

AZ HWMA PERMIT
EPA ID NO. AZD 980 814 479
UNIVERSAL PROPULSION COMPANY

PERMIT ATTACHMENT A
FACILITY DESCRIPTION
FINAL PERMIT REV 0

ATTACHMENT A
FACILITY DESCRIPTION

TABLE OF CONTENTS

	<u>Page</u>
Section A.1. GENERAL DESCRIPTION	A-1
Section A.2. LOCATION INFORMATION	A-1
Section A.3. HYDROGEOLOGICAL CHARACTERISTICS OF THE SITE	A-1
Section A.4. SOILS	A-3
Section A.5. GROUNDWATER QUALITY	A-3
Section A.6. SURFACE WATER AND WETLANDS	A-3
Section A.7. OTHER	A-4
Section A.8. SOLID WASTE MANAGEMENT UNITS	A-4

LIST OF EXHIBITS

Exhibit A-1	Aerial Photo
Exhibit A-2	Flood Insurance Rate Map
Exhibit A-3	Geologic Map
Exhibit A-4	Water Table Map
Exhibit A-5	Soil Map
Exhibit A-6	Master Drainage Report Map
Exhibit A-7	Topographical Map
Exhibit A-8	Acknowledgement of Partial Closure (OBU, OBD, and TTU)
Exhibit A-9	Waterbore Area
Exhibit A-10	C- Complex
Exhibit A-11	New Burn Area

FACILITY DESCRIPTION

This section provides a description of the Universal Propulsion Company, Inc. (UPCO) Corrective Action Facility located in Phoenix, Arizona. For convenience, this section will refer to the UPCO Corrective Action Facility simply as the UPCO Facility.

A.1. GENERAL DESCRIPTION

The UPCO facility was an aerospace manufacturing facility that was in operation from August 14, 1972 until January 9 2010.at its location on a 160 acre site about 25 miles north of central Phoenix, Arizona. Currently, the facility is vacant land with groundwater monitoring wells onsite and offsite, and security fencing.

The street address of the facility is:

Universal Propulsion Company, Inc.
25401 North Central Avenue
Phoenix, Arizona 85027-7899
Telephone Number: 602/516-3340

Exhibit A-1 shows an aerial photograph of the entire facility with surrounding areas. Until January 9, 2010, UPCO designed, developed and manufactured military aircraft ejection seats and related components for emergency escape and survival, including the required propellants. UPCO provided pyrotechnic devices for NASA's Space Shuttle program and also developed, marketed and produced automotive safety products.

A.2. LOCATION INFORMATION

Seismic Standard

The UPCO facility is an existing facility; therefore, seismic standards do not pertain. Additionally, the UPCO facility is not located in a county or election district listed in Appendix VI of 40 CFR Part 264.

Floodplain Standard

The UPCO facility is not located within the 100-year floodplain as shown in the Federal Emergency Management Agency (FEMA) Flood Insurance Program (FIA) Flood Insurance Rate map (Exhibit A-2). The master drainage reports for the facility; they include all calculations, maps, and appendices for 100 year flood study were certified by Mr. Bill Liemkuhler of Amwest Engineering Company, Inc. and were completed in August 1992.

Topographical Map

A topographical map showing the UPCO facility is included as Exhibit A-7.

A.3. HYDROGEOLOGICAL CHARACTERISTICS OF THE SITE

The UPCO facility is located within the Basin and Range Physiographic Province. The basin and range is characterized by northwest trending bedrock mountain ranges separated by gently sloping alluvial valleys (basins). The UPCO facility is located between the southern flanks of the Union Hills, a northwest trending bedrock mountain range, and the northern margin of the West Salt River Valley within the Union Hills USGS 7.5' Quadrangle. Topographic relief near the facility ranges up to 800 feet within the Union Hills and slopes southward and westward towards the West Salt River Valley.

Depth to groundwater in the vicinity of the UPCO facility ranges from approximately 150 to 250 feet below surface. Regional groundwater flow direction in the vicinity is generally considered to be southwest as shown in Exhibit A-4. Well yields are low from the bedrock aquifer at and near the facility. Sixteen groundwater monitoring wells have been installed on the site as of June 1, 2010. A map showing the location of the existing monitoring network can be found in Permit Attachment F.

The geology of the Union Hills and West Salt River Valley is described below.

Bedrock Geology of the Union Hills

Near the UPCO facility, the Union Hills are composed of Early to Middle Proterozoic (1740 to 1335 Ma) metavolcanic, plutonic, and metasedimentary bedrock (Holloway and Leighty, 1998). The bedrock is often covered by a thin veneer of regolith, but it may locally outcrop in the dry washes or road cuts in the Union Hills. The geologic map in Exhibit A-3 shows the surface distribution of the bedrock to the north, east, and south of the facility as mapped by Holloway and Leighty (1998).

The bedrock unit is comprised of several different rock types (metavolcanic, plutonic, and metasedimentary) of Precambrian age.

The metavolcanic bedrock units are highly foliated, predominantly intermediate to mafic in composition, and are of greenschist or lower metamorphic grade (Holloway and Leighty (1998). These rocks have been collectively referred to as the greenstone (Wilson et al., 1957).

The plutonic bedrock units are predominantly granitic to granodioritic in composition. Two distinct intrusive bodies are present near the UPCO facility which include a foliated plutonic suite and a relatively unfoliated granitic to granodioritic plutonic suite. The foliated suite is geochemically similar to the metavolcanic bedrock discussed above, and may be related to its parent magma (Anderson, 1989a). The unfoliated plutonic rocks cross-cut the metavolcanic bedrock; and most likely belong to a group of granitic batholiths extending from the mid-continent region to the Mojave Desert (Anderson, 1989b).

The metasedimentary bedrock unit includes indurated, slightly foliated meta-greywacke, stretched pebble conglomerate, breccia, and ferruginous chert (Holloway and Leighty (1998). The metasedimentary unit forms a minor component of the bedrock in the Union Hills.

The foliated structural fabric observed in several of the Early to Middle Proterozoic bedrock units of the Union Hills is reported to have a preferred strike to the north and/or northeast and is steeply dipping to northwest.

Sedimentary Geology of the West Salt River Valley

Near the UPCO facility, the surface deposits of the West Salt River Valley are comprised of alluvial sediments likely derived from the surrounding Union Hills (Holloway and Leighty (1998)). The geologic map in Exhibit A-3 shows the surface distribution of this sedimentary unit which is interpreted to be Middle Pleistocene (1 Ma) to Holocene in age (recent). The sedimentary unit overlies the down-dropped Precambrian bedrock lows and the contact between the sedimentary unit and Precambrian basement rocks is mapped at the surface as a depositional nonconformity (Holloway and Leighty (1998)).

A.4. SOILS

Soils in the area of the UPCO facility are described as being Gachado - Rock outcrop - Quilotosa type, consisting of strongly sloping to steep, very gravelly, loamy soils and rock outcrop as shown in Exhibit A-5.

A.5. GROUNDWATER QUALITY

UPCO conducts groundwater monitoring at its monitoring well network and at private wells to the north of the facility. Groundwater quality data for the monitoring is submitted quarterly, and is summarized by UPCO annually.

A.6. SURFACE WATER AND WETLANDS

The UPCO facility is located in an arid, desert setting which is characterized by ephemeral streams (i.e., normally dry washes) traversing the 160 acre site from north-northeast to south-south-west. These drainage washes can be identified from the Master Drainage Report maps (Exhibit A-6) and the topographical map (Exhibit A-7). The area is subjected to very little precipitation and has high evaporation rates, especially in spring, summer and fall seasons. Storms, when they do occur, are usually intense but of short duration. Historical data indicates the maximum 24 hour precipitation event for Phoenix, Arizona was 3.07 inches in August 1943. The annual precipitation for Phoenix, Arizona is approximately seven (7) inches.

Important elements of the surface water hydrology in the vicinity of the facility include stream patterns, floodplain boundaries, the Central Arizona Project Canal, and the nearby Cave Creek Dam. Drainages (i.e., dry washes) that traverse the UPCO facility have been mapped in detail and are described in the Master Drainage Study Report (Exhibit A-6).

Ephemeral streams (i.e., normally dry washes) drain the southern portion of the Union Hills and flow southwestward through a swale-like depression that is bounded by broad topographic highs along the western and eastern margins of the property (refer to the topographical map - Exhibit A-7). Southwest of the UPCO facility boundaries, surface water, if present during storm events, is

temporarily impounded and diverted to the east by the Central Arizona Project (CAP) Canal which passes within 0.5 miles of the facility. Storm water run-off from the facility collects in dry washes which drain to the southwest through culverts under Happy Valley Road, and into the catchment under the canal through a 36 inch diameter syphon.

