April 27, 2012
Revision Draft

ATTACHMENT A

FACILITY DESCRIPTION

ATTACHMENT A (Application SECTION 2)

FACILITY DESCRIPTION

2.1 GENERAL DESCRIPTION

The Page Ranch Landfill is located in the Oracle/Oracle Junction area of Pinal County, Arizona, north of State Highway 77, approximately seven miles west of Oracle and 30 miles north of Tucson. Site location map is shown in Figure A-1. Page Ranch is located in Township 9 South, Range 14 East, Gila and Salt River Base and Meridian, and includes the southern half of Section 27 and the northern half of Section 34.

The land to the north and northeast of the Page Ranch Landfill is owned by the State of Arizona and used as open range grazing land. The land to the north, northwest, and east is owned and used by the University of Arizona for agricultural research. The land to the southwest, south, and southeast of Page Ranch Landfill is owned by Robson Ranch Mountains, LLC, a developer, and used for residential development. Since the last permit application, approximately 103 homes and a clubhouse have been constructed in the Saddlebrooke Resort Community.

The University of Arizona (UA) used Page Ranch from 1962 to February 1, 1986 (with some isolated prior use) for disposal of low-level radioactive and chemical wastes generated by laboratories at the UA, Northern Arizona University, Arizona State University, and Veterans Hospital in Tucson. The Arizona Atomic Energy Commission [currently Arizona Radiation Regulatory Agency (ARRA)] oversaw and maintained the approval of disposed radioactive laboratory wastes.

Page Ranch Landfill site occupies a total of 3.25 acres and consists of two units: Unit A (northern unit, 200 feet by 200 feet) and Unit B (southern unit, 200 feet wide by 500 feet long). In both units, wastes were placed into individual cells (pits) that were approximately 15 feet deep. Disposal operations began at Unit B, which from early 1960's received and maintained approval from the Arizona Atomic Energy Commission for disposal of low-level radioactive laboratory wastes. Disposal of mixed wastes at Unit B started in late 1960's, and continued to 1986.

Chemical wastes disposal cells at Unit B were first utilized as open neutralization and burn pits; subsequently, they were used for direct burial of chemicals in one- and five gallon containers (bottles, cans, boxes, bags) and 55-gallon drums packed with adsorbent materials (lab-packs).

In 1982, Unit A, which was used only for disposal of chemical wastes, replaced Unit B for disposal of RCRA waste only. Unit A was designed and subsequently operated in accordance with the applicable RCRA standards for landfills. The disposal cells were individually double-lined with a chemically resistant synthetic liner. Wastes were received in sealed, 55-gallon drums (DOT 17Cl. These drums were placed into the cells in single layers, sealed with the plastic liner, and covered with soil.

From mid-1983, the quantity of materials disposed at the site was reduced due to the addition of the chemical waste incinerator and neutralization facilities at the UA campus. As a result, when

landfill operations ceased, less than half of the predetermined capacity of Unit A had been actually used.

Page Ranch Landfill record keeping began in 1978. Based on the manifests and earlier UA disposal records, a total of 80 tons of original containers and approximately 200 tons of laboratory packs had been disposed in Unit A and in the hazardous portions of Unit B. This inventory does not include the radioactive wastes or undocumented chemical wastes. The chemical wastes consisted primarily of solvents, ignitable, acids, bases, heavy metals, pesticides, and photographic compounds (ADEQ, 1996, p.1). Page Ranch Landfill closure construction was finished in August 1997 in accordance with ADEQ-approved closure plan (RUST, 1995) and its modifications (SCS, 1996a), and the Project Manual (SCS, 1996b) and Project Drawings (SCS, 1996c). Closure activities are summarized in the Closure Report (SCS, 1998). Final closure entailed the following:

- Construction of a single monolithic earthen final cover system over each, Unit A and Unit B (see Figure A-1). consisting of the following units from bottom to top:
    - 24-inch subgrade with two layers of geogrid;
    - 24-inch soil infiltration barrier;
    - 200-mil geonet; and
    - 24-inch vegetative soil cover.
- Installation of a 6-foot-high chain-link fence, with barbed wire on top, around the facility boundary, including both, Unit A and Unit B (see Figure A-1);
- Construction of a road network to provide easy access to the facility during post-closure period (see Figure A-1);
- Installation of 36-inch x 22-inch corrugated metal pipe-arch culverts for storm water channels: one along Unit A and one along Unit B (see Figure A-1);
- Construction of storm water channels for surface water control (see Figure A-1); and
- Hydroseeding of the final cover on both, Unit A and Unit B.

A Post-Closure Permit application was submitted in December 1997 and was approved by the Arizona Department of Environmental Quality (ADEQ) on November 6, 2001 (ADEQ, 2001). The landfill is regulated by this permit.

