Proposed Plan

Superfund Site Area A
North of Los Reales Road
Tucson, Arizona

Tucson International Airport Area

March 2017

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) evaluated alternatives for cleanup of contaminants in groundwater at the Tucson International Airport Area Superfund Site (TIAA Superfund Site or Site) Area A in Tucson, Arizona. This **Proposed Plan** presents those alternatives, along with EPA's **Preferred Alternative**, for public review and comment. The current **contaminants of concern (COCs)** at the site are **trichloroethylene (TCE)**, **1,1-dichloroethylene (DCE)**, **trans-1,2-DCE**, **chloroform**, and **1,4-dioxane.** The contaminants most widespread and of greatest concern are **TCE** and **1,4-dioxane**. TIAA Superfund Site Area A is the area north of Los Reales Road and consists of the Airport Property (which includes the Tucson International Airport and Three Hangers Building) and the Tucson Airport Remediation Project (TARP), as shown on **Figure 1**.

The purpose of this **Proposed Plan** is to provide the public with background information on the groundwater at the TIAA Superfund Site Area A, to identify EPA's **Preferred Alternative** for remedial action, and to describe the other remedial alternatives considered. Currently, the **remedy** for groundwater cleanup at the TIAA Superfund Site Area A was documented in an EPA **Record of Decision (ROD)** signed in 1988. The alternatives in this **Proposed Plan** add to and reinforce the original **remedy**, and the **Preferred Alternative** will be documented in a **ROD** Amendment. A **glossary** of commonly used terms is available for reference on page 13, where the **bolded** words throughout this document are also defined.

Preferred Alternative

⇒ *Continued operation and treatment of groundwater using an ultra-violet light advanced oxidation process*

⇒ *Continue to provide drinking water resources to the City of Tucson*

⇒ *Continue to monitor natural attenuation of the groundwater plume*

Public Meeting and Comment Period

Public Comment Period
March 22, 2017—April 21, 2017

EPA will accept written comments on the Proposed Plan during this public comment period.

Public Meeting
5:00 p.m., March 30, 2017

EPA will hold a public meeting to explain the Proposed Plan and the alternatives in the Focused Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at El Pueblo, Activity Center, 101 W Irvington Road, Tucson, Arizona 85706 at 5:00 p.m.

EPA ANNOUNCES PROPOSED PLAN

The responsible parties, U.S. Air Force (USAF), City of Tucson, Tucson Airport Authority, Hughes Aircraft Company, and McDonnell-Douglas Corporation, are performing environmental investigation and/or cleanup of groundwater at TIAA Superfund Site Area A, pursuant to the 1988 ROD under the **Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)**. This **Proposed Plan** focuses on the **COCs** in groundwater at the TIAA Superfund Site Area A. EPA issues this **Proposed Plan** as the lead agency with support from the Arizona Department of Environmental Quality (ADEQ).

