

**RECORD OF DECISION
FORMER CAPITOL CASTINGS FACILITY
VOLUNTARY REMEDIATION PROGRAM SITE
TEMPE, ARIZONA**

**Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007**



October 2016

**FORMER CAPITOL CASTING FACILITY VRP SITE
RECORD OF DECISION**

APPROVAL PAGE

Prepared By: _____



Joey Pace, Project Manager
Voluntary Remediation Program
Arizona Department of Environmental Quality

10/04/2016
Date

Approved By: _____



Tina LePage, Manager
Remedial Projects Section
Arizona Department of Environmental Quality

10/11/16
Date

Approved By: _____



Laura L. Malone, Division Director
Waste Programs Division
Arizona Department of Environmental Quality

10/19/16
Date

TABLE OF CONTENTS

| | |
|--|-----|
| Approval Page..... | i |
| Table of Contents..... | ii |
| List of Tables | iii |
| List of Figures | iii |
| List of Attachments..... | iii |
| 1.0 Declaration..... | 1 |
| 1.1 Site Name and Location | 1 |
| 1.2 Volunteer of Record..... | 1 |
| 1.3 Regulatory Scope and Purpose..... | 1 |
| 1.4 Overall Assessment of Site | 2 |
| 1.5 Contaminants of Concern..... | 2 |
| 1.6 Description of the Selected Remedy | 2 |
| 1.7 Statutory Determinations..... | 3 |
| 2.0 Decision Summary..... | 3 |
| 2.1 Chronology of Events..... | 3 |
| 2.2 Soil, Soil Vapor, and Groundwater Conditions..... | 4 |
| 3.0 Selected Remedy..... | 6 |
| 3.1 Remedy Determination | 6 |
| 3.2 Remedy Description and Implementation..... | 7 |
| 3.3 Demonstration of Compliance with A.R.S. §49-282.06 | 8 |
| 3.4 Consistency with General Land Use Plans | 8 |
| 3.5 Consistency with Water Use Plans..... | 8 |
| 3.6 Remedy Commencement and Duration | 9 |
| 3.7 Performance Standards..... | 9 |
| 3.8 Community Involvement..... | 9 |
| 3.9 Remedy Review | 10 |
| 4.0 Responsiveness Summary..... | 10 |
| 5.0 Cost Estimate For Selected Remedy..... | 10 |
| 5.1 Historical Costs | 11 |
| 5.2 Future Costs..... | 11 |
| 6.0 References..... | 13 |

LIST OF TABLES

Table 1. Chronology of Major Events

Table 2. Community Involvement Activities

LIST OF FIGURES

Figure 1. Facility Location

Figure 2. Monitoring Well Locations

LIST OF ATTACHMENTS

Attachment A. Monitoring Schedules

1.0 DECLARATION

1.1 Site Name and Location

This Record of Decision (ROD) is for the Former Capitol Castings Facility Voluntary Remediation Program (VRP) Site (the Site), located at 5857 South Kyrene Road in Tempe, Maricopa County, Arizona (**Figure 1**). The Site is generally bounded by the Western Canal and Kiwanis Park to the north and east, Kyrene Road to the west, and Guadalupe Road to the south (**Figure 2**).

1.2 Volunteer of Record

The Volunteer of Record is David J. Cline, President, Victoria Technology, Inc. (VTI).

Operation of the facility began in 1953 as a secondary steel foundry that produced various steel castings used primarily by the mining industry for wear-resistant and structural applications. Capitol Castings, Inc., predecessor in interest to VTI, owned and operated the facility from 1988 until 1994, when the facility was purchased by ME International. ME International's successor in interest, ME Elecmetal (ME Global), currently owns and operates the facility as a metals casting facility.

1.3 Regulatory Scope and Purpose

The Site is under the regulatory oversight of the Arizona Department of Environmental Quality (ADEQ) VRP. Pursuant to Arizona Revised Statutes (A.R.S.) § 49-175(B)(4), a site with a source that causes or contributes to an exceedance of the Aquifer Water Quality Standards (AWQS) beyond the boundary of the facility where the source is located, must remediate using levels and/or controls pursuant to the remedial action criteria adopted in A.R.S. § 49-282.06, and the rules adopted specific to this section, including Arizona Administrative Code (A.A.C.) Title 18, Chapter 16. Specific to the remedial actions required for a VRP site, the referenced Rules are as follows:

- A.A.C. R18-16-406 et seq. Remedial Investigations
- A.A.C. R18-16-407 et seq. Feasibility Study
- A.A.C. R18-16-408 et seq. Proposed Remedial Action Plan (PRAP), and
- A.A.C. R18-16-410 et seq. Record of Decision (ROD)

In addition, the VRP follows the community involvement requirements for the specific remedial actions referenced above, and further defined in A.A.C. R18-16-404.

Pursuant to A.A.C. R18-16-410(A), ADEQ has prepared this ROD to document the selected remedial action identified in the PRAP. This ROD presents the selected remedy for chlorinated volatile organic compounds (CVOCs) in groundwater at the Site. The decision in this ROD is based upon previous activities and investigations completed for this Site and documented in the ADEQ Administrative Record. The State of Arizona, acting by and through ADEQ, has selected the remedy detailed in this document.

1.4 Overall Assessment of Site

Investigation activities have been conducted since 1989, initially related to a fuel release from a Leaking Underground Storage Tank (LUST) located near the entrance to the facility. The LUST case is being managed separately under the VRP and has associated LUST file number 4715-0726.