The Cave Creek Dam (CCD) is located on the eastern side of Union Hills, about one (1) mile east of the UPCO facility. During periods of heavy storm water run-off, surface water impounded behind the dam may cover an area in excess of one (1) square mile. The U.S. Army Corps of Engineers (CORPS) was contacted to learn whether the storm water run-off from CCD might impact the UPCO facility. Mr. Joseph Dixon (CORPS), who has extensive personal knowledge of the construction of CCD, stated that under no circumstances would storm water from the dam site be diverted toward the UPCO facility through the Union Hills. Instead, excess water during periods of heavy storm run-off would be conveyed through spillways located at the western end of CCD and then returned to Cave Creek.

There are no standing waters, surface water bodies or wetlands at the UPCO facility. The facility drains rapidly, via the washes, during storm events.

A.7. OTHER

Limited industrial activity occurs in the area of Phoenix in which the UPCO facility is located.

Although the UPCO facility is in the Phoenix metropolitan area, the area surrounding it is best characterized as rural rather than urban. The population in the nearby area is concentrated in a 0.5 square mile tract directly north of the UPCO facility. The population density in the tract is approximately 125 people per square mile, while the population density in all other areas adjoining the facility is less than 5 people per square mile. The principle reason for low population density on nearby land is that it is owned by various governmental entities, and no homebuilding or other development has occurred. This large amount of relatively vacant land provides an excellent buffer zone around the UPCO facility.

A.8. SOLID WASTE MANAGEMENT UNITS

Based on investigation activities conducted at the facility, it has been determined that perchlorate has been released to the environment from historic operations at UPCO. The primary source is considered the refurbishing of rocket motor tubes at the Waterbore Area with secondary sources related to propellant production activities, including cleaning activities in the C-Complex and open burning of waste energetic materials at the former-Open Burn Unit in the New Burn Area (see Exhibit A-1).

The Waterbore source area is thought to be the primary contribution of perchlorate observed in soil and groundwater beneath the site. Perchlorate concentrations detected in monitor wells downgradient of C-Complex and the New Burn Area, may also indicate some contribution from potential secondary sources (impacted soils in the C-Complex and New Burn Area). Based on the concentration of perchlorate detected in soil at the Waterbore Area, a historic driver (infiltration of

wastewater from waterbore operations) and the apparent direction of historic groundwater flow (southwest), the former evaporation ponds in the Waterbore Area are assumed to be the primary source of perchlorate impacts. A potential third minor source of perchlorate detected in groundwater may possibly be attributed to recharge of impacted surface water from historic F-Complex, D-Complex, and/or Old Burn Area operations in the wash along the west side of the site. This potential third source may explain the low level perchlorate impacts (15 to 20 ug/L) in groundwater at MW-6. The source areas for the primary constituent of concern, perchlorate, are shown on Exhibit A-1).

A.8.1 Waterbore Area

Since at least 1983, a high pressure water spray wand operation was used to remove solid propellant and binders from rocket motor tubes so that the tubes could be reused. This process was referred to as the waterbore operation. The Waterbore Area (Exhibit A-9) consisted of the waterbore water wand station, fiberglass and polyethylene above ground waterbore wastewater evaporation tanks, and two fiberglass evaporation tanks used for the evaporation of non-hazardous mop/rinse water generated throughout the facility.

Prior to use of the water spray wand, An out-of-service water wand (former water wand) was located approximately 30 feet north of the water spray wand. The former water wand was decontaminated and demolished concurrently with the closure activities conducted for the New Burn Area and the Thermal Treatment Unit. The former water wand was located in a fiberglass containment tank and in November 2002, the wand was shielded with plastic sheeting to limit horizontal water spray. In mid-2003, the former water wand was decommissioned and replaced with the fully-contained water wand station.

The wastewater generated by the waterbore operation contained suspended solids and dissolved oxidizers. The wastewater was filtered to remove the solids and the remaining solution containing the oxidizers was piped to the open-top evaporation tanks.

Prior to 1988, waterbore wastewater was collected and diverted into two earthen containment ponds lined with plastic. The former ponds covered a surface area of approximately 2,000 square feet and were located in the same area as the current holding tanks. The wastewater in the ponds was allowed to evaporate and the remaining solids were removed for treatment or disposal. The ponds were excavated and removed from service in the fall of 1988 and replaced with the fiberglass open-top tanks. In 2003, inner open-top polyethylene tanks were added so that the fiberglass tanks functioned as secondary containment. Additional containment was also provided by a 40 mil polyethylene liner underlying the six-inch sand layer beneath the tanks.

The non-hazardous mop/rinse-water evaporation tanks were utilized for the evaporation of non-hazardous process rinse water and mop water generated throughout the UPCO operation. The resulting solution/solids were transported off-site for disposal.

A.8.2 C-Complex

The C-Complex Area (Exhibit A-10) consisted of various buildings/structures used for manufacturing of castable propellants including material weigh-out, oxidizer grinding, propellant

mixing and casting. The C-Complex also served as a research and development area to improve and refine products and performance. The research and development activities included development of new castable propellants and energetic powders. Historically, Buildings C-2, C-9, and C-11 were used for the quality assurance/quality control laboratory activities that occurred in the F-Complex Building F-10 QC Laboratory. Oxidizers, binders, and metallic powders were also stored in the C-Complex Area.

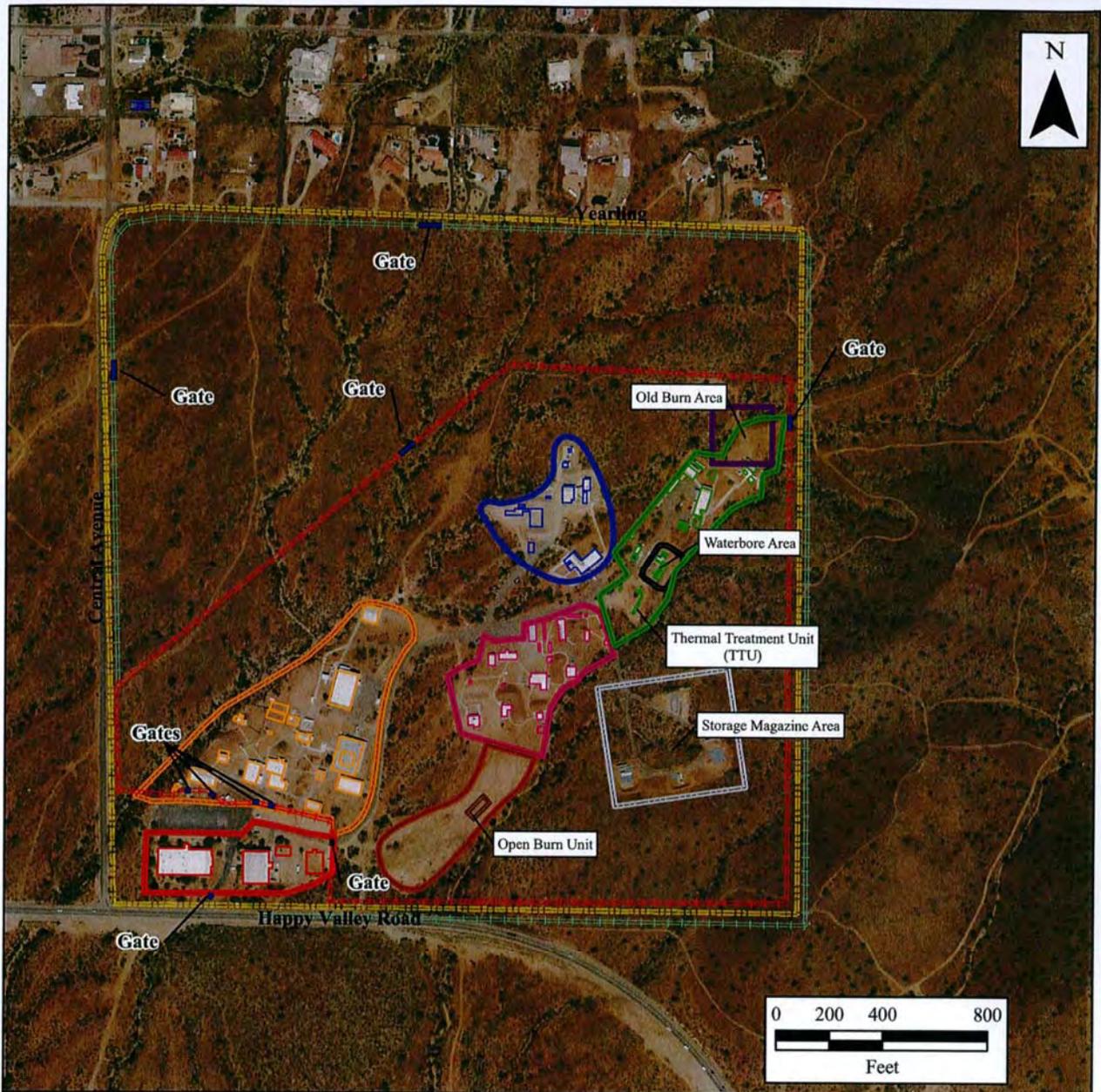
During the manufacturing process, dry oxidizer materials were mechanically ground to the desired particle size distribution, sieved to break up agglomerates, and weighed out for a particular batch size. Polymeric binders consisting of polyurethane or polybutadiene and carbon black were then evenly applied to the interior of the motor tubes. At times, solvents may also have been used to fluidize the binder for ease of application during the lining process. These solvents included methylene chloride and, previously, TCA. After the lining was cured, the tubes were placed into the casting fixture. Tooling was inserted into the tubes to form the appropriate annulus space that was then filled with the propellant mixture. Polymeric binder and fuels (magnesium or aluminum powders) were added to the oxidizer to form a raw propellant blend. The propellant was then vacuum-cast into the lined tubes and cured in ovens. After curing, the tooling was removed and the propellant tubes were prepared for further assembly.