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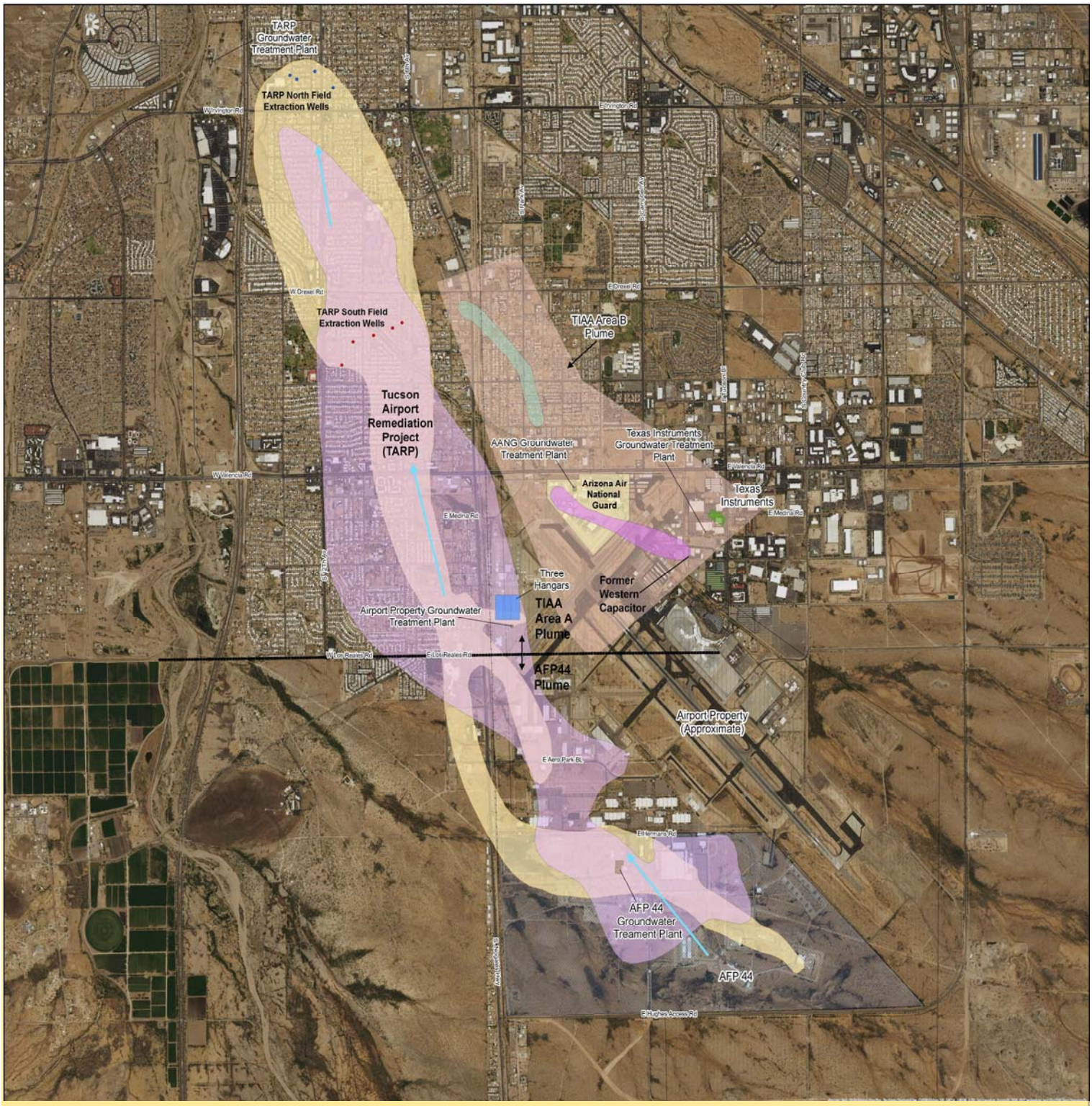

Figure 1—Location of TIAA Area A and B Groundwater Plumes

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EPA is soliciting public comment on this **Proposed Plan** as part of its public participation responsibilities under Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan and Section 117 (a) of **CERCLA**. EPA will select a final amendment to the **remedy** for groundwater at the TIAA Superfund Site Area A after reviewing and considering all information submitted during the 30-day public comment period. EPA may modify the **Preferred Alternative** or select another alternative presented in this **Proposed Plan** based on new information or public comments. Therefore, we encourage the public to review and comment on the alternatives presented in this **Proposed Plan**. Information on how to provide comments is provided on page 12 of this **Proposed Plan**. The time and location of the public meeting is shown on page 1 of this **Proposed Plan**.

This **Proposed Plan** summarizes the information that is presented in detail in the Focused Remedial Investigation/Feasibility Study (RI/FS) completed by EGC, Inc. on behalf of the USAF in 2016, and other documents in the TIAA Superfund Site Administrative Record File. The Administrative Record is a compilation of information considered in the **remedy** selection process, including information used to prepare this **Proposed Plan**. The Administrative Record provides a comprehensive record of investigations and response activities.

For More Information

Administrative Record Files are located at:

By Appointment:
U.S. EPA Records Center, Region 9
Mail Stop SFD-7C
95 Hawthorne Street, Room 403
San Francisco, California 94105
415.536.2000

Information Repository Location:
Valencia Public Library
202 W. Valencia Road
Tucson, Arizona 85706
520.594.5390

SITE BACKGROUND AND CHARACTERISTICS

In 1981, **volatile organic compounds (VOCs)**, which included **TCE, DCE, trans-1,2-DCE,** and **chloroform**, were detected in groundwater wells in the vicinity of the TIAA Superfund Site. The Site was placed on the National Priorities List and named a federal Superfund site in 1983. For the purpose of investigating and remediating the groundwater contamination, EPA divided the Site into distinct geographic areas (see **Figure 1**). Area A comprises the main groundwater contamination plume west of the Tucson International Airport. Area B includes West Plume B, Arizona Air National Guard, Texas Instruments, and former West-Cap project areas, and is located north and west of the Tucson International Airport. Air Force Plant 44 is located south of Tucson International Airport and includes the groundwater plume south of Los Reales Road. The groundwater plumes associated with Area B[1] and Air Force Plant 44 are not summarized as part of this **Proposed Plan** and are being addressed in separate decision documents.