2.2 POST-CLOSURE INVESTIGATION, INTERIM MEASURE, AND RISK ASSESSMENT

Following landfill closure, multiple investigations have been conducted to evaluate potential impacts of the landfill on subsurface soil, soil vapor, and groundwater conditions at and in the immediate vicinity of the landfill, as listed below. The results are summarized in the Human Health Risk Assessment (AMEC, 2009).

- In July and August 2002, Weston Solutions, Inc. (Weston) conducted a soil investigation to determine the nature and extent of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and organochlorine pesticides in soil surrounding the

landfill, and collected soil vapor samples around the perimeter of both landfill units and for analysis of target VOCs (Weston 2003).

- In November 2003, Hydro Geo Chem, Inc. (HGC) conducted interim measure investigation by installing six soil vapor monitoring points in three soil borings (two in each boring).
- A solar-powered soil vapor extraction (SVE) system was installed at the landfill as an interim measure in June 2006 and continues to be operated.
- Soil vapor samples were collected at the six soil vapor monitoring points in May 2006, November 2006, April 2007, December 2007, April 2008, October 2008, April 2009, November 2009, and October 2010.
- In December 2007, AMEC conducted a shallow soil vapor survey at twelve locations along the landfill perimeter.
- The UA Department of Risk Management Services has been collecting groundwater samples from groundwater monitoring wells MW-2 through MW-5 on a semi-annual basis.
- HGC conducted a preliminary screening risk assessment for the landfill in 2005 (HGC, 2005).
- AMEC conducted human health risk assessment in 2009 (AMEC, 2009).

2.3 TOPOGRAPHIC MAP

2.3.1 General Requirements

Site topographic map (Figure A-1) contains the following information:

- Map date;
- Scale (1 inch equal 200 feet);
- Map orientation;
- Facility location and 1,000-feet surrounding area;
- Surface contours;
- Surrounding land uses;
- Facility legal boundary;
- Facility fencing and gates;
- Facility access road network;
- Location of hazardous waste disposal units (Unit A and Unit B);
- Location of storm water control structures (culverts and channels);
- Final cover limits (Unit A and Unit B);
- Wind rose.

2.4 Additional Requirements

Site topographic map (Figure A-1) also contains the following information:

- Location of groundwater monitoring wells.
- Location of soil vapor monitoring wells.
- Location of SVE system.

Representative groundwater flow direction and rate are shown on Figure A-2.

Figure A-3 shows the following subsurface conditions at the site:

- Lithological units from surface to depth of 840 feet (as derived from the site groundwater monitoring wells boring logs); and
- Depth to the uppermost aquifer and the lower water-bearing zone.

2.5 LOCATION INFORMATION

2.5.1 Seismic Standard

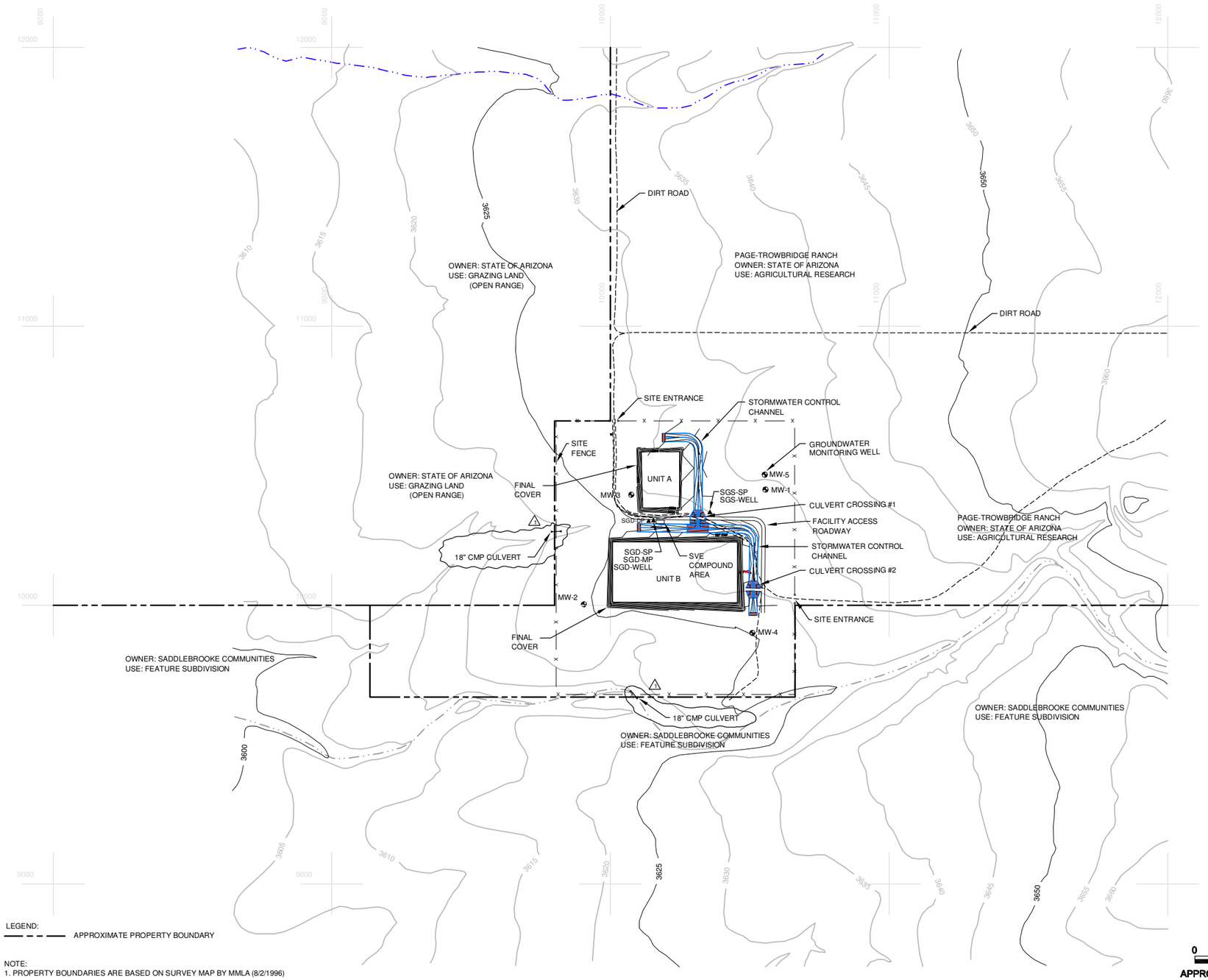
Page Ranch Landfill is located near Oracle and Oracle Junction in Pinal County, Arizona. These political jurisdictions are not listed in Appendix VI of 40 CFR Part 264. Consequently, no further information is required.