During research and development activities, new castable propellants and powders were generated in smaller quantities using the same techniques described for the manufacturing process.

The chemicals predominantly used in the C-Complex included ammonium perchlorate, potassium perchlorate, lead nitrate, ammonium nitrate, potassium nitrate, iron oxide, polymeric binders (e.g., polyurethane or polybutadiene-based materials), magnesium or aluminum-based powders, methylene chloride, acetone, and isopropyl alcohol.

A.8.3 New Burn Area

The Open Burn Unit (OBU) was operated at the New Burn Area, located south of the C-Complex near the south central property boundary (Exhibit A-11). Open burning of waste and off-specification solid propellant materials were performed in this area from 1980 until 2004. Originally, wastes were burned on bare soil. In 1986 the OBU was upgraded with a burn pad consisting of 25 feet by 75 feet of four-inch steel-reinforced concrete covered with six inches of sand. In 1989, a 10-foot wide outer concrete apron, sloped towards the center, was constructed around the perimeter of the burn pad. Open burning activities were discontinued in December 2004. Closure of the OBU, associated open burning devices (OBD), and the Thermal Treatment Unit (TTU) was conducted in December 2007 and January 2008 in accordance with the hazardous waste closure Plan. Removal of some impacted soil in the New Burn Area was conducted in September 2008. A hazardous waste closure report for the OBU was submitted to ADEQ on December 19, 2008. ADEQ acknowledged partial closure of the OBU on February 23, 2009 (HWP-EX2250, Exhibit A-8).



Aerial Photo copyright Landiscor, Inc. 2008 all rights reserved

Legend

- | | |
|-------------------------|---------------|
| Lease Property Boundary | B-Complex |
| 6-Foot Chain Link Fence | C-Complex |
| Barbed Wire Fence | D-Complex |
| Gate | E-Complex |
| A-Complex | F-Complex |
| | New Burn Area |

MALCOLM PIRNIE	4646 E. Van Buren St., Suite 400 Phoenix, AZ 85008
	Facility Operations Map UPCO RCRA Permit Renewal
April 2010	Exhibit A-1

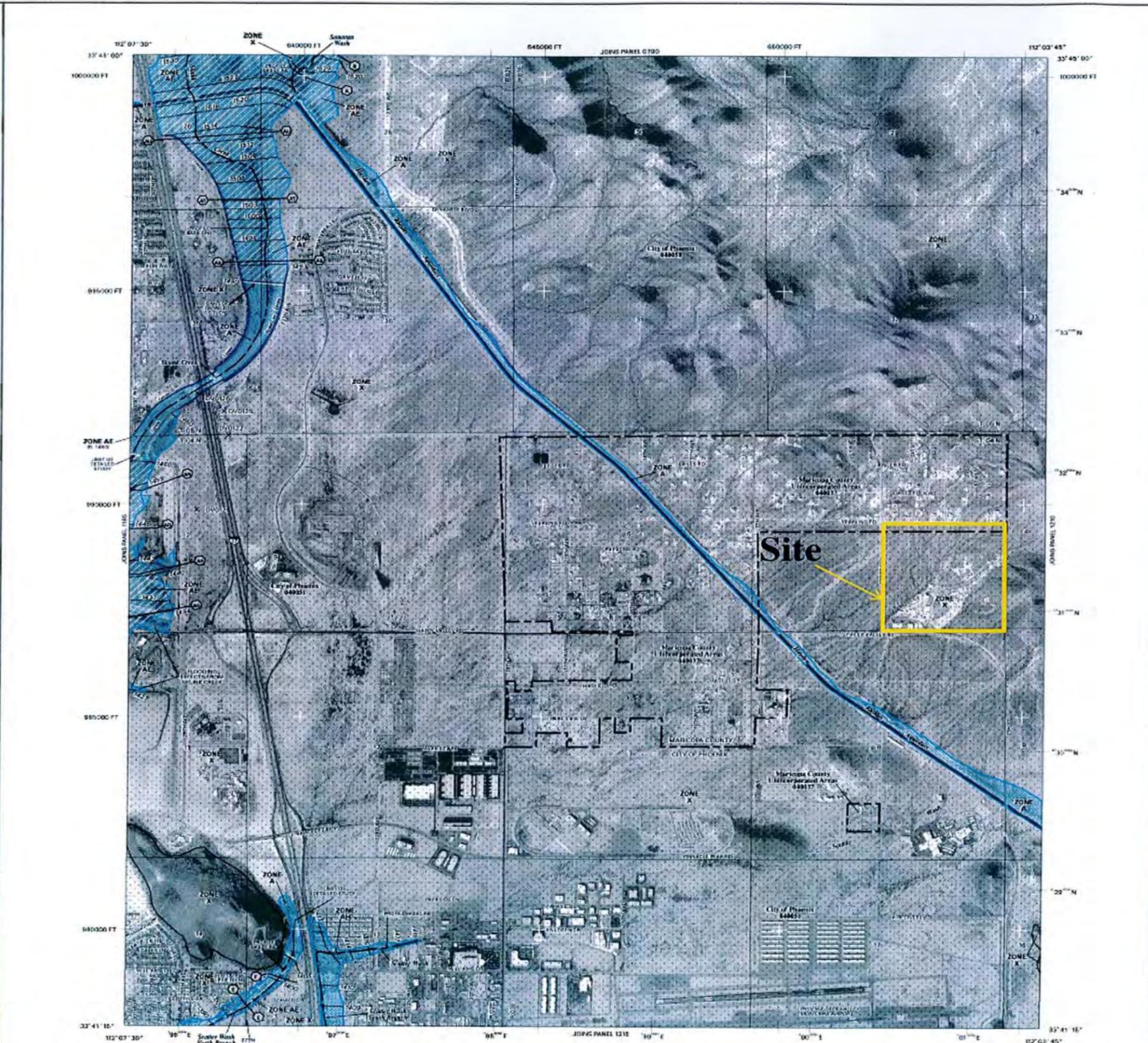
NOTES TO USERS

The map is for use in determining the National Flood Insurance Program (NFIP) Flood Hazard Insurance Risk Category for the Universal Propulsion Company (UPC) facility. It is not intended to be used for any other purpose. The map is not a warranty of insurance coverage. The map is not a guarantee of insurance coverage. The map is not a guarantee of insurance coverage. The map is not a guarantee of insurance coverage.

To obtain more detailed information on the National Flood Insurance Program (NFIP) Flood Hazard Insurance Risk Category for the Universal Propulsion Company (UPC) facility, please contact the National Flood Insurance Program (NFIP) at 1-800-358-3242. The National Flood Insurance Program (NFIP) is a federal program that provides flood insurance to property owners in participating communities. The National Flood Insurance Program (NFIP) is a federal program that provides flood insurance to property owners in participating communities. The National Flood Insurance Program (NFIP) is a federal program that provides flood insurance to property owners in participating communities.

Special Reference System: NAD 83, UTM Zone 18N, UTM Easting 640000, UTM Northing 1000000. The map is based on the National Flood Insurance Program (NFIP) Flood Hazard Insurance Risk Category for the Universal Propulsion Company (UPC) facility. The map is based on the National Flood Insurance Program (NFIP) Flood Hazard Insurance Risk Category for the Universal Propulsion Company (UPC) facility. The map is based on the National Flood Insurance Program (NFIP) Flood Hazard Insurance Risk Category for the Universal Propulsion Company (UPC) facility.

Scale: 1" = 1000'. The map is based on the National Flood Insurance Program (NFIP) Flood Hazard Insurance Risk Category for the Universal Propulsion Company (UPC) facility. The map is based on the National Flood Insurance Program (NFIP) Flood Hazard Insurance Risk Category for the Universal Propulsion Company (UPC) facility. The map is based on the National Flood Insurance Program (NFIP) Flood Hazard Insurance Risk Category for the Universal Propulsion Company (UPC) facility.