Historical industrial and defense-related activities have caused widespread groundwater contamination at the TIAA Superfund Site, which subsequently affected the City of Tucson's **regional aquifer**. The EPA **ROD** for the

[1] A **ROD** Amendment for groundwater in Area B was signed in 2012 and is not addressed in this **Proposed Plan**.

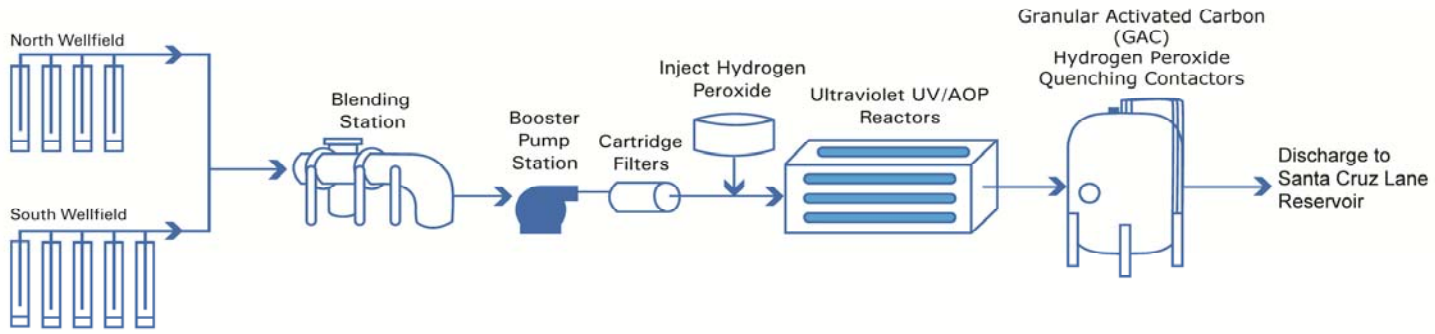

Figure 2—Proposed TARP Groundwater Treatment System Schematic

groundwater in Area A and Area B north of Los Reales Road was signed in 1988, and identified multiple parties as contributors to the **VOCs** in groundwater. The main components of the EPA 1988 **ROD** are listed below:

- Control groundwater contamination through extraction wells
- Treat contaminated groundwater using packed column aeration
- Treat generated off-gas
- Provide treated groundwater to the City of Tucson for use as drinking water
- Monitor groundwater in the area

A 1991 consent decree establishes the work and funding responsibilities for implementing the 1988 **ROD remedy** in TIAA Superfund Site Area A. In 1994, a groundwater remediation system (known as the Tucson Airport Remediation Project or TARP) was constructed by the City of Tucson Water Department (Tucson Water) to treat **TCE** in groundwater before it was delivered to the Tucson Water's potable water-distribution system. The 1994 remediation system included a packed column aeration water treatment plant and two remediation well fields.

The City of Tucson began sampling for **1,4-dioxane** in the TARP extraction and monitoring wells in 2002. In 2008, USAF began working on a focused RI/FS specifically focused on the two most prevalent contaminants in groundwater, **TCE** and **1,4-dioxane**. In 2014, following the discovery of **1,4-dioxane** in

