



# EDWARDS AFB CALIFORNIA

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## ADMINISTRATIVE RECORD COVER SHEET

AR File Number 5618



**DEPARTMENT OF THE AIR FORCE**  
**AIR FORCE CIVIL ENGINEER CENTER**  
**INSTALLATION SUPPORT TEAM**  
**EDWARDS AIR FORCE BASE, CALIFORNIA**



18 September 2018

MEMORANDUM FOR REMEDIAL PROJECT MANAGERS

FROM: AFCEC/CZOW  
 120 North Rosamond Boulevard  
 Edwards AFB CA 93524

SUBJECT: Minutes of the 23 February 2017 Remedial Project Manager (RPM) Meeting

1. The 23 February 2017 RPM meeting was held at 15095 Amargosa Road, Victorville, California. The meeting agenda is attached (Attachment 1).
2. The following attendees were present (RPM names are shown in **bold**):

<u>Name</u>	<u>Organization</u>	<u>Phone Number</u>	<u>E-mail</u>
Hunter Anderson*	AFCEC/CZTE	(210) 395-0625	<a href="mailto:richard.anderson.55@us.af.mil">richard.anderson.55@us.af.mil</a>
Eric Barefoot*	AFCEC/CZRW	(210) 395-0634	<a href="mailto:eric.barefoot.1@us.af.mil">eric.barefoot.1@us.af.mil</a>
Claudia Basura*	AGEISS, Inc.	(661) 277-1479	<a href="mailto:claudia.basura.ctr@us.af.mil">claudia.basura.ctr@us.af.mil</a>
Karla Brasaemle	TechLaw, Inc.	(415) 762-0566	<a href="mailto:kbrasaemle@techlawinc.com">kbrasaemle@techlawinc.com</a>
Kimberly Coleman	AECOM	(916) 361-6406	<a href="mailto:kimberly.coleman@aecom.com">kimberly.coleman@aecom.com</a>
<b>Kevin Depies</b>	<b>Cal/EPA DTSC</b>	<b>(916) 255-6547</b>	<a href="mailto:kevin.depies@dtsc.ca.gov">kevin.depies@dtsc.ca.gov</a>
<b>Chris Dirscherl</b>	<b>U.S. EPA, Region 9</b>	<b>(415) 972-3315</b>	<a href="mailto:dirscherl.christopher@epa.gov">dirscherl.christopher@epa.gov</a>
James Elliot*	Tetra Tech Inc.	(805) 681-1355	<a href="mailto:james.elliott@tetrattech.com">james.elliott@tetrattech.com</a>
<b>Christina Guerra</b>	<b>Cal/EPA LRWQCB</b>	<b>(760) 241-7333</b>	<a href="mailto:christina.guerra@waterboards.ca.gov">christina.guerra@waterboards.ca.gov</a>
Jennifer Harting	Oneida Total Integrated Enterprises (OTIE)	(805) 585-6395	<a href="mailto:jharting@otie.com">jharting@otie.com</a>
Cecil Irby*	OTIE	(210) 712-2197	<a href="mailto:cirby@otie.com">cirby@otie.com</a>
Manish Joshi	AECOM	(210) 452-1024	<a href="mailto:manish.joshi@aecom.com">manish.joshi@aecom.com</a>
Robert Kohlhardt*	AECOM	(916) 361-6419	<a href="mailto:robert.kohlhardt@aecom.com">robert.kohlhardt@aecom.com</a>
<b>Bruce Lewis</b>	<b>Cal/EPA DTSC</b>	<b>(916) 255-6648</b>	<a href="mailto:bruce.lewis@dtsc.ca.gov">bruce.lewis@dtsc.ca.gov</a>
David Manriquez*	Alaniz Associates Corp.	(909) 289-9562	<a href="mailto:david@alanizassociates.com">david@alanizassociates.com</a>
Craig Nathe*	AFCEC/CZOW	(661) 277-1945	<a href="mailto:craig.nathe@us.af.mil">craig.nathe@us.af.mil</a>
<b>Alonzo Poach</b>	<b>Cal/EPA LRWQCB</b>	<b>(760) 241-7365</b>	<a href="mailto:alonzo.poach@waterboards.ca.gov">alonzo.poach@waterboards.ca.gov</a>

<u>Name</u>	<u>Organization</u>	<u>Phone Number</u>	<u>E-mail</u>
Leilani Richardson	JT3 (Recorder)	(661) 277-5394	<a href="mailto:leilani.richardson.ctr@us.af.mil">leilani.richardson.ctr@us.af.mil</a>
Peter Robles	AGEISS Inc.	(661) 277-1960	<a href="mailto:peter.robles.1.ctr@us.af.mil">peter.robles.1.ctr@us.af.mil</a>
Mike Rohall*	AFCEC/CZOW	(661) 277-1439	<a href="mailto:michael.rohall@us.af.mil">michael.rohall@us.af.mil</a>
Nash Saleh*	AFCEC/CZOW	(661) 277-1437	<a href="mailto:nashat.saleh@us.af.mil">nashat.saleh@us.af.mil</a>
<b>Paul Schiff</b>	<b>AFCEC/CZOW</b>	<b>(661) 277-1469</b>	<b><a href="mailto:paul.schiff@us.af.mil">paul.schiff@us.af.mil</a></b>
Harvinder Singh*	AECOM	(713) 267-3227	<a href="mailto:harvinder.singh@aecom.com">harvinder.singh@aecom.com</a>
Thomas Skaug*	Cal/EPA DTSC	(916) 255-6524	<a href="mailto:thomas.skaug@dtsc.ca.gov">thomas.skaug@dtsc.ca.gov</a>
Julia Tseng	AFCEC/CZOW	(661) 277-1415	<a href="mailto:julia.tseng@us.af.mil">julia.tseng@us.af.mil</a>
Mark Wanek	OTIE	(805) 585-6397	<a href="mailto:m.wanek@otie.com">m.wanek@otie.com</a>

\*Participated by phone.

3. **Introduction.** Mr. Schiff asked everyone to introduce themselves and asked if there were any comments regarding the 22 February 2017 RPM meeting. Mr. Poach asked if the Site 25 Well Installation Letter Work Plan can include the sampling of established wells between the OU6 and Site 25 plumes as part of the effort. Mr. Joshi said the Air Force may be able to sample additional wells while they are installing the new Site 25 wells.

4. **Status of RPM Meeting Minutes.** Ms. Richardson presented the Air Force's tracking spreadsheet for the RPM meeting minutes, which was provided to the RPMs with the draft October 2016 RPM minutes on 2 February 2017. She noted that DTSC is reviewing the November 2015 minutes to ensure their concerns were accurately captured on the conclusions regarding the Site 25 lakebed well installation and aquifer test. The RPMs provided their final approval on the 30 March, 26 April, and 18 May 2016 meeting minutes for signature.

5. **Review Action Items from Previous RPM Meetings.** Ms. Richardson presented the Draft 12 January 2017 RPM Action Items spreadsheet (Attachment 2).

a. Regarding Action Item 1—U.S. Geological Survey (USGS) presentation of the Air Force Research Laboratory, Detachment 7 (AFRL) geophysical survey—Mr. Schiff said Mr. Gillespie advised waiting until the May 2017 RPM meeting at Edwards AFB because USGS should be at the base performing work during that timeframe.

b. The RPMs agreed to close Action Items 2, 3, 4, 5, and 8.

c. Mr. Depies requested Action Item 7—Site 31 documents—remain open until he has an opportunity to review the reports Ms. Basura provided to him via e-mail on 13 January 2017.

d. Regarding Action Item 6—coordinating with DTSC to schedule a teleconference to update Ms. Campbell on the Operable Unit (OU) 1/8 lakebed fieldwork activities—Mr. Elliot reported that he e-mailed Mr. Depies on 18 January 2017 to schedule a suitable time, but has not received a response. Mr. Depies said he will make a note to review his e-mails and respond to Mr. Elliot's e-mail.

e. Action Item 9—gradient evaluations at OU6 and Site 25—was not discussed at the 22 February RPM meeting because of time constraints, so the RPMs agreed to address the topic at the April 2017 RPM meeting instead.

f. For Action Item 11— add upcoming OU6 documents to the Federal Facility Agreement (FFA) Schedule—Ms. Coleman provided the RPMs with a draft list of documents with projected submittal dates.

(1) Mr. Schiff mentioned that the Air Force began including a default Remedial Action Work Plan (RAWP) Addendum to follow each Five-Year Review (FYR) document in the FFA Schedule, per a request from a former U.S. EPA RPM. He explained that dates for the default RAWP Addendums are chosen arbitrarily, so the Air Force is forced to justify an extension request, even in cases where a RAWP Addendum is unnecessary. Mr. Schiff noted that a similar situation occurred with the OU6 RAWP Addendum, which was due in April 2017 according to the FFA Schedule, but could not be completed because of ongoing studies at OU6.

(2) Mr. Poach said the Second OU6 FYR stated that *in situ* chemical oxidation (ISCO) activities should resume by 2017, but according to the draft OU6 document list, it appears ISCO activities will not resume until 2018. Ms. Coleman explained that the milestones in the U.S. EPA concurrence letter said the Air Force needs to delineate the plume in 2017 and evaluate different technologies to provide recommendations for field implementation. She confirmed that the remedial technology evaluation will look at different varieties of ISCO and how they can be implemented at OU6, but no test studies will be conducted. Ms. Brasaemle noted that the U.S. EPA concurrence letter requested the Air Force look into ISCO technologies that minimize the potential spread of contamination between two occupied OU6 buildings—Buildings 4806 and 4807. Mr. Schiff recalled that the Air Force already conducted a vapor intrusion assessment on both buildings. Ms. Brasaemle responded that the RPMs are concerned about injections into the source area possibly pushing higher concentrations under the buildings. Mr. Poach recalled the RPMs' concern was the reason the Air Force planned to evaluate passive or time-release technologies, and Mr. Schiff said the Air Force will take that into consideration during the evaluation.

(3) Ms. Coleman offered to present elements of the OU6 Plume Delineation Letter Work Plan at the April 2017 RPM meeting. Mr. Dirscherl asked Ms. Coleman to provide him with some background material or references prior to the meeting. Ms. Coleman explained that the plume delineation effort is expected to occur in the summer of 2017 and will include direct-push samples and step outs. After the effort is complete, the Air Force will generate a report recommending placement of groundwater monitoring (GWM) wells. Ms. Coleman reminded the RPMs that, at the November 2016 RPM meeting, there was consensus that the Air Force only had to recommend well placement by December 2017 in order to meet the intent of one of the milestones in the U.S. EPA concurrence letter on the Second OU6 FYR. Mr. Depies asked why the Air Force has not defined the plume sooner. Ms. Coleman responded that the Air Force already installed wells to try to define the plume at OU6 based on RPM input, and data results from those wells raised more questions. Therefore, the Air Force is taking a more aggressive approach to collect more than 25 direct-push samples on the lakebed. Mr. Depies commented that the new wells will not be installed for 18 months, to which Mr. Lewis replied that the delay will be worthwhile if the direct-push data helps ensure better placement of the new wells.

Ms. Guerra noted that the Air Force will not be applying any form of groundwater treatment until late 2018. Ms. Coleman explained that treatment will be implemented in late 2017 or early 2018 at the source area. Mr. Depies advised that treatment be applied no later than anticipated.

(4) Mr. Schiff recommended Ms. Coleman come to the April 2017 RPM meeting with proposed well locations, which can be adjusted by the direct-push results—a process that proved successful with the installation of new OU1/8 GWM wells. The RPMs recommended the OU6 Plume Delineation Letter Work Plan include recommendations for GWM well placement along with a note that the locations may change based on the cone-penetrometer test (CPT) groundwater sampling results. Final well placements may be selected during a technical working group meeting after the CPT results have been analyzed. Mr. Depies said the Air Force will need to reference an established quality assurance project plan (QAPP) for the majority of information that needs to be documented. Mr. Elliot reminded the RPMs that a work plan was already in place for the new OU1/8 GWM wells, which is not the case for the OU6 lakebed wells. Ms. Coleman noted that weather conditions and a lack of funding may delay the well installation. The RPMs asked the Air Force to install the OU6 lakebed wells before the winter of 2017. Mr. Schiff recommended Ms. Coleman create a Gantt chart to show the timeline of new OU6 documents and field activities. The RPMs agreed to skip a draft final document and shorten the review cycles of the OU6 Plume Delineation Letter Work Plan, even though it is considered to be a primary document, to facilitate a faster turnaround of the document. Mr. Dirscherl asked if the OU6 Well Installation Report and the Remedy Performance and GWM Report can be combined. Ms. Coleman explained that the RPMs only receive Final OU6 Remedy Performance and GWM Reports, whereas the OU6 Well Installation Report will be issued to the RPMs as a draft and a final. Mr. Dirscherl said he will respond to the Air Force's request for an extension on the OU6 RAWP Addendum. The RPMs disagreed with Ms. Coleman's suggestion to delete all default RAWP Addendums from the FFA Schedule.

g. Mr. Barefoot reported on Action Item 12—AFRL Arroyos Settlement Agreement—saying that the Air Force added a publication date to the document, removed the “Draft” watermark, and specified when actions were implemented. Mr. Barefoot said a transmittal letter has been staffed for Mr. Ian Smith's signature. Mr. Smith is coordinating with Air Force attorneys on a position statement for the remaining disputed items. Mr. Barefoot estimated that the transmittal letter should be signed by the end of March 2017. Mr. Schiff informed Mr. Barefoot that Ms. Patrice Copeland is the new Dispute Resolution Committee (DRC) member for the Water Board. The Water Board RPMs said they will provide Ms. Copeland's contact information via e-mail.

h. As part of an ongoing action item, the Air Force updated the RPMs on upcoming fieldwork activities at Edwards AFB:

(1) Mr. Schiff reported that the Air Force is still waiting for dry conditions to install five GWM wells on Rogers Dry Lakebed as part of an ongoing OU1/8 effort. He expected the fieldwork to resume in May or June 2017.

(2) Dr. Saleh announced that the Air Force plans to start soil sampling at Sites 39 and 270, the former open burn/open detonation (OB/OD) areas. Ms. Guerra asked about the status of Monitoring Well 13-MW52 at the South AFRL. She said the RPMs are in agreement to proceed with the Air Force's original proposed location, which is approximately 1,000 feet from the

boundary of the South AFRL Containment Zone. Mr. Joshi said he will take that as verbal concurrence from the RPMs to start the well installation. Mr. Depies commented that there is still uncertainty about the groundwater flow direction of the Site 37 plume, which may be a data gap that needs to be addressed later.

(3) Mr. Elliot reported that the 2017 monitoring round for AFRL groundwater areas are expected to start in April or May 2017. He said the sampling was already approved by the RPMs in the Final Basewide GWM Sampling and Analysis Plan (SAP) Volume III for OU4/9. Mr. Elliot said an e-mail will be sent to the RPMs when the Air Force plans to mobilize in the field.

(4) Mr. Joshi reported that the Air Force is continuing fieldwork at Site 3, a former landfill in the Main Base area. Once fieldwork is complete, the Air Force will issue a revised work plan to update the RPMs on the completed fieldwork, which will include a proposed plan to address the western portion of the landfill.

(5) Mr. Joshi reported that the Site 5 Carbon Tetrachloride Data Gap Letter Work Plan was submitted to the regulators. The Water Board and DTSC had requested sampling for n-nitrosodimethylamine (NDMA) and 1,4-dioxane. The Air Force selected a few suspect wells, but only trace hits below notification levels were found. Mr. Joshi said a data gap remains to delineate the downward extent of carbon tetrachloride at the site.

(6) Ms. Guerra recalled that she sent Ms. Hobbs an e-mail to set up a teleconference to discuss the Site 86 sparging, and Mr. Joshi said they can schedule the teleconference as soon as Ms. Hobbs returns to the office. Mr. Lewis noted that DTSC has an issue with the Site 86 Annual Remedial Action Status Report (ARASR), specifically the layout of the document, which made it difficult to determine whether the Air Force was in compliance. Ms. Guerra agreed, saying she did not think the Air Force was following the decision rules from the Site 86 RAWP. All of the regulatory agencies agreed that some of the sparging points listed in the Site 86 ARASR need to remain in operation. The RPMs agreed that the Air Force needs to document changes to the decision rules in a Site 86 RAWP Addendum. Mr. Joshi said he will coordinate with Ms. Hobbs to schedule a Site 86 teleconference, tentatively set for 14 March 2017 at 9 a.m. Pacific Standard Time.

