 | | | | | | |
| AC-11S | 3/9/1994 | 3 | 4 | | | | | | |
| AC-12D | 3/9/1994 | 2 | 4 | | | | | | |
| AC-12S | 3/9/1994 | 1 | 2 | | | | | | |
| AC-13D | 3/9/1994 | 11 | 12 | | | | | | |
| AC-13M | 3/9/1994 | 6 | 7 | | | | | | |
| AC-13S | 3/9/1994 | 2 | 4 | | | | | | |
| AC-14D | 3/9/1994 | 4 | 5 | | | | | | |
| AC-14S | 3/9/1994 | 2 | 3 | | | | | | |
| AC-15S | 3/9/1994 | 3 | 4 | | | | | | |
| AC-16D | 3/9/1994 | 6 | 7.5 | | | | | | |
| AC-16M | 3/9/1994 | 4 | 5 | | | | | | |
| AC-16S | 3/9/1994 | 3 | 4 | | | | | | |
| AC-1D | 3/9/1994 | 2 | 4 | | <6.1 | <6.1 | | <6.1 | |
| AC-1S | 3/9/1994 | 1 | 2 | | <5.7 | <5.7 | | <5.7 | |
| AC-2D | 3/9/1994 | 3 | 4 | | <5.2 | <5.2 | | <5.2 | |
| AC-2S | 3/9/1994 | 1 | 2 | | 8.2 | <6.2 | | 34 | |
| AC-2S (DL) | 3/9/1994 | 1 | 2 | | <31 | <31 | | <31 | |
| AC-3S | 3/9/1994 | 2 | 4.5 | | <6.7 | <6.7 | | <6.7 | |
| AC-5S | 3/9/1994 | 1 | 3 | | <5.6 | <5.6 | | <5.6 | |
| AC-6D | 3/9/1994 | 6 | 8 | | <6.1 | <6.1 | | 53 | |
| AC-6M | 3/9/1994 | 4 | 6 | | <6.5 | <6.5 | | <6.5 | |
| AC-6S | 3/9/1994 | 1 | 3 | | <5.6 | <5.6 | | <5.6 | |
| AC-7S | 3/9/1994 | 3 | 5 | | <6.6 | <6.6 | | <6.6 | |
| AC-8D | 3/9/1994 | 5 | 7 | | <6.3 | <6.3 | | <6.3 | |
| AC-8M | 3/9/1994 | 3 | 5 | | <6.6 | <6.6 | | <6.6 | |
| AC-8S | 3/9/1994 | 1 | 3 | | <6.2 | <6.2 | | <6.2 | |
| AC-9S | 3/9/1994 | 2 | 4 | | <5.7 | <5.7 | | <5.7 | |
| LS-1 | 2/4/1991 | 1.5 | 3.5 | | <30 | <30 | | <30 | |
| LS-15 (Dup of LS-1) | 2/4/1991 | 1.5 | 3.5 | | <31 | <31 | | <31 | |
| LS-1 | 2/4/1991 | 9.5 | 11.5 | | <790 | 940 | | <790 | |
| LS-11 | 1/31/1991 | 2.5 | 4.5 | | <30 | <30 | | <30 | |
| LS-11 | 1/31/1991 | 6.5 | 8.5 | | <6.3 | <6.3 | | <6.3 | |
| LS-12 | 1/31/1991 | 0.5 | 2.5 | | <5.7 | <5.7 | | <5.7 | |
| LS-12 | 1/31/1991 | 2.5 | 4.5 | | <31 | <31 | | <31 | |
| LS-13A | 2/1/1991 | 1 | 3 | | <5.7 | 8.9 | | 12 | |
| LS-14 | 1/31/1991 | 0.5 | 2.5 | | <6 | <6 | | <6 | |
| LS-14 | 1/31/1991 | 2.5 | 4.5 | | <6 | <6 | | <6 | |
| LS-2 | 2/1/1991 | 1 | 3 | | <5.7 | <5.7 | | <5.7 | |
| LS-2 | 2/1/1991 | 9 | 11 | | <790 | <790 | | <790 | |
| LS-6 | 2/4/1991 | 1 | 3 | | <7600 | <7600 | | <7600 | |
| LS-6 | 2/4/1991 | 9 | 11 | | <750 | <750 | | <750 | |
| LS-15 (Dup of LS-6) | 2/4/1991 | 9 | 11 | | <1500 | <1500 | | <1500 | |
| LS-7 | 2/4/1991 | 1.5 | 3.5 | | <740 | <740 | | <740 | |
| LS-7 | 2/4/1991 | 7.5 | 9.5 | | <7800 | <7800 | | <7800 | |
| LS-8 | 2/1/1991 | 0.6 | 2.5 | | <5.7 | <5.7 | | <5.7 | |
| LSS-1 | 10/8/1992 | 3 | 3.8 | | <700 | <700 | | <700 | 93000 |
| SB-A | 6/5/2000 | 0 | 2 | 5200 B | <5.6 | <5.6 | 12000 | <11 | 94000 |
| SB-B | 6/5/2000 | 0 | 2 | <5600 | <4.6 | <4.6 | 18000 | <9.2 | 95000 |
| APA04-03-8-10 | 6/30/2004 | 8 | 10 | | 8.6 | <4.5 | | 10 | |
| APA04-04-8-10 | 7/1/2004 | 8 | 10 | | <6.8 | <4.4 | | <8.8 | |
| APA04-05-9-11 | 6/30/2004 | 9 | 11 | | 7 J | <18000 | | 76 J | |
| APA04-05-9-11-DUP | 6/30/2004 | 9 | 11 | | 7.3 J | <18000 | | 42 J | |
| APA04-07-1-3 | 7/1/2004 | 1 | 3 | | <4.8 | <4.8 | | <9.7 | |
| APA04-11-10-12 | 7/1/2004 | 10 | 12 | | <2200 | <2200 | | <4400 | |
| APA04-12-10-12 | 7/2/2004 | 10 | 12 | | 9 | 3 J | | <8.8 | |
| APA06-01-2-3 | 4/17/2006 | 2 | 3 | | | | | | |
| APA06-01-2-3-D | 4/17/2006 | 2 | 3 | | | | | | |
| APA06-02-2-3 | 4/17/2006 | 2 | 3 | | | | | | |
| APA06-03-2-3 | 4/17/2006 | 2 | 3 | | | | | | |
| APA06-04-2-3 | 4/17/2006 | 2 | 3 | | | | | | |
| APA06-05-0-1 | 4/17/2006 | 0 | 1 | | | | | | |
| APA06-07-2-3 | 4/17/2006 | 2 | 3 | | | | | | |
| APA06-08-2-3 | 4/17/2006 | 2 | 3 | | | | | | |
| APA06-09-2-3 | 4/17/2006 | 2 | 3 | | | | | | |
| APA06-10-2-3 | 4/17/2006 | 2 | 3 | | | | | | |
| **Representative Concentration (Rep.)** | | | | 4000 | 270 | 701 | 15000 | 300 | 94000 |
| **Maximum Detected Concentration (Max.)** | | | | 5200 | 9 | 940 | 18000 | 53 | 95000 |
| **Concentration Ratio (Max./Rep.)** | | | | N/A | 0.03 | 1.3 | N/A | 0.2 | N/A |
| **Background Concentration** | | | | 7267 | NA | NA | 18667 | NA | 143333 |
| **Exceed/Not Exceed (Rep./Background)** | | | | Not Exceed | N/A | N/A | Not Exceed | N/A | Not Exceed |