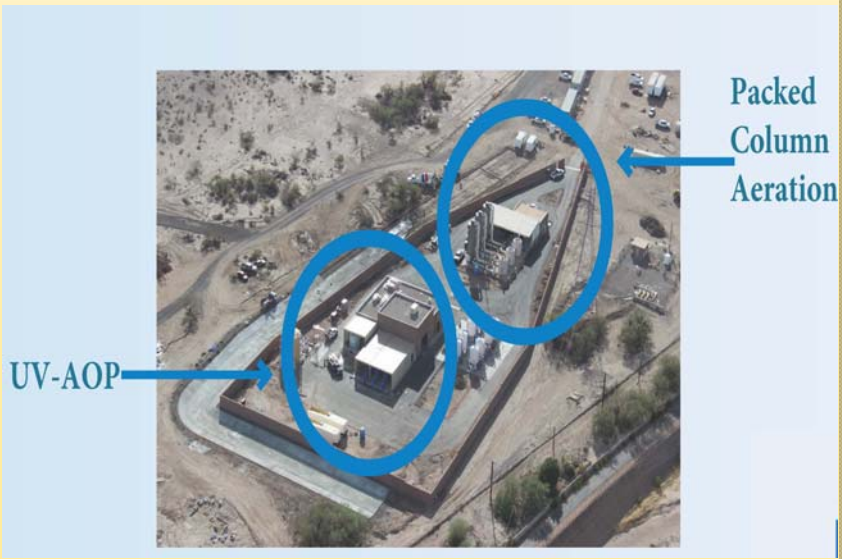

Figure 3—Aerial Photograph of Packed Column Aeration and UV-AOP Systems

regional aquifer monitoring wells, Tucson Water added an **ultraviolet light peroxide advanced oxidation process (UV-AOP)** water treatment facility to the existing packed column aeration system at TARP, which reduced both the original **VOC** and **1,4-dioxane** concentrations to below cleanup levels. Currently, both systems (**UV-AOP** and packed column aeration) are in operation at the same time; however, the **Preferred Alternative** for TIAA Superfund Site Area A includes removal of the packed column aeration step because it is no longer needed. The proposed TARP groundwater remediation system configuration without the packed column aeration step is shown on **Figure 2**. An aerial photograph of both the **UV-AOP** and the packed column aeration systems is shown on **Figure 3**.

SUMMARY OF SITE RISKS

"Risk" is the likelihood or probability that a hazardous chemical, when released to the environment, will cause effects (such as cancer or other illnesses) to exposed humans or wildlife. EPA assessed risk to determine current and future potential impacts on human health from both **TCE** and **1,4-dioxane** in contaminated groundwater.

Human Health Risk Evaluation

A primary goal of the Superfund program is to protect the health of people exposed, or potentially exposed, to contamination at a site. Risk assessment is the process by which contaminant-related threats to human health are evaluated and three risk assessments were performed for **TCE** and **1,4-dioxane** groundwater contamination at the TIAA Superfund Site Area A: one by the EPA (issued September 2015), another by USAF (issued September 2015), and a third (Final Unified Focused Human Health Risk Assessment issued November 2015), which combined and summarized the EPA and USAF risk assessments.

Potential human health risks were evaluated for: (1) groundwater from existing private wells in south Tucson, (2) groundwater at a location next to Air Force Plant 44 where a private well could be installed sometime in the future, and (3) groundwater treated by TARP and served as tap water by the City of Tucson. The risk assessments evaluated the possibilities that risks of developing cancer and/or other illnesses could be increased by using groundwater for tap water purposes. These risk assessments concluded that contaminated groundwater, if left untreated, can pose significant risks for developing cancer or other illnesses. Specifically, excess lifetime cancer risks can range from 2-in-one-million ($2x10^{-6}$) to 430-in-one-million ($4.3x10^{-4}$), and non-cancer hazard quotients can range from 0.04 to 21.5.

Under Superfund, it is EPA's responsibility to reduce cancer risks to less than 100-in-one-million ($1x10^{-4}$), with the goal to reduce risks to less than 1-in-one-million ($1x10^{-6}$). The goal for non-cancer hazard quotients is 1.0 or lower. Thus, based on the risk assessments, EPA determined that **TCE** and **1,4-dioxane** contamination in groundwater at TIAA Superfund Site Area A should be remediated to reduce potential threats to public health. The risk assessments also concluded that the TARP **groundwater treatment plant** effectively cleans contaminated groundwater so that the water provided to the City of Tucson is safe for all tap water uses, including drinking water. It is

important to note that no one is currently served untreated groundwater by Tucson Water.

Ecological Risk Evaluation

A **ROD** Amendment for the TIAA Superfund Site Area A and B (issued in 2004) noted that following a review of potential ecological **receptors**, there were no completed pathways of exposure. Because groundwater at the TIAA Superfund Site Area A and B does not seep to the surface or directly impact any of the small washes on the Site, there are no known **receptors** for an ecological assessment. Thus, ecological **receptors** were not evaluated as part of the remedial alternatives.

REMEDIAL ACTION OBJECTIVES

After the three risk assessments discussed above were completed, EPA developed **remedial action objectives (RAOs)** to assist in identifying and assessing remedial alternatives that would address risks of the groundwater at the TIAA Superfund Site Area A. **RAOs** consist of goals for protecting human health and the environment, and can be achieved by reducing exposure or removing the **COCs**. **RAOs** drive the formulation and development of response actions.