(7) Mr. Barefoot reminded the RPMs that the Air Force needs to keep on track in order to submit the Site 5 Carbon Tetrachloride Feasibility Study before the Performance-Based Remediation (PBR) contract ends in September 2018.

**5. Review RPM Document Priority List.** Mr. Depies presented the 21 February 2017 Edwards AFB Regulator Document Review Status/Priorities (Attachment 3).

a. Mr. Depies asked if any of the documents need to be designated as a higher priority. Mr. Schiff responded that the Site 5 Carbon Tetrachloride Data Gap Letter Work Plan needs to be a priority in order to meet contract deadlines.

b. Ms. Guerra asked about the priority of the Basewide GWM SAP Volume V for Site 25, which led to a discussion of the OU designation for Site 25. Mr. Schiff explained that the formal

process of merging OU1 and OU8 will be documented in the OU1/8 FS Addendum. The Air Force is already using the OU1/8 designation in GWM reports. Mr. Depies said the change in designation needs to be noted in the GWM reports, and Mr. Manriquez confirmed that the Draft 2015 OU1/8 GWM Report contains that language. The RPMs agreed to remove the OU designation for Site 25 in future references.

c. Mr. Poach said his review of the Draft 2015 OU1/8 GWM Report will be late because of his current workload. Mr. Depies said DTSC reviews of other documents may also be delayed because he is spending up to 80 percent of his time promulgating the new regulation for perchloroethene (PCE).

d. Referring to Volumes I and II of the Sitewide Vapor Intrusion (VI) Assessment Reports (Eleven Buildings and Buildings 1807 and 1830), Mr. Schiff stated that the Air Force plans to redraft Volume II so that it is a more comprehensive assessment. Mr. Singh said, based on RPM comments, the Air Force is consolidating data from previous VI reports into a revised Volume II. The RPMs agreed they do not need to review the Air Force's response-to-comments (RTCs) before receiving the revised Volume II report. Mr. Schiff said he prefers the RPMs not take 60 days to review the revised document. Mr. Depies said he will try to help with an accelerated review, and Mr. Schiff said a technical working group meeting may be required. Mr. Singh asked the RPMs to provide comments on the table he sent in January 2017 so that he may address all RPM concerns in the revised document. Mr. Schiff asked Mr. Singh to resubmit the table to the RPMs for comment.

e. The RPMs reviewed the Air Force's comprehensive document tracking spreadsheet to determine the documents expected to be submitted to them before the April 2017 RPM meeting. Mr. Depies asked that the spreadsheet be sent to him so he can review it in greater detail for use in planning his workload.

#### **6. Status of Formal Disputes: South AFRL ESD and Arroyos ROD.**

a. The RPMs noted the AFRL Arroyos Record of Decision (ROD) dispute was adequately covered during the review of RPM action items (refer to Section 4.g). Mr. Barefoot clarified that the letter being staffed for Mr. Smith's signature will propose to schedule a DRC meeting after the Air Force issues a letter clarifying their position on the remaining three disputed items.

b. Mr. Dirscherl announced that he is trying to set up a Senior Executive Committee (SEC) meeting for the South AFRL dispute. Mr. Depies reported that DTSC received several comments on the pre-draft toxicity criteria regulation, and they are in the process of making changes to the document. He noted that DTSC may or may not send out another pre-draft for public comment—a path forward is currently being discussed at higher levels in DTSC. Mr. Dirscherl reported that the U.S. EPA submitted their quarterly update of the South AFRL dispute during the week of 15 February 2017, and the RPMs should have all received a copy of the report.

## 7. Technical Working Group Session: CRP Sites, Documentation and Applicability to CERCLA Sites.

a. Mr. Schiff provided background information on the Compliance Restoration Program (CRP) sites, saying that in the 1990s, every site at Edwards AFB was managed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In 2002-2003, the U.S. EPA requested that petroleum-only sites be excluded from the CERCLA program. Therefore, the Air Force moved petroleum-only sites that contained no CERCLA contaminants into the CRP, which was managed by Kern County. In 2013, the county relinquished oversight of the CRP sites to the Water Board. During the process of applying to close CRP sites under the Water Board's Low Threat Closure Policy, the Air Force discovered commingling of CERCLA contaminants with petroleum in the groundwater at Sites 20, 21, and 24. As a result, the Air Force asked the Water Board to approve closure of the soil at Sites 20 and 24. The Air Force decided to transfer Site 20 and 24 groundwater, and Site 21 soil and groundwater, back into the CERCLA program under OU1/8.

b. Mr. Dirscherl reported that the U.S. EPA does not have an immediate need or requirement to transfer the CRP sites into the CERCLA program; the RPMs have the authority to decide as a group how to proceed with cleanup at the sites. He added that, even if the sites move into CERCLA, state-run programs can continue to address the cleanup.

c. Ms. Guerra explained that, in 2014, the Water Board received Corrective Action Plans (CAPs) for eight CRP sites from the Air Force. All of the CAPs requested soil-only closures. At the time, Water Board management agreed to consider closing one type of media, but further evaluation of the Low Threat Closure Policy led to the conclusion that the Water Board cannot support a split-media closure of a site. Therefore, Ms. Guerra provided comments on the Site 24 Case Closure Request Report (CCRR) to recommend closure of both media under the Low Threat Closure Policy, contingent on the Air Force's ability to provide a natural attenuation timeframe for the 1,2-dichloroethene (DCE). Mr. Joshi asked if there are any issues with Ms. Guerra's proposed path forward for Site 24, and the RPMs had no objections.

d. Mr. Singh presented a briefing titled *Technical Working Group Session—Inclusion of CRP Sites 20 (Groundwater), 21 and 24 (Groundwater) into CERCLA* (Attachment 4). Mr. Schiff responded to Ms. Guerra's question that the Site 20 GWM wells were sampled as part of the OU1/8 comprehensive sampling event. Mr. Schiff added that previous investigations performed at CRP sites were performed in accordance with CERCLA Quality Assurance Project Plans (QAPPs). Mr. Singh said the Air Force can provide additional reference documents (Attachment 5) to the U.S. EPA and DTSC, if the sites are transferred into the CERCLA program.

e. Mr. Depies stated that DTSC has full confidence in the Water Board's ability to conduct investigations of the CRP sites without DTSC involvement, if the RPMs decide to keep the sites under the CRP. He added that DTSC does not have a requirement to move the sites into the CERCLA program as a result of commingling between the petroleum and CERCLA contaminants.

f. When Mr. Singh presented the 2016 GWM sampling data for Site 20 (Attachment 6), Mr. Depies asked the origin of the high concentrations of trihalomethanes. The RPMs



speculated it might be from a breakdown of carbon tetrachloride in the area. Ms. Guerra noted that the 2016 data had not been included in the Site 20 CCRR, and Mr. Schiff explained the data was excluded because the Air Force planned to address the groundwater at Site 20 under the CERCLA program. Ms. Guerra responded that the Site 20 plumes have never been drawn as being commingled with the North OU1 plume. Mr. Kohlhardt explained that the Air Force believes the TCE and non-petroleum products originate from a drainage ditch to the north of Site 20.

g. Ms. Guerra asked if the drainage ditch is discussed in the Site 20 CCRR because she recalled that the TCE source was attributed to Ramp 12. Mr. Singh explained that chemicals from activities that took place at Ramp 12 were drained into the ditch. Mr. Poach asked whether the chemicals were driven across the Ramp 12 parking lot in order to be discharged into the drainage ditch. Mr. Schiff said the flow from Ramp 12 has historically traveled toward the drainage ditch. Mr. Poach asked the flow of the drainage ditch and Mr. Singh responded that the flow direction of the drainage ditch is toward Site 58. Mr. Depies asked why there are no wells around the ditch if it is considered to be a source of contamination, and Mr. Poach asked if the ditch or Ramp 12 has been or will be identified as a site. Mr. Singh confirmed that Ramp 12 has been identified as the source for the North OU1 plume in several CERCLA documents, including the 2012 OU1/8 GWM Report. Mr. Joshi asked Mr. Singh to provide the RPMs with a list of documents where Ramp 12 has been identified as a contaminant source. Mr. Depies said the drainage ditch does not seem to have been investigated, but may be the source for high trihalomethane concentrations present in one of the Site 20 wells. The RPMs speculated that petroleum products at Site 20 were degrading carbon tetrachloride, but no one recalled any detections of carbon tetrachloride at Site 20. Mr. Singh said he would check the historical records for any detections.

h. Ms. Guerra declared that Site 20 is not ready for closure. She explained that the Water Board would like to see treatment of the benzene, which should also treat any TCE or other solvents present at the site, thereby allowing full closure of the site. Ms. Guerra said she does not want to transfer the site into the CERCLA program, and Mr. Schiff responded that he feels Site 20 should be transferred. Mr. Kohlhardt asked if treatment at the site will trigger an automatic transfer of the site into CERCLA. The RPMs disagreed. Ms. Guerra explained that treatment would focus primarily on benzene, and TCE concentrations are low enough not to warrant transfer into CERCLA. Mr. Joshi asked if the presence of high chloroform will trigger a move into CERCLA. Ms. Guerra said that would depend on the source of the chloroform, which is a determination that requires further investigation. The RPMs speculated whether the chloroform detections are anomalous or coming from something other than carbon tetrachloride degradation. The RPMs agreed carbon tetrachloride may be present in the groundwater, but undetectable because of the high concentrations of other constituents. Ms. Brasaemle noted that there must be high concentrations of carbon tetrachloride, based on the 3,200 micrograms per liter ( $\mu\text{g/L}$ ) of chloroform at Monitoring Well 20-MW17. Mr. Kohlhardt said historical data shows chloroform concentrations as high as 30,000  $\mu\text{g/L}$  in 2012 at Site 20. He confirmed that there were no detections of carbon tetrachloride in 2012, but added that it may have been masked by higher concentrations of other constituents. Mr. Depies asked about the possibility of a chloroform source. The Air Force noted that chloroform concentrations began showing up at the same time ISCO treatments were being conducted at Site 20. Ms. Brasaemle researched online to find that chloroform is used in fire extinguishers, to make resins, and as a solvent for oils and

rubber. She said the presence of chloroform might also be explained if those types of activities were performed at Site 20 in the past.

i. Mr. Schiff asked the regulators to explain why the Air Force should keep Site 20 in CRP. Mr. Depies replied that there is no strong indication of commingling, and the regulators prefer the Air Force to address Site 20 under CRP. Mr. Schiff noted that keeping the site under CRP does not guarantee a quicker cleanup response than if it were to be managed under CERCLA. Ms. Guerra asked if Site 20 was the location where the Air Force reported acidic conditions resulting from ISCO treatment. Mr. Singh said he will review the data and get back with Ms. Guerra. Mr. Schiff recalled that when ISCO—specifically using activated persulfate—was performed at some of his sites, the groundwater’s potential of hydrogen (pH) tended to drop.

j. The regulatory agencies agreed that they prefer to keep Site 20 in CRP. Ms. Guerra added that she needs at least one more round of Site 20 groundwater data, and she needs to check with her management to ensure that more than one sampling round is not necessary.

k. Mr. Barefoot asked if the RPMs will allow the Air Force to abandon the Site 20 wells once a CCRR is approved. Mr. Schiff said that is the standard procedure. Ms. Guerra replied that well abandonment is at the Air Force’s discretion.

l. The RPMs agreed that the Air Force will provide the Water Board with the 2016 groundwater data for Site 20; and Ms. Guerra will review the data, talk with her management, and provide an update at the April 2017 RPM meeting. The RPMs agreed that if the Air Force can show decreasing trends of all constituents at Site 20, then a Low Threat Closure is preferred.

m. For scheduling purposes, the RPMs decided to continue the CRP discussion (reference Section 10) after the per- and polyfluoroalkyl substances (PFAS) Site Inspection (SI) Work Plan TWG (Section 9) concluded.

**8. Confirm Next RPM Meetings.** The RPMs agreed to meet 4-5 April 2017 in Oakland; 17-18 May 2017 at Edwards AFB; 11-12 July 2017 in Sacramento; and 23-24 August 2017 at Lake Tahoe. Mr. Schiff mentioned that the Air Force will offer Mr. Dirscherl a tour of ERP sites, tentatively scheduled for 16 May 2017. He invited the other RPMs to join the tour. Mr. Depies said Mr. Lewis may have to attend the 18 May 2017 Restoration Advisory Board (RAB) meeting in his place.

**9. PFAS QAPP Comment Resolution Technical Working Group.** Mr. Schiff introduced Ms. Tseng, the new Air Force program manager overseeing the PFAS effort at Edwards AFB. Ms. Harting and Mr. Wanek introduced themselves as the contractors handling the PFAS fieldwork effort.

a. Mr. Schiff said the Air Force issued the PFAS SI Work Plan in October 2016, received comments from regulatory agencies, provided responses to the comments, and are now presenting the RPMs’ review of the Air Force’s responses. Ms. Harting presented Appendix F figures from the PFAS SI Work Plan to assist with the review of comments (Attachment 7).

b. Water Board comments (Attachment 8):

(1) In response to the Water Board's Item #1, the Air Force disagreed with collecting surface water samples at the current Main Base Sewage Treatment Plant. Mr. Poach asked how the Air Force determined that Ponds 3 and 4 should be the only ponds sampled. Ms. Harting explained that Ponds 3 and 4 were the primary disposal ponds, which were filled before any of the other ponds were filled. Therefore, concentrations should be higher in Ponds 3 and 4, and representative of all of the treatment plant ponds.

(2) Mr. Poach added that the report was not clear about groundwater flow direction, which made it difficult to determine the downgradient wells. Ms. Harting responded that the Air Force will collect water-level data during the upcoming field effort to verify current groundwater flow direction.

(3) Mr. Poach accepted the Air Force's disagreement with his suggestion to collect surface water samples because of the ubiquitous nature of PFAS detections in the surface waters of North America.

(4) Ms. Harting confirmed that four wells near the treatment plant evaporation ponds will be sampled.

(5) Mr. Poach asked that the final document include the clarification that Ponds 3 and 4 were utilized before water was diverted into other ponds.

c. U.S. EPA comments (Attachment 9):

(1) In reference to the Air Force's response to Item #5 of the U.S. EPA's comments, Ms. Brasaemle noted that, although the Air Force added Worksheet #37—Data Usability Assessment—they did not revise the work plan to address the U.S. EPA's concerns about the need to include data quality assessment information in the Final PFAS SI Report. Ms. Brasaemle recommended the Air Force revise the work plan to indicate that the final report will discuss how data quality indicators, trends, and biases were evaluated, and provide sufficient information to support the data usability conclusions. Ms. Harting said she will consult with the Air Force's chemistry expert to address the U.S. EPA's concerns.

(2) Ms. Brasaemle said that U.S. EPA's Item #6 also needs a work plan revision to specify that the statistical tests for outliers that are discussed in Worksheet #37 will not be conducted for the PFAS effort.

(3) Mr. Dirscherl told Ms. Harting that he is amenable to e-mail exchanges to finalize revisions so that U.S. EPA comments are addressed in a timely manner. Ms. Brasaemle noted that the U.S. EPA also needs to have their Quality Assurance expert review Worksheet #36 before they can resolve comments related to the worksheet.

(4) Mr. Dirscherl asked if any of the Air Force installations are past the SI phase, where actions are being taken because of confirmed PFAS at significant concentrations. Dr. Anderson confirmed that there are up to 12 installations where some type of mitigation is ongoing, but they

are exclusively being performed as interim actions. He said the goal is to characterize and perform risk assessments to mitigate exposures, and then take a strategic pause before implementing cleanup remedies, which will require additional Air Force policy.

d. DTSC comments (Attachments 10 and 11):

(1) Mr. Depies announced that he has an overarching issue that remains, despite various comments he has expressed in previous meetings, regarding the limited scope of investigation for several of the PFAS sites and whether SI objectives are being met. He considered the goal for the SI to be to “confirm the presence or absence of PFAS from Air Force mediated aqueous film forming foam (AFFF) releases at the 24 SI areas.” Mr. Depies said the goal seems very ambitious—considering the magnitude of the conceptual site model (CSM) complexity—which is why he is concerned if the Air Force can meet the goal. Mr. Depies explained the specific issues with the PFAS sites include: uncertainty about the release locations and migration paths; uncertainty if the Air Force is sampling in the correct locations because of a limiting number of sample locations per site; low confidence that samples are being collected downgradient of a release location because of an insufficient understanding of groundwater flow direction; uncertainty if a release occurred in another location within a site because of the limiting number of borings per site; and logistical restrictions on boring locations. Mr. Depies recalled a site where DTSC asked the Air Force to sample at a location that contained established vegetation, but because the location is inaccessible to a drill rig, the Air Force will be forced to drill a distance away from where water seems to collect. Mr. Depies concluded that the limited scope of the PFAS investigation may adversely affect the RPMs’ ability to make a determination for no further action (NFA) at the PFAS sites.