Notes:
All concentrations in ug/kg (micrograms per kilogram).
ft bgs: Feet below ground surface
B: Value less than the Contract Required Detection Limit but greater than or equal to Instrument Detection Limit
J: Value estimated
NA: Not available
N/A: Not applicable

**Constituents in Bold and Underlined** considered in risk calculation based on background

**Table 4-7(a)(R)**
**Calculation of Risks for a Current On-site Non-residential Worker**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| 1,1,1-Trichloroethane | 222 | NA | 7.30E-07 | NA | 7.74E-07 | NA | 5.17E-06 | --- | --- | --- | --- | --- | --- | NA | 6.68E-06 |
| 1,2-Dichloroethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 309 | 2.96E-07 | 6.51E-03 | 2.96E-07 | 6.51E-03 |
| 2-Butanone (MEK) | 6735 | NA | 1.04E-05 | NA | 1.10E-05 | NA | 1.35E-05 | --- | --- | --- | --- | --- | --- | NA | 3.48E-05 |
| 2-Methyl naphthalene | 120 | NA | 2.76E-05 | NA | 2.92E-05 | NA | 1.10E-05 | --- | --- | --- | --- | --- | --- | NA | 6.78E-05 |
| Acenaphthene | 158 | NA | 7.26E-06 | NA | 2.57E-06 | NA | 3.63E-07 | --- | --- | --- | --- | --- | --- | NA | 1.02E-05 |
| Acetone | 4,274 | NA | 4.38E-06 | NA | 4.65E-06 | NA | 1.59E-05 | --- | --- | --- | --- | --- | --- | NA | 2.49E-05 |
| Alachlor | 859 | 1.58E-08 | 7.92E-05 | 1.68E-08 | 8.41E-05 | 1.30E-09 | 4.57E-06 | --- | --- | --- | --- | --- | --- | 3.40E-08 | 1.68E-04 |
| Anthracene | 127 | NA | 1.17E-06 | NA | 4.14E-07 | NA | 5.42E-08 | --- | --- | --- | --- | --- | --- | NA | 1.64E-06 |
| Arsenic | 6,150 | 3.04E-08 | 1.89E-04 | 3.06E-06 | 1.91E-02 | 1.72E-08 | NA | --- | --- | --- | --- | --- | --- | 3.11E-06 | 1.92E-02 |
| Benzo(a)anthracene | 640 | 2.00E-07 | NA | 1.63E-07 | NA | 2.71E-10 | NA | --- | --- | --- | --- | --- | --- | 3.64E-07 | NA |
| Benzo(a)pyrene | 800 | 2.50E-06 | NA | 1.73E-06 | NA | 3.24E-09 | NA | --- | --- | --- | --- | --- | --- | 4.24E-06 | NA |
| Benzo(b)fluoranthene | 600 | 1.88E-07 | NA | 1.53E-07 | NA | 4.67E-10 | NA | --- | --- | --- | --- | --- | --- | 3.41E-07 | NA |
| Benzo(g,h,i)perylene | 605 | NA | 2.42E-05 | NA | 1.97E-05 | NA | 4.79E-08 | --- | --- | --- | --- | --- | --- | NA | 4.40E-05 |
| Benzo(k)fluoranthene | 695 | 2.17E-08 | NA | 1.77E-08 | NA | 1.06E-11 | NA | --- | --- | --- | --- | --- | --- | 3.95E-08 | NA |
| Bis(2-ethylhexyl)phthalate | 205 | 9.46E-10 | 9.46E-06 | 1.00E-09 | 1.00E-05 | NA | 7.01E-09 | --- | --- | --- | --- | --- | --- | 1.95E-09 | 1.95E-05 |
| Cadmium | 820 | NA | 1.51E-04 | NA | 1.60E-03 | 9.54E-10 | NA | --- | --- | --- | --- | --- | --- | 9.54E-10 | 1.76E-03 |
| Carbon disulfide | 216 | NA | 1.99E-06 | NA | 2.12E-06 | NA | 2.73E-05 | --- | --- | --- | --- | --- | --- | NA | 3.14E-05 |
| Chlorobenzene | 3,391 | NA | 1.56E-04 | NA | 1.66E-04 | NA | 9.82E-04 | 683 | NA | 9.26E-04 | 53,414 | NA | 1.91E-01 | NA | 1.93E-01 |
| Chromium | 12,500 | NA | 7.69E-06 | NA | 8.15E-06 | NA | 2.26E-04 | --- | --- | --- | --- | --- | --- | NA | 2.42E-04 |
| Chrysene | 710 | 2.22E-09 | NA | 1.81E-09 | NA | 9.11E-12 | NA | --- | --- | --- | --- | --- | --- | 4.04E-09 | NA |
| cis-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 218 | NA | 1.53E-03 | NA | 1.53E-03 |
| Cobalt | 5,350 | NA | 2.47E-05 | NA | 2.62E-04 | 9.69E-09 | 4.86E-04 | --- | --- | --- | --- | --- | --- | 9.69E-09 | 7.72E-04 |
| Copper | 47,000 | NA | 1.08E-04 | NA | 1.15E-03 | NA | 8.51E-05 | --- | --- | --- | --- | --- | --- | NA | 1.34E-03 |
| Dibenzo(a,h)anthracene | 105 | 3.28E-07 | NA | 2.68E-07 | NA | 1.02E-10 | NA | --- | --- | --- | --- | --- | --- | 5.96E-07 | NA |
| Dibenzofuran | 142 | NA | 9.79E-06 | NA | 3.46E-05 | NA | 6.54E-06 | --- | --- | --- | --- | --- | --- | NA | 5.09E-05 |
| Di-n-buthylphthalate | 77 | NA | 7.06E-07 | NA | 7.49E-07 | NA | 3.96E-10 | --- | --- | --- | --- | --- | --- | NA | 1.45E-06 |
| Ethyl methacrylate | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 547 | NA | 1.23E-02 | NA | 1.23E-02 |
| Fluoranthene | 1,225 | NA | 2.83E-05 | NA | 1.50E-05 | NA | 3.21E-07 | --- | --- | --- | --- | --- | --- | NA | 4.36E-05 |
| Fluorene | 148 | NA | 1.02E-05 | NA | 3.61E-06 | NA | 2.20E-07 | --- | --- | --- | --- | --- | --- | NA | 1.40E-05 |
| Indeno-(1,2,3-cd)pyrene | 450 | 2.31E-07 | NA | 1.89E-07 | NA | 6.86E-11 | NA | --- | --- | --- | --- | --- | --- | 4.20E-07 | NA |
| Mercury | 789 | NA | NA | NA | NA | NA | 1.92E-01 | 46 | NA | 2.21E-01 | --- | --- | --- | NA | 4.13E-01 |
| Methylene chloride | 219 | 5.41E-10 | 3.36E-06 | 5.74E-10 | 3.57E-06 | 1.88E-09 | 2.80E-05 | 79 | 9.41E-09 | 1.40E-04 | --- | --- | --- | 1.24E-08 | 1.75E-04 |
| Naphthalene | 128 | NA | 1.77E-05 | NA | 6.26E-06 | NA | 8.05E-05 | --- | --- | --- | --- | --- | --- | NA | 1.04E-04 |
| Nickel | 16,500 | NA | 7.61E-05 | NA | 8.07E-04 | 2.77E-09 | 3.32E-04 | --- | --- | --- | --- | --- | --- | 2.77E-09 | 1.22E-03 |
| Phenanthrene | 815 | NA | 2.51E-05 | NA | 2.66E-05 | NA | 2.19E-06 | --- | --- | --- | --- | --- | --- | NA | 5.38E-05 |
| Pyrene | 1,745 | NA | 5.37E-05 | NA | 5.69E-05 | NA | 4.99E-07 | --- | --- | --- | --- | --- | --- | NA | 1.11E-04 |
| Tetrachloroethene | 217 | 3.71E-09 | 2.00E-05 | 3.94E-09 | 2.12E-05 | 9.69E-09 | 1.60E-05 | --- | --- | --- | --- | --- | --- | 1.73E-08 | 5.72E-05 |
| Toluene | 216 | NA | 2.99E-07 | NA | 1.06E-06 | NA | 1.48E-05 | --- | --- | --- | 307 | NA | 2.91E-04 | NA | 3.07E-04 |
| Trichloroethene | 216 | 9.26E-10 | 1.17E-06 | 9.82E-10 | 1.24E-06 | 5.21E-09 | 1.23E-05 | --- | --- | --- | 307 | 1.11E-07 | 2.62E-04 | 1.18E-07 | 2.76E-04 |
| Xylene | 219 | NA | 3.02E-07 | NA | 9.83E-08 | NA | 5.48E-06 | --- | --- | --- | --- | --- | --- | NA | 5.88E-06 |
| CUMULATIVE RISK | | 3.52E-06 | 1.05E-03 | 5.61E-06 | 2.34E-02 | 5.28E-08 | 1.94E-01 | | 9.41E-09 | 2.22E-01 | | 4.07E-07 | 2.11E-01 | 9.61E-06 | 6.52E-01 |