The **RAOs** for the groundwater at the TIAA Superfund Site Area A are as follows:

- Contain the contaminated groundwater plumes.
- Remediate groundwater to **maximum contaminant levels (MCLs)** or appropriate risk-based cleanup level.
- Minimize exposure to groundwater contamination in excess of cleanup levels.
- Conduct groundwater restoration in a manner that meets **Applicable or Relevant and Appropriate Requirements (ARARs)** as required under **CERCLA**.
- Conduct groundwater restoration in a manner that does not interfere with local water use.

EPA developed the preliminary cleanup levels for each **COC** in the contaminated groundwater at the TIAA Superfund Site Area A from chemical-specific **ARARs** and risk-based criteria. **MCLs** are concentrations that EPA has determined to be safe for drinking water and are generally relevant and appropriate for groundwater that may be used as a source of drinking water. For the **1,4-dioxane** for which **MCLs** have not yet been established, EPA set risk-based cleanup goals. The risk-based cleanup value selected for **1,4-dioxane** is considered to be protective of human health similar to an **MCL**. The cleanup levels for TIAA Superfund Site Area A are summarized in **Table 1**.

SUMMARY OF REMEDIAL ALTERNATIVES

EPA developed remedial alternatives to achieve remediation of groundwater to the cleanup levels identified in **Table 1**, as summarized below. A more detailed evaluation of the alternatives is included in the Focused RI/FS.

- Alternative 1—No Further Action
- Alternative 2—Monitored Natural Attenuation and Institutional Controls
- Alternative 3—Existing Pump-and-Treat System with Ultraviolet (UV)-Peroxide Plus Monitored Natural Attenuation and Institutional Controls (**Preferred Alternative**)

Contaminants of Concern	Cleanup Level Microgram per Liter (µg/L) or Parts Per Billion
TCE	1.5 µg/L (treated water) 5 µg/L (in-situ groundwater)
1,4-Dioxane	0.35 µg/L (treated and in-situ ground-water)
Trans-1,2-DCE	100 µg/L
Chloroform	70 µg/L
1,1-DCE	7 µg/L

Table 1—Groundwater Cleanup Levels

- Alternative 4—Optimized Pump-and-Treat with UV-Peroxide and Partial Management of Water by Reinjection to the Regional Aquifer Plus Monitored Natural Attenuation and Institutional Controls
- Alternative 5—Existing Pump-and-Treat with UV-Peroxide Plus In-Situ Bioremediation and Monitored Natural Attenuation and Institutional Controls
- Alternative 6—Existing Pump-and-Treat with UV-Peroxide Plus In-Situ Chemical Oxidation and Monitored Natural Attenuation and Institutional Controls

Alternatives 2 through 6 include institutional controls, which would restrict access, assist in implementing administrative policies (such as deed restrictions), and provide compliance and enforcement mechanisms. These institutional controls would reduce exposure to contaminated media and ensure continued success of the proposed **remedy**. In addition, Alternatives 2 through 6 also include **monitored natural attenuation**, which would be used to monitor the reductions in contaminant concentrations within the groundwater plume.

The six groundwater alternatives are summarized in the following paragraphs, along with estimated capital, operation and maintenance (O&M) over 30 years, total cost, and net present value, which is a discounted rate.

Alternative 1—No Further Action

Estimated Capital Cost: *$0*

Estimate O&M Cost: *$0*

Estimated Present Worth (Total): *$0*

Net Present Value Cost: *$0*

This alternative assumes no remedial action would be taken to address groundwater contamination at TIAA Superfund Site Area A and is included for reference as a baseline alternative. This is not considered an acceptable alternative, as the site currently presents unacceptable risk to human health. This is a standard, required alternative in the evaluation of alternatives process.

Alternative 2—Monitored Natural Attenuation and Institutional Controls

Estimated Capital Cost: *$13,106*

Estimate O&M Cost: *$7,709,569*

Estimated Present Worth (Total): *$7,722,675*

Net Present Value Cost: *$5,850,046*

This alternative includes no active remediation but does include monitoring of the current groundwater plume. Groundwater concentrations would be monitored as they naturally attenuate (or decrease) through biodegradation, sorption, and dispersion within the groundwater.