LEGEND

GENERAL FLOOD HAZARD AREAS SUBJECT TO REGULATION BY THE FEDERAL EMERGENCY PLANING ACT

- ZONE AE** Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood
- ZONE X** Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood
- ZONE V** Special Flood Hazard Area (SFHA) - Very High Risk Flood

FLOODWAY AREAS IN ZONE AE

- 1% ANNUAL CHANCE FLOODWAY**
- 5% ANNUAL CHANCE FLOODWAY**
- 10% ANNUAL CHANCE FLOODWAY**
- 25% ANNUAL CHANCE FLOODWAY**
- 50% ANNUAL CHANCE FLOODWAY**
- 100% ANNUAL CHANCE FLOODWAY**

OTHER FLOOD AREAS

- 1% ANNUAL CHANCE FLOOD**
- 5% ANNUAL CHANCE FLOOD**
- 10% ANNUAL CHANCE FLOOD**
- 25% ANNUAL CHANCE FLOOD**
- 50% ANNUAL CHANCE FLOOD**
- 100% ANNUAL CHANCE FLOOD**

BOUNDARIES

- CITY OF PHOENIX**
- MARICOPA COUNTY**
- CITY OF PHOENIX INCORPORATED AREA**
- MARICOPA COUNTY INCORPORATED AREA**

Scale: 1" = 1000'