Notes:
HI: Hazard index
IELCR: Individual excess lifetime cancer risk
---: Risk was not calculated as constituent was not a concern.
HQ: Hazard quotient
NA: Not available

Table 4-7(b)(R)
Calculation of Risks for a Future On-site Non-residential Worker
Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| 1,1,1-Trichloroethane | 222 | NA | 7.30E-07 | NA | 7.74E-07 | NA | 5.17E-06 | 66 | NA | 2.17E-05 | --- | --- | --- | NA | 2.84E-05 |
| 1,2-Dichloroethane | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 227 | 2.17E-07 | 4.77E-03 | 2.17E-07 | 4.77E-03 |
| 2-Butanone (MEK) | 6735 | NA | 1.04E-05 | NA | 1.10E-05 | NA | 1.35E-05 | --- | --- | --- | --- | --- | --- | NA | 3.48E-05 |
| 2-Chlorophenol | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 4.0 | NA | 6.08E-06 | NA | 6.08E-06 |
| 2-Methyl naphthalene | 120 | NA | 2.76E-05 | NA | 2.92E-05 | NA | 1.10E-05 | --- | --- | --- | --- | --- | --- | NA | 6.78E-05 |
| Acenaphthene | 158 | NA | 7.26E-06 | NA | 2.57E-06 | NA | 3.63E-07 | --- | --- | --- | --- | --- | --- | NA | 1.02E-05 |
| Acetone | 4,274 | NA | 4.38E-06 | NA | 4.65E-06 | NA | 1.59E-05 | 802 | NA | 9.48E-06 | --- | --- | --- | NA | 3.44E-05 |
| Alachlor | 859 | 1.58E-08 | 7.92E-05 | 1.68E-08 | 8.41E-05 | 1.30E-09 | 4.57E-06 | --- | --- | --- | --- | --- | --- | 3.40E-08 | 1.68E-04 |
| Anthracene | 127 | NA | 1.17E-06 | NA | 4.14E-07 | NA | 5.42E-08 | --- | --- | --- | --- | --- | --- | NA | 1.64E-06 |
| Arsenic | 6,150 | 3.04E-08 | 1.89E-04 | 3.06E-06 | 1.91E-02 | 1.72E-08 | NA | --- | --- | --- | --- | --- | --- | 3.11E-06 | 1.92E-02 |
| Benzene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 224 | 2.28E-07 | 1.28E-02 | 2.28E-07 | 1.28E-02 |
| Benzo(a)anthracene | 640 | 2.00E-07 | NA | 1.63E-07 | NA | 2.71E-10 | NA | --- | --- | --- | --- | --- | --- | 3.64E-07 | NA |
| Benzo(a)pyrene | 800 | 2.50E-06 | NA | 1.73E-06 | NA | 3.24E-09 | NA | --- | --- | --- | --- | --- | --- | 4.24E-06 | NA |
| Benzo(b)fluoranthene | 600 | 1.88E-07 | NA | 1.53E-07 | NA | 4.67E-10 | NA | --- | --- | --- | --- | --- | --- | 3.41E-07 | NA |
| Benzo(g,h,i)perylene | 605 | NA | 2.42E-05 | NA | 1.97E-05 | NA | 4.79E-08 | --- | --- | --- | --- | --- | --- | NA | 4.40E-05 |
| Benzo(k)fluoranthene | 695 | 2.17E-08 | NA | 1.77E-08 | NA | 1.06E-11 | NA | --- | --- | --- | --- | --- | --- | 3.95E-08 | NA |
| Bis(2-ethylhexyl)phthalate | 205 | 9.46E-10 | 9.46E-06 | 1.00E-09 | 1.00E-05 | NA | 7.01E-09 | --- | --- | --- | --- | --- | --- | 1.95E-09 | 1.95E-05 |
| Cadmium | 820 | NA | 1.51E-04 | NA | 1.60E-03 | 9.54E-10 | NA | --- | --- | --- | --- | --- | --- | 9.54E-10 | 1.76E-03 |
| Carbon disulfide | 216 | NA | 1.99E-06 | NA | 2.12E-06 | NA | 2.73E-05 | --- | --- | --- | --- | --- | --- | NA | 3.14E-05 |
| Chlorobenzene | 3,391 | NA | 1.56E-04 | NA | 1.66E-04 | NA | 9.82E-04 | 1,457 | NA | 1.98E-03 | 38,880 | NA | 1.39E-01 | NA | 1.42E-01 |
| Chromium | 12,500 | NA | 7.69E-06 | NA | 8.15E-06 | NA | 2.26E-04 | --- | --- | --- | --- | --- | --- | NA | 2.42E-04 |
| Chrysene | 710 | 2.22E-09 | NA | 1.81E-09 | NA | 9.11E-12 | NA | --- | --- | --- | 3.9 | 4.26E-12 | NA | 4.04E-09 | NA |
| cis-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 191 | NA | 1.34E-03 | NA | 1.34E-03 |
| cis/trans-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 542 | NA | 3.81E-03 | NA | 3.81E-03 |
| Cobalt | 5,350 | NA | 2.47E-05 | NA | 2.62E-04 | 9.69E-09 | 4.86E-04 | --- | --- | --- | --- | --- | --- | 9.69E-09 | 7.72E-04 |
| Copper | 47,000 | NA | 1.08E-04 | NA | 1.15E-03 | NA | 8.51E-05 | --- | --- | --- | --- | --- | --- | NA | 1.34E-03 |
| Dibenzo(a,h)anthracene | 105 | 3.28E-07 | NA | 2.68E-07 | NA | 1.02E-10 | NA | --- | --- | --- | --- | --- | --- | 5.96E-07 | NA |
| Dibenzofuran | 142 | NA | 9.79E-06 | NA | 3.46E-05 | NA | 6.54E-06 | --- | --- | --- | --- | --- | --- | NA | 5.09E-05 |
| Di-n-buthylphthalate | 77 | NA | 7.06E-07 | NA | 7.49E-07 | NA | 3.96E-10 | --- | --- | --- | --- | --- | --- | NA | 1.45E-06 |
| Ethyl methacrylate | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 399 | NA | 8.98E-03 | NA | 8.98E-03 |
| Fluoranthene | 1,225 | NA | 2.83E-05 | NA | 1.50E-05 | NA | 3.21E-07 | --- | --- | --- | --- | --- | --- | NA | 4.36E-05 |
| Fluorene | 148 | NA | 1.02E-05 | NA | 3.61E-06 | NA | 2.20E-07 | --- | --- | --- | --- | --- | --- | NA | 1.40E-05 |
| Indeno-(1,2,3-cd)pyrene | 450 | 2.31E-07 | NA | 1.89E-07 | NA | 6.86E-11 | NA | --- | --- | --- | --- | --- | --- | 4.20E-07 | NA |
| Mercury | 789 | NA | NA | NA | NA | NA | 1.92E-01 | 46 | NA | 2.21E-01 | --- | --- | --- | NA | 4.13E-01 |
| Methylene chloride | 219 | 5.41E-10 | 3.36E-06 | 5.74E-10 | 3.57E-06 | 1.88E-09 | 2.80E-05 | 69 | 8.19E-09 | 1.22E-04 | --- | --- | --- | 1.12E-08 | 1.57E-04 |
| Naphthalene | 128 | NA | 1.77E-05 | NA | 6.26E-06 | NA | 8.05E-05 | --- | --- | --- | --- | --- | --- | NA | 1.04E-04 |
| Nickel | 16,500 | NA | 7.61E-05 | NA | 8.07E-04 | 2.77E-09 | 3.32E-04 | --- | --- | --- | --- | --- | --- | 2.77E-09 | 1.22E-03 |
| Phenanthrene | 815 | NA | 2.51E-05 | NA | 2.66E-05 | NA | 2.19E-06 | --- | --- | --- | --- | --- | --- | NA | 5.38E-05 |
| Pyrene | 1,745 | NA | 5.37E-05 | NA | 5.69E-05 | NA | 4.99E-07 | --- | --- | --- | 3.1 | NA | 1.47E-08 | NA | 1.11E-04 |
| Tetrachloroethene | 217 | 3.71E-09 | 2.00E-05 | 3.94E-09 | 2.12E-05 | 9.69E-09 | 1.60E-05 | --- | --- | --- | 258 | 2.00E-07 | 3.29E-04 | 2.17E-07 | 3.86E-04 |
| Toluene | 216 | NA | 2.99E-07 | NA | 1.06E-06 | NA | 1.48E-05 | --- | --- | --- | 225 | NA | 2.13E-04 | NA | 2.29E-04 |
| Trichloroethene | 216 | 9.26E-10 | 1.17E-06 | 9.82E-10 | 1.24E-06 | 5.21E-09 | 1.23E-05 | --- | --- | --- | 233 | 8.42E-08 | 1.98E-04 | 9.14E-08 | 2.13E-04 |
| Vinyl chloride | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 112 | 5.14E-07 | 1.63E-03 | 5.14E-07 | 1.63E-03 |
| Xylene | 219 | NA | 3.02E-07 | NA | 9.83E-08 | NA | 5.48E-06 | 69 | NA | 8.25E-06 | --- | --- | --- | NA | 1.41E-05 |
| CUMULATIVE RISK | | 3.52E-06 | 1.05E-03 | 5.61E-06 | 2.34E-02 | 5.28E-08 | 1.94E-01 | | 8.19E-09 | 2.23E-01 | | 1.24E-06 | 1.73E-01 | 1.04E-05 | 6.15E-01 |