Alternative 3—Existing Pump-and-Treat System with UV-Peroxide Plus Monitored Natural Attenuation and Institutional Controls (Preferred Alternative)

Estimated Capital Cost: *$13,106*

Estimate O&M Cost: *$84,301,569*

Estimated Present Worth (Total): *$84,314,675*

Net Present Value Cost: *$63,522,390*

This alternative involves continued operation of the current treatment systems, i.e., the TARP extraction wells in combination with the 2014 TARP **AOP** treatment system. Additionally, the historic packed column aeration treatment at the TARP would no longer be used since the 2014 **UV-AOP** treatment system is achieving groundwater treatment levels without the use of the packed column aeration treatment as documented in a technical memorandum prepared by the responsible parties' contractor, Arcadis, in 2016.

Alternative 4—Optimized Pump-and-Treat with UV-Peroxide and Partial Management of Water by Reinjection to the Regional Aquifer Plus Monitored Natural Attenuation and Institutional Controls

Estimated Capital Cost: *$258,452*

Figure 4—Evaluation Criteria Overview

Estimate O&M Cost: *$88,240,445*

Estimated Present Worth (Total): *$88,498,897*

Net Present Value Cost: *$67,509,242*

This alternative includes continued operation of the two existing **pump-and-treat** systems described in Alternative 3 with potential optimization of the well fields, and the addition of re-injecting the treated groundwater back into the subsurface to control the off-site migration of the groundwater plume. The process of optimizing the **pump-and-treat** systems would entail identifying and utilizing the wells in the well field which have the ability to make the greatest impact on treatment of the groundwater plume.

Alternative 5—Existing Pump-and-Treat with UV-Peroxide Plus In-Situ Bioremediation and Monitored Natural Attenuation and Institutional Controls

Estimated Capital Cost: *$6,498,248*

Estimate O&M Cost: *$161,912,640*

Estimated Present Worth (Total): *$168,410,888*

Net Present Value Cost: *$131,197,821*

This alternative includes continued operation of the two existing **pump-and-treat** systems described in Alternative 3 and installation of **in-situ bioremediation** injection wells throughout the **1,4-dioxane** source zone, which would be used for introduction of microbes within the groundwater plume.

Alternative 6—Existing Pump-and-Treat with UV-Peroxide Plus In-Situ Chemical Oxidation and Monitored Natural Attenuation and Institutional Controls

Estimated Capital Cost: *$4,039,677*

Estimate O&M Cost: *$104,327,225*

Estimated Present Worth (Total): *$108,366,901*

Net Present Value Cost: *$84,730,485*

This alternative includes continued operation of the two existing **pump-and-treat** systems described in Alternative 3 and installation of **in-situ chemical oxidation** injection wells within the **1,4-dioxane** plume, which would be used for the introduction of chemical oxidants.

EVALUATION OF ALTERNATIVES

Nine criteria are used to evaluate the different remedial alternatives individually and against each other to select a **remedy** (**Figure 4**). The first two criteria are considered threshold criteria that must be met by the selected **remedy**. The next five criteria are considered balancing criteria and are balanced to achieve the best overall solution. The final two criteria are considered modifying criteria. This section of the **Proposed Plan** profiles the relative performance of each alternative against the nine criteria, noting how each compares to the other options under consideration. The "Detailed Analysis of Alternatives" is presented in the 2016 Focused RI/FS.

Threshold Criteria

1. **Overall Protection of Human Health and the Environment**

All alternatives, except Alternatives 1 and 2, are protective of human health and the environment. All of remaining alternatives (Alternatives 3 through 6) provide for treatment of the groundwater plume.

Because Alternative 1 (No Further Action) and Alternative 2 (**monitored natural attenuation**) are not protective of human health and the environment, they were eliminated from consideration as potential remedial alternatives. Alternative 1 (No Further Action) is always carried forward under **CERCLA** guidance as a baseline for the other alternatives.

2. Compliance with Federal and State Applicable or Relevant and Appropriate Requirements

Protection of human health and the environment and compliance with **ARARs**, which consist of state and federal laws and regulations, are threshold criteria that each alternative must meet to be eligible for selection. A complete list of the **ARARs** is included in the Focused RI/FS and in the Administrative Record. Alternatives 3 through 6 would comply with all **ARARs**.

Balancing Criteria

3. Long-Term Effectiveness

Alternatives 3 through 6 would maintain protection of human health and the environment over time by treating or containing **VOCs** in groundwater. Alternatives 3 through 6 would use groundwater extraction (via **pump-and-treat**) to contain and remove **VOCs** and **1,4-dioxane** that are contributing to groundwater contamination.