Map Date: April 6, 2005

100 Year Flood Data
 in and Around
 Universal Propulsion Co.

Exhibit A-2

NFIP

PANEL 1205G

FIRM FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA

AND INCORPORATED AREAS

PANEL 1205 OF 4350

CONTRACT

COMPLETION DATE

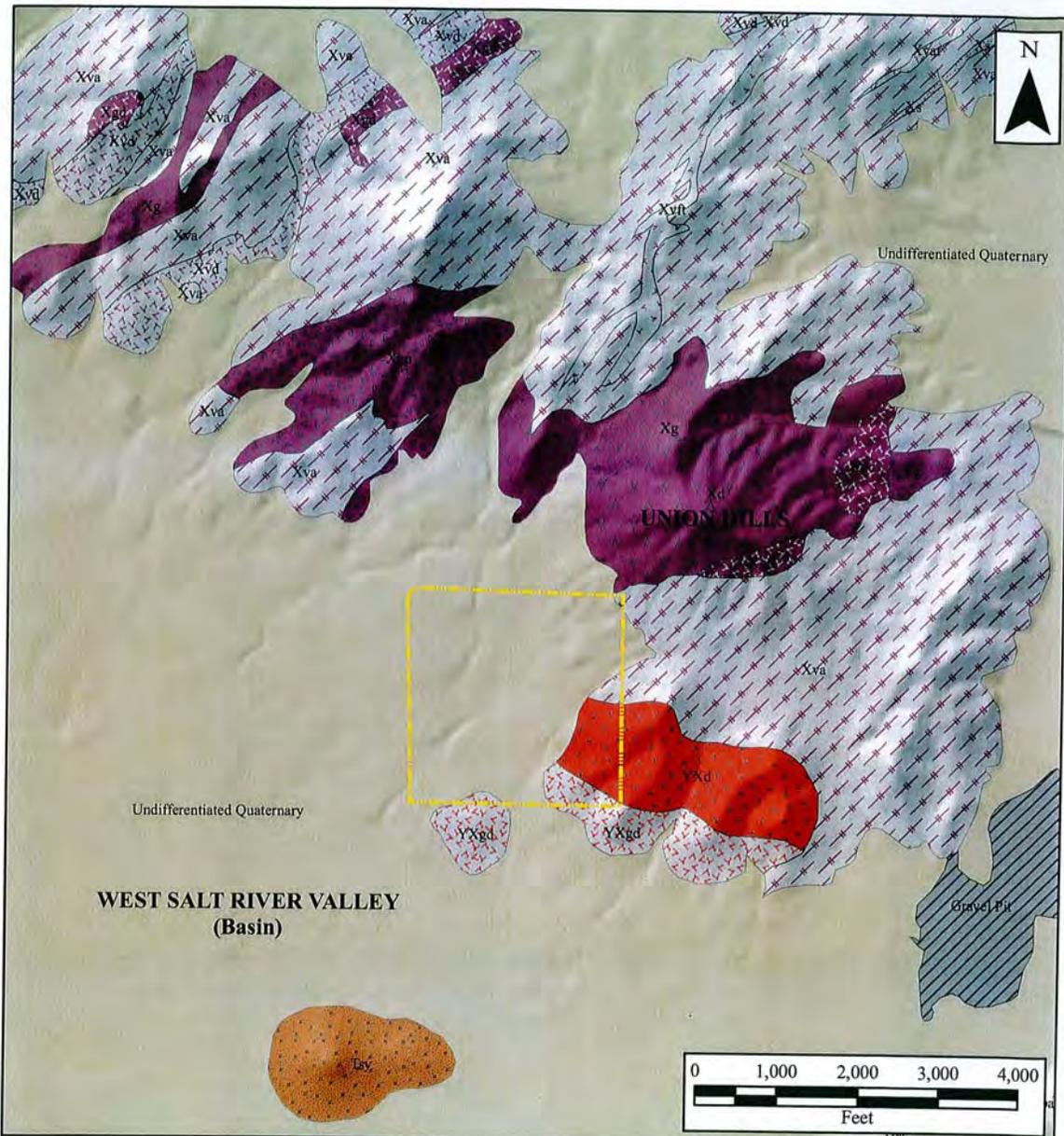
MAP NUMBER

04013C1205G

MAP REVISED

SEPTEMBER 30, 2005

Federal Emergency Management Agency

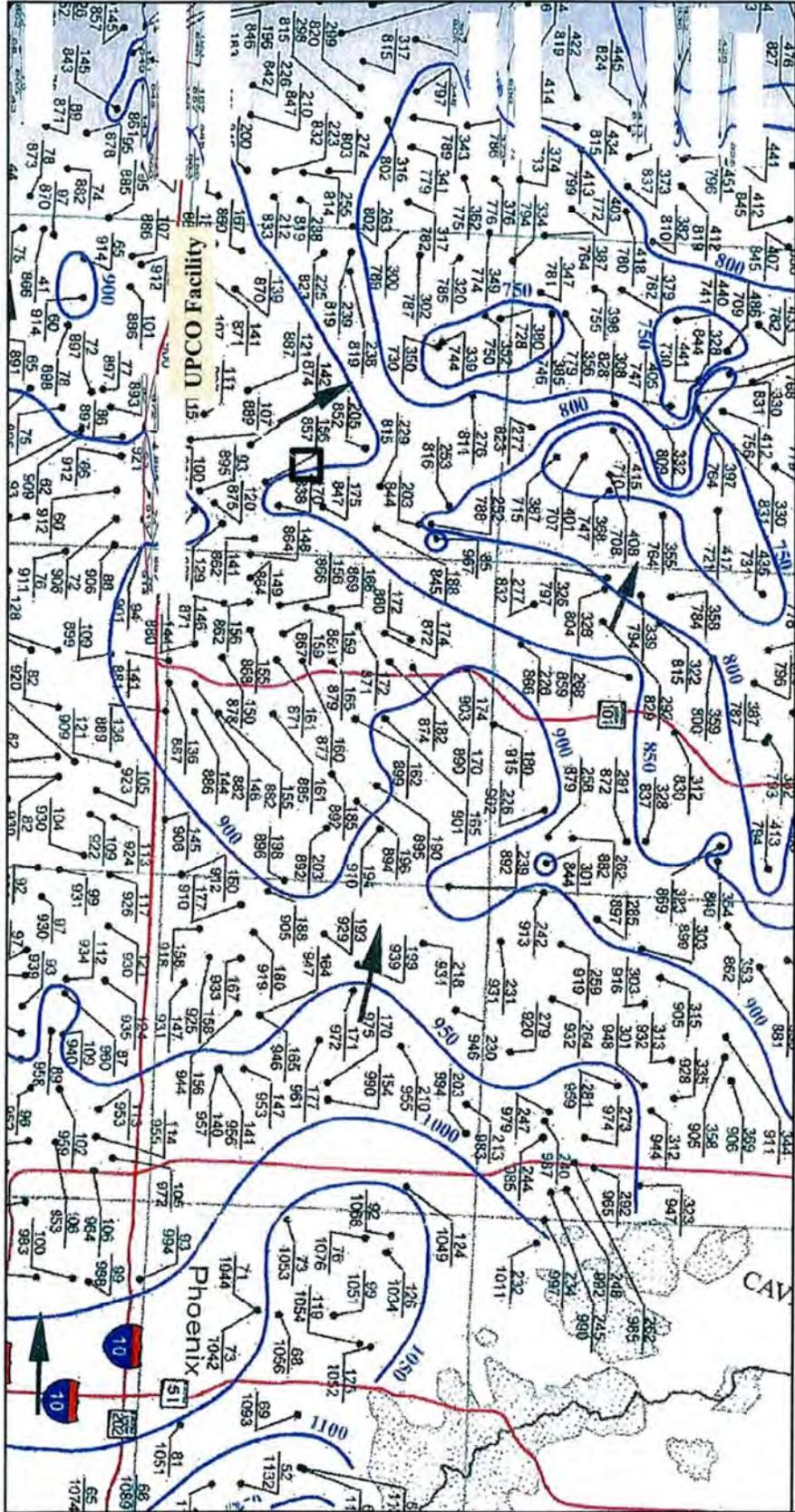


Legend

Basin		Proterozoic Bedrock Units			
Fill Deposits		Intrusive		Meta-volcanic	Meta-sedimentary
Q - Undifferentiated	YXd	Xgp	Xva	Xs	
Tsy	YXg	Xgd	Xvft		
Gravel Pit	YXgd	Xd	Xvat		
Lease Property Boundary	Xg	Xvd	Xvf		

Note: Geology taken from Holloway and Leighty, 1995.

	4646 E Van Buren St. Suite 400 Phoenix, AZ 85008
	Geologic Map UPCO RCRA Permit Renewal Universal Propulsion Company, Inc.
April 2009	Exhibit A-3



Source: S.J Rascona, 2005.

Base Map from USGS, Phoenix, Arizona, 1954, revised 1969, 1:250,000.

Legend

- Bedrock
- Valley-fill deposits
- Well location, depth to water in feet below ground surface, and water table elevation (November 2002 to February 2003) (2003)
- Water level elevation contour in feet above mean sea level. Contour interval is 50 feet

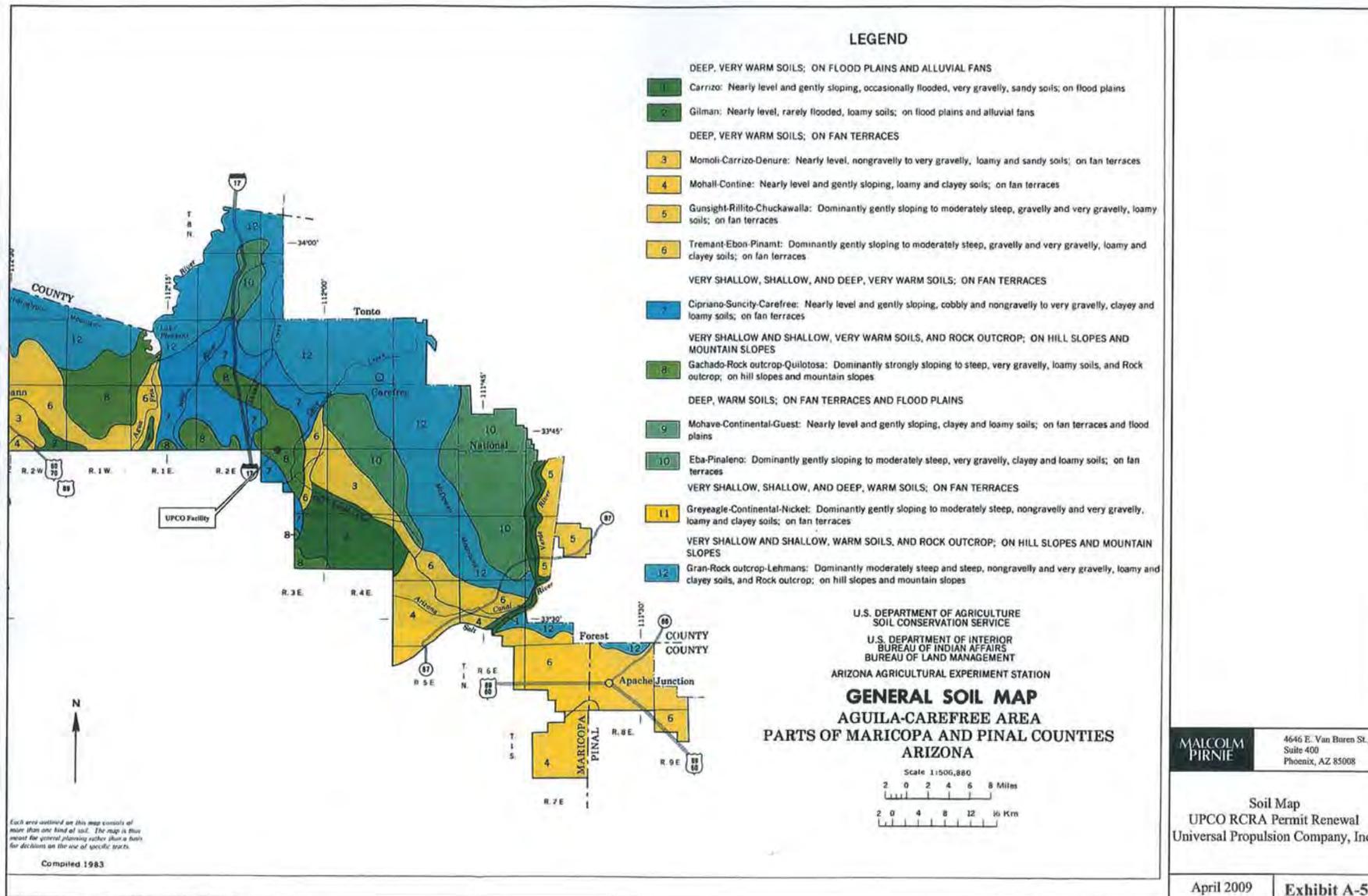
MALCOLM PIRNIE
 4646 E. Van Buren St.,
 Suite 400
 Phoenix, AZ 85050

Water Table Map
 UPCO RCRA Permit Renewal
 Universal Propulsion Company, Inc.

April 2009 **Exhibit A-4**

0 3 9 Mile

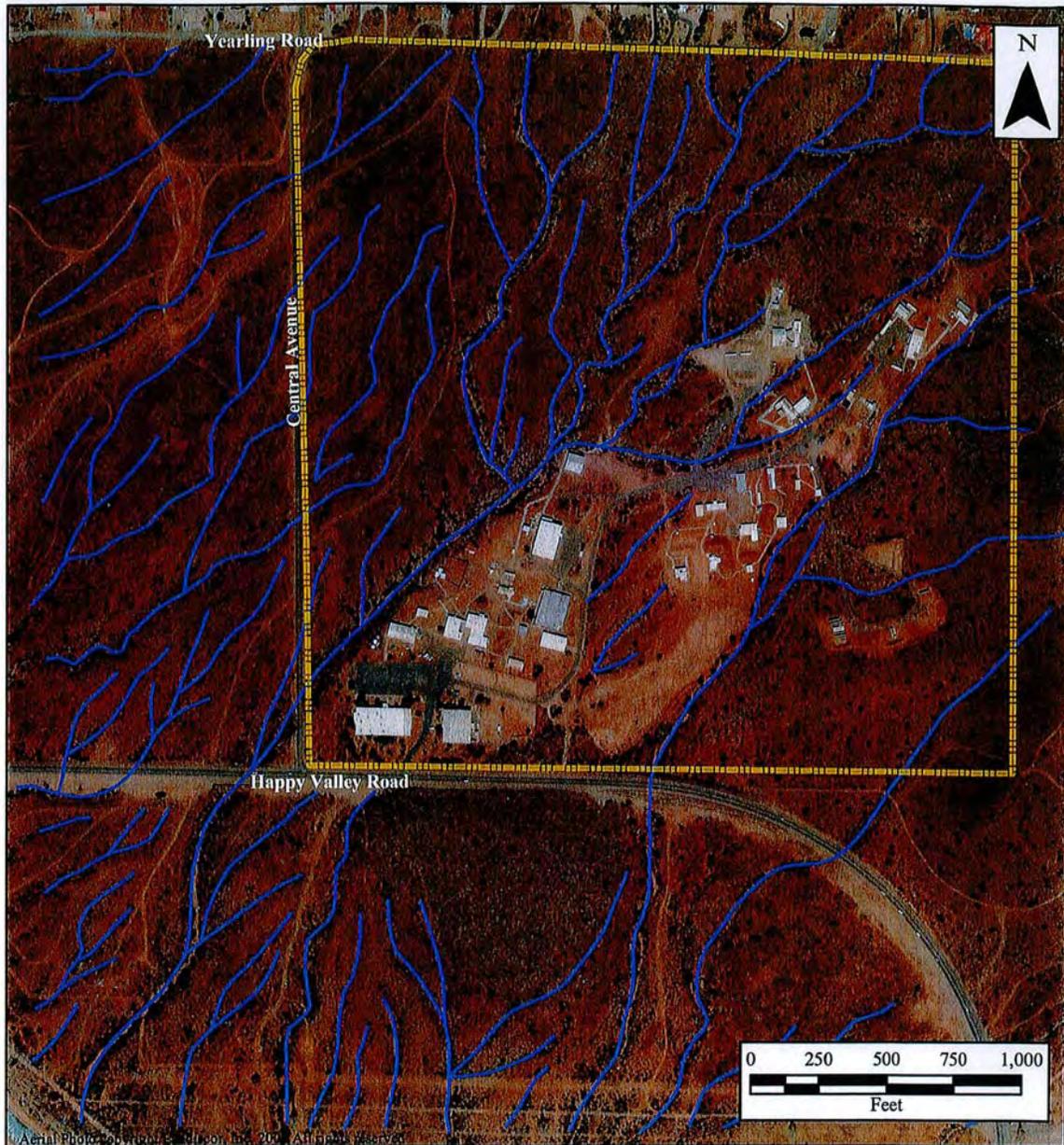
M:\3994003\GIS\Projects_MXD\RCRA_Permit_Renewal\April 2009 Submittal