(2) Mr. Depies referred to DTSC Item #8h regarding Hangar 1874, and questioned if the Air Force’s proposed sampling locations are truly downgradient of the release site. He admitted that Monitoring Well 18-MW47 can be construed as due east of Hangar 1874, and therefore downgradient. Ms. Harting explained that the Air Force will also collect a water sample at Soil Boring 1874-SB04. Ms. Brasaemle added that the borehole water sample was included to address the U.S. EPA’s comment for the need to distinguish the origin of PFAS between Buildings 1874 and 1881. Mr. Depies clarified that, even though Monitoring Well 18-MW47 can be considered downgradient of Hangar 1874, there may be lingering uncertainty for this site. He said the Air Force does not need to make any changes to the work plan to address his comment—unless they plan to install a new well, which is not in the scope of work.

(3) Mr. Depies referenced DTSC Item #8i, saying that he did not see any groundwater sampling locations downgradient of Building 1881. He said he was not requesting the Air Force to change anything in the work plan; he only highlighted the comment to make a point that significant data gaps may remain after the SI is complete. Ms. Brasaemle noted that the only wells downgradient of Building 1881 were dry. Mr. Depies suggested the Air Force check to see if water is present in downgradient wells now that recent rainfall events have occurred. Mr. Elliot said the Air Force confirmed in October 2016 that Wells 18-T02 and 18-T04 were dry. He added that another Site 18 water-level measurement is expected to take place in March 2017, and the Air Force can check on those two wells specifically to see if water has returned.

(4) Referring to DTSC Item #8n, Mr. Depies recommended adding TCE to the sampling regime for the borings being drilled near Building 1850. He said doing so will help address a potential data gap for volatile organic compounds (VOCs) at Site N7, which is part of OU6. Mr. Depies suspected the former fire station may be causing an elevated TCE concentration of 370 µg/L in Monitoring Well N7-MW16. Mr. Poach agreed that sampling near Building 1850 will help with the plume delineation effort for OU6. Mr. Depies reiterated his recommendation for the Air Force to perform a VOC analysis on at least one of the groundwater samples collected for Building 1850. He said if a VOC analysis is not performed, DTSC may have to request an investigation of the former fire station at a later date. Dr. Anderson, Ms. Harting, and Mr. Joshi agreed that the Air Force can perform a VOC analysis of a groundwater sample taken at Soil Boring 1850-SB01. Mr. Depies said that action will address his concern.

(5) For DTSC Item #8o, Mr. Depies explained that he had an issue confirming the information provided on the work plan maps. Specifically, he spent a substantial amount of time verifying a reference on groundwater flow direction in a cited document. He added that there should be an explicit reference on flow direction in the GWM reports, and asked that the Air Force be clearer when citing references so that the RPMs can easily find the information. Ms. Harting acknowledged the issue, saying the Air Force will work harder to make future references more specific.

(6) For DTSC Item #8p—the Boeing 720 Controlled Impact Demonstration (CID) area—Mr. Depies questioned the limited amount of samples in relation to the size of the CID area. Dr. Anderson explained that soil results may be non-detect if a sample is not taken in the immediate vicinity of the release. However, because the groundwater samples focus on the surface of the water table, usually some sort of detection occurs when a sample is collected within a general area. Dr. Anderson added that to be below the health advisory limit of 70 parts per trillion is very meaningful if a sample is taken within a half mile of any release discharge point. He concluded by saying the Air Force may need to identify additional sources during the Remedial Investigation (RI) phase, which is more extensive than the SI phase. Mr. Depies reiterated that taking three groundwater samples is very limiting for the overall area of concern. Ms. Brasaemle noted that firefighting foam generally sprays over a distance of tens to hundreds of feet. Mr. Robles explained the Air Force is not worried about the amount or locations of samples in the CID area because the Air Force sprayed firefighting foam over the entire CID area. Therefore, detections of PFAS are expected to be found, regardless of location or the amount of samples taken.

(7) In reference to DTSC Item #8r—former nozzle spray test area (FNSTA)—Mr. Depies asked that the location of Soil Boring FNSTA-SB01 be moved closer to the tree in the test area, which seems to be where water naturally collects. He recommended the Air Force collect a hand sample at a shallow depth under the tree. Dr. Anderson explained that collecting a soil sample in that location may not address DTSC's concern, so Mr. Depies proposed moving Soil Boring FNSTA-SB01 downgradient of the tree's location. The Air Force and RPMs agreed. Mr. Depies added that the Air Force should use their professional judgement before they collect the sample to verify if his suggestion to move the soil boring is sensible; otherwise, he advised the Air Force to keep the Soil Boring FNSTA-SB01 location in its original spot.

(8) In reference to DTSC Item #8u—the Pad 7 Outfall—Mr. Depies questioned if the Air Force was taking samples downgradient, considering the groundwater flow direction. He recommended the Air Force sample Monitoring Well 19-MW14. Mr. Depies asked why the Air Force prefers to sample two wells northeast of the detention pond—Monitoring Wells 19-MW15 and 19-MW16. Ms. Harting replied that both wells were chosen because they are screened across the water table, as described in the document’s sampling rationale. Because Monitoring Well 19-MW14 was screened at an interval within 10 feet of the water table, the Air Force agreed with Mr. Depies’ suggestion to collect a groundwater sample at Monitoring Well 19-MW14 instead of Monitoring Well 19-MW16.

(9) Mr. Skaug reiterated DTSC’s concern about the Air Force collecting enough data to justify NFA at the PFAS sites. He specifically referenced DTSC Items #9 and #15 regarding the soil under Hangar 1624, which was built on top of a release location and cannot be sampled, as was noted in the Summary of Findings document. Mr. Skaug added that DTSC will not concur with NFA at the current fire training area at Site 14, even if boring results are non-detect, because a liner was built on top of the release location. He explained that a sample could not be collected where the actual release occurred. Mr. Poach responded that the SI Work Plan states that all fire training facilities will be carried into the RI phase. Mr. Depies reiterated that DTSC may not concur with NFA if sample results are non-detect for PFAS.

(10) In reference to DTSC Item #19—which are similar to Items #26 and #28—Mr. Skaug questioned the location of the former fire training area at Site 14. He said historical documents show the training area in different locations, which is an uncertainty that warrants more exploration. Mr. Skaug recommended moving Soil Borings 14-SB02 and 14-SB03 to locations near the former fire training area to determine its exact location. Ms. Brasaemle noted that the original locations for Soil Borings 14-SB02 and 14-SB03 are necessary in order to document the overspray at the current fire training area. Mr. Poach asked if the Air Force will consider taking an influent sample from the Site 14 groundwater extraction and treatment system (GETS). The RPMs discussed the issue, but made no decision to use a GETS extraction well. After more discussion, Mr. Skaug and Mr. Depies agreed to leave the soil borings in their original locations, contingent on the belief that the fire training areas will go into the RI phase and uncertainties related to the former fire training area at Site 14 can be addressed then.

## **10. Continuation of Technical Working Group Session: CRP Sites, Documentation and Applicability to CERCLA Sites (continued from Section 7).**

a. Mr. Singh notified the RPMs that Volume II of the Sitewide Vapor Intrusion Assessment Reports (Eleven Buildings and Buildings 1807 and 1830) may be ready for Mr. Schiff’s review in March 2017. He then briefed the rest of the Air Force’s slide presentation (Attachment 4).

b. Ms. Guerra asked if the Air Force can confirm the presence of TCE commingled with benzene at Site 21. She noted that high concentrations of benzene may be masking the estimated concentrations of TCE that the Air Force is using to delineate the TCE plume. The Air Force and RPMs agreed to move Site 21 into CERCLA, and document the action with a memorandum for record. The memorandum will reference the February 2017 RPM meeting, include signature blocks for all of the RPMs to sign, and will be included as an appendix in the OU1/8 FS Addendum.

c. Mr. Joshi verified that the Water Board will approve a Site 24 CCRR if the Air Force provides a degradation curve for cis-1,2-DCE. Ms. Guerra confirmed, explaining that the cis-1,2-DCE is known to originate from Site 18. To address Mr. Kohlhardt's question about a Water Board comment on the draft Site 24 CCRR, Ms. Guerra explained that the Air Force needs to add two columns to the risk assessment for comparison purposes only: DTSC Human and Ecological Risk Office (HERO) screening levels and San Francisco Water Board Environmental Screening Levels (ESLs). The Air Force agreed, saying that a note will be added to the Site 24 CCRR saying the risk assessment additions are for comparison purposes only, not to be used to evaluate the site for closure.

d. The Water Board agreed that Site 24 can be closed for both soil and groundwater under the Low Threat Closure Policy, if the cis-1,2-DCE plume is monitored as part of Site 18 under CERCLA, using existing Site 24 wells to monitor groundwater concentrations.

e. To summarize a path forward, Mr. Joshi confirmed that in order to reach closure on Site 20 by September 2018, a revised CCRR needs to be submitted to the Water Board by March 2018, which means any issues on the site need to be addressed before January 2018. Ms. Guerra responded that the timeframe may fluctuate depending on her management's advisement of a path forward for Site 20. First, she needs to review the 2016 groundwater data for Site 20 and talk to her management. For Site 24, the Air Force will provide Ms. Guerra with responses to comments on the draft Site 24 CCRR and a redline final document.

f. The Air Force and Water Board decided to provide an update on Sites 20 and 24 at the April 2017 RPM meeting.

## **11. RPM Issues.**

a. Mr. Schiff mentioned that the conceptual site model (CSM) effort that is underway at Site 25 will also be applied to OU1/8, which may slightly delay the OU1/8 FS Addendum. He added that the Air Force plans to conduct scoping meetings for the OU1/8 FS Addendum to obtain RPM buyoff before the draft document is formally submitted for review.

b. Mr. Depies said that, while looking through the Draft PFAS SI Work Plan, he noticed an anomalous point where Monitoring Well N1-MW06 had lower TCE concentrations than Monitoring Well N1-MW07, which is a deeper well. He noted a similar situation with Monitoring Well N4-MW16 and asked for an explanation. The other RPMs reminded Mr. Depies that they discussed the discrepancy in concentrations at those wells during a previous meeting, which is why the OU6 plume delineation is underway and hydropunch samples will be taken in specific areas to address those concerns.

c. Mr. Depies raised a concern about groundwater wells that may be submerged underwater due to recent rainfall events at Edwards AFB, and asked if the seals on those wells are adequate. Mr. Poach used Monitoring Well 18-MW39 as an example, saying there is uncertainty if the well cap serves as an adequate seal to stop surface water from infiltrating the well. Mr. Depies asked the Air Force to make maintenance on lakebed wells a higher priority item. Mr. Elliot responded that the Air Force addresses maintenance issues on the wells to ensure there is a good seal. He

reminded the RPMs that well submergence is not a new issue because lakebed flooding is common during significant rainfall events at Edwards AFB. Mr. Elliot added that the Air Force is addressing the conditions of seals during routine well maintenance. Mr. Depies asked if infiltration is being factored into the analysis of data and if the Air Force is logging which wells are underwater to document where infiltration may be occurring. Mr. Elliot suggested that, during the fall 2017 sampling event, the Air Force can document any wells that appear to have seal issues. The RPMs noted that a visual inspection is not an accurate method for determining which seals may be leaking. Mr. Elliot asked how much effect infiltration will have on the results, which he felt may be nominal. Mr. Poach asked if the Air Force is installing watertight plugs on the wells. Mr. Elliot said he will need to check with a field supervisor. He informed the RPMs that long-term monitoring data can provide answers to their concerns. For example, if several lakebed wells experience a drop in concentration, a logical conclusion would be that fresh water infiltrated the wells. However, if concentrations remain the same, then a logical conclusion would be that lakebed flooding did not impact the wells. Mr. Elliot and Mr. Joshi said they will continue to monitor the conditions of well seals whenever they are performing well maintenance.

d. Mr. Lewis reported that he has issues with Site 86, which he hopes will be addressed during the 14 March 2017 teleconference with Ms. Hobbs (reference Section 5.h.iv).

e. Ms. Guerra did not have anything to report. Mr. Poach mentioned that the Water Board is very busy with their workloads. Ms. Richardson reported that state approval on additions to the current Joint Execution Plan (JEP) are under review by DTSC. Ms. Guerra said she will continue to charge to miscellaneous or project management tasks until the new tasks are approved.

f. Mr. Schiff reported that the Air Force met with the Water Board to look at pursuing an amendment of the Lahontan Basin Plan. The result of the meeting is that the Air Force does not have enough widespread total dissolved solid (TDS) concentrations to qualify for an amendment.

**12. Review New Action Items.** Ms. Richardson reported that most of the recorded action items were generated during the Site 25 Technical Working Group meeting on 22 February 2017. Those action items are recorded and tracked separately from the RPM action items. Two minor RPM items that will not be recorded or tracked are: 1) the Water Board will e-mail Ms. Copeland's contact information to the RPMs; and 2) the Air Force will provide the RPMs with the 23 February 2017 snapshot of the Air Force's Comprehensive Document Tracking Spreadsheet. Mr. Depies asked Ms. Richardson to automatically send a snapshot of the tracking spreadsheet after each RPM meeting.



PAUL A. SCHIFF  
Remedial Project Manager  
Edwards Air Force Base, CA



Attachments:

1. Edwards AFB RPM Meeting Agenda, 23 February 2017
2. Draft 12 January 2017 RPM Action Items Spreadsheet, updated 17 February 2017
3. RPM Document Priority List, 21 February 2017
4. Technical Working Group Session—Inclusion of CRP Sites 20 (Groundwater), 21 and 24 (Groundwater) into CERCLA, 23 February 2017
5. Tables 1, 2, and 3: Summary of Reports/Investigations for Sites 20, 21, and 24
6. Figure 2: Site 20 Benzene, 1,2-DCA, and TCE in Groundwater (2016), February 2017
7. PFAS SI Work Plan Appendix F Figures, 23 March 2016
8. Air Force RTCs to Water Board Comments on the Draft PFAS SI Work Plan, 22 February 2017
9. Air Force RTCs to U.S. EPA Comments on the Draft PFAS SI Work Plan, 22 February 2017
10. Air Force RTCs to DTSC (Depies) Comments on the Draft PFAS SI Work Plan, 22 February 2017
11. Air Force RTCs to DTSC (Skaug) Comments on the Draft PFAS SI Work Plan, 22 February 2017

Other handouts and/or presentations provided at the meeting are not attached.

## Edwards AFB RPM Meeting Agenda 22-23 February 2017

**Location:**

LRWQCB

15095 Amargosa Road, Bldg. 2, Ste 210

Victorville, CA 92394

**Call-In Number for 22-23 February:** (661) 277-6387*No access code required***WEDNESDAY, 22 FEBRUARY 2017**

See Ms. Duley's attached agenda

**THURSDAY, 23 FEBRUARY 2017****9 – 11:30 a.m.**

- Status of RPM Meeting Minutes (*5 min – Richardson*)
- Review Action Items from Previous RPM Meetings (*10 min – Richardson*)\*
  - Upcoming Field Activities (*10 min – AF PMs*)
- Review RPM Document Priority List (*20 min – Depies*)\*
  - Pending Documents (*10 min – RPMs*)
- Status of Formal Disputes: South AFRL ESD and Arroyos ROD (*10 min – RPMs*)
- Technical Working Group Session: CRP Sites, Documentation and Applicability to CERCLA Sites (*85 min – Schiff, Harvinder*)

**11:30 a.m. – 12:30 p.m.****LUNCH****12:30 – 2:30 p.m.**

- PFAS QAPP Comment Resolution Technical Working Group (*2 hours – Nathe, Basura*)

**2:30 – 2:45 p.m.****BREAK****2:45 – 3:25 p.m.**

- RPM Issues (*30 min – RPMs*)
- Confirm Next RPM Meetings (*5 min – RPMs*)
- Review New Action Items (*5 min – RPMs*)

\* Indicates a handout will be provided prior to the meeting.