Notes:
HI: Hazard index
IELCR: Individual excess lifetime cancer risk
—: Risk was not calculated as constituent was not a concern.

HQ: Hazard quotient
NA: Not available

**Table 4-7(c)(R)**
**Calculation of Risks for a Future On-site Construction Worker**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Conc. | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groudnwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| 1,1,1-Trichloroethane | 691 | NA | 1.23E-06 | NA | 8.70E-07 | NA | 7.96E-05 | --- | --- | --- | --- | --- | NA | 8.17E-05 |
| 1,2-Dichloroethane | 270 | 1.75E-10 | 4.49E-06 | 1.24E-10 | 3.18E-06 | 1.53E-08 | 8.39E-03 | 227 | 4.67E-08 | 1.20E-03 | 6.40E-12 | 3.52E-06 | 6.23E-08 | 9.60E-03 |
| 2-Butanone (MEK) | 10,067 | NA | 8.36E-06 | NA | 5.91E-06 | NA | 9.95E-05 | --- | --- | --- | --- | --- | NA | 1.14E-04 |
| 2-Chlorophenol | --- | --- | --- | --- | --- | --- | --- | 4.0 | NA | 1.06E-04 | NA | 1.30E-08 | NA | 1.06E-04 |
| 2-Methyl naphthalene | 120 | NA | 1.49E-05 | NA | 1.05E-05 | NA | 5.42E-05 | --- | --- | --- | --- | --- | NA | 7.96E-05 |
| Acenaphthene | 167 | NA | 4.15E-06 | NA | 9.78E-07 | NA | 1.89E-06 | --- | --- | --- | --- | --- | NA | 7.02E-06 |
| Acetone | 7,274 | NA | 4.03E-06 | NA | 2.85E-06 | NA | 1.33E-04 | --- | --- | --- | --- | --- | NA | 1.40E-04 |
| Alachor | 9,992 | 3.98E-09 | 4.98E-04 | 2.82E-09 | 3.52E-04 | 2.97E-09 | 2.60E-04 | 161,671 | 1.77E-05 | 2.21E+00 | 4.85E-11 | 4.24E-06 | **1.77E-05** | **2.21E+00** |
| Anthracene | 146 | NA | 7.29E-07 | NA | 1.72E-07 | NA | 3.07E-07 | --- | --- | --- | --- | --- | NA | 1.21E-06 |
| Antimony | --- | --- | --- | --- | --- | --- | --- | 8.3 | NA | 3.46E-04 | NA | NA | NA | 3.46E-04 |
| Arsenic | --- | --- | --- | --- | --- | --- | --- | 24 | NA | NA | NA | NA | NA | NA |
| Barium | --- | --- | --- | --- | --- | --- | --- | 200 | NA | NA | NA | NA | NA | NA |
| Benzene | 270 | 1.67E-10 | 1.35E-04 | 3.95E-11 | 3.18E-05 | 6.62E-09 | 9.33E-03 | 224 | 2.54E-08 | 2.05E-02 | 3.77E-12 | 5.32E-06 | 3.23E-08 | 3.00E-02 |
| Benzo(a)anthracene | 488 | 3.30E-09 | NA | 1.79E-09 | NA | 3.64E-11 | NA | 2.5 | 2.78E-07 | NA | 2.07E-14 | NA | 2.83E-07 | NA |
| Benzo(a)pyrene | 657 | 4.43E-08 | NA | 2.05E-08 | NA | 4.08E-10 | NA | 3.1 | 6.44E-06 | NA | 2.30E-13 | NA | 6.51E-06 | NA |
| Benzo(b)fluoranthene | 462 | 3.12E-09 | NA | 1.70E-09 | NA | 6.67E-11 | NA | 3.3 | 6.75E-07 | NA | 1.03E-13 | NA | 6.80E-07 | NA |
| Benzo(g,h,i)perylene | 465 | NA | 1.00E-05 | NA | 5.46E-06 | NA | 1.50E-07 | 3.1 | NA | 2.04E-03 | NA | 2.68E-10 | NA | 2.05E-03 |
| Benzo(k)fluoranthene | 525 | 3.55E-10 | NA | 1.93E-10 | NA | 1.10E-12 | NA | 3.2 | 6.55E-08 | NA | 5.91E-16 | NA | 6.60E-08 | NA |
| Beryllium | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | NA | NA |
| Bis(2-ethylhexyl)phthalate | 198 | 1.98E-11 | 4.94E-06 | 1.40E-11 | 3.49E-06 | NA | 1.32E-08 | 3.3 | 2.70E-10 | 6.75E-05 | NA | 3.21E-11 | 3.04E-10 | 7.59E-05 |
| Butylbenzylphthalate | --- | --- | --- | --- | --- | --- | --- | 3.8 | NA | 1.39E-05 | NA | 7.97E-12 | NA | 1.39E-05 |
| Cadmium | 773 | NA | 7.70E-05 | NA | 5.45E-04 | 3.55E-11 | NA | --- | --- | --- | --- | --- | 3.55E-11 | 6.22E-04 |
| Carbon disulfide | 483 | NA | 2.40E-06 | NA | 1.70E-06 | NA | 3.59E-04 | --- | --- | --- | --- | --- | NA | 3.63E-04 |
| Chlorobenzene | 22,192 | NA | 5.53E-04 | NA | 3.91E-04 | NA | 3.17E-02 | 38,880 | NA | 9.04E-01 | NA | 6.43E-05 | NA | 9.37E-01 |
| Chloroform | 688 | 1.52E-10 | 3.43E-05 | 1.07E-10 | 2.42E-05 | 4.90E-08 | 4.95E-02 | --- | --- | --- | --- | --- | 4.92E-08 | 4.96E-02 |
| Chromium | 12,000 | NA | 3.99E-06 | NA | 2.82E-06 | NA | 2.14E-04 | 8.1 | NA | NA | NA | NA | NA | 2.21E-04 |
| Chrysene | 535 | 3.61E-11 | NA | 1.97E-11 | NA | 1.31E-12 | NA | 3.9 | 4.28E-09 | NA | 1.29E-15 | NA | 4.34E-09 | NA |
| cis-1,2-Dichloroethene | 894 | NA | 4.45E-05 | NA | 3.15E-05 | NA | 5.10E-03 | 191 | NA | 2.43E-03 | NA | 6.51E-07 | NA | 7.61E-03 |
| cis/trans-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | 542 | NA | 6.90E-03 | NA | 1.85E-06 | NA | 6.90E-03 |
| Cobalt | 5,350 | NA | 1.33E-05 | NA | 9.42E-05 | 3.82E-10 | 4.79E-04 | 4.3 | --- | --- | --- | --- | 3.82E-10 | 5.87E-04 |
| Copper | 37,000 | NA | 4.61E-05 | NA | 3.26E-04 | NA | 6.61E-05 | 13 | --- | --- | --- | --- | NA | 4.38E-04 |
| Dibenzo(a,h)anthracene | 132 | 8.89E-09 | NA | 4.84E-09 | NA | 1.34E-11 | NA | 2.9 | 1.10E-05 | NA | 3.06E-14 | NA | **1.11E-05** | NA |
| Dibenzofuran | 142 | NA | 5.29E-06 | NA | 1.25E-05 | NA | 3.22E-05 | --- | --- | --- | --- | --- | NA | 4.99E-05 |
| Diethylphthalate | --- | --- | --- | --- | --- | --- | --- | 2.9 | NA | 2.34E-07 | NA | 1.42E-12 | NA | 2.34E-07 |
| Di-n-buthylphthalate | 113 | NA | 5.61E-07 | NA | 3.97E-07 | NA | 5.75E-10 | 2.9 | NA | 1.17E-05 | NA | 1.03E-11 | NA | 1.26E-05 |
| Di-n-octhylphthalate | --- | --- | --- | --- | --- | --- | --- | 2.0 | NA | 3.73E-03 | NA | 1.92E-10 | NA | 3.73E-03 |
| Ethyl methacrylate | --- | --- | --- | --- | --- | --- | --- | 399 | NA | 3.91E-05 | NA | 3.01E-06 | NA | 4.22E-05 |
| Ethylbenzene | 270 | NA | 4.03E-06 | NA | 8.74E-07 | NA | 2.65E-05 | --- | --- | --- | --- | --- | NA | 3.14E-05 |
| Fluoranthene | 878 | NA | 1.09E-05 | NA | 3.87E-06 | NA | 1.09E-06 | 2.9 | NA | 4.21E-04 | NA | 2.53E-10 | NA | 4.37E-04 |
| Fluorene | 160 | NA | 5.98E-06 | NA | 1.41E-06 | NA | 1.17E-06 | --- | --- | --- | --- | --- | NA | 8.55E-06 |
| Indeno-(1,2,3-cd)pyrene | 362 | 4.02E-09 | NA | 2.18E-09 | NA | 6.77E-12 | NA | 3.0 | 8.43E-07 | NA | 8.81E-15 | NA | 8.49E-07 | NA |
| Mercury | 732 | NA | NA | NA | NA | NA | 8.77E-01 | --- | --- | --- | --- | --- | NA | 8.77E-01 |
| Methylene chloride | 690 | 3.77E-11 | 5.87E-06 | 2.67E-11 | 4.15E-06 | 1.20E-09 | 4.46E-04 | --- | --- | --- | --- | --- | 1.26E-09 | 4.56E-04 |
| Naphthalene | 147 | NA | 1.10E-05 | NA | 2.59E-06 | NA | 4.56E-04 | --- | --- | --- | --- | --- | NA | 4.69E-04 |
| Nickel | --- | --- | --- | --- | --- | --- | --- | 15 | NA | 2.44E-06 | NA | NA | NA | 2.44E-06 |
| Phenanthrene | 605 | NA | 1.00E-05 | NA | 7.10E-06 | NA | 7.99E-06 | --- | --- | --- | --- | --- | NA | 2.51E-05 |
| Phenol | --- | --- | --- | --- | --- | --- | --- | 3.9 | NA | 9.36E-07 | NA | 4.89E-11 | NA | 9.36E-07 |