MALCOLM PIRNIE 4646 E. Van Buren St., Suite 400, Phoenix, AZ 85008

Soil Map
 UFCO RCRA Permit Renewal
 Universal Propulsion Company, Inc.

April 2009 Exhibit A-5



Legend

-  Lease Property Boundary
-  Drainage

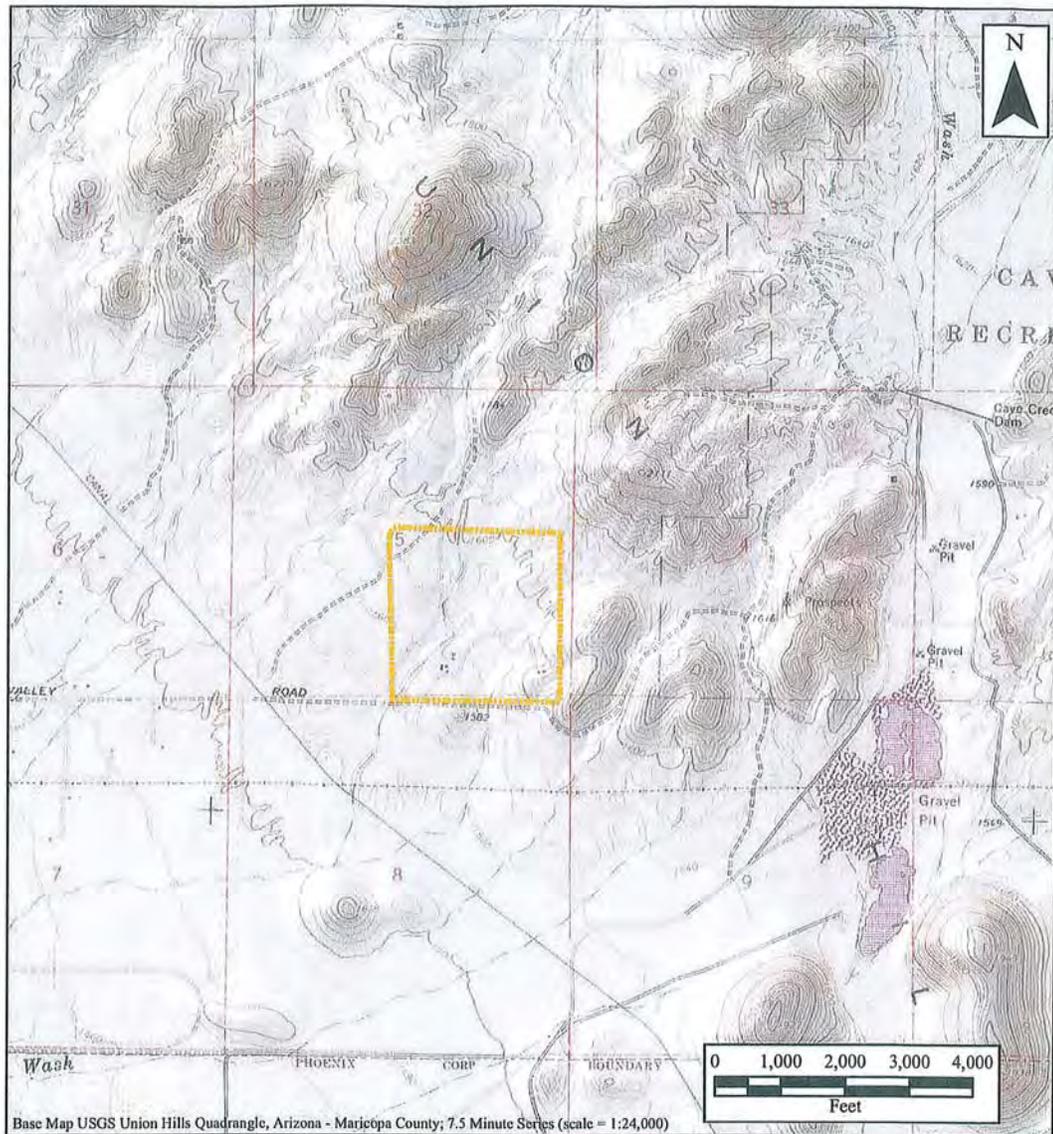
**MAICOLM
PIRNIE**

4646 E. Van Buren St.,
Suite 400
Phoenix, AZ 85008

Surface Water Drainage
UPCO RCRA Permit Renewal
Universal Propulsion Company, Inc.

April 2009

Exhibit A-6



Legend

 Lease Property Boundary

**MALCOLM
PIRNIE**

4646 E. Van Buren St.,
Suite 400
Phoenix, AZ 85008

USGS Topographic Map
UPCO RCRA Permit Renewal

September 2008

Exhibit A-7

Exhibit A-8

Acknowledgement of Partial Closure (OBU, OBD, and TTU)



Janice K. Brewer
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov



Patrick J. Cunningham
Acting Director

February 23, 2009
REF: HWP- EX2250

Mr. Jerry Ricketts
Universal Propulsion Company
Goodrich Interiors
25401 N. Central Avenue
Phoenix, AZ 85085-2837

**Re: Acknowledgement of Partial Closure;
Universal Propulsion Company, 25401 North Central Ave., Phoenix, AZ 85027;
EPA ID No. AZD 980 814 479**

Dear Mr. Ricketts:

The Arizona Department of Environmental Quality (ADEQ) has completed its review of the Closure Report, the owner/operator closure certification, and the engineer's certification submitted by Universal Propulsion Company (UPCO) on December 19, 2008. ADEQ finds that the report adequately documents closure of the Open Burn Unit, the Open Burn Devices, and the Thermal Treatment Unit, formerly covered by UPCO's Hazardous Waste Permit. The report shows that the units were properly decontaminated, characterized, and disposed. Decontamination residues were properly sampled, characterized and managed in accordance with the approved Closure Plan. The decontamination and disposition of the former water wand and former evaporation tank in the Waterbore Area were also completed in accordance with the approved Closure Plan.

ADEQ hereby acknowledges that UPCO has completed closure of the permitted hazardous waste treatment units at the facility in accordance with the approved Closure Plan. ADEQ notes that existing soil and groundwater contamination at the site will require post-closure monitoring and corrective action. Post-closure monitoring and corrective action requirements will be addressed in the new hazardous waste permit for the facility.

UPCO is notified that it must maintain the full financial assurance amounts (corrective action surety bond and closure trust fund) already established for the facility. Additional financial assurance may be required pending ADEQ's review of the permit application and/or following approval of the forthcoming correctives measures study.