Edwards AFB RPM Action Items  
(as of 12 January 2017)

LINE ITEM #	MEETING DATE	SUBJECT	SUSPENSE DATE	PERSON RESPONSIBLE	STATUS	DATE CLOSED	ACTION
1	12-Jan-17	Mr. Gillespie will schedule USGS presentation of AFRL Arroyos geophysical survey	23-Feb-17	John Gillespie	OPEN		On the agenda for 23 February 2017 RPM meeting
2	12-Jan-17	Ms. Richardson will ask for RPM input on each agency's core members for the Site 25 TWGs and RPMs have 1 week to respond	19-Jan-17	L. Richardson	CLOSED	20-Jan-17	
3	12-Jan-17	After Site 25 TWGs established, Mr. Gillespie will schedule a webinar with the University of Oklahoma expert. The webinar and a meet-up will take place prior to the February 2017 RPM meeting	23-Feb-17	John Gillespie	CLOSED	10-Feb-17	
4	12-Jan-17	The Air Force will send Mr. Dirscherl examples of letter work plans	21-Feb-17	L. Richardson	CLOSED	9-Feb-17	
5	12-Jan-17	Mr. Manriquez will provide the RPMs with an updated Site 25/basewide Google Earth layer	21-Feb-17	David Manriquez	CLOSED	15-Feb-17	
6	12-Jan-17	Mr. Elliot will coordinate with DTSC to schedule a teleconference to update Ms. Campbell on the OU1/8 lakebed fieldwork activities	23-Feb-17	James Elliot	OPEN		
7	12-Jan-17	Mr. Nathe will provide Mr. Depies with Site 31 documents	20-Jan-17	Craig Nathe	CLOSED	13-Jan-17 (Basura)	
8	12-Jan-17	Ms. Richardson will distribute the January 2017 POC list to the RPM group with a reminder about Ms. Brasaemle's new mailing address	20-Jan-17	L. Richardson	CLOSED	17-Jan-17	
9	<del>17-Nov-16</del> 12-Jan-17	Air Force will conduct gradient evaluations of long-screened wells (80-100ft) at OU6 and Site 25	<del>12-Jan-17</del> 23-Feb-17	Craig Nathe K. Coleman Yuanyuan Andren	OPEN		On the agenda for 23 February 2017 RPM meeting
10	<del>17-Nov-16</del> 12-Jan-17	Air Force will hold a PFC QAPP comment resolution TWG at the January 2017 meeting	<del>12-Jan-17</del> 23-Feb-17	Craig Nathe	OPEN		On the agenda for 23 February 2017 RPM meeting

LINE ITEM #	MEETING DATE	SUBJECT	SUSPENSE DATE	PERSON RESPONSIBLE	STATUS	DATE CLOSED	ACTION
11	<del>5-Oct-16</del> <del>17-Nov-16</del> 12-Jan-17	Air Force will add upcoming OU6 documents (generated from 2nd FYR comments/concurrence letter) to the FFA Schedule and DTS	<del>17-Nov-16</del> <del>12-Jan-17</del> 23-Feb-17	Craig Nathe K. Coleman	OPEN		Contract not awarded yet; will add documents once contract is in place
12	<del>5-Oct-16</del> 12-Jan-17	Water Board and DTSC will provide feedback on the AFRL Arroyos ROD Settlement Agreement. 1 week after receipt of RPM comments, AF will engage with DRC members regarding agreement. AF will add a date to the document when it is final, take "Draft" out of the watermark, and adjust the green sections regarding Bldg. 8753, specifying when the actions were implemented	<del>10-Oct-16</del> 23-Feb-17	Christina Guerra Kevin Depies	CLOSED on comments;  OPEN on finalization of document?		Ms. Richardson will follow up with Mr. Barefoot to check on status of DRC engagement (sent e-mail 30-Jan-17)
13	8-Jul-15	Submit reports to the RPMs as one or two electronic files maximum	N/A	AF Program Managers and Contractors	ONGOING		Ms. Brasaemle said she was receiving reports broken into several electronic files, which makes it difficult to search for things, especially in appendices.
14	21-May-15 revised 8-Jul-15	Ensure a transmittal letter accompanies every report submitted to the regulators	N/A	AF Program Managers and Contractors	ONGOING		8-Jul-15: Ms. Guerra said she is still not receiving cover letters with report submittals. Mr. Duong asked his group to ensure cover letters accompany all AF document submittals. 21-May-15: Mr. Mayer said a few reports he received were missing transmittal letters and he relies on them for due date and POC information.
15	21-May-15	Flag documents requiring a risk assessment for regulators	N/A	Ai Duong	ONGOING		Mr. Lewis asked if risk assessment documents can be highlighted in the transmittal letter; Mr. Mayer prefers a notification prior to receiving the document. Mr. Duong said he'd find a solution.

LINE ITEM #	MEETING DATE	SUBJECT	SUSPENSE DATE	PERSON RESPONSIBLE	STATUS	DATE CLOSED	ACTION
16	3-Apr-13	USE OF WORD "AQUIFER" - Contractors to be mindful of how they use the term "aquifer". The Water Board has many strict regulations when defining an "aquifer". If fractured bedrock is not capable of producing adequate flow, as defined by the State, then contractors should not refer to it as an aquifer.	ON-GOING	AF Program Managers and Contractors	ONGOING		Mr. Post asked contractors to not refer to water-bearing fractured bedrock as a 'bedrock aquifer.'
17	3-Apr-13	CONTRACTORS - Please provide enough information regarding the Professional Geologist's qualifications/background in the document explanation portion in the AF Cover letter, signature page or, the report documentation page (especially if no PG signature is included).	ONGOING	AF Program Managers and Contractors	ONGOING		Will include qualifications of the author in the report documentation pages, the preface of the report, or any form particular to each contractor's specifications.
18	22-Feb-13	CD of ALL PILOT STUDY REPORTS - To be included in all documents that reference these studies.	ONGOING	AF Program Managers and Contractors	ONGOING		
19	22-Feb-13	Make sure the use of the word bedrock, weathered bedrock, alluvium, and/or competent bedrock is adequately defined in the documents.	ONGOING	AF Program Managers and Contractors	ONGOING		10 Jul RPM Meeting - It was decided to leave this action item open until the PBR starts.

Edwards AFB RPM Action Items  
(as of 12 January 2017)

LINE ITEM #	MEETING DATE	SUBJECT	SUSPENSE DATE	PERSON RESPONSIBLE	STATUS	DATE CLOSED	ACTION
20	22-Feb-13	CONTRACTORS - Please include before and after plume maps in ALL reports. ***Before and after plume maps - NEED Consistent presentation*** (Healy)	ONGOING	AF Program Managers and Contractors	ONGOING		Ex. If there is a groundwater monitoring report, the contractor would include the previous one (from the year prior) and the current. This could apply to RI/FS as well.
21	7-Oct-10	AGMR/UFP QAPP CDs - Update all annual groundwater monitoring reports with a CD containing the latest UFP QAPP.	ONGOING	AF Program Managers	ONGOING		
22	8-Jul-10	Request extensions one week before due dates.	ONGOING	ALL	ONGOING		
23	22-Apr-10	AF will support Cal/EPA DTSC questions on NFA for Sites during RI. EPA will review Sites not included in RODs with DTSC.	ONGOING	AF Program Managers	ONGOING		
24	18-Feb-10	Upcoming field work: The Air Force Program Managers will send an email when fieldwork will be performed should the RPMs care to observe activities.	ONGOING	AF Program Managers	ONGOING		Mr. Schiff said the Military Munitions Response Program (MMRP) work is ongoing; Ms. Hobbs said OU2 has some routine operations ongoing. Ms. Nester said that drilling was beginning at Site 25 during the July 2012 RPM Meeting.
25	18-Feb-10 revised 26-Aug-12	Include explanation of divergence from CERCLA guidance and the FFA (Federal Facility Agreement) in document transmittal letters.	ONGOING	AF Program Managers	ONGOING		

**Edwards AFB**  
**Regulator Document Review Status/Priorities**

Updated 2/21/17 (pre RPM meeting)

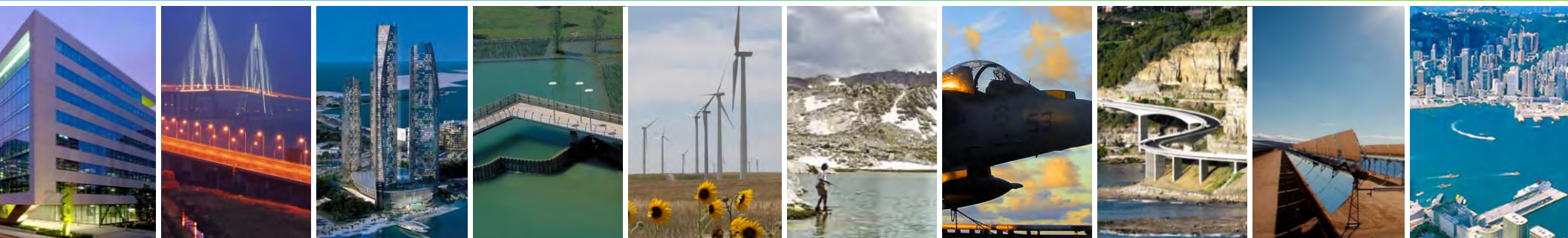
No.	Documents Currently Under Review	Primary?	Due Date	Comments
1	NE AFRL FS (RTCs and redline)	P	TBD	Currently low priority considering outstanding Arroyos and South AFRL disputes that impact this document.
2	OU 1/8 FS Workplan (RTCs and redline)	P	11/26/16	Will discuss further in 4/23/17 RPM meeting
3	Site Wide Vapor Intrusion Buildings 1807 & 1810 - Interim Responses to Comments		12/12/16	DTSC unsure if review is needed or if new document is forthcoming
4	Site 20 CCRR (WB Only Review)		1/13/17	On-going review.
5	MMRP AL505-3/AL505-5 CSE Phase II Report (dft)	P	2/28/17	Initial due date 2/14/2017. DTSC Extension Request 2/26/2017.
6	PFC SI QAPP (RTCs)		2/23/17	Prepare for comment resolution in 4/23/17 RPM meeting
7	OU 2 Site 76 ARASR (dft)		2/27/17	
8	OU 2 Site 86 ARASR (dft)		2/27/17	WB provided comments 2/16/17
9	Site 225 CCRR (WB Only Review)		3/7/17	On-going review.
10	Site 5 Carbon Tet FS Data Gap Letter Workplan (dft)		3/17/17	
11	NE AFRL 2015 GMR (dft)		4/8/17	
12	South AFRL 2015 GMR (dft)		4/8/17	
13	OU 1/8 2015 GMR (dft)		4/10/17	
14	BW SAP Vol V, Site 25 Long-Term Optimization Plan Vol. V (dft)	P	4/17/17	
15	SAFRL Well Installation & Indoor Air Sampling Report (dft)	P	4/15/17	

Pending Documents			Distribution for Regulator Review

# Technical Work Group Session – Inclusion of CRP Sites 20 (Groundwater), 21 and 24 (Groundwater) into CERCLA

## Operable Units 1 and 8, Edwards Air Force Base, California

### RPM Meeting – February 2017



23 February 2016

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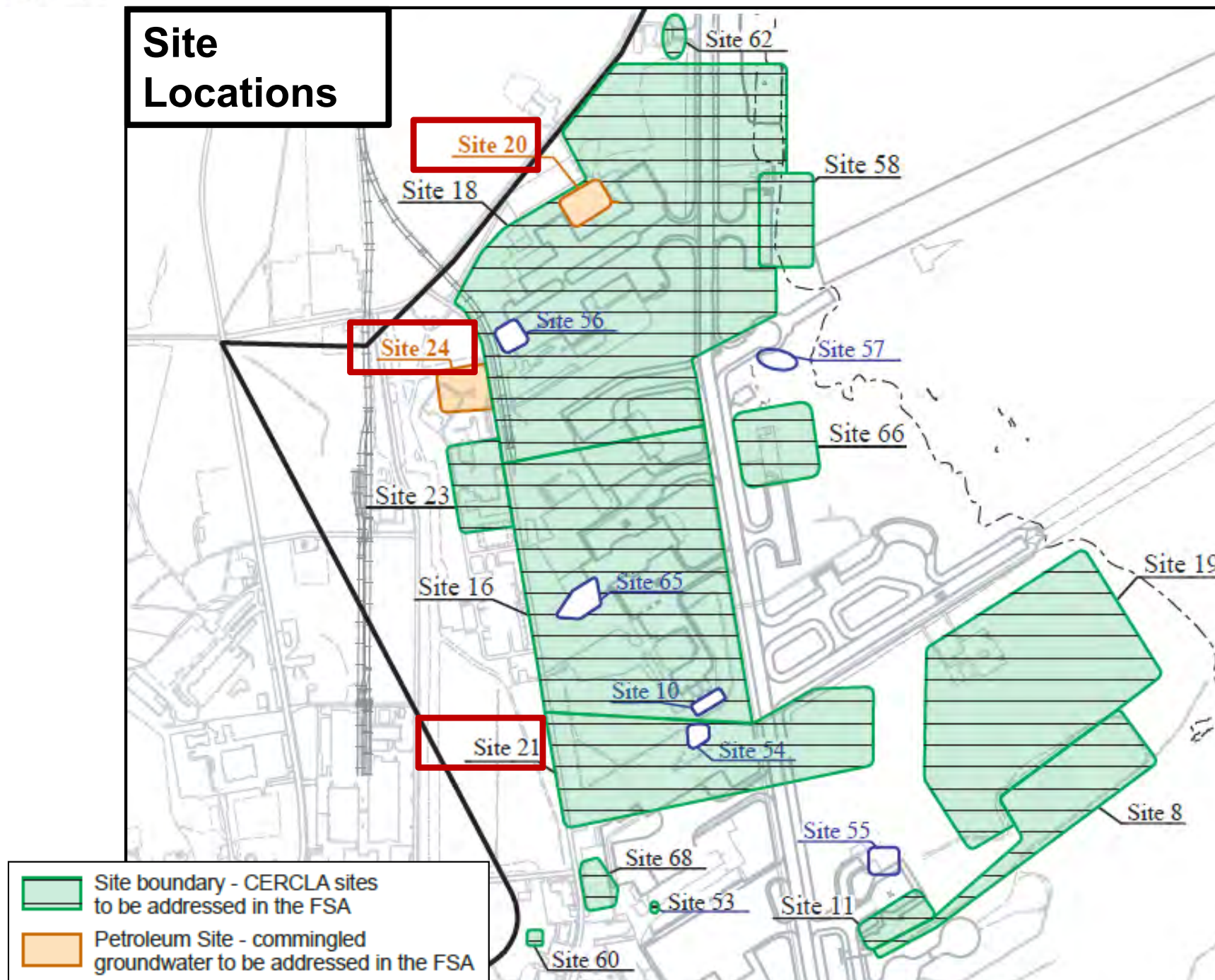
# Outline

- Background
- CRP Sites Summary
  - Site 20
  - Site 21
  - Site 24
- Path-Forward Discussion

# Background

- CRP Sites proposed to be addressed under CERCLA and OUs 1/8 FS Addendum
  - **Site 20 (Groundwater only)**
  - **Site 21 (Soil and Groundwater)**
  - **Site 24 (Groundwater only)**
- Petroleum impacted groundwater at Sites 20, 21 and 24 commingled with chlorinated hydrocarbons
- Soil remediation at Sites 20 and 24 conducted under CRP and the Soil Case Closure Reports currently under review by the RWQCB.