4. Reduction of Toxicity, Mobility, and/or Volume through Treatment

Alternatives 3 and 4 are strictly **pump-and-treat** technologies, which are expected to have minimal reduction in toxicity, mobility, and volume of contaminants in groundwater. Alternatives 5 and 6 could potentially reduce the toxicity, mobility, and volume through source treatment by using either **in-situ bioremediation** or **in-situ chemical oxidation**.

5. Short-Term Effectiveness

For Alternatives 3 and 4, treatment has been at least partially implemented with **pump-and-treat** systems in place and could be implemented quickly with the highest short-term effectiveness. For Alternatives 5 and 6, short-term effectiveness would be slightly less than for Alternatives 3 and 4 because of the construction time frame needed to implement the **in-situ bioremediation** and **in-situ chemical oxidation** technologies. Alternatives 5 and 6 would pose more short-term risks to Site workers and the surrounding community due to the invasive nature of **in-situ bioremediation** and **in-situ chemical oxidation** technologies. This potential risk would be of limited duration and extent, and would not affect the public on a long-term basis.

Short-term risks to workers associated with normal construction hazards and potential contact with contaminated water would be reduced through appropriate controls and adherence to proper health and safety protocols.

6. Implementability

Alternatives 3 and 4 are common remediation technology methods and are currently in operation at TIAA Superfund Site Area A. Alternative 3 is considered the most implementable alternative since the **pump-and-treat** systems are already in place and the alternative requires no changes to the existing treatment system. Alternatives 5 and 6 are considered the least implementable due to multiple well and piping installation for the injection wells, and the

proximity to potential **receptors** and the existing building, foundation, and road locations, which would limit placement of wells.

7. Cost

Alternative 3 is the most cost-effective as it relies on already installed groundwater **pump-and -treat** systems. Alternative 5 is the most costly, with estimated costs of approximately $131,197,821. Depending on the alternative selected, costs range from $63,522,390 to $131,197,821.

Modifying Criteria

8. State/Support Agency Acceptance

The State of Arizona supports the **Preferred Alternative** (Alternative 3).

9. Community Acceptance

Community acceptance of the **Preferred Alternative** will be evaluated after the public comment period ends and will be described in the **ROD** Amendment for the groundwater at TIAA Superfund Site Area A.

SCOPE AND ROLE OF RESPONSE ACTION

The goals (as outlined in Remedial Action Objective section) of this proposed action are to decrease the **TCE** and **1,4-dioxane** concentrations in groundwater, contain the current groundwater plume, and minimize potential exposure while still achieving the goals identified in the 1988 **ROD** for other **VOCs** in groundwater. EPA will select the remedy after considering the remedial alternatives presented above.

SUMMARY OF THE PREFERRED ALTERNATIVE

Alternative 3, operation of the current extraction wells, treatment using **UV-AOP**, and continued monitoring of **monitored natural attenuation** and institutional controls is the **Preferred Alternative** for the **TCE** and **1,4-dioxane** in groundwater at TIAA Superfund Site Area A. This alternative would remove the packed column aeration step currently in place since it is not providing any additional benefit following cleanup using the **UV-AOP**. This alternative is expected to provide hydraulic containment of the groundwater plume, and provide long-term plume stability and protection of downgradient **receptors**. Since the **pump-and-treat** system is already in place, there is little to no impact to potential Site workers and the surrounding communities. Additionally, institutional controls provide an administrative mechanism for ensuring the public does not come into contact with contaminated groundwater.

EPA believes the **Preferred Alternative** meets the threshold criteria and provides the best balance of trade-offs among the other alternatives with respect to the balancing and modifying criteria. EPA expects the **Preferred Alternative** to be protective of human health and the environment, to comply with **ARARs**, to be cost effective, and to use permanent solutions and alternative treatment technologies to the maximum extent practicable. ADEQ concurs with the **Preferred Alternative**. The **Preferred Alternative** may change in response to public comment or new information.

COMMUNITY PARTICIPATION

EPA and ADEQ provide information regarding the cleanup of the TIAA Superfund Site to the public through public meetings, quarterly Unified Community Action Board (UCAB) meetings, the Administrative Record file for the site, EPA Fact Sheets, and announcements in the Tucson, Arizona newspaper. The public may also visit the EPA website at http://www.epa.gov/superfund/tucsonairport or the ADEQ website at http://www.azdeq.gov/environ/waste/sps/Tucson_Airport_Remediation_Project.html. EPA and ADEQ encourage the public to learn more about the Site and to attend the quarterly UCAB meetings to become more involved in Site activities.