**Table 4-7(c)(R)**
**Calculation of Risks for a Future On-site Construction Worker**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Conc. | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groudnwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| Pyrene | 1,225 | NA | 2.03E-05 | NA | 1.44E-05 | NA | 1.65E-06 | 3.1 | NA | 6.07E-04 | NA | 2.73E-10 | NA | 6.44E-04 |
| Selenium | 2,213 | NA | 2.21E-04 | NA | 1.25E-04 | NA | NA | --- | --- | --- | --- | --- | NA | 3.45E-04 |
| Tetrachloroethene | 271 | 1.00E-10 | 1.35E-05 | 7.09E-11 | 9.55E-06 | 2.39E-09 | 9.85E-05 | 258 | 1.05E-07 | 1.41E-02 | 2.87E-12 | 1.18E-07 | 1.07E-07 | 1.42E-02 |
| Toluene | 270 | NA | 2.02E-07 | NA | 4.76E-07 | NA | 9.12E-05 | 225 | NA | 6.20E-04 | NA | 8.40E-08 | NA | 7.12E-04 |
| Trichloroethene | 701 | 6.48E-11 | 2.05E-06 | 4.59E-11 | 1.45E-06 | 3.33E-09 | 1.96E-04 | 233 | 8.61E-09 | 2.73E-04 | 1.28E-12 | 7.52E-08 | 1.21E-08 | 4.72E-04 |
| Vanadium | --- | --- | --- | --- | --- | --- | --- | 11 | NA | 2.59E-05 | NA | NA | NA | 2.59E-05 |
| Vinyl chloride | --- | --- | --- | --- | --- | --- | --- | 112 | 2.09E-07 | 3.49E-03 | 6.90E-12 | 5.49E-07 | 2.09E-07 | 3.49E-03 |
| Xylenes | 300 | NA | 2.24E-07 | NA | 4.86E-08 | NA | 3.71E-05 | --- | --- | --- | --- | --- | NA | 3.74E-05 |
| Zinc | --- | --- | --- | --- | --- | --- | --- | 45 | NA | 1.48E-06 | NA | NA | NA | 1.48E-06 |
| CUMULATIVE RISK | | 6.88E-08 | 1.77E-03 | 3.45E-08 | 2.02E-03 | 8.17E-08 | 9.84E-01 | | 3.74E-05 | 3.17E+00 | 7.01E-11 | 8.37E-05 | 3.76E-05 | **4.16E+00** |

Notes:
HI: Hazard index
IELCR: Individual excess lifetime cancer risk
---: Risk was not calculated as constituent was not a concern.

HQ: Hazard quotient
NA: Not available
**Values in bold** exceed target risk.

**Table 5-1(a)(R)**
**Calculated Risks and Cleanup Goals for a Current On-site Non-residential Worker (Reduction of Surficial Soil Concentration)**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| 1,1,1-Trichloroethane | | | | | | | | | | | | | | | |
| 1,2-Dichloroethane | | | | | | | | | | | | | | | |
| 2-Butanone (MEK) | | | | | | | | | | | | | | | |
| 2-Methyl naphthalene | | | | | | | | | | | | | | | |
| Acenaphthene | | | | | | | | | | | | | | | |
| Acetone | | | | | | | | | | | | | | | |
| Alachlor | | | | | | | | | | | | | | | |
| Anthracene | | | | | | | | | | | | | | | |
| Arsenic | | | | | | | | | | | | | | | |
| Benzo(a)anthracene | | | | | | | | | | | | | | | |
| Benzo(a)pyrene | | | | | | | | | | | | | | | |
| Benzo(b)fluoranthene | | | | | | | | | | | | | | | |
| Benzo(g,h,i)perylene | | | | | | | | | | | | | | | |
| Benzo(k)fluoranthene | | | | | | | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | | | | | | | | | | | | | | | |
| Cadmium | | | | | | | | | | | | | | | |
| Carbon disulfide | | | | | | | | | | | | | | | |
| Chlorobenzene | | | | | | | | | | | | | | | |
| Chromium | | | | | | | | | | | | | | | |
| Chrysene | | | | | | | | | | | | | | | |
| cis-1,2-Dichloroethene | | | | | | | | | | | | | | | |
| Cobalt | | | | | | | | | | | | | | | |
| Copper | | | | | | | | | | | | | | | |
| Dibenzo(a,h)anthracene | | | | | | | | | | | | | | | |
| Dibenzofuran | | | | | | | | | | | | | | | |
| Di-n-buthylphthalate | | | | | | | | | | | | | | | |
| Ethyl methacrylate | | | | | | | | | | | | | | | |
| Fluoranthene | | | | | | | | | | | | | | | |
| Fluorene | | | | | | | | | | | | | | | |
| Indeno-(1,2,3-cd)pyrene | | | | | | | | | | | | | | | |
| Mercury | | | | | | | | | | | | | | | |
| Methylene chloride | | | | | | | | | | | | | | | |
| Naphthalene | | | | | | | | | | | | | | | |
| Nickel | | | | | | | | | | | | | | | |
| Phenanthrene | | | | | | | | | | | | | | | |
| Pyrene | | | | | | | | | | | | | | | |
| Tetrachloroethene | | | | | | | | | | | | | | | |
| Toluene | | | | | | | | | | | | | | | |
| Trichloroethene | | | | | | | | | | | | | | | |
| Xylene | | | | | | | | | | | | | | | |
| CUMULATIVE RISK | | | | | | | | | | | | | | | |

Not Required in Updated 2005 RA

Notes:
HI: Hazard index
IELCR: Individual excess lifetime cancer risk.
—: Risk was not calculated as constituent was not a concern.
HQ: Hazard quotient
NA: Not available

Table 5-1(b)(R)
**Calculated Risks and Cleanup Goals for a Future On-site Non-residential Worker (Reduction of Surficial Soil Concentration)**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Surficial Soil Conc. | Dermal Contact with Surficial Soil | | Ingestion of Surficial Soil | | Outdoor Inhalation of Vapors and Particulates from Surficial Soil | | Subsurface Soil Conc. | Indoor Inhalation of Vapors from Subsurface Soil | | Groundwater Conc. | Indoor Inhalation of Vapors from Groundwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/kg) | IELCR | HQ | (ug/L) | IELCR | HQ | | |
| 1,1,1-Trichloroethane | | | | | | | | | | | | | | | |
| 1,2-Dichloroethane | | | | | | | | | | | | | | | |
| 2-Butanone (MEK) | | | | | | | | | | | | | | | |
| 2-Chlorophenol | | | | | | | | | | | | | | | |
| 2-Methyl naphthalene | | | | | | | | | | | | | | | |
| Acenaphthene | | | | | | | | | | | | | | | |
| Acetone | | | | | | | | | | | | | | | |
| Alachlor | | | | | | | | | | | | | | | |
| Anthracene | | | | | | | | | | | | | | | |
| Arsenic | | | | | | | | | | | | | | | |
| Benzene | | | | | | | | | | | | | | | |
| Benzo(a)anthracene | | | | | | | | | | | | | | | |
| Benzo(a)pyrene | | | | | | | | | | | | | | | |
| Benzo(b)fluoranthene | | | | | | | | | | | | | | | |
| Benzo(g,h,i)perylene | | | | | | | | | | | | | | | |
| Benzo(k)fluoranthene | | | | | | | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | | | | | | | | | | | | | | | |
| Cadmium | | | | | | | | | | | | | | | |
| Carbon disulfide | | | | | | | | | | | | | | | |
| Chlorobenzene | | | | | | | | | | | | | | | |
| Chromium | | | | | | | | | | | | | | | |
| Chrysene | | | | | | | | | | | | | | | |
| cis-1,2-Dichloroethene | | | | | | | | | | | | | | | |
| cis/trans-1,2-Dichloroethene | | | | | | | | | | | | | | | |
| Cobalt | | | | | | | | | | | | | | | |
| Copper | | | | | | | | | | | | | | | |
| Dibenzo(a,h)anthracene | | | | | | | | | | | | | | | |
| Dibenzofuran | | | | | | | | | | | | | | | |
| Di-n-buthylphthalate | | | | | | | | | | | | | | | |
| Ethyl methacrylate | | | | | | | | | | | | | | | |
| Fluoranthene | | | | | | | | | | | | | | | |
| Fluorene | | | | | | | | | | | | | | | |
| Indeno-(1,2,3-cd)pyrene | | | | | | | | | | | | | | | |
| Mercury | | | | | | | | | | | | | | | |
| Methylene chloride | | | | | | | | | | | | | | | |
| Naphthalene | | | | | | | | | | | | | | | |
| Nickel | | | | | | | | | | | | | | | |
| Phenanthrene | | | | | | | | | | | | | | | |
| Pyrene | | | | | | | | | | | | | | | |
| Tetrachloroethene | | | | | | | | | | | | | | | |
| Toluene | | | | | | | | | | | | | | | |
| Trichloroethene | | | | | | | | | | | | | | | |
| Vinyl chloride | | | | | | | | | | | | | | | |
| Xylene | | | | | | | | | | | | | | | |
| CUMULATIVE RISK | | | | | | | | | | | | | | | |