# Site Locations



# Site 20 Brief Summary

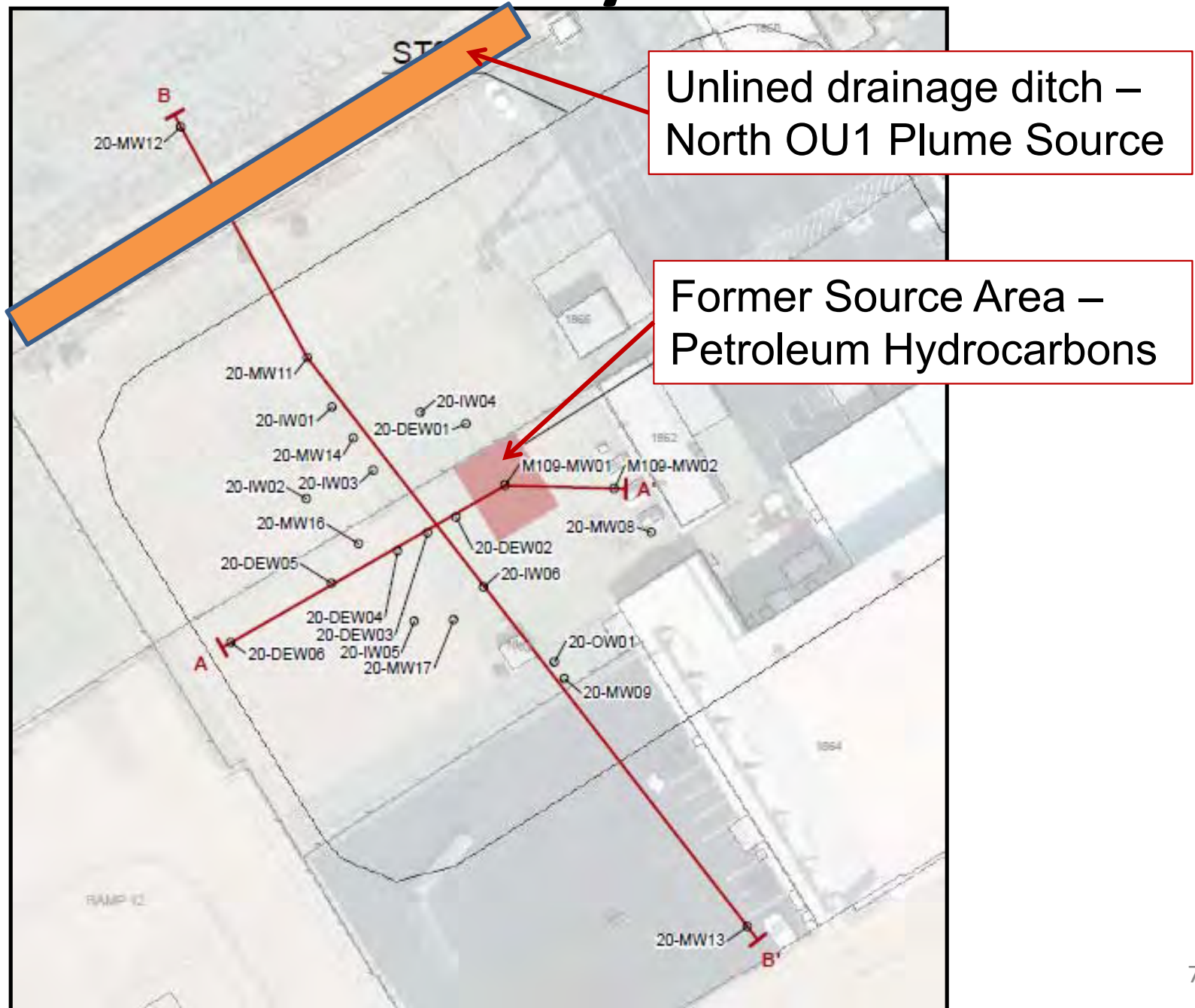
- Former gasoline station including two USTs (M109 and M110)
- *Fuel release* took place over time as perforations developed in the USTs
- Both USTs and associated piping removed in April 1991
- Investigations conducted in accordance with the **final Base-wide Generic Uniform Federal Policy Quality Assurance Project Plan**
- **Handout Table 1** – Listing of Site 20 reports/investigations

# Site 20 Brief Summary

- Previous remedial actions
  - Soil excavation (1997)
  - Multi-phase extraction ( 2000 – 2004)
  - In situ chemical oxidation (2007 – 2008)
- Draft Soil Case Closure Request Report currently under review by the RWQCB
  - Soil remediation complete under the Low-Threat Underground Storage Tank (LTUST) Program
  - Soil meets the closure criteria under LTUST (commercial/industrial)
  - Soil gas meets the closure criteria (residential) under LTUST
- Groundwater commingled with chlorinated hydrocarbons including chloroform and TCE

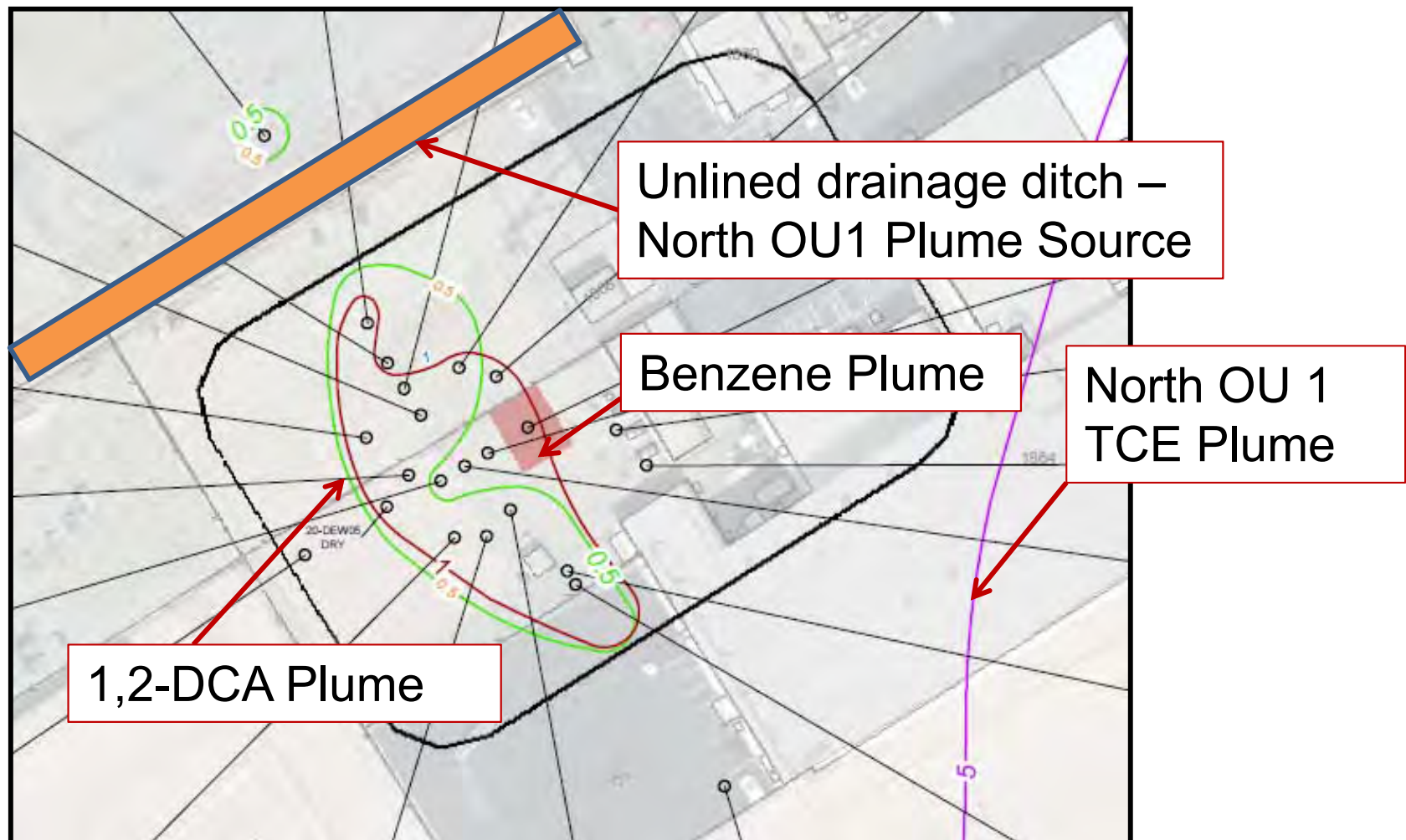


# Site 20 Layout

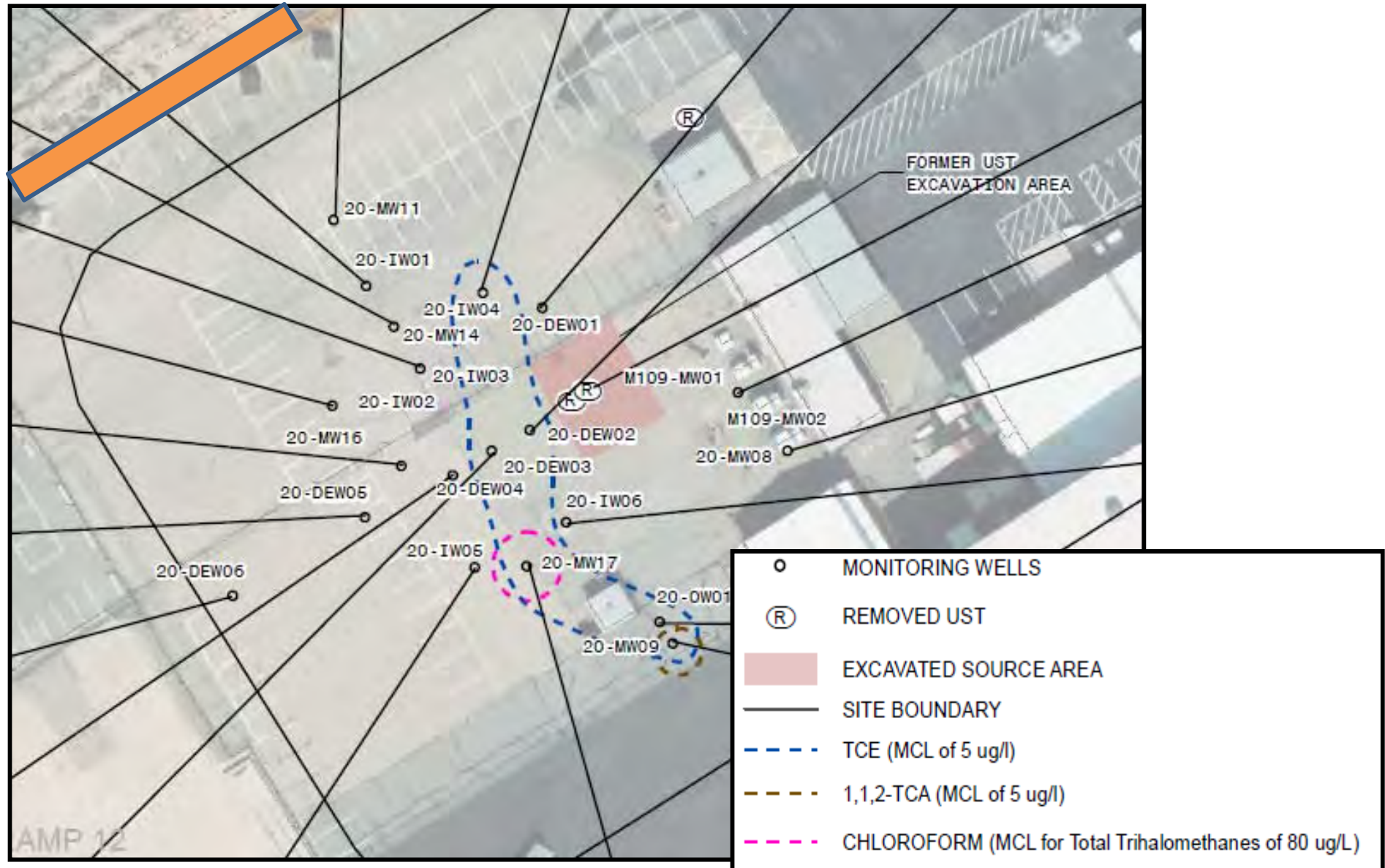


# Site 20 Groundwater (2015-2016)

- See **Handout Figures 1, 2, and 3**



# Site 20 Groundwater (2012)





# Chlorinated Hydrocarbons -- Site 20

## Groundwater

- Chlorinated hydrocarbons including TCE, chloroform, and methylene chloride are commingled with petroleum hydrocarbons
- Likely sources of chlorinated hydrocarbons are Ramp 12 activities
- Site 20 groundwater recommended for inclusion into the CERCLA program based on commingling of chlorinated and petroleum hydrocarbons

# Chlorinated Hydrocarbon Sources Near Site 20

- Drainage ditch north of Site 20
  - Used to collect surface runoff from Ramp 12
  - Ramp 12 historical activities included aircraft maintenance, commonly involving using TCE as degreaser
  - Likely source of TCE detected in groundwater at Site 20
  - Identified as a potential source of North OU 1 Groundwater Plume in previous reports including 2012 GMSR

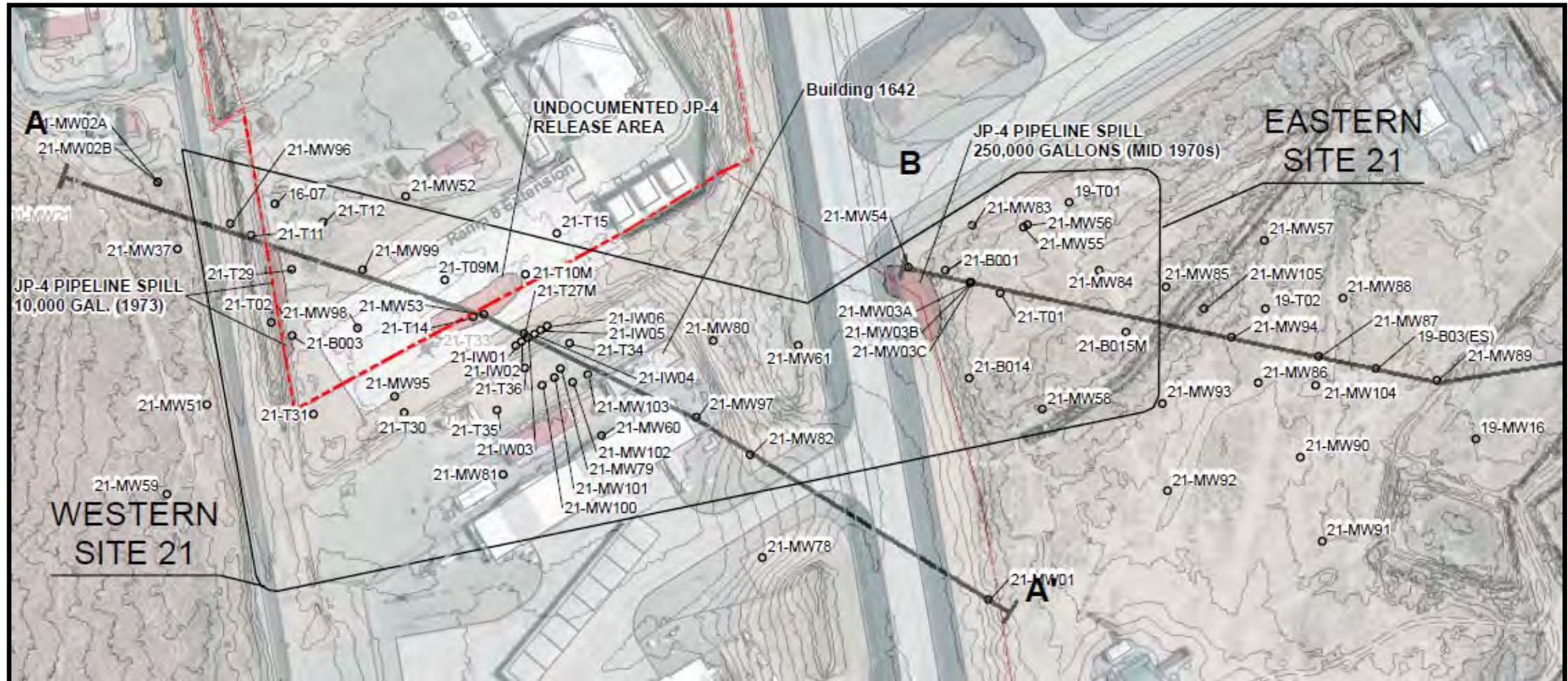
# **Discussion / Conclusions – Site 20**

# Site 21

# Site 21 Brief Summary

- Abandoned 2.5 mile long JP-4 pipeline
- Several documented and undocumented JP-4 releases identified along the length of the pipeline
- Several investigations completed since 1982
- Investigations conducted in accordance with the final **Base-wide Generic Uniform Federal Policy Quality Assurance Project Plan**
- Previous remedial actions
  - Oxygen release compound (ORC) socks installed in 4 wells (1996-1998)
  - Oxygen injection treatability study (2008 – 2009)
  - LNAPL removal (1997 – 2013)
- **Handout Table 2** presents detailed listing of Site 21 reports/investigations