The investigation of the LUST led to the discovery of CVOCs in groundwater downgradient of the LUST. Subsequent investigations determined the CVOCs originated from a vehicle maintenance area (near monitoring well MW-22; **Figure 2**) of the facility where 1,1,1-trichloroethane (TCA) was used to degrease equipment in the 1950s. The spent degreasing liquids were reportedly washed with water into an unlined pond and began to degrade to 1,1-dichloroethene (1,1-DCE) via hydrolysis in the warmer pond water. TCA and/or 1,1-DCE affected pond water subsequently infiltrated to and mixed with the groundwater in the underlying perched aquifer, referred to in remedial investigations as the “S-Zone”. Based on historical groundwater monitoring data, TCA degradation to 1,1-DCE was essentially complete by the early 1990s (Geraghty & Miller 1991). The discharged pond water mounded and spread laterally along the lower hydraulic conductivity S-Zone. The 1,1-DCE dispersed into the groundwater and began to migrate south, as well as vertically downward to the underlying aquifer units (D-Zone, D2-Zone, and D3-Zone). The migration of the 1,1-DCE downward was mainly caused by pumping from nearby water supply wells, chiefly Salt River Project (SRP) wells (ARCADIS 2005).

1.5 Contaminants of Concern

Since 2010, only one CVOC (1,1-DCE) has been detected above its AWQS beyond the facility boundary (ARCADIS 2014a). The AWQS for 1,1-DCE is 7 micrograms per liter ($\mu\text{g/L}$).

1.6 Description of the Selected Remedy

The selected remedy is continued groundwater monitoring, with a contingency remedy of controlled migration consisting of groundwater extraction and granular activated carbon (GAC) treatment coupled with continued groundwater monitoring. The remedy and contingency remedy are described further in **Section 3**.

1.7 Statutory Determinations

Pursuant to A.A.C. R18-16-406 and R18-16-407, VTI completed the Final Remedial Investigation (RI) Report in 2010 (ARCADIS 2010) and VTI completed the Final Feasibility Study (FS) Report in 2014 (ARCADIS 2014b). The Final RI Report:

- Established the nature and extent of the contamination and the determinable sources thereof;
- Identified current and potential impacts to public health, welfare and the environment;
- Identified current and reasonable foreseeable uses of land and waters of the state; and
- Obtained and evaluated information necessary for identification and comparison of alternative remedial actions.

Pursuant to A.A.C. R18-16-410, this ROD is the final administrative decision as defined under A.R.S. §41-1092(5). The remedy of continued groundwater monitoring and the contingency remedy of controlled migration consisting of groundwater extraction and GAC treatment coupled with continued groundwater monitoring were selected because they meet the following criteria pursuant to A.R.S. § 49-282.06(A):

- Assure the protection of public health and welfare and the environment;
- To the extent practicable, provide for the control, management and cleanup of the 1,1-DCE in order to allow the maximum beneficial use of the groundwater; and
- Are reasonable, necessary, cost-effective, and technically feasible.

2.0 DECISION SUMMARY

This Decision Summary summarizes the information and approaches used to arrive at ADEQ's decision under A.A.C. R18-16-410 to select the remedy of continued groundwater monitoring and contingency remedy of controlled migration consisting of groundwater extraction and GAC treatment coupled with continued groundwater monitoring for the dissolved 1,1-DCE in groundwater at the Site.

2.1 Chronology of Events

A detailed history of Site investigations completed is provided in the Final RI Report (ARCADIS 2010) and the Final FS Report (ARCADIS 2014b). **Table 1**, below, provides a brief summary of the main events and investigative milestones for the Site:

Table 1.
Chronology of Major Events
Former Capitol Castings Facility

| Date | Event |
|---------------------|---|
| 1993 | 1,1-DCE detected in groundwater |
| 1993 to 1999 | Soil, soil vapor, and groundwater investigations conducted to investigate source area |
| 1991 to 2000 | Groundwater remediation conducted in source area shallow aquifer (S-Zone) using two extraction wells and <i>ex-situ</i> treatment |
| 1999 to 2006 | On facility and off-facility groundwater investigations conducted, including groundwater monitoring and monitoring well installations |
| 2002 | The Site entered into VRP |
| 2002 to 2006 | An early response action consisting of <i>in situ</i> enhanced reductive dechlorination in the D-Zone “hot spot” pilot-tested and implemented |
| 2006 to present day | Off-facility groundwater investigations conducted, including groundwater monitoring and monitoring well installations |
| 2006 | The Land and Water Use Study was approved by ADEQ |
| 2010 | The Remedial Objectives Report was approved by ADEQ |
| 2011 | The Final Remedial Investigation Report was approved by ADEQ |
| 2014 | The Final Feasibility Study Report was approved by ADEQ |
| 2016 | The Proposed Remedial Action Plan was approved by ADEQ |

2.2 Soil, Soil Vapor, and Groundwater Conditions

Soils and soil vapor were evaluated during the 1,1-DCE source area investigations between 1993 and 1999. The investigations indicated the primary source area was in the vicinity of the vehicle maintenance area (near monitoring well MW-22; **Figure 2**). Soil analytical results in this area indicated all volatile organic compound (VOC) concentrations, including 1,1-DCE, were below the predetermined residential and non-residential soil remediation levels (SRLs).

There are no regulatory limits for 1,1-DCE in soil vapor. However, subsequent assessments in the Final FS indicated the 1,1-DCE concentrations observed in groundwater at the Site did not pose an unacceptable risk to human health via a vapor migration pathway.

Groundwater monitoring of the 1,1-DCE affected groundwater has been ongoing since 1993. The monitoring well network has been expanded over the years and currently covers five groundwater aquifers (S-, D-, D2-, D3-, and D4-Zones) and extends approximately 2,400 feet beyond the facility boundary (**Figure 2**). Concentrations of 1,1-DCE in groundwater greater than the AWQS of 7 µg/L extend from approximately 65 feet below the ground surface (perched S-Zone aquifer) to a maximum depth of approximately 285 feet below the ground surface (upper D3-Zone). Concentrations of 1,1-DCE have not been detected above the laboratory reporting limits in the deeper D3b-Zone (lower D3-Zone) or D4-Zone.