Northern Regional Office
1801 W. Route 66 • Suite 117 • Flagstaff, AZ 86001
(928) 779-0313

Southern Regional Office
400 West Congress Street • Suite 433 • Tucson, AZ 85701
(520) 628-6733

February 23, 2009
Mr. Jerry Ricketts
REF: HWP-EX2250
Page 2 of 2

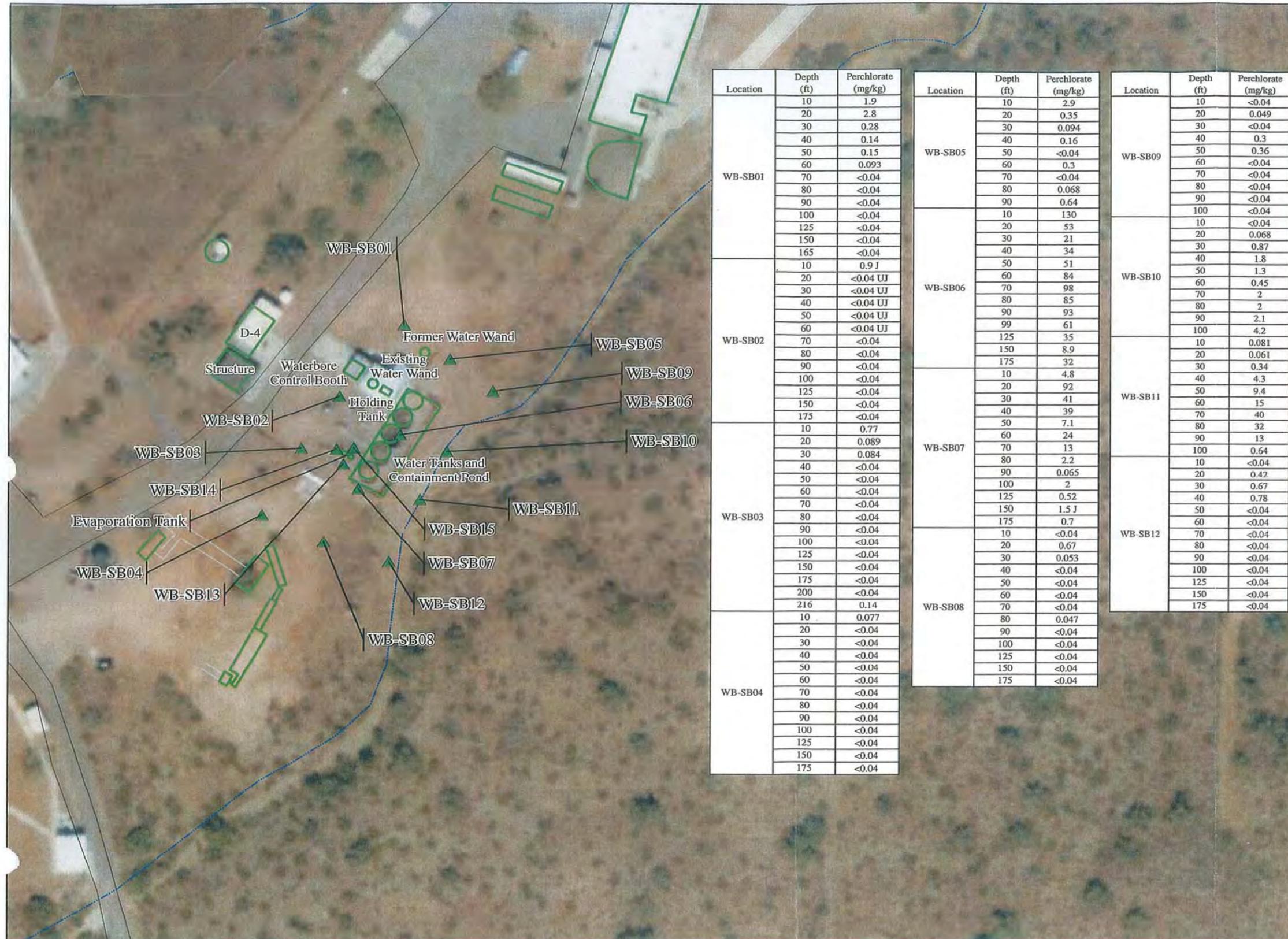
If you have any questions do not hesitate to contact me at 602-771-4160.

Sincerely,

A handwritten signature in green ink, appearing to read "Anthony Leverock". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Anthony Leverock
Hazardous Waste Permits Unit
Waste Programs Division

cc: Greg Workman, Goodrich Aircraft Interior Products
Joseph Mikitish, Attorney General's Office
Bruce Campbell, State Land Department
Robin Thomas, Manager of Waste Permits Section
Mel Bunkers, Supervisor of Hazardous Waste Inspections and Compliance Unit
Rich Olm, Environmental Engineer Sr



Legend

- Waterbore Soil Data
- D-Complex Site Facilities
- Sidewalk or Paved Area
- Ephemeral Wash
- Paved Road

mg/kg = milligram per kilogram

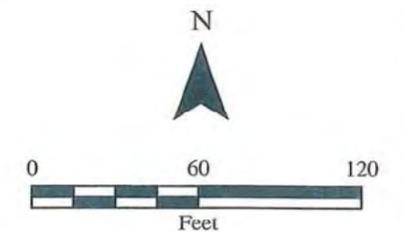
< = Analyte not reported above the listed laboratory detection limit

ft = feet below ground surface

J = Analyte was positively identified; however, the result should be considered an estimate

UJ = The listed laboratory detection limit is considered an estimate

Note: Soil Boring WB-SB13 through WB-SB15 were not analyzed for perchlorate

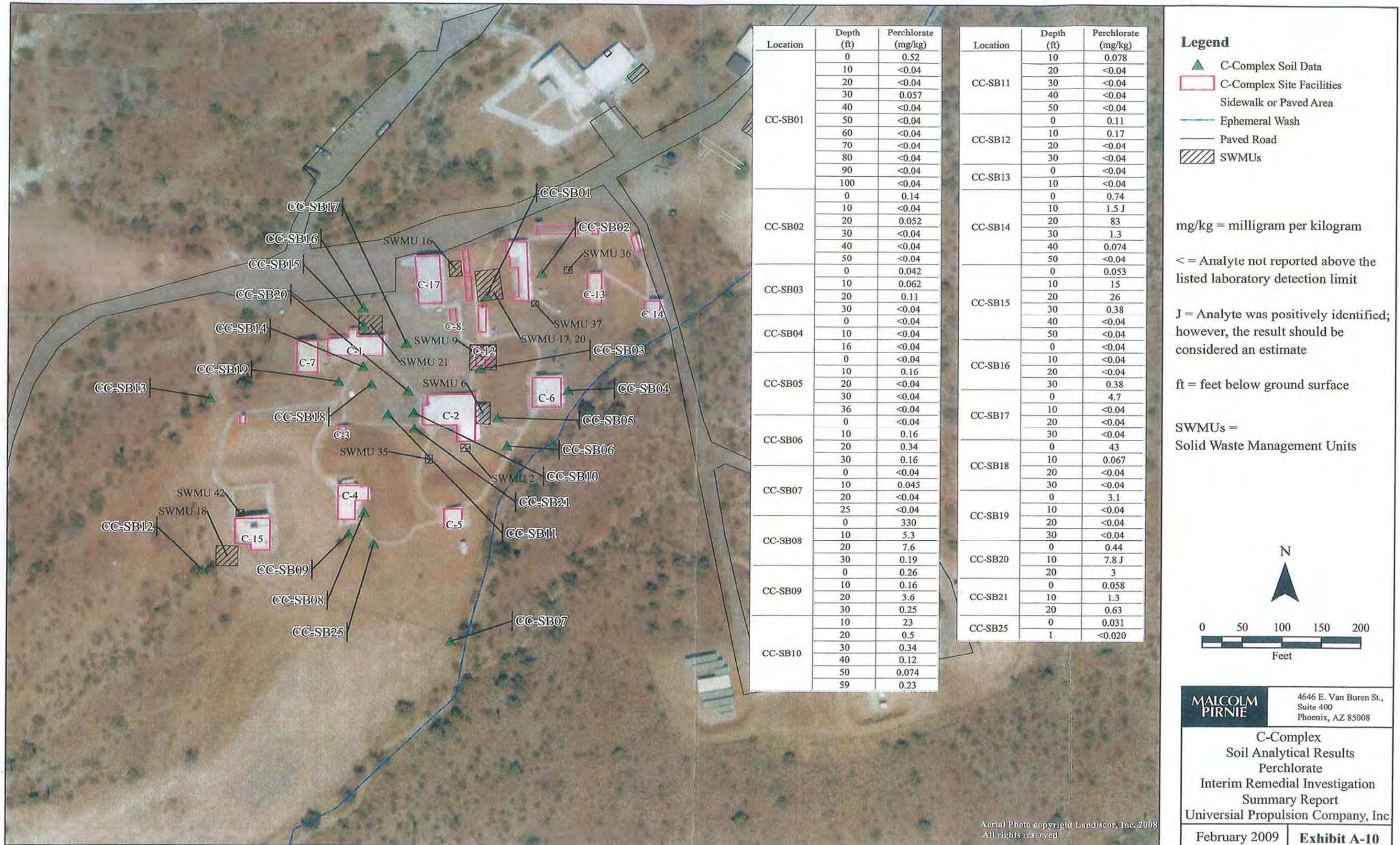


Location	Depth (ft)	Perchlorate (mg/kg)	
WB-SB01	10	1.9	
	20	2.8	
	30	0.28	
	40	0.14	
	50	0.15	
	60	0.093	
	70	<0.04	
	80	<0.04	
	90	<0.04	
	100	<0.04	
	125	<0.04	
	150	<0.04	
	165	<0.04	
	WB-SB02	10	0.9 J
		20	<0.04 UJ
30		<0.04 UJ	
40		<0.04 UJ	
50		<0.04 UJ	
60		<0.04 UJ	
70		<0.04	
80		<0.04	
90		<0.04	
100		<0.04	
125		<0.04	
150		<0.04	
175		<0.04	
WB-SB03		10	0.77
		20	0.089
	30	0.084	
	40	<0.04	
	50	<0.04	
	60	<0.04	
	70	<0.04	
	80	<0.04	
	90	<0.04	
	100	<0.04	
	125	<0.04	
	150	<0.04	
	175	<0.04	
	200	<0.04	
	216	0.14	
WB-SB04	10	0.077	
	20	<0.04	
	30	<0.04	
	40	<0.04	
	50	<0.04	
	60	<0.04	
	70	<0.04	
	80	<0.04	
	90	<0.04	
	100	<0.04	
	125	<0.04	
	150	<0.04	
	175	<0.04	