The dates for the public comment period, location, and time of the public meeting, and the locations of the Administrative Record files, are provided on pages 1 and 3 of this **Proposed Plan**.

There will be an opportunity for community members to provide verbal and written comments at the **Proposed Plan** Public Meeting on March 30, 2017.

Comments can also be submitted via email or regular mail. Please email or send regular mail comments to the EPA at the address below. Comments must be received by the EPA by April 24, 2017.

Mary Aycock
EPA, Region 9
Mail Code SFD 8-1
75 Hawthorne Street
San Francisco, CA 94105
415.972.3289

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GLOSSARY

1,1-Dichloroethylene: A colorless industrial chemical used to make certain plastics and flame retardants.

1,4-Dioxane: A clear liquid typically used as a solvent in the manufacturing of other chemicals and as a laboratory reagent.

Advanced oxidation process (AOP): A set of chemical treatment procedures designed to remove organic materials from water using chemical processes that employ ozone, hydrogen peroxide, or ultraviolet light.

Applicable or Relevant and Appropriate Requirements (ARARs): Cleanup standards, criteria, or limitations that are either "applicable" or "relevant and appropriate" and must be met by a remedy.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): The federal law (also referred to as the "Superfund" law) establishing a program to identify hazardous waste sites and procedures for cleaning up sites to protect human health and the environment, and to evaluate damages to natural resources.

Chloroform: A colorless liquid typically used in the manufacturing of other chemicals.

Contaminant of Concern (COC): A metal, organic chemical, or inorganic chemical present in soil, soil gas, or groundwater at concentrations greater than those considered safe for humans or wildlife.

Groundwater treatment plant: The treatment portion of a groundwater remediation system that removes groundwater via extraction wells and treats the contaminated groundwater at the surface. The treatment technologies that are picked to extract and treat groundwater depend on site conditions.

In-situ bioremediation: Adding microbes to "eat" contaminants in the subsurface, thereby converting them to harmless compounds.

In-situ chemical oxidation: Adding oxygen-containing compounds to a contaminated area to "oxidize" or destroy contaminants through chemical reactions.

Maximum Contaminant Level (MCL): A legally enforceable regulatory standard occurring under the Safe Drinking Water Act that must be met by all public drinking water systems to which they apply.

Monitored natural attenuation: A process that describes a range of physical and biological processes, which, unaided by deliberate human intervention, reduce the concentration, toxicity, or mobility of chemical contaminants.

Preferred Alternative: The remedial alternative selected by the EPA, in conjunction with other regulatory agencies that best satisfies the remedial action objective and remedial goal, based on the evaluation of alternatives presented in the Focused RI/FS Report.

Proposed Plan: A document used to facilitate public involvement in the remedy selection process. The document presents the lead agency's preliminary recommendations about how to best address contamination at the site, presents alternatives that were evaluated, and explains the reasons the lead agency recommends the Preferred Alternative.

Pump-and-treat: A general term that describes the extraction of contaminated groundwater and the removal or destruction of the dissolved contaminants.

Receptor: Receptors include any living organism, the habitat that supports such organisms, or natural resources that could be adversely affected by environmental contamination resulting from a release at or migration from a site.

Regional Aquifer: The geological formation containing and conducting groundwater that lies beneath TIAA Superfund Site Area A.

Remedy: The remedial alternative that is selected, documented in a ROD, and implemented at a site.

Record of Decision (ROD): A decision document that identifies the remedial alternative chosen for implementation at a CERCLA site. The ROD is based on information from the Focused RI/FS, and other reports, and on public comments and community concerns.

Remedial Action Objectives (RAOs): Cleanup objectives that specify contaminants to be cleaned up, the cleanup standard, the area of cleanup, or the time required to achieve cleanup, for the purpose of protecting human health and environment.

Trans-1,2-Dichloroethylene: A highly flammable, colorless liquid used to produce solvents and in chemical mixtures.

Trichloroethylene (TCE): A nonflammable, colorless liquid which is mainly used as a solvent to remove grease from metal parts.

Volatile organic compound (VOC): Organic chemicals that evaporate readily and have a low-to-medium solubility in water.