Concentrations of 1,1-DCE in groundwater greater than 7 µg/L currently extend approximately 2,200 feet hydraulically downgradient from the facility and has a maximum width of approximately 2,000 feet near Orion Street (**Figure 1**). The concentrations of 1,1-DCE are highest in the D-Zone, at approximately 590 µg/L in October 2015, and generally decrease with depth in the underlying aquifers (ARCADIS 2014a). The D2-Zone and the D3-Zone are significantly influenced by nearby groundwater pumping (most notably SRP wells) and are considered the primary groundwater migration pathways.

Upon evaluation of the wells identified in the Land and Water Use Study (ARCADIS 2009), six active water supply wells were identified within one half mile of the Site boundary, including four SRP wells and two ME Global wells. Of these six wells, one ME Global well (WS-2) was abandoned in 2013, and two of the SRP wells (21.1E-0.0S and 21.5E-1.5S; **Figure 1**) were determined not to have had appreciable influences on the 1,1-DCE plume, nor appear to have the potential to do so (ARCADIS 2014b). The remaining three wells (one owned by ME Global and two owned by SRP) may be threatened to be impaired as a result of concentrations of 1,1-DCE in groundwater. The two wells owned and operated by SRP are well 20.6E-1.1S, and well 21.5E-1.0S (**Figure 1**) which supply irrigation water to the Highline Canal and the Western Canal, respectively. The final well, located on the Site (WS-1; **Figure 1**), is owned and operated by ME Global and is used for industrial (non-potable) purposes, primarily as a fire suppression backup water supply.

In addition to the six wells described above, the Land and Water Use Study also identified one monitoring well and one water supply well owned by the City of Tempe. However, upon further inspection, it was determined that neither well was located within one half mile of the Site boundary.

Based upon VTI's groundwater flow and solute transport modeling (Phase III Model; ARCADIS 2014b), ME Global's industrial use of the groundwater is not threatened, and VTI's Phase III Model indicates the discharge of WS-1 would never exceed 0.5 µg/L to 1.0 µg/L. As such, SRP well 20.6E-1.1S and SRP well 21.5E-1.0S are the only wells identified to have the potential to be affected by the 1,1-DCE plume. VTI's Phase III Model indicates that concentrations of 1,1-DCE in the discharge from SRP well 21.5E-1.0S into the Western Canal would not exceed 4 µg/L, and the highest concentration would occur around year 2080. VTI's Phase III Model indicates that concentrations of 1,1-DCE in the discharge from SRP well 20.6E-1.1S into the Highline Canal would never exceed 0.5 µg/L to 1.0 µg/L.

Current and foreseeable agricultural, industrial, and recreational uses of groundwater pumped from SRP wells 20.6E-1.1S and 21.5E-1.0S are not potentially threatened to be lost or impaired as a result of the 1,1-DCE. There are no current municipal uses of groundwater pumped from SRP wells 20.6E-1.1S or 21.5E-1.0S; however, municipal uses of the Western Canal and Highline Canal water are considered foreseeable as identified in the Land and Water Use Study. Based on the foregoing, the Final RI Report, Final FS Report, and the PRAP, the foreseeable municipal use of groundwater pumped from SRP water supply wells 21.5E-1.0S and 20.6E-1.1S (**Figure 1**) is considered potentially threatened to be impaired as a result of concentrations of 1,1-DCE in groundwater.

Current and foreseeable industrial uses of groundwater pumped from the ME Global well (**Figure 1** and **Figure 2**) are not threatened to be lost or impaired as a result of the 1,1-DCE. There are no current or foreseeable municipal, agricultural, or recreational uses of groundwater pumped from ME Global wells (ARCADIS 2016).

3.0 SELECTED REMEDY

3.1 Remedy Determination

The Final FS was prepared in 2014 to evaluate remedial alternatives for the 1,1-DCE affected groundwater. The Final FS was prepared in accordance with A.A.C. R18-16-407 and relied upon the data contained in the Final RI Report (ARCADIS 2014b). The remedial alternatives in the Final FS were developed to meet the ROs documented in the Final RI Report (ARCADIS 2010).

The remedy for the 1,1-DCE affected groundwater, selected in the Final FS and developed in the PRAP, consists of groundwater monitoring with a contingency remedy of controlled migration consisting of groundwater extraction and GAC treatment coupled with continued groundwater monitoring. Groundwater monitoring data will be used to determine whether there develops a threat of loss or impairment of any municipal, agricultural, industrial or other beneficial use of groundwater

pumped from SRP well 21.5E-1.0S or SRP well 20.6E-1.1S as a result of the 1,1-DCE, which would be a trigger for the implementation of the contingency remedy. If met, the contingency remedy would trigger the requirement to complete the design and construction of, as well as operate, a groundwater treatment system while continuing groundwater monitoring. The goal of controlled migration and treatment will be to ensure the concentration of any 1,1-DCE in the discharge from SRP well 21.5E-1.0S or SRP well 20.6E-1.1S is no greater than 90 percent of the most stringent 1,1-DCE numeric water quality standard for the currently applicable designated use or future designated use of the canal water into which the SRP wells discharge.

Groundwater monitoring data will also be used to determine whether there is a threat of loss or impairment of industrial use of groundwater pumped from ME Global well WS-1 as a result of the 1,1-DCE. Since ME Global's industrial use of the groundwater is not threatened (i.e., the maximum groundwater concentration is less than the most conservative, applicable numeric water quality standard), no contingency actions have been established for this well. If ME Global's use of the groundwater changes, VTI will evaluate and employ additional remedial strategies to safeguard ME Global's use of this well.