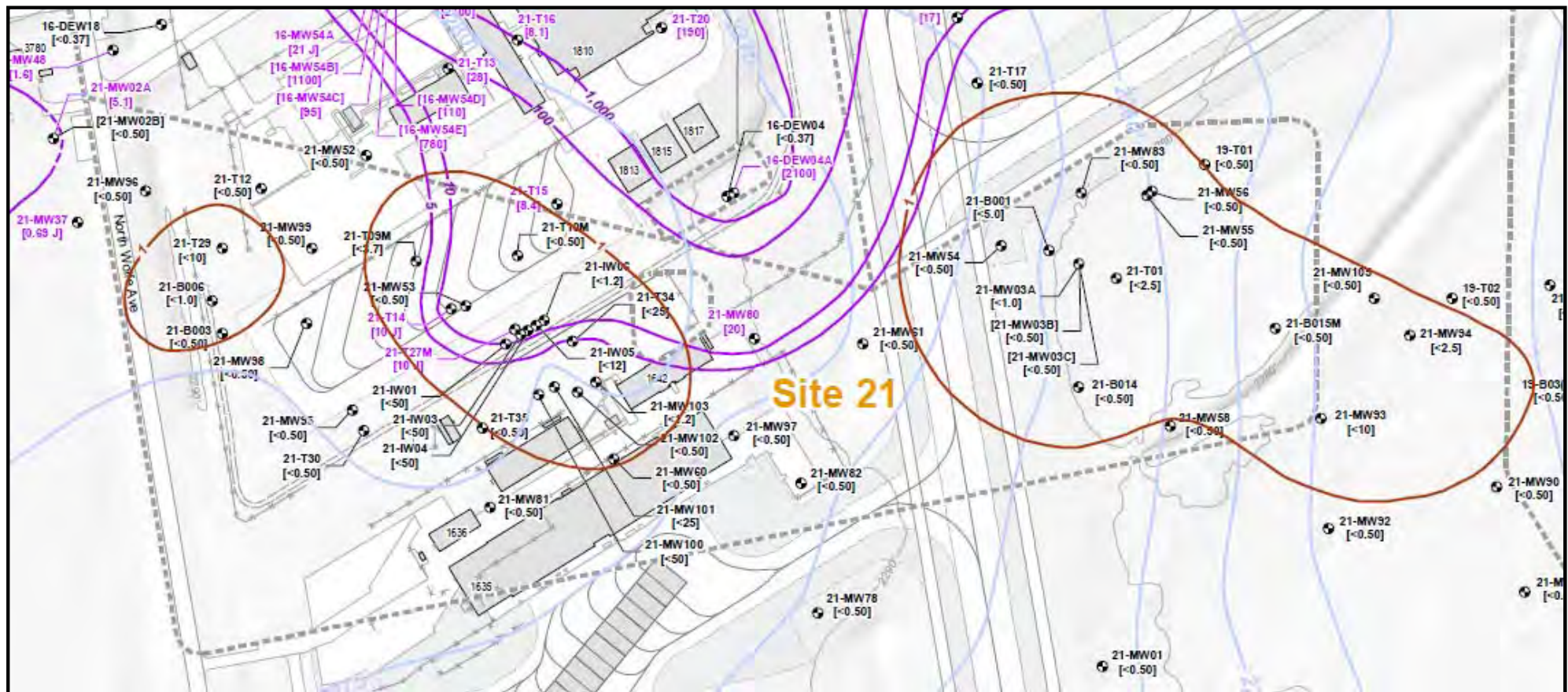
# Site 21 Layout





# Site 21 Groundwater – Benzene and TCE (2015)

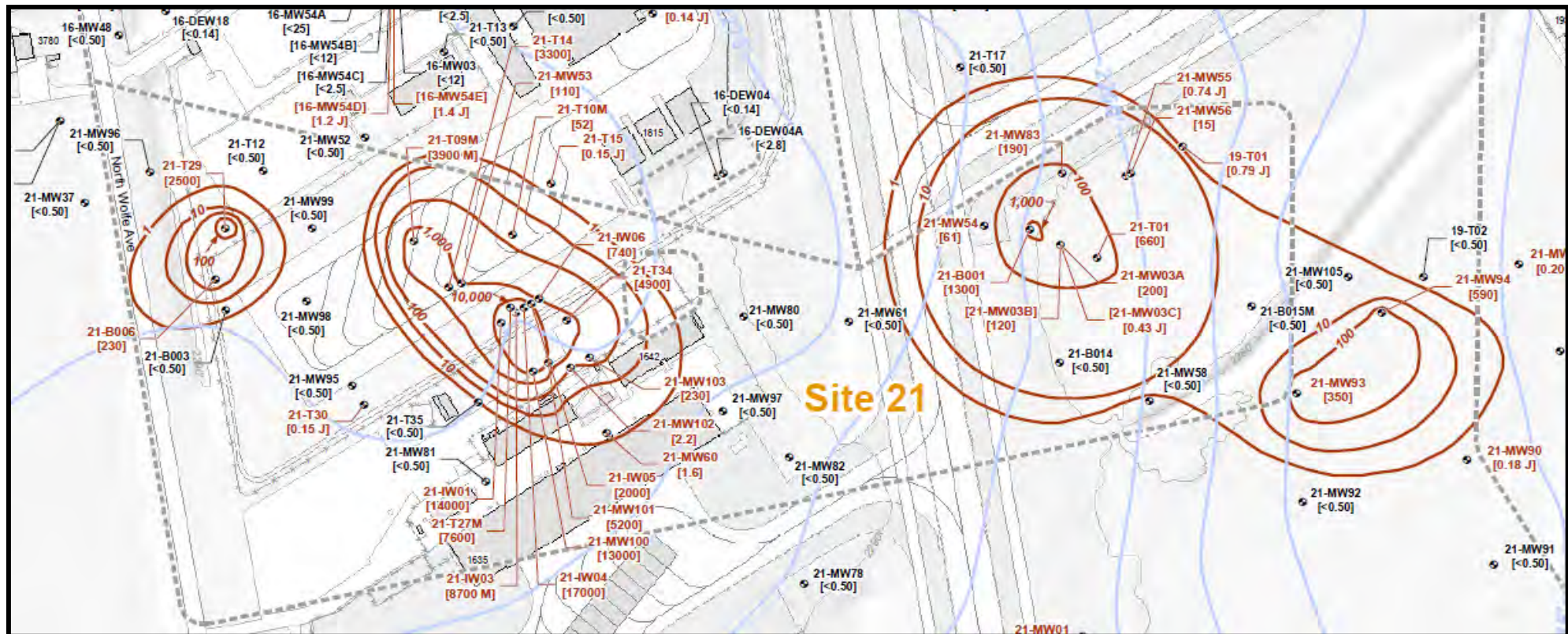
- See **Handout Figures 4 and 5**





# Site 21 Groundwater – Benzene (2015)

- See **Handout Figures 4 and 5**





## Site 21 Soil

- **Detected analytes greater than LTUST Policy soil criteria:**
  - Benzene
  - Ethylbenzene
  - Naphthalene
  - TPH-Total
- **Sporadic detections of very low concentrations of chlorinated aliphatic hydrocarbons**
- **Vapor intrusion investigations completed; no unacceptable VI risk identified for industrial use**
- **Both soil and groundwater are proposed to be addressed under CERCLA**

# Discussion / Conclusions – Site 21

# Site 24

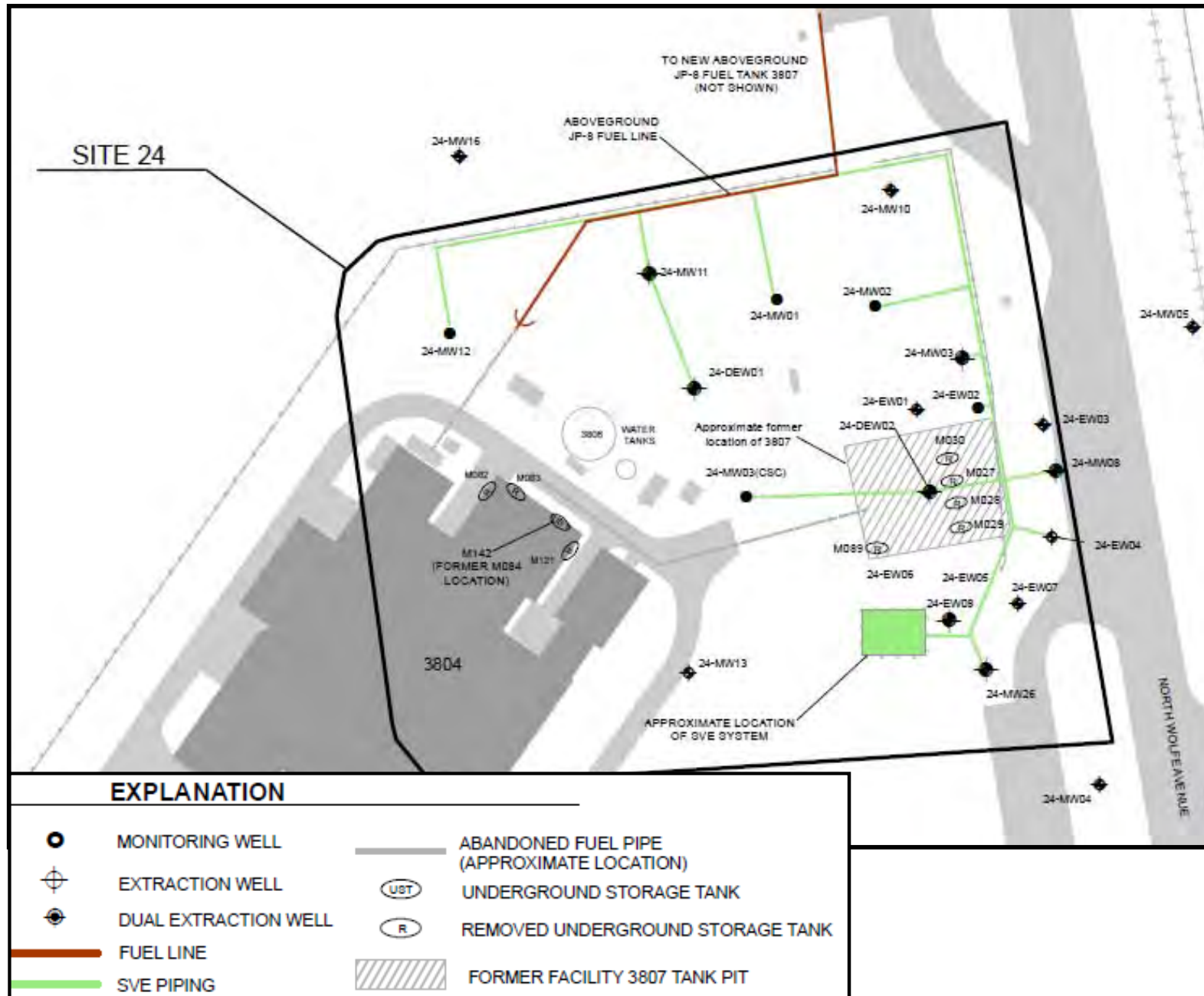
# Site 24 Brief Summary

- Encompasses the following
  - Building 3804 (Engine Test Cell Facility) and former Facility 3807
  - Five USTs associated with Building 3804
  - Five USTs associated with Facility 3807
- 9 USTs have been removed; 1 UST replaced in 1995 still in operation
- Investigations conducted in accordance with the final **Base-wide Generic Uniform Federal Policy Quality Assurance Project Plan**
- **Handout Table 3** presents detailed listing of Site 24 reports/investigations

# Site 24 Brief Summary

- Previous remedial actions
  - Free product recovery (1994 – 2002)
  - Soil excavation (2000)
  - SVE operation (2003 – 2008; 2013 - 2014)
- Draft Soil Case Closure Request Report review completed by the RWQCB
  - Soil remediation complete under the Low-Threat Underground Storage Tank (LTUST) Program
  - Soil meets the closure criteria under LTUST (residential)
  - Soil gas meets the closure criteria (residential) under LTUST
- Groundwater commingled with chlorinated hydrocarbons including TCE and cis-1,2-DCE