Location	Depth (ft)	Perchlorate (mg/kg)	
WB-SB05	10	2.9	
	20	0.35	
	30	0.094	
	40	0.16	
	50	<0.04	
	60	0.3	
	70	<0.04	
	80	0.068	
	90	0.64	
	10	130	
	20	53	
	30	21	
	40	34	
	50	51	
	60	84	
WB-SB06	70	98	
	80	85	
	90	93	
	99	61	
	125	35	
	150	8.9	
	175	32	
	WB-SB07	10	4.8
		20	92
		30	41
		40	39
		50	7.1
		60	24
		70	13
		80	2.2
90		0.065	
100		2	
125		0.52	
150		1.5 J	
175		0.7	
WB-SB08		10	<0.04
		20	0.67
	30	0.053	
	40	<0.04	
	50	<0.04	
	60	<0.04	
	70	<0.04	
	80	0.047	
	90	<0.04	
	100	<0.04	
	125	<0.04	
	150	<0.04	
	175	<0.04	

Location	Depth (ft)	Perchlorate (mg/kg)	
WB-SB09	10	<0.04	
	20	0.049	
	30	<0.04	
	40	0.3	
	50	0.36	
	60	<0.04	
	70	<0.04	
	80	<0.04	
	90	<0.04	
	100	<0.04	
	10	<0.04	
	20	0.068	
	30	0.87	
	40	1.8	
	WB-SB10	50	1.3
60		0.45	
70		2	
80		2	
90		2.1	
100		4.2	
10		0.081	
20		0.061	
30		0.34	
40		4.3	
WB-SB11		50	9.4
		60	15
		70	40
		80	32
		90	13
	100	0.64	
	WB-SB12	10	<0.04
		20	0.42
		30	0.67
		40	0.78
		50	<0.04
		60	<0.04
		70	<0.04
		80	<0.04
		90	<0.04
100		<0.04	
125		<0.04	
150		<0.04	
175		<0.04	

MALCOLM PIRNIE	4646 E. Van Buren St., Suite 400 Phoenix, AZ 85008
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M:\3994003\GIS\Projects_MXD\Revised_RI_Summary_Report\Figure 10 C-Complex Perchlorate Soil.mxd

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Legend

- C-Complex Soil Data
- C-Complex Site Facilities
- Sidewalk or Paved Area
- Ephemeral Wash
- Paved Road
- SWMUs

mg/kg = milligram per kilogram

< = Analyte not reported above the listed laboratory detection limit

J = Analyte was positively identified; however, the result should be considered an estimate

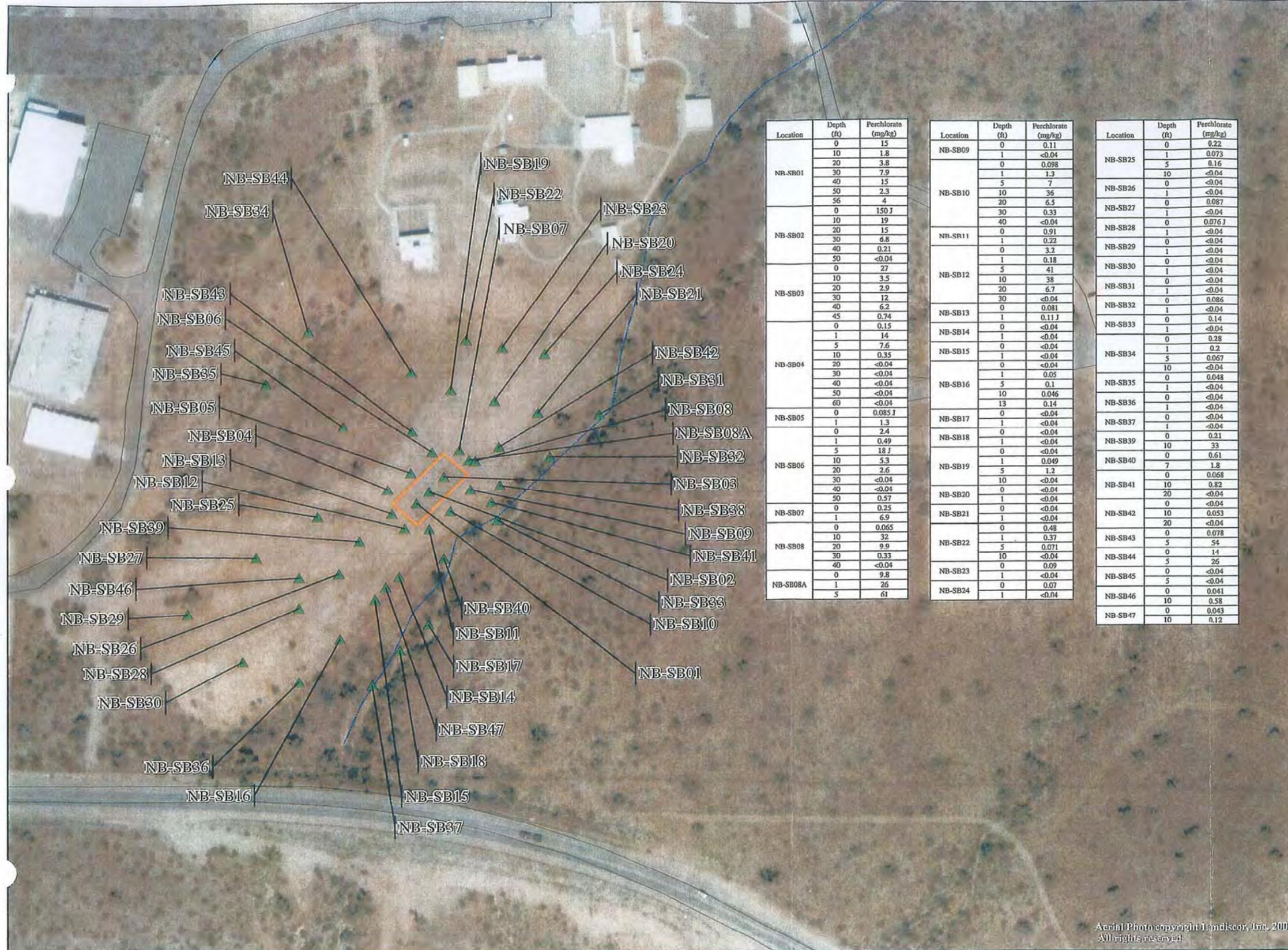
ft = feet below ground surface

SWMUs = Solid Waste Management Units

MALCOLM PIRNIE 4646 E. Van Buren St., Suite 400, Phoenix, AZ 85008

C-Complex Soil Analytical Results Perchlorate Interim Remedial Investigation Summary Report Universal Propulsion Company, Inc.

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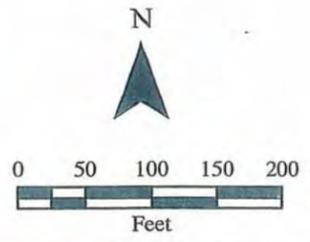


Legend

- ▲ New Burn Soil Data
- Building
- ◻ Former Open Burn Unit
- ◻ Sidewalk or Paved Area
- Ephemeral Wash
- Paved Road

mg/kg = milligram per kilogram
 < = Analyte not reported above the listed laboratory detection limit
 ft = feet below ground surface
 J = Analyte was positively identified; however, the result should be considered an estimate

Note: Soil samples collected at NB-SB38 were not analyzed for perchlorate



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New Burn Area
 Soil Analytical Results
 Perchlorate
 Interim Remedial Investigation
 Summary Report
 Universal Propulsion Company, Inc.

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