3.2 Remedy Description and Implementation

The reference remedy as identified by the Final FS and described in the PRAP has been selected as the remedy for the Site. The groundwater monitoring data will be used to determine if the implementation of the contingency remedy of controlled migration coupled with continued groundwater monitoring is triggered. The approach to such a determination would involve an escalation of remedial activities in a phased manner, depending on the groundwater monitoring data, and include elements such as increased groundwater monitoring, sampling and analysis; increased reporting; installation of additional monitoring wells; updates of the groundwater flow and solute transport model; and, if necessary, installation of contingency groundwater extraction wells and implementation of the contingency remedy. The approach provides sufficient time to determine whether there develops a threat of loss or impairment of any municipal, agricultural, industrial or other beneficial use of groundwater pumped from SRP well 21.5E-1.0S or SRP well 20.6E-1.1S as a result of the 1,1-DCE.

The remedy requires monitoring of specific groundwater monitoring wells, as well as SRP wells 20.6E-1.1S and 21.5E-1.0S. Groundwater monitoring data will be collected on an established frequency (**Attachment A**) and will enable a determination over the long term of whether:

- There develops a threat of loss or impairment of any municipal, agricultural, industrial or other beneficial use of groundwater pumped from SRP well 21.5E-1.0S or SRP well 20.6E-1.1S as a result of the 1,1-DCE, which would be a trigger for the implementation of the

contingency remedy of controlled migration coupled with continued groundwater monitoring; or

- There develops a threat of loss or impairment of any industrial use of groundwater pumped from ME Global well WS-1 as a result of the 1,1-DCE.

The contingency remedy includes controlled migration coupled with continued groundwater monitoring with an escalation or de-escalation of remedial activities in a phased manner. The escalation of remedial activities in a phased manner would be based on specific analytical data and would include elements such as increased groundwater monitoring, sampling and analysis; increased reporting; installation of additional monitoring wells; updates of the groundwater flow and solute transport model; and, if necessary, installation of contingency groundwater extraction wells and implementation of the contingency remedy.

3.3 Demonstration of Compliance with A.R.S. §49-282.06

The remedy of continued groundwater monitoring, and the contingency remedy of controlled migration coupled with continued groundwater monitoring, have been developed to:

1. Adequately assure the protection of public health and welfare and the environment;
2. Provide for the control, management, and cleanup of 1,1-DCE, to the extent practicable, to allow the maximum beneficial use of the groundwater; and
3. Be reasonable, necessary, cost-effective, and technically feasible.

Pursuant to the PRAP, the remedy and, if necessary, the contingency remedy, will remain in place as long as necessary to achieve the ROs documented in the Final RI Report.

3.4 Consistency with General Land Use Plans

The remedy of continued groundwater monitoring, as well as the contingency remedy, are consistent with the general land use plans of local governments with land use jurisdiction over the Site, as documented in detail in the Final FS Report.

3.5 Consistency with Water Use Plans

The remedy of continued groundwater monitoring, as well as the contingency remedy are consistent with the general water use plans of local governments with water use jurisdiction over the Site, as documented in detail in the Final FS Report, which indicates there is no potential for risk to human health associated with concentrations of 1,1-DCE in the groundwater other than perhaps the use of the groundwater as a water supply (ARCADIS 2014b).

3.6 Remedy Commencement and Duration

The remedy will formally begin once this ROD is fully executed and entered into ADEQ's administrative record. The remedy will remain in place until monitored concentrations of 1,1-DCE in groundwater at the Site are below the AWQS for 1,1-DCE or the ADEQ Director otherwise determines the requirements of A.R.S §49-282.06[D] have been met.

Current data trends indicate that in approximately 10 to 50 years, the foreseeable municipal use of groundwater pumped from SRP water supply wells will no longer be potentially threatened to be impaired as a result of the 1,1-DCE in groundwater, based upon the studies presented in the Final FS, the PRAP, and the observed and predicted 1,1-DCE concentration trends in groundwater. For cost estimating purposes, VTI has estimated the minimum duration of this remedy is 10 years.

Pursuant to A.A.C. R18-16-410(B)(8), a periodic Site Review will be conducted to confirm the effectiveness and adequacy of the implemented remedy in meeting the ROs. Expected duration of the remedy will be re-assessed after each review.

3.7 Performance Standards

The performance standards are geared to achieve the ROs for the Site, which include the protection against a loss or impairment of each municipal, agricultural, industrial or other beneficial use of groundwater pumped from SRP's groundwater supply wells that is threatened to be lost or impaired as a result of the 1,1-DCE, while such threat exists.

3.8 Community Involvement

VTI and ADEQ have completed the required community involvement and public comment requirements for the Site, as summarized in **Table 2**, below.

Table 2.
Community Involvement Activities
Former Capitol Castings Facility

| Community Involvement Activities | Regulatory Citation/Rule | Date |
|--|--|--------------------|
| Questionnaires mailed for draft <i>Land and Water Use Study</i> | A.A.C. R18-16-404(C)(1)(a) | June 21, 2006 |
| Notice of opportunity to comment on <i>Draft Remedial Investigation Report</i> | A.A.C. R18-16-404(C)(1)(b) A.A.C. R18-16-406(F) | July 24, 2009 |
| Public meeting to establish Remedial Objectives | A.A.C. R18-16-404(C)(1)(b) A.A.C. R18-16-406(I) | September 10, 2009 |

| Community Involvement Activities | Regulatory Citation/Rule | Date |
|--|---|-------------------|
| Notice of opportunity to comment on <i>Proposed Remedial Objectives Report</i> | A.A.C. R18-16-404(C)(1)(c) A.A.C. R18-16-406(I) | July 24, 2009 |
| Notice of Availability of <i>Final Remedial Investigation Report</i> and <i>Remedial Objectives Report</i> | A.A.C. R18-16-406(J) | November 24, 2010 |
| Notice of Availability of the <i>Feasibility Study Work Plan</i> | A.A.C. R18-16-404(C)(1)(d) A.A.C. R18-16-407(J) | March 31, 2014 |
| Notice of Availability and Opportunity to Comment on <i>Proposed Remedial Action Plan</i> | A.A.C. R18-16-404(C)(1)(e) A.A.C. R18-16-408(C)(2) | March 26, 2016 |

In addition, the community has been kept advised of investigative and remedial activities at the Site through personal communications, presentations, and various public notices.