# Site 24 Layout



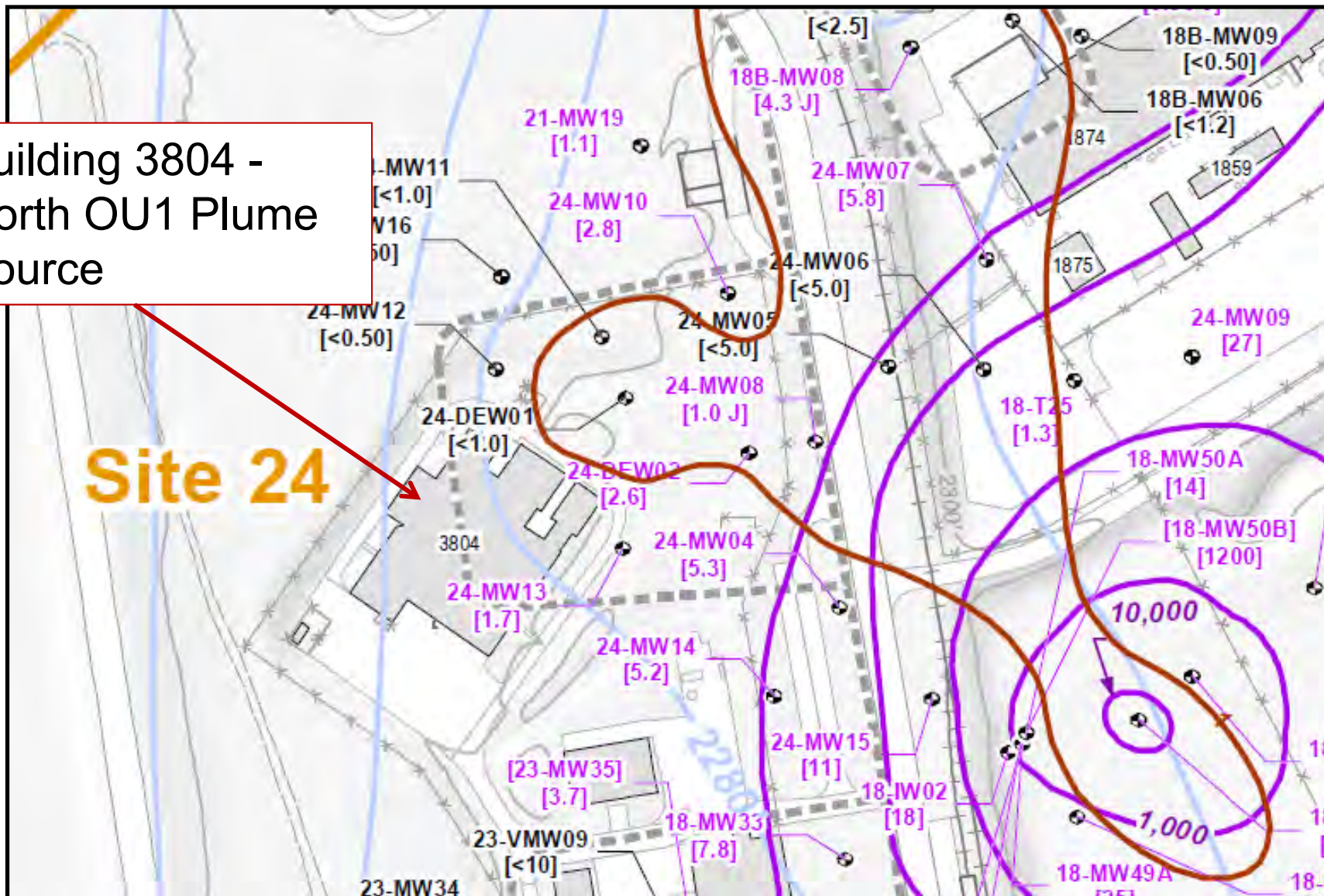


# Site 24 – TCE and Benzene

- See Handout Figures 1, 6 and 7

Building 3804 -  
North OU1 Plume  
Source

Site 24



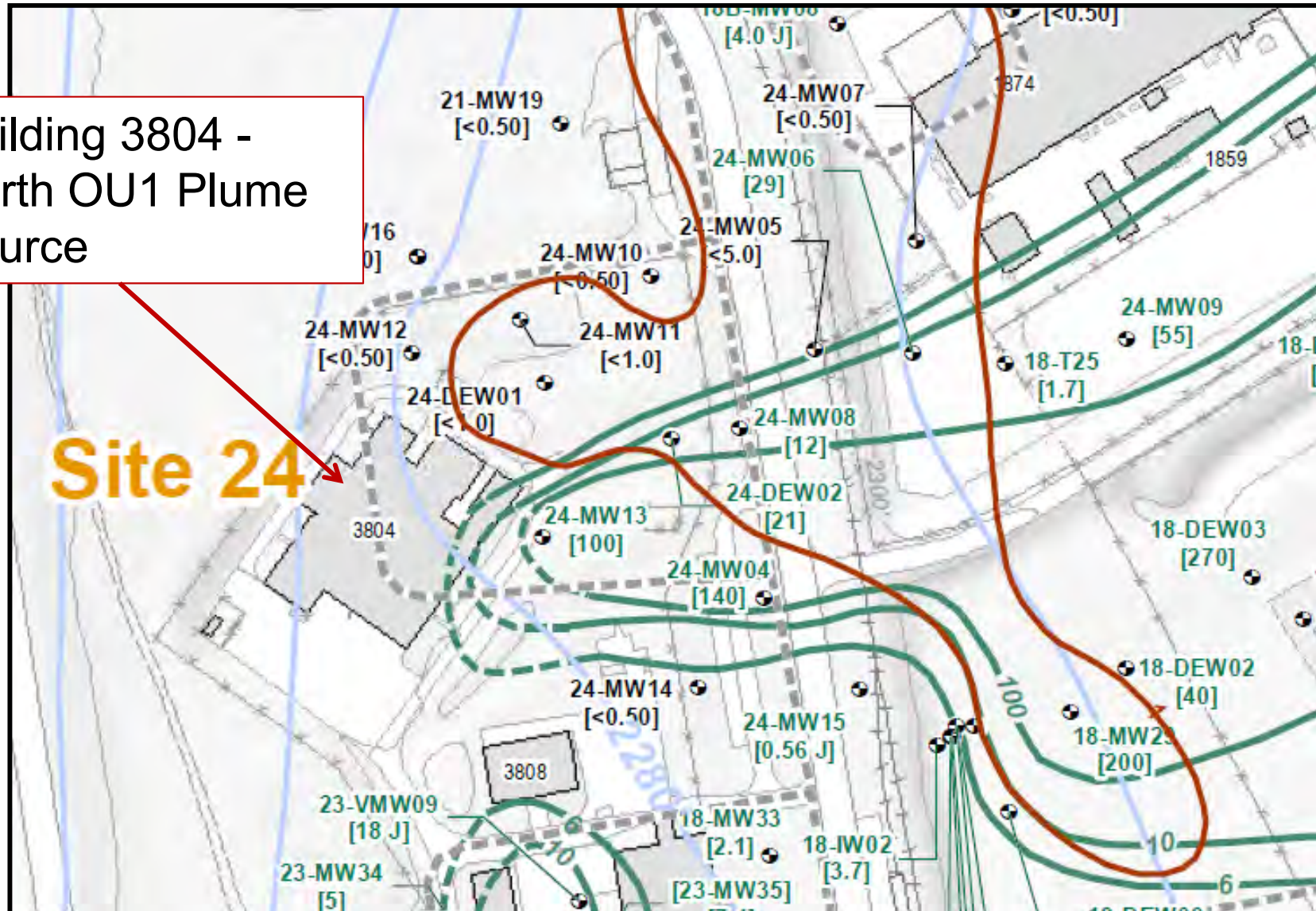


# Site 24 – cDCE and Benzene

- See **Handout Figures 1, 6 and 7**

Building 3804 -  
North OU1 Plume  
Source

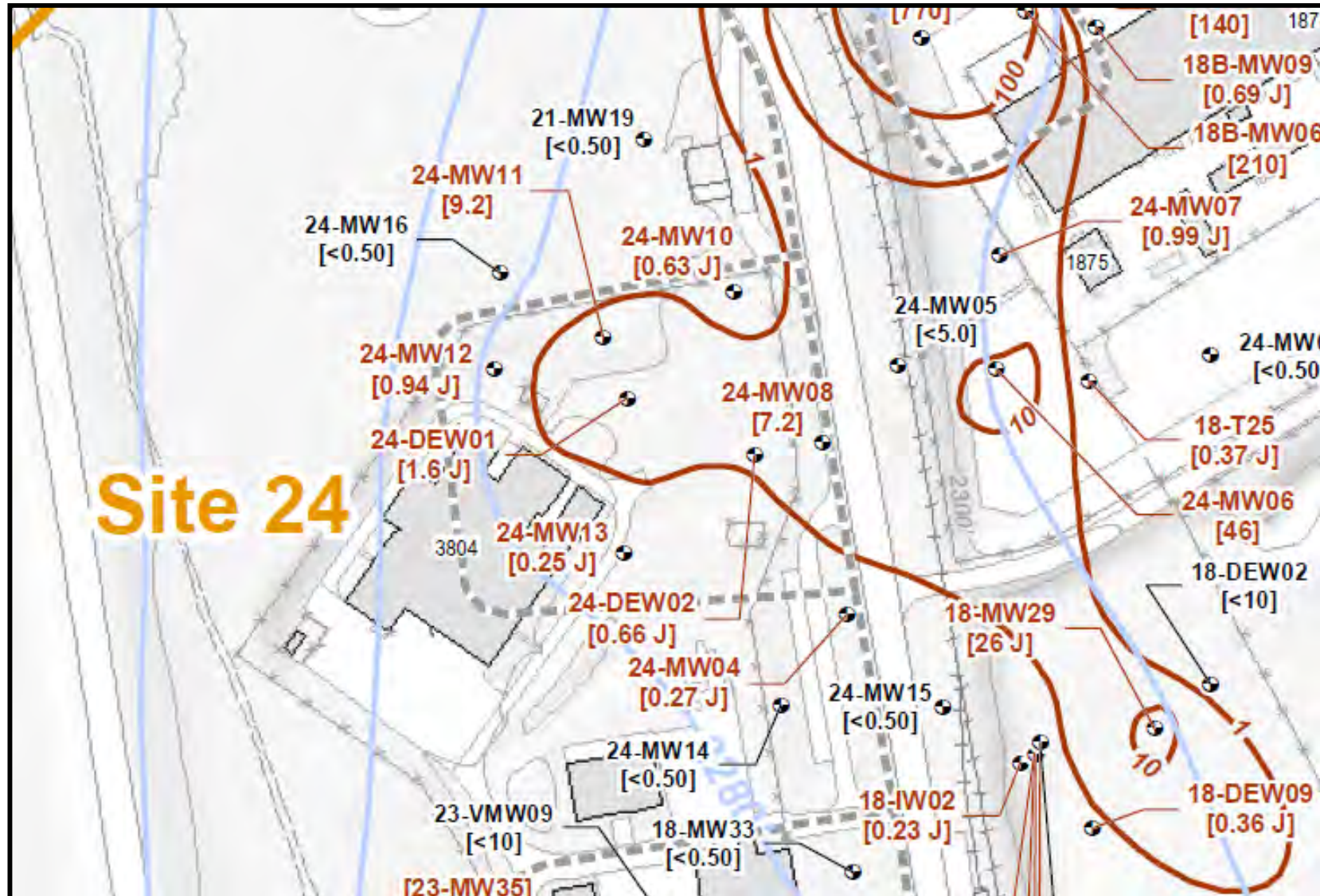
**Site 24**





# Site 24 – Benzene

- See Handout Figures 1, 6 and 7



# Chlorinated Hydrocarbons -- Site 24

## Groundwater

- Chlorinated hydrocarbons including TCE and cis-1,2-DCE are commingled with petroleum hydrocarbons
- The 1996 OU 1 RI States that widespread solvent groundwater plume at Site 24 is a direct result of the former waste practices at the site and contributes to the extensive solvent plume which underlies the area
- Buildings 3804 and former Facility 3807 identified as a potential sources of North OU 1 Groundwater Plume in previous reports including 2012 GMSR

# Discussion / Conclusions – Site 24

**Table 1: Summary of Reports/ Investigations – Site 20**

Investigation/ Report	Full Reference for the Report
Site 20 Treatability Study Report	Earth Tech, Inc. 2002. Installation Restoration Program, Multisite Treatability Study Report for Sites 20, 45, 49, 51, and 58, Main Base Flight Line, Operable Unit 1, Edwards Air Force Base, California. Final. February.
Site 20 Treatability Study Report No. 2	Earth Tech, Inc. 2003. Environmental Restoration Program, Multisite Treatability Study Report No. 2 for Sites 20, 46, 51, and 58, Main Base Flightline, Operable Unit 1, Edwards AFB, California. Final. February.
Site 20 Treatability Study Report No. 3	Earth Tech, Inc. 2005. Environmental Restoration Program, Multisite Treatability Study Report No. 3 for Sites 20, 11, and 17, Main Base Flightline, Operable Unit 1, Edwards AFB, California. Final. October.
Site 20 MNA Annual Report	Earth Tech, Inc. 2007. Environmental Restoration Program, Sites 20 and 21 Monitored Natural Attenuation Annual Report, Main Base Flightline, Operable Unit No. 1, Edwards Air Force Base, California. Final. January.
Site 20 Remedial Action Plan	Earth Tech, Inc. 2007. Environmental Restoration Program, Site 20 Remedial Action Plan, Main Base Flightline, Operable Unit No. 1, Edwards Air Force Base, California. Final. September.
Site 20 ISCO Remedial Action Report	AECOM. 2009. Site 20 In Situ Chemical Oxidation Remedial Action Report, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. March.
Site 20 ISCO Remedial Action Report Addendum	AECOM. 2010. Site 20 In Situ Chemical Oxidation Remedial Action Report Addendum, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. January.
Site 20 SAP for Post Remedial Monitoring	AECOM. 2011. Sampling and Analysis Plan for Post Remedial Action Groundwater Monitoring, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. April.
Site 20 Post Remedial Action Report	AECOM. 2011. Site 20 Post Remedial Action Groundwater Report, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. August.
Site 20 Post Remedial Action Groundwater Monitoring Report	URS Group, Inc. 2012. Site 20 Post Remedial Action Groundwater Report – February 2012, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. September.
Site 20 RAP Addendum	AECOM. 2013. Site 20 Remedial Action Plan Addendum, Operable Unit 1, Main Base Flightline, Edwards Air Force Base, California. Final. June.
Site 20 Technical Memorandum, Baseline Groundwater Sampling Field Activities	AECOM. 2015. Technical Memorandum, Baseline Groundwater Sampling Field Activities, Site 20, Main Base, Operable Unit 1, Edwards AFB, CA. June.
Site 20 Revised Draft Site 20 Corrective Action Plan	AECOM. 2015. Revised Draft Site 20 Corrective Action Plan, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. February.
Site 20 (Soil) Case Closure Request Report	AECOM. 2016. Compliance Restoration Program Site 20 Case Closure Request Report, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Draft. November.

Note: Reports in highlighted rows proposed to be provided to DTSC.

**Table 2: Summary of Reports/ Investigations – Site 21**

<b>Investigation/ Report</b>	<b>Full Reference for the Report</b>
Site 21 Treatability Study Well Installation Work Plan	JT3/CH2M Hill. 2008. Site 21 Treatability Study Well Installation Work Plan, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Draft. September.
Site 21 Well Installation Work Plan	JT3/CH2M HILL. 2009. Monitoring Well Installation Work Plan, Site 21, Operable Unit 1, Main Base Flightline, Edwards Air Force Base, California. Draft. May.
Site 21 Site Characterization and Treatability Study Report	AECOM. 2010. Site 21 Site Characterization and Treatability Study Report, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. August.
Site 21 Annual Groundwater Monitoring and Well Installation Report	AECOM. 2011. Site 21 Annual Groundwater Monitoring and Well Installation Report, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. August.
Site 21 2011 Annual Groundwater Monitoring Report	AECOM. 2012. Site 21 2011 Annual Groundwater Monitoring and Well Installation Report, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. July.
Site 21 Vapor Intrusion QAPP	AECOM. 2012. Site 21 Site 21 Evaluation of the Vapor Intrusion Pathway, Uniform Federal Policy Quality Assurance Project Plan, Operable Unit 1, Main Base Flightline, Edwards Air Force Base, California. Final. July.
Site 21 QAPP and 2012 Annual Groundwater Monitoring Report	JT3/CH2M Hill. 2012. Quality Assurance Project Pan (Project-Specific), Site 21 2012 Annual Groundwater Monitoring, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. July.
Site 21 2012 Annual Groundwater Monitoring Report	AECOM. 2013. Site 21 2012 Annual Groundwater Monitoring and Well Installation Report, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. January.
Site 21 Vapor Intrusion Pathway Monitoring Report	AECOM. 2013. Site 21 Vapor Intrusion Pathway Monitoring Report, Operable Unit 1, Main Base Flightline, Edwards Air Force Base, California. Final. June.
Site 21 Operation and Maintenance Report	AECOM. 2014. Site 21 Operation and Maintenance Report, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. August.
Site 21 Annual Operation and Maintenance Report	Tetra Tech. 2015. 2014 Annual Operation and Maintenance Report, Main Base Flightline Operable Unit 1, Edwards Air Force Base. Final. February.
Site 21 Technical Memorandum, Preliminary Remedial Design and Remediation Well Installation	AECOM. 2015. Technical Memorandum, Preliminary Remedial Design, Remediation Well Installation, and Associated Field Activities, Site 21, Main Base, Operable Unit 1, Edwards AFB, CA. September.

Note: Reports in highlighted rows proposed to be provided to DTSC.

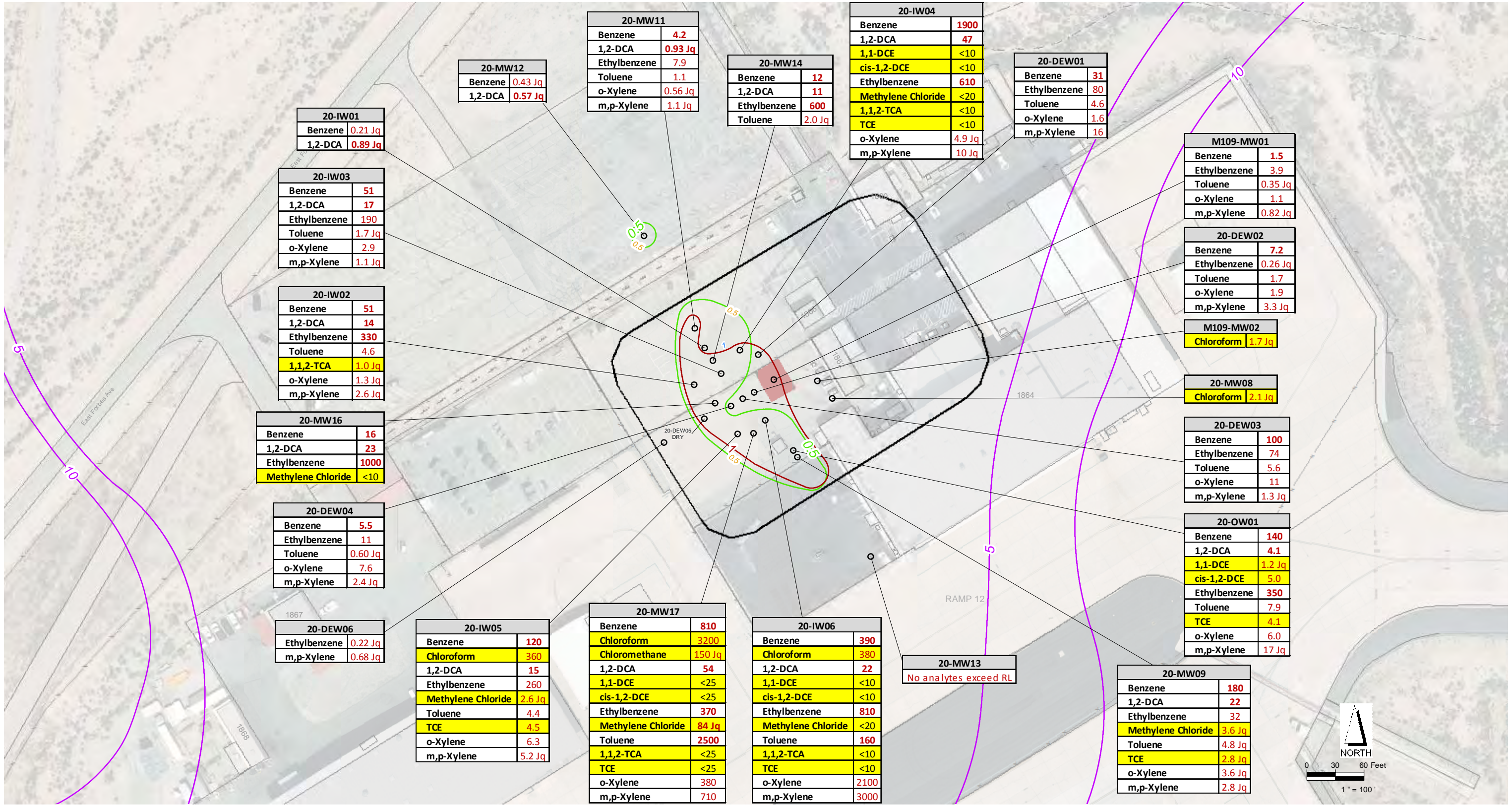
**Table 3: Summary of Reports/ Investigations – Site 24**