Not Required in Updated 2005 RA

Notes:
HI: Hazard index
IELCR: Individual excess lifetime cancer risk.
---: Risk was not calculated as constituent was not a concern.
HQ: Hazard quotient
NA: Not available

**Table 5-1(c)(R)**
**Calculated Risks and Cleanup Goals for a Future On-site Construction Worker (Reduction of Soil and Groundwater Concentrations)**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Conc. | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groudnwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| 1,1,1-Trichloroethane | 691 | NA | 1.23E-06 | NA | 8.70E-07 | NA | 7.96E-05 | --- | --- | --- | --- | --- | NA | 8.17E-05 |
| 1,2-Dichloroethane | 270 | 1.75E-10 | 4.49E-06 | 1.24E-10 | 3.18E-06 | 1.53E-08 | 8.39E-03 | 227 | 4.67E-08 | 1.20E-03 | 6.40E-12 | 3.52E-06 | 6.23E-08 | 9.60E-03 |
| 2-Butanone (MEK) | 10,067 | NA | 8.36E-06 | NA | 5.91E-06 | NA | 9.95E-05 | --- | --- | --- | --- | --- | NA | 1.14E-04 |
| 2-Chlorophenol | --- | --- | --- | --- | --- | --- | --- | 4.0 | NA | 1.06E-04 | NA | 1.30E-08 | NA | 1.06E-04 |
| 2-Methyl naphthalene | 120 | NA | 1.49E-05 | NA | 1.05E-05 | NA | 5.42E-05 | --- | --- | --- | --- | --- | NA | 7.96E-05 |
| Acenaphthene | 167 | NA | 4.15E-06 | NA | 9.78E-07 | NA | 1.89E-06 | --- | --- | --- | --- | --- | NA | 7.02E-06 |
| Acetone | 7,274 | NA | 4.03E-06 | NA | 2.85E-06 | NA | 1.33E-04 | --- | --- | --- | --- | --- | NA | 1.40E-04 |
| Alachor | 9,992 | 3.98E-09 | 4.98E-04 | 2.82E-09 | 3.52E-04 | 2.97E-09 | 2.60E-04 | 20,209 | 2.21E-06 | 2.76E-01 | 6.06E-12 | 5.30E-07 | 2.22E-06 | 2.77E-01 |
| Anthracene | 146 | NA | 7.29E-07 | NA | 1.72E-07 | NA | 3.07E-07 | --- | --- | --- | --- | --- | NA | 1.21E-06 |
| Antimony | --- | --- | --- | --- | --- | --- | --- | 8.3 | NA | 3.46E-04 | NA | NA | NA | 3.46E-04 |
| Arsenic | --- | --- | --- | --- | --- | --- | --- | 24 | NA | NA | NA | NA | NA | NA |
| Barium | --- | --- | --- | --- | --- | --- | --- | 200 | NA | NA | NA | NA | NA | NA |
| Benzene | 270 | 1.67E-10 | 1.35E-04 | 3.95E-11 | 3.18E-05 | 6.62E-09 | 9.33E-03 | 224 | 2.54E-08 | 2.05E-02 | 3.77E-12 | 5.32E-06 | 3.23E-08 | 3.00E-02 |
| Benzo(a)anthracene | 488 | 3.30E-09 | NA | 1.79E-09 | NA | 3.64E-11 | NA | 2.5 | 2.78E-07 | NA | 2.07E-14 | NA | 2.83E-07 | NA |
| Benzo(a)pyrene | 657 | 4.43E-08 | NA | 2.05E-08 | NA | 4.08E-10 | NA | 3.1 | 6.44E-06 | NA | 2.30E-13 | NA | 6.51E-06 | NA |
| Benzo(b)fluoranthene | 462 | 3.12E-09 | NA | 1.70E-09 | NA | 6.67E-11 | NA | 3.3 | 6.75E-07 | NA | 1.03E-13 | NA | 6.80E-07 | NA |
| Benzo(g,h,i)perylene | 465 | NA | 1.00E-05 | NA | 5.46E-06 | NA | 1.50E-07 | 3.1 | NA | 2.04E-03 | NA | 2.68E-10 | NA | 2.05E-03 |
| Benzo(k)fluoranthene | 525 | 3.55E-10 | NA | 1.93E-10 | NA | 1.10E-12 | NA | 3.2 | 6.55E-08 | NA | 5.91E-16 | NA | 6.60E-08 | NA |
| Beryllium | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | NA | NA |
| Bis(2-ethylhexyl)phthalate | 198 | 1.98E-11 | 4.94E-06 | 1.40E-11 | 3.49E-06 | NA | 1.32E-08 | 3.3 | 2.70E-10 | 6.75E-05 | NA | 3.21E-11 | 3.04E-10 | 7.59E-05 |
| Butylbenzylphthalate | --- | --- | --- | --- | --- | --- | --- | 3.8 | NA | 1.39E-05 | NA | 7.97E-12 | NA | 1.39E-05 |