3.9 Remedy Review

Pursuant to A.A.C. R18-16-410(B)(8), a periodic Site Review will be conducted to confirm the effectiveness and adequacy of the implemented remedy in achieving the ROs. The first Site Review will be performed at Year Three (2019) and the schedule of subsequent reviews will be determined based upon current site conditions and continued protectiveness of the ROs. As part of the Site Review, VTI will complete an updated groundwater use survey to identify potential changes to groundwater usage by the public within one mile of the Site.

4.0 RESPONSIVENESS SUMMARY

Pursuant to the requirements of A.A.C. R18-16-410(B)(2), a comprehensive responsiveness summary shall be prepared by the director regarding all comments received on the PRAP after the conclusion of all public comment periods. A 30-day comment period for the PRAP was held starting on March 26, 2016 and ending on April 25, 2016. No comments were received during this public notice/comment period. Therefore, a responsiveness summary is not required.

5.0 COST ESTIMATE FOR SELECTED REMEDY

The remedy associated with this Site is exempt from the requirements of A.A.C. R18-16-410(C), as all costs associated with this project are non-recoverable by the State/ADEQ since the project is fully financed by VTI, the Volunteer of Record, for all past and future costs associated with the remedy.

5.1 Historical Costs

The historical costs associated with the remedial actions related to this Site were not calculated for this ROD, as the remedy associated with this Site is exempt from the requirements of A.A.C. R18-16-410(C).

5.2 Future Costs

The ROD presents Future Costs associated with this project, through the end of Year 10. The selected remedy requires monitoring of wells identified in **Attachment A** for at least 10 years.

For cost estimation purposes, the monitoring program will consist of the following:

- Depth to water will be measured in up to 40 wells each year during base level monitoring;
- Groundwater samples will be collected each year with a total of 17 to 37 samples, depending on the year collected, with an average of 27 samples per year, during the base level monitoring. The groundwater samples will be analyzed for 1,1,-DCE using United States Environmental Protection Agency Method 8260B.

The cost breakdown for completing the base level remedy (as specified in the PRAP) for a 10 year period are as follows:

- Groundwater Monitoring and Sampling = \$510,000
- Data Management and Reporting = \$183,000
- Management, Communications, Contingency, and Miscellaneous = \$187,000
- Total Cost for Years 1 through 10 = \$880,000

If in the event Action Level 4 is triggered, then the contingency remedy would be implemented. The estimated cost breakdown of the contingency remedy for a 10 year period are as follows:

- Contingency Remedy Design and Installation:
 - Modeling, Remedial Work Plan, System Design, and Permitting = \$242,800
 - Contingency Extraction Well Installation = \$307,000
 - Groundwater Treatment System Installation and Startup = \$1,007,300
 - Miscellaneous and Contingency = \$ 482,700

- Contingency Remedy Operation, Maintenance, and Monitoring for a 10 year period:
 - Operation and Maintenance of Treatment System = \$3,540,000
 - Groundwater Monitoring and Sampling = \$2,242,000
 - Data Management and Reporting = \$644,000
 - Management, Communications, Contingency, and Miscellaneous = \$914,000
- Total 10 Year Contingency Remedy (Level 4) Cost = \$9,379,800

Following ADEQ's approval of the satisfactory completion of the remedy and/or contingency remedy, the site monitoring wells would be abandoned and a No Further Action determination requested. The cost for abandoning the existing monitoring wells is approximately \$550,000.

6.0 REFERENCES

ARCADIS 2005. Groundwater Flow and Solute Transport Model Preliminary Report Former Capitol Castings Facility 5857 South Kyrene Road, Tempe, Arizona. June 23, 2005.

ARCADIS 2009. Draft Remedial Investigation Report. Former Capitol Castings Facility 5857 South Kyrene Road Tempe, Arizona. February 5, 2009.

ARCADIS 2010. Final Remedial Investigation Report. Former Capitol Castings Facility 5857 South Kyrene Road Tempe, Arizona. October 25, 2010.

ARCADIS 2014a. Fourth Quarter Groundwater Report. Former Capitol Castings Facility, Tempe, Arizona, ADEQ VRP Site Code: 504426-00. March 5, 2014.