<b>Investigation/ Report</b>	<b>Full Reference for the Report</b>
Site 24 Technical Report for Bioslurper Testing	Battelle. 1996. Site-Specific Technical Report for Bioslurper Testing at Site 24, Edwards AFB, California, Draft.
Site 24, Building 3804 Site Characterization Summary Report	Earth Tech, Inc. 2000. Site 24, Building 3804, Site Characterization Summary Report, Main Base Flight Line, Operable Unit 1, Edwards Air Force Base, California. Final. January.
Site 24 Free Product Recovery Test Work Plan	Earth Tech, Inc. 2000. Site 24 Free-Product Recovery Test Work Plan, Main Base Flight Line, Operable Unit No. 1. Final. January.
Site 24, JP-8 Fuel Release Site Investigation Work Plan	Earth Tech, Inc. 2000. Site 24, Building 3804, JP-8 Fuel Release Site Investigation Work Plan, Main Base Flight Line, Operable Unit No. 1, Edwards Air Force Base, California. Final. May
Site 24, JP-8 Fuel Release Site Investigation Summary Report	Earth Tech, Inc. 2001. Site 24, Building 3804, JP 8 Fuel Release Site Investigation Summary Report, Main Base Flight Line, Operable Unit No. 1. Final. January.
Site 24 Free-Product Recovery Test Report	Earth Tech, Inc. 2001. Site 24 Free-Product Recovery Test Report, Main Base Flight Line, Operable Unit No. 1, Edwards Air Force Base, California. Final. October.
Site 24 Treatability Study Work Plan	Earth Tech, Inc. 2003. Site 24 Treatability Study Work Plan, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. March.
Site 24 Treatability Study Report	Earth Tech, Inc. 2004. Site 24 Treatability Study Report for the Soil Vapor Extraction System, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. May.
Site 24 SVE Semiannual SVE Monitoring Report	Earth Tech. 2009. Site 24 Semiannual Monitoring Report for the Soil Vapor Extraction System, 22 January 2008 to 31 July 2008, Main Base Flightline, Operable Unit No. 1, Edwards Air Force Base. Final. February.
Site 24 Treatability Study Work Plan	Earth Tech, Inc. 2009. Site 24 Treatability Study Work Plan, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Final. March
Site 24 Soil Vapor Extraction and Groundwater Monitoring Data Package	JT3/CH2M Hill (JT3). 2012. 2012 Soil Vapor Extraction and Groundwater Monitoring Data Package- Compliance Restoration Site 24, Edwards Air Force Base, California. Final. December.
Site 24 2013 Annual Groundwater Monitoring Report	Tetra Tech, Inc. (Tetra Tech). 2013. 2013 Annual Groundwater Monitoring Report for Site 24, Operable Unit 1, Edwards Air Force Base, California. Preliminary Draft. September.
Site 24 SVE O&M Field Activities Report -- June 2013 – August 2013	Tetra Tech, Inc. (Tetra Tech). 2013. Site 24 Soil Vapor Extraction & Treatment System Operations & Maintenance Field Activities Report, June 2013 – August 2013, Main Base Flightline, Operable Unit 1. October.
Site 24 SVE O&M Field Activities Report -- December 2013 – June 2014	Tetra Tech, Inc. (Tetra Tech). 2014. Compliance Restoration Program, Site 24 Soil Vapor Extraction & Treatment System Operations & Maintenance Field Activities Report, December 2013 – June 2014, Main Base Flightline, Operable Unit 1. September.

Investigation/ Report	Full Reference for the Report
Site 24 Correct Action Plan	AECOM. 2014. Site 24 Corrective Action Plan, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Draft. Prepared for AFCEC, Edwards AFB, CA; and the USACE, Tulsa, OK. August.
Site 24 (Soil) Case Closure Request Report	AECOM. 2016. Compliance Restoration Program Site 24 Case Closure Request Report, Main Base Flightline, Operable Unit 1, Edwards Air Force Base, California. Draft. June.

Note: Reports in highlighted rows proposed to be provided to DTSC.





**EXPLANATION**

- MONITORING WELLS
- EXCAVATED SOURCE AREA
- SITE BOUNDARY
- BENZENE ISOCONCENTRATION CONTOUR IN µg/L (MCL 1 µg/L)
- 1,2 DCA ISOCONCENTRATION CONTOUR IN µg/L (MCL 0.5 µg/L)
- TCE CONTOUR

**ABBREVIATIONS**

- µg/L MICROGRAMS PER LITER
- AFB AIR FORCE BASE
- COC CONSTITUENT OF CONCERN
- DCA DICHLOROETHANE
- DL DETECTION LIMIT
- EDB ETHYLENE DIBROMIDE
- LOD LIMIT OF DETECTION
- MCL MAXIMUM CONTAMINANT LEVEL
- RL REPORTING LIMIT
- TCE TRICHLOROETHENE

**LABORATORY-ASSIGNED DATA QUALIFIERS**

- J THE ANALYTE WAS DETECTED AT A CONCENTRATION ABOVE THE DL AND BELOW THE LOD. THE REPORTED CONCENTRATION IS AN ESTIMATE.
- q THE ANALYTE DETECTION WAS BELOW THE LIMIT OF QUANTITATION.

**NOTES**

1. DATA PROVIDED IN µg/L.
2. VALUES IN **BOLD** SHOWN FOR COCs EXCEEDING THE RESPECTIVE MCLs.
3. WELLS SAMPLED ON OCTOBER 11 THROUGH 13, 2016.
4. DATA PROJECTED IN NAD83 CA STATE PLANE ZONE 5 US SURVEY FEET.
5. WELL 20-DEW05 WAS DRY IN 2016. THIS WELL WAS LAST SAMPLED IN APRIL 2011. COCs EXCEEDED MCLs IN 2011 AS FOLLOWS:
6. ONLY DETECTED ANALYTES WITH CONCENTRATIONS EXCEEDING THEIR RESPECTIVE MCLs OR NON-DETECTED ANALYTES WITH REPORTING LIMITS EXCEEDING MCLs ARE SHOWN.

**20-DEW05**

Benzene	3,600
1,2-DCA	45 J
Ethylbenzene	2,100
Toluene	8,800
Total Xylenes	14,800

**Site 20 - Benzene, 1,2-DCA, and TCE in Groundwater (2016)**

Date 02-2017	Site 20 Case Closure Request Report	Figure
Project No. 60309314	OU 1 Edwards AFB	2



**Figure 1A**  
**Site Locations Map (Main Base)**

Revision: 1	By: EC	Date: 03/23/2016
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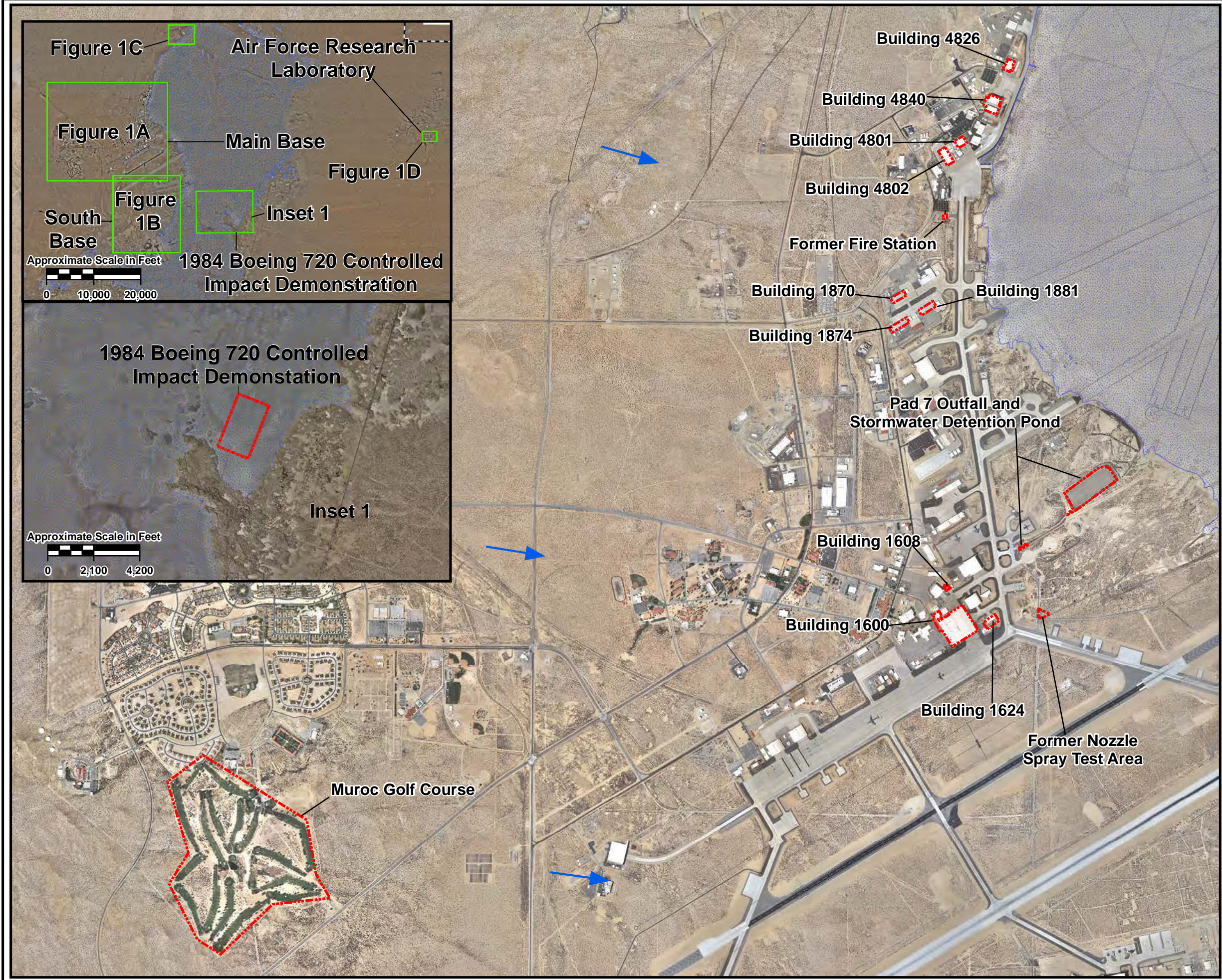
**Legend**

- Installation Boundary
- Preliminary Assessment (July, 2015) Site Boundary
- Zoomed Map View Extent
- Rogers Dry Lake
- Groundwater Flow Direction  
(CH2M Hill, Preliminary Assessment, July, 2015)

AFB = Air Force Base  
ERP = Environmental Restoration Program  
U.S. EPA = United States Environmental Protection Agency



Approximate Scale in Feet  
0 2,000 4,000





**Figure 1B**  
**Site Locations (South Base)**

Revision: 1

By: EC

Date: 03/23/2016



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**Legend**



Rogers Dry Lake



Preliminary Assessment (July, 2015) Site Boundary



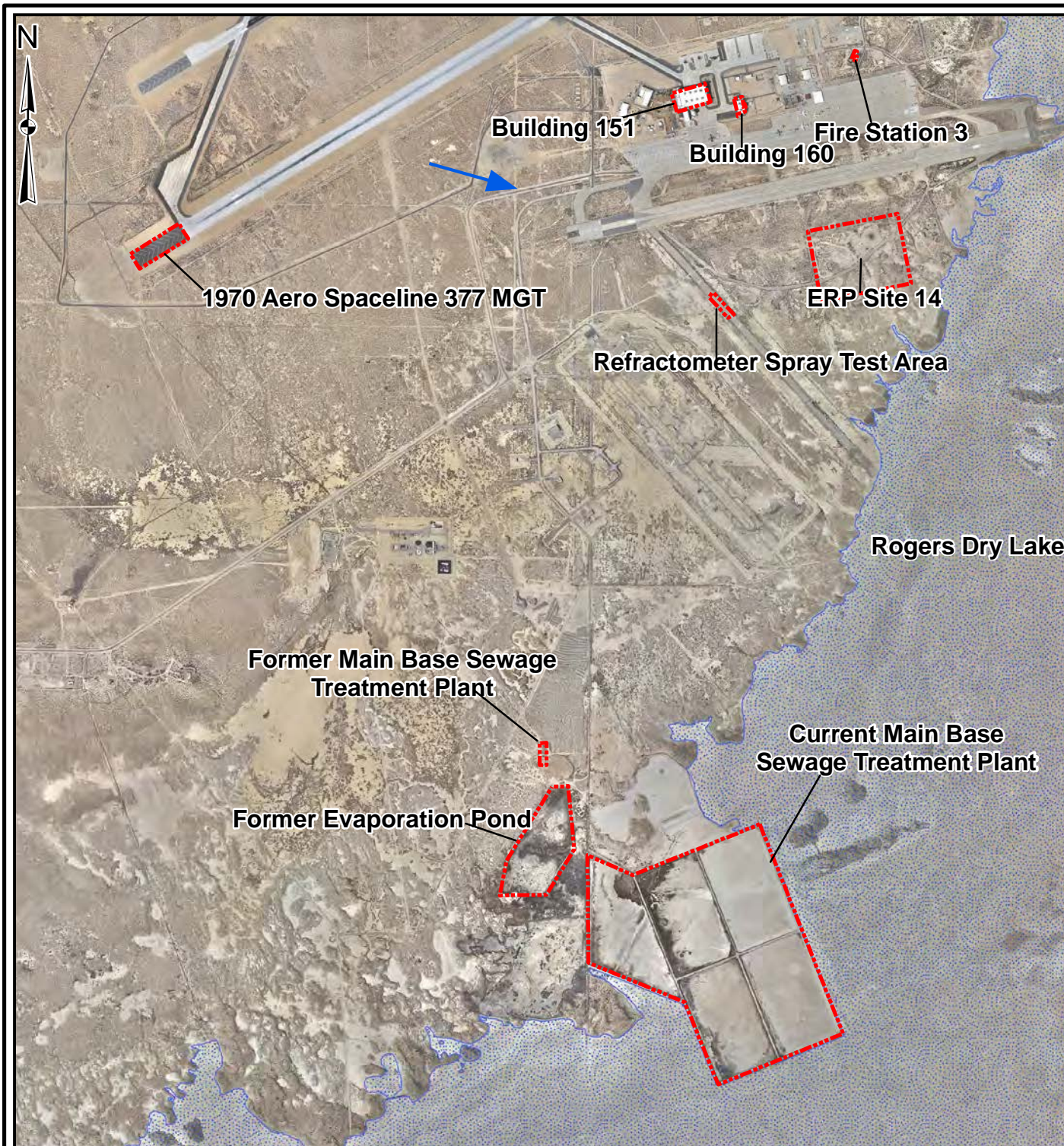
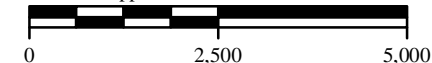
Groundwater Flow Direction  
(CH2M Hill, Preliminary Assessment, July, 2015)

AFB = Air Force Base

ERP = Environmental Restoration Program

U.S. EPA = United States Environmental Protection Agency

Approximate Scale in Feet





## Figure 1C Site Locations (North Base)

Revision: 1

By: EC

Date: 08/2/2016





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### Legend

- Preliminary Assessment (July, 2015) Site Boundary
-  Rogers Dry Lake
-  Groundwater Flow Direction  
(TetraTech, 2014)

AFB = Air Force Base

U.S. EPA = United States Environmental Protection Agency

Approximate Scale in Feet





## Figure 1D

### Air Force Research Laboratory

Revision: 1

By: EC

Date: 03/23/2016



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### Legend



Preliminary Assessment (July, 2015) Site Boundary



Regional Groundwater Flow Direction  
(CH2M Hill, Preliminary Assessment, July,  
2015)

AFB = Air Force Base

AFRL = Air Force Research Laboratory

ERP = Environmental Restoration Program

FTA = Fire Training Area

U.S. EPA = United States Environmental Protection Agency

Approximate Scale in Feet