| Cadmium | 773 | NA | 7.70E-05 | NA | 5.45E-04 | 3.55E-11 | NA | --- | --- | --- | --- | --- | 3.55E-11 | 6.22E-04 |
| Carbon disulfide | 483 | NA | 2.40E-06 | NA | 1.70E-06 | NA | 3.59E-04 | --- | --- | --- | --- | --- | NA | 3.63E-04 |
| Chlorobenzene | 22,192 | NA | 5.53E-04 | NA | 3.91E-04 | NA | 3.17E-02 | 4,860 | NA | 1.13E-01 | NA | 8.04E-06 | NA | 1.46E-01 |
| Chloroform | 688 | 1.52E-10 | 3.43E-05 | 1.07E-10 | 2.42E-05 | 4.90E-08 | 4.95E-02 | --- | --- | --- | --- | --- | 4.92E-08 | 4.96E-02 |
| Chromium | 12,000 | NA | 3.99E-06 | NA | 2.82E-06 | NA | 2.14E-04 | 8.1 | NA | NA | NA | NA | NA | 2.21E-04 |
| Chrysene | 535 | 3.61E-11 | NA | 1.97E-11 | NA | 1.31E-12 | NA | 3.9 | 4.28E-09 | NA | 1.29E-15 | NA | 4.34E-09 | NA |
| cis-1,2-Dichloroethene | 894 | NA | 4.45E-05 | NA | 3.15E-05 | NA | 5.10E-03 | 191 | NA | 2.43E-03 | NA | 6.51E-07 | NA | 7.61E-03 |
| cis/trans-1,2-Dichloroethene | --- | --- | --- | --- | --- | --- | --- | 542 | NA | 6.90E-03 | NA | 1.85E-06 | NA | 6.90E-03 |
| Cobalt | 5,350 | NA | 1.33E-05 | NA | 9.42E-05 | 3.82E-10 | 4.79E-04 | 4.3 | --- | --- | --- | --- | 3.82E-10 | 5.87E-04 |
| Copper | 37,000 | NA | 4.61E-05 | NA | 3.26E-04 | NA | 6.61E-05 | 13 | --- | --- | --- | --- | NA | 4.38E-04 |
| Dibenzo(a,h)anthracene | 132 | 8.89E-09 | NA | 4.84E-09 | NA | 1.34E-11 | NA | 2.6 | 9.95E-06 | NA | 2.75E-14 | NA | 9.97E-06 | NA |
| Dibenzofuran | 142 | NA | 5.29E-06 | NA | 1.25E-05 | NA | 3.22E-05 | --- | --- | --- | --- | --- | NA | 4.99E-05 |
| Diethylphthalate | --- | --- | --- | --- | --- | --- | --- | 2.9 | NA | 2.34E-07 | NA | 1.42E-12 | NA | 2.34E-07 |
| Di-n-buthylphthalate | 113 | NA | 5.61E-07 | NA | 3.97E-07 | NA | 5.75E-10 | 2.9 | NA | 1.17E-05 | NA | 1.03E-11 | NA | 1.26E-05 |
| Di-n-octhylphthalate | --- | --- | --- | --- | --- | --- | --- | 2.0 | NA | 3.73E-03 | NA | 1.92E-10 | NA | 3.73E-03 |
| Ethyl methacrylate | --- | --- | --- | --- | --- | --- | --- | 399 | NA | 3.91E-05 | NA | 3.01E-06 | NA | 4.22E-05 |
| Ethylbenzene | 270 | NA | 4.03E-06 | NA | 8.74E-07 | NA | 2.65E-05 | --- | --- | --- | --- | --- | NA | 3.14E-05 |
| Fluoranthene | 878 | NA | 1.09E-05 | NA | 3.87E-06 | NA | 1.09E-06 | 2.9 | NA | 4.21E-04 | NA | 2.53E-10 | NA | 4.37E-04 |
| Fluorene | 160 | NA | 5.98E-06 | NA | 1.41E-06 | NA | 1.17E-06 | --- | --- | --- | --- | --- | NA | 8.55E-06 |
| Indeno-(1,2,3-cd)pyrene | 362 | 4.02E-09 | NA | 2.18E-09 | NA | 6.77E-12 | NA | 3.0 | 8.43E-07 | NA | 8.81E-15 | NA | 8.49E-07 | NA |
| Mercury | 366 | NA | NA | NA | NA | NA | 4.38E-01 | --- | --- | --- | --- | --- | NA | 4.38E-01 |
| Methylene chloride | 707 | 3.77E-11 | 5.87E-06 | 2.67E-11 | 4.15E-06 | 1.20E-09 | 4.46E-04 | --- | --- | --- | --- | --- | 1.26E-09 | 4.56E-04 |
| Naphthalene | 147 | NA | 1.10E-05 | NA | 2.59E-06 | NA | 4.56E-04 | --- | --- | --- | --- | --- | NA | 4.69E-04 |
| Nickel | --- | --- | --- | --- | --- | --- | --- | 15 | NA | 2.44E-06 | NA | NA | NA | 2.44E-06 |
| Phenanthrene | 605 | NA | 1.00E-05 | NA | 7.10E-06 | NA | 7.99E-06 | --- | --- | --- | --- | --- | NA | 2.51E-05 |
| Phenol | --- | --- | --- | --- | --- | --- | --- | 3.9 | NA | 9.36E-07 | NA | 4.89E-11 | NA | 9.36E-07 |