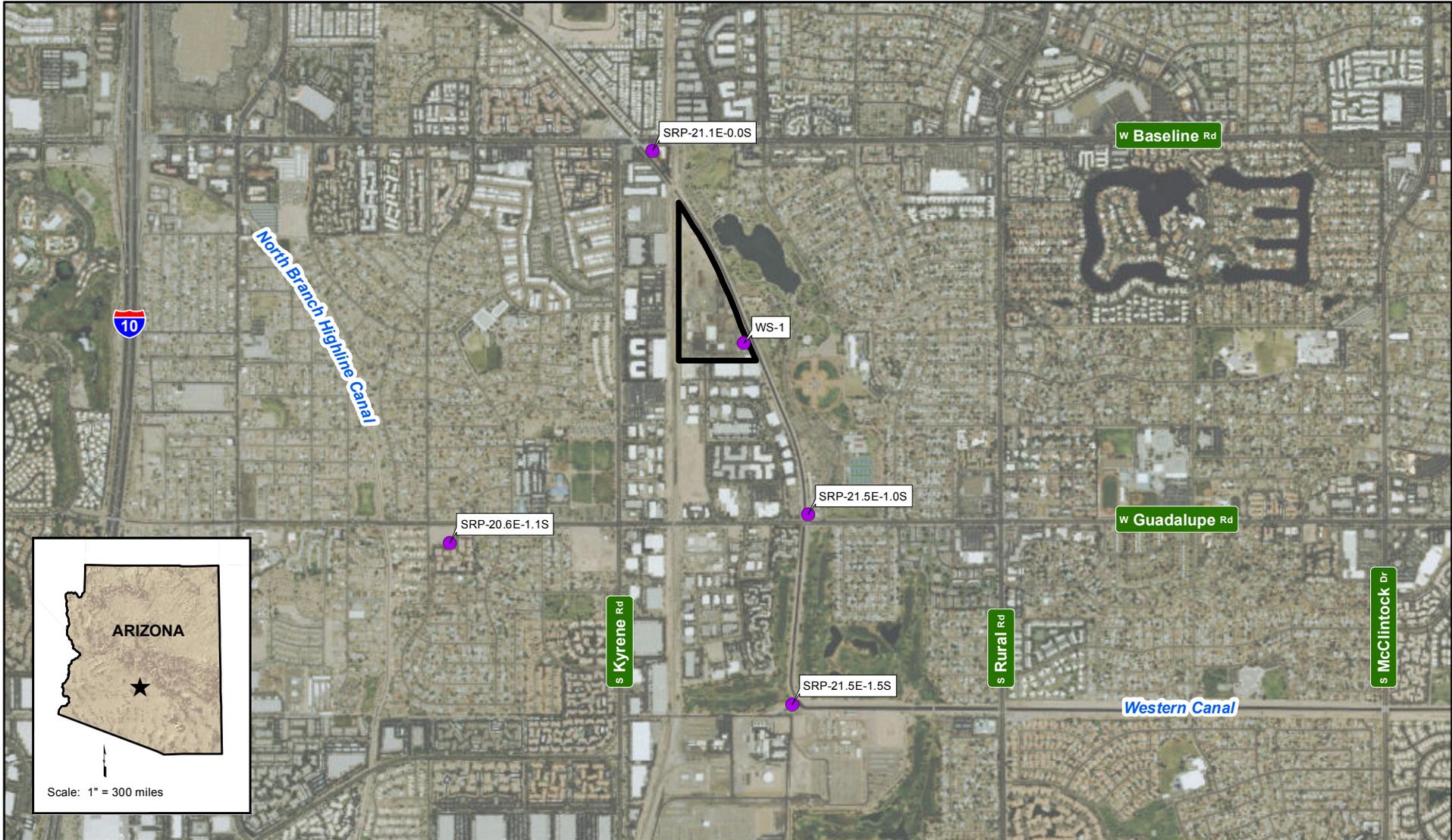
ARCADIS 2014b. Final Feasibility Study Report. Former Capitol Castings, Tempe, Arizona. October 13, 2014.

ARCADIS 2016. Proposed Remedial Action Plan. Former Capitol Castings, Tempe, Arizona. VRP Site Code: 504426-00. February 29, 2016.

Geraghty & Miller 1991. Leaking Underground Storage Tank Quarterly Monitoring Report, Second Quarter of 1991, Capitol Castings, Inc. Facility, 5857 South Kyrene Road, Tempe, Arizona. August 14, 1991.

Record of Decision Figure 1

\\Scottsdale-AZ\OfficeData\Project\Capitol Castings\GIS\Projects\Proposed RAP 03-2015\Figure 01 facility location map.mxd 6/24/2015

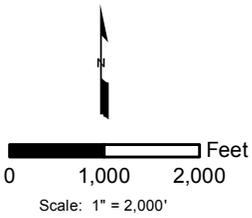


LEGEND

-  Former facility boundary
-  Water supply well (within 1/2 mile of the Site)

NOTES

· Aerial photo source: ESRI World Imagery.