**Table 5-1(c)(R)**
**Calculated Risks and Cleanup Goals for a Future On-site Construction Worker (Reduction of Soil and Groundwater Concentrations)**
**Former Acetanilides Production Area, Solutia - J.F. Queeny Plant, St. Louis, Missouri**

| COCs | Soil Conc. | Dermal Contact with Soil | | Ingestion of Soil | | Outdoor Inhalation of Vapors from Soil | | Groundwater Conc. | Dermal Contact with Groundwater | | Outdoor Inhalation of Vapors from Groudnwater | | Sum of IELCR | Sum of HQ (HI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ug/kg) | IELCR | HQ | IELCR | HQ | IELCR | HQ | (ug/L) | IELCR | HQ | IELCR | HQ | | |
| Pyrene | 1,225 | NA | 2.03E-05 | NA | 1.44E-05 | NA | 1.65E-06 | 3.1 | NA | 6.07E-04 | NA | 2.73E-10 | NA | 6.44E-04 |
| Selenium | 2,213 | NA | 2.21E-04 | NA | 1.25E-04 | NA | NA | --- | --- | --- | --- | --- | NA | 3.45E-04 |
| Tetrachloroethene | 271 | 1.00E-10 | 1.35E-05 | 7.09E-11 | 9.55E-06 | 2.39E-09 | 9.85E-05 | 258 | 1.05E-07 | 1.41E-02 | 2.87E-12 | 1.18E-07 | 1.07E-07 | 1.42E-02 |
| Toluene | 270 | NA | 2.02E-07 | NA | 4.76E-07 | NA | 9.12E-05 | 225 | NA | 6.20E-04 | NA | 8.40E-08 | NA | 7.12E-04 |
| Trichloroethene | 701 | 6.48E-11 | 2.05E-06 | 4.59E-11 | 1.45E-06 | 3.33E-09 | 1.96E-04 | 233 | 8.61E-09 | 2.73E-04 | 1.28E-12 | 7.52E-08 | 1.21E-08 | 4.72E-04 |
| Vanadium | --- | --- | --- | --- | --- | --- | --- | 11 | NA | 2.59E-05 | NA | NA | NA | 2.59E-05 |
| Vinyl chloride | --- | --- | --- | --- | --- | --- | --- | 112 | 2.09E-07 | 3.49E-03 | 6.90E-12 | 5.49E-07 | 2.09E-07 | 3.49E-03 |
| Xylenes | 300 | NA | 2.24E-07 | NA | 4.86E-08 | NA | 3.71E-05 | --- | --- | --- | --- | --- | NA | 3.74E-05 |
| Zinc | --- | --- | --- | --- | --- | --- | --- | 45 | NA | 1.48E-06 | NA | NA | NA | 1.48E-06 |
| CUMULATIVE RISK | | 6.88E-08 | 1.77E-03 | 3.45E-08 | 2.02E-03 | 8.17E-08 | 5.46E-01 | | 2.09E-05 | 4.46E-01 | 2.77E-11 | 2.38E-05 | 2.10E-05 | 9.95E-01 |

Notes:
HI: Hazard index
IELCR: Individual excess lifetime cancer risk
---: Risk was not calculated as constituent was not a concern.
HQ: Hazard quotient
NA: Not available

Note this appendix is blank because the risk and conceptual risk management plan for the VV Building Area have not been updated from the 2005 risk assessment.

Refer to *Updated Risk Assessment and Development of Site-Specific Media Cleanup Goals for Selected Areas in Solutia – J.F. Queeny Plant* (RAM Group, Inc. and URS, February 2005)