FORMER CAPITOL CASTINGS FACILITY
TEMPE, ARIZONA
PROPOSED REMEDIAL ACTION PLAN

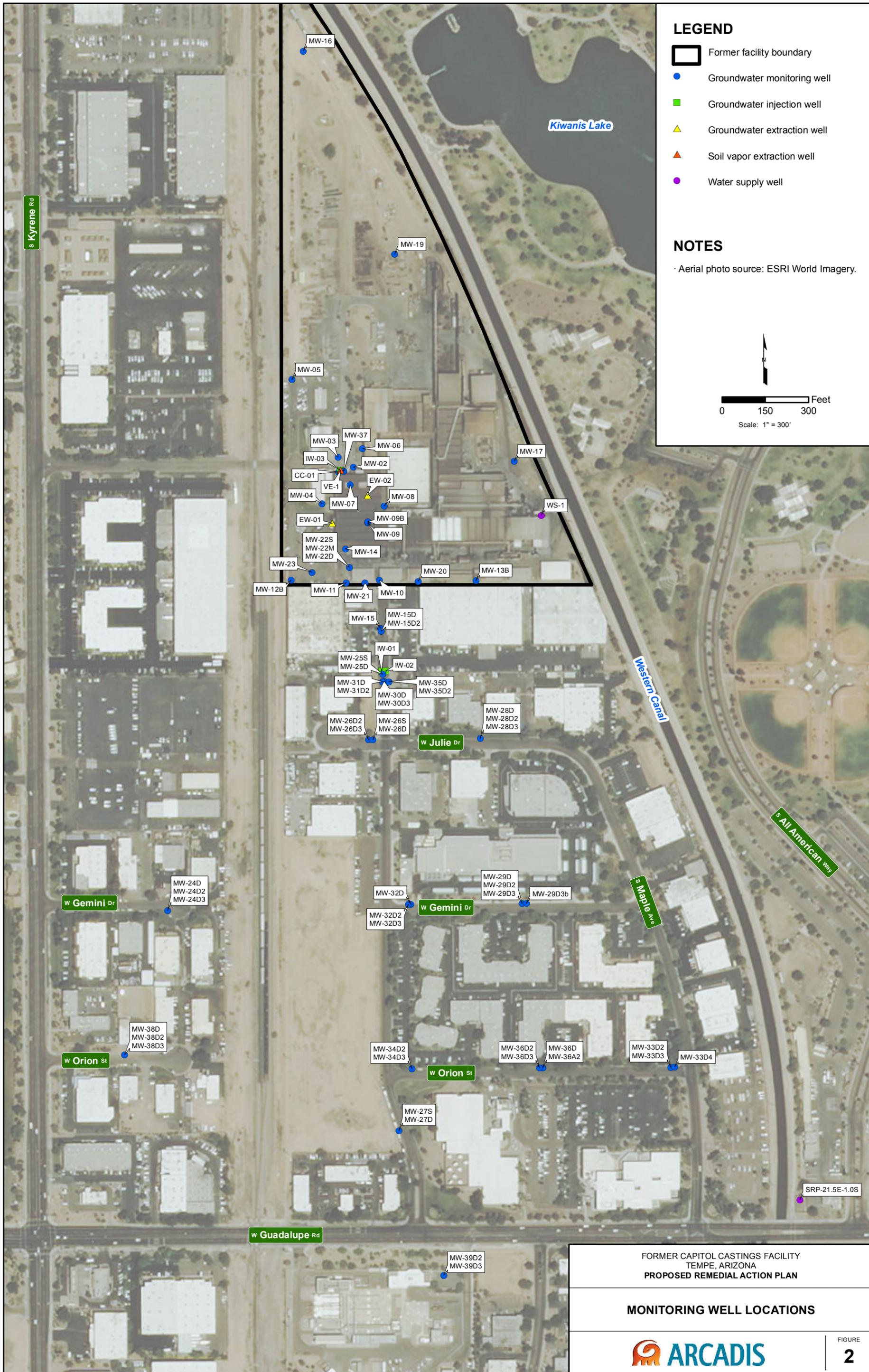
FACILITY LOCATION



FIGURE
1

Record of Decision Figure 2

\\Scottsdale-AZ\OfficeData\Project\Capitol Castings\GIS\Projects\Proposed RAP 03-2015\Figure 02 well location map.mxd 6/24/2015

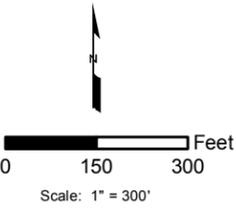


LEGEND

-  Former facility boundary
-  Groundwater monitoring well
-  Groundwater injection well
-  Groundwater extraction well
-  Soil vapor extraction well
-  Water supply well

NOTES

Aerial photo source: ESRI World Imagery.



FORMER CAPITOL CASTINGS FACILITY
 TEMPE, ARIZONA
 PROPOSED REMEDIAL ACTION PLAN

MONITORING WELL LOCATIONS

**ATTACHMENT A - TABLE 1 OF 2
BASE LEVEL MONITORING SCHEDULE
FORMER CAPITOL CASTINGS FACILITY**

| Wells | Aquifer (Zone) | Well Use Designation | Base Level Sampling Frequency |
|---------------------|---------------------------|---------------------------------|--|
| MW-12B | S | WL | -- |
| MW-13B | S | WL | -- |
| MW-14 | S | WL | -- |
| MW-15D | D | CSM | 1/4yrs |
| MW-15D2 | D2 | CSM | 1/4yrs |
| MW-22S | S | CSM | 1/4yrs |
| MW-22D | D | Key | 1/2yrs |
| MW-24D* | D | Key | 1/2yrs |
| MW-24D2 | D2 | Sentinel | 1/yr |
| MW-24D3 | D3 | Sentinel | 2/yr |
| MW-25S | S | WL | -- |
| MW-26D | D | CSM | 1/4yrs |
| MW-26D2 | D2 | CSM | 1/4yrs |
| MW-26D3 | D3 | CSM | 1/4yrs |
| MW-27D | D | WL | -- |
| MW-28D | D | WL | -- |
| MW-28D2 | D2 | CSM | 1/4yrs |
| MW-28D3 | D3 | WL | -- |
| MW-29D | D | CSM | 1/4yrs |
| MW-29D2 | D2 | Key | 1/2yrs |
| MW-29D3 | D3 | Key | 1/2yrs |
| MW-29D3b | D3 | CSM | 1/4yrs |
| MW-30D3 | D3 | WL | -- |
| MW-32D | D | Key | 1/2yrs |
| MW-32D2 | D2 | Key | 1/2yrs |
| MW-32D3 | D3 | Key | 1/2yrs |
| MW-33D2 | D2 | Sentinel | 1/yr |
| MW-33D3 | D3 | Sentinel | 2/yr |
| MW-33D4 | D4 | Key | 1/2yrs |
| MW-34D2 | D2 | Sentinel | 1/yr |
| MW-34D3 | D3 | Sentinel | 2/yr |
| MW-36A2 | A2 | Key | 1/2yrs |
| MW-36D2 | D2 | Sentinel | 1/yr |
| MW-36D3 | D3 | Sentinel | 2/yr |
| MW-38D2 | D2 | Sentinel | 1/yr |
| MW-38D3 | D3 | Sentinel | 2/yr |
| MW-39D2 | D2 | Key | 1/2yrs |
| MW-39D3 | D3 | Key | 1/2yrs |
| SRP Well 20.6E-1.1S | A2-D3 | SRP | 1/yr |
| SRP Well 21.5E-1.0S | D2-D4 | SRP | 1/yr |

Notes:

* = piezometer well

-- = no groundwater sampling

Water levels gauged in all wells annually

1/2yrs = one time every two years

1/4yrs = one time every four years

1/yr = one time per year

2/yr = two times per year

WL = water level only monitoring well as designated in the PRAP

Key = key monitoring well as designated in PRAP

Sentinel = sentinel monitoring well as designated in the PRAP

Contingency = contingency well as designated in the PRAP

CSM = conceptual site model well as designated in the PRAP

**ATTACHMENT A - TABLE 2 OF 2
LEVEL 1 THROUGH LEVEL 4 MONITORING SCHEDULE
FORMER CAPITOL CASTINGS FACILITY**

| Wells | Aquifer (Zone) | Well Use Designation | Contingency Sampling Frequency | | | | WL Monitoring |
|---------------------|-------------------|-------------------------|--------------------------------|---------|---------|---------|------------------|
| | | | Level 1 | Level 2 | Level 3 | Level 4 | |
| MW-12B | S | WL | -- | -- | -- | -- | ● |
| MW-13B | S | WL | -- | -- | -- | -- | ● |
| MW-14 | S | WL | -- | -- | -- | -- | ● |
| MW-15D | D | CSM | 1/3yrs | 1/3yrs | 1/2yrs | 1/2yrs | ● |
| MW-15D2 | D2 | CSM | 1/3yrs | 1/3yrs | 1/2yrs | 1/2yrs | ● |
| MW-22S | S | CSM | 1/3yrs | 1/3yrs | 1/2yrs | 1/2yrs | ● |
| MW-22D | D | Key | 1/yr | 1/yr | 2/yr | 2/yr | ● |
| MW-24D* | D | Key | 1/yr | 1/yr | 2/yr | 2/yr | ● |
| MW-24D2 | D2 | Sentinel | 2/yr | 4/yr | 4/yr | 4/yr | ● |
| MW-24D3 | D3 | Sentinel | 2/yr | 4/yr | 4/yr | 4/yr | ● |
| MW-25S | S | WL | -- | -- | -- | -- | ● |
| MW-26D | D | CSM | 1/3yrs | 1/3yrs | 1/2yrs | 1/2yrs | ● |
| MW-26D2 | D2 | CSM | 1/3yrs | 1/3yrs | 1/2yrs | 1/2yrs | ● |
| MW-26D3 | D3 | CSM | 1/3yrs | 1/3yrs | 1/2yrs | 1/2yrs | ● |
| MW-27D | D | WL | -- | -- | -- | -- | ● |
| MW-28D | D | WL | -- | -- | -- | -- | ● |
| MW-28D2 | D2 | CSM | 1/3yrs | 1/3yrs | 1/2yrs | 1/2yrs | ● |
| MW-28D3 | D3 | WL | -- | -- | -- | -- | ● |
| MW-29D | D | CSM | 1/3yrs | 1/3yrs | 1/2yrs | 1/2yrs | ● |
| MW-29D2 | D2 | Key | 1/yr | 1/yr | 2/yr | 2/yr | ● |
| MW-29D3 | D3 | Key | 1/yr | 1/yr | 2/yr | 2/yr | ● |
| MW-29D3b | D3 | CSM | 1/3yrs | 1/3yrs | 1/2yrs | 1/2yrs | ● |
| MW-30D3 | D3 | WL | -- | -- | -- | -- | ● |
| MW-32D | D | Key | 1/yr | 1/yr | 2/yr | 2/yr | ● |
| MW-32D2 | D2 | Key | 1/yr | 1/yr | 2/yr | 2/yr | ● |
| MW-32D3 | D3 | Key | 1/yr | 1/yr | 2/yr | 2/yr | ● |
| MW-33D2 | D2 | Sentinel | 2/yr | 4/yr | 4/yr | 4/yr | ● |
| MW-33D3 | D3 | Sentinel | 2/yr | 4/yr | 4/yr | 4/yr | ● |
| MW-33D4 | D4 | Key | 1/yr | 1/yr | 2/yr | 2/yr | ● |
| MW-34D2 | D2 | Sentinel | 2/yr | 4/yr | 4/yr | 4/yr | ● |
| MW-34D3 | D3 | Sentinel | 2/yr | 4/yr | 4/yr | 4/yr | ● |
| MW-36A2 | A2 | Key | 1/yr | 1/yr | 2/yr | 2/yr | ● |
| MW-36D2 | D2 | Sentinel | 2/yr | 4/yr | 4/yr | 4/yr | ● |
| MW-36D3 | D3 | Sentinel | 2/yr | 4/yr | 4/yr | 4/yr | ● |
| MW-38D2 | D2 | Sentinel | 2/yr | 4/yr | 4/yr | 4/yr | ● |
| MW-38D3 | D3 | Sentinel | 2/yr | 4/yr | 4/yr | 4/yr | ● |
| MW-39D2 | D2 | Key | 1/yr | 1/yr | 2/yr | 2/yr | ● |
| MW-39D3 | D3 | Key | 1/yr | 1/yr | 2/yr | 2/yr | ● |
| SRP Well 20.6E-1.1S | A2-D3 | SRP | -- | 4/yr | 4/yr | 4/yr | ◇ |
| SRP Well 21.5E-1.0S | D2-D4 | SRP | 1/yr | 2/yr | 2/yr | 4/yr | ◇ |

Notes:

* = piezometer well

-- = no groundwater sampling

Water levels gauged in all wells annually

1/2yrs = one time every two years

1/4yrs = one time every four years

1/yr = one time per year

2/yr = two times per year

● = water level measurement frequency based on sentinel well monitoring frequency

◇ = water levels (as allowable) and pumping monitoring

Contingency = contingency well as designated in the PRAP

CSM = conceptual site model well as designated in the PRAP

Key = key monitoring well as designated in PRAP

WL = water level only monitoring well as designated in the PRAP

Sentinel = sentinel monitoring well as designated in the PRAP