2.5.2 Floodplain Standard

The facility is not located in the 100-year floodplain (Figure A-4).

FIGURE A-1

TOPOGRAPHICAL MAP



LEGEND:

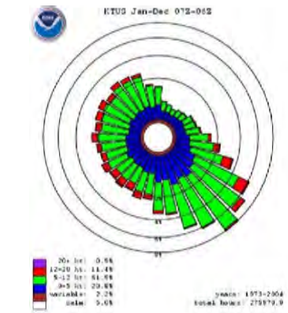
APPROXIMATE PROPERTY BOUNDARY

NOTE:
1. PROPERTY BOUNDARIES ARE BASED ON SURVEY MAP BY MMLA (8/2/1996)

0 200 400

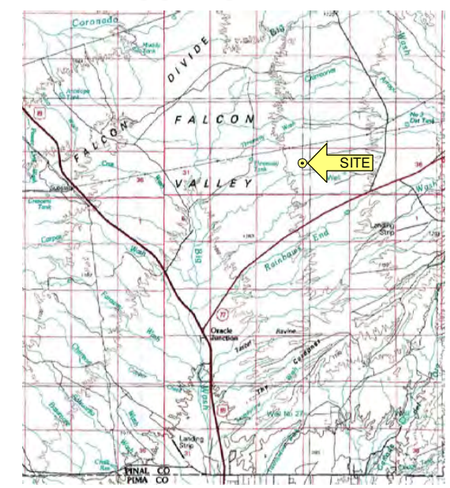
APPROXIMATE SCALE IN FEET

ALL WEATHER WINDROSE



SOURCE: U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER RECORD CENTER FOR YEARS JANUARY 1973 TO DECEMBER 2004.

LOCATION MAP



SOURCE: USGS MAMMOTH, ARIZONA 1986
1:100000 SCALE

SOURCE: STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, PHOENIX, ARIZONA DECEMBER 12, 1997.

REV	D	M	Y	ISSUE/REVISION DESCRIPTION	ENG.	APPR.
5						
4						
3						
2						
1						
5	15	11	2011	REVISED FOR PERMIT APPLICATION	ENG.	M.Z.
4	17	06	2011	ISSUED FOR PERMIT APPLICATION	XX.	M.Z.

Client Logo:

Client:
UNIVERSITY OF ARIZONA
P.O. BOX 210460
TUCSON, AZ. 85721-0460

AMEC Earth & Environmental
1405 West Auto Drive
Tempe AZ 85284-1016

DATUM: --
PROJECTION: --
DRAWN BY: APS
REVIEWED BY: MZ
ORIGINAL SCALE: AS SHOWN

PROJECT: PAGE - TROWBRIDGE RANCH LANDFILL
RCRA PART B POST CLOSURE PERMIT APPLICATION
(EPA ID AZ98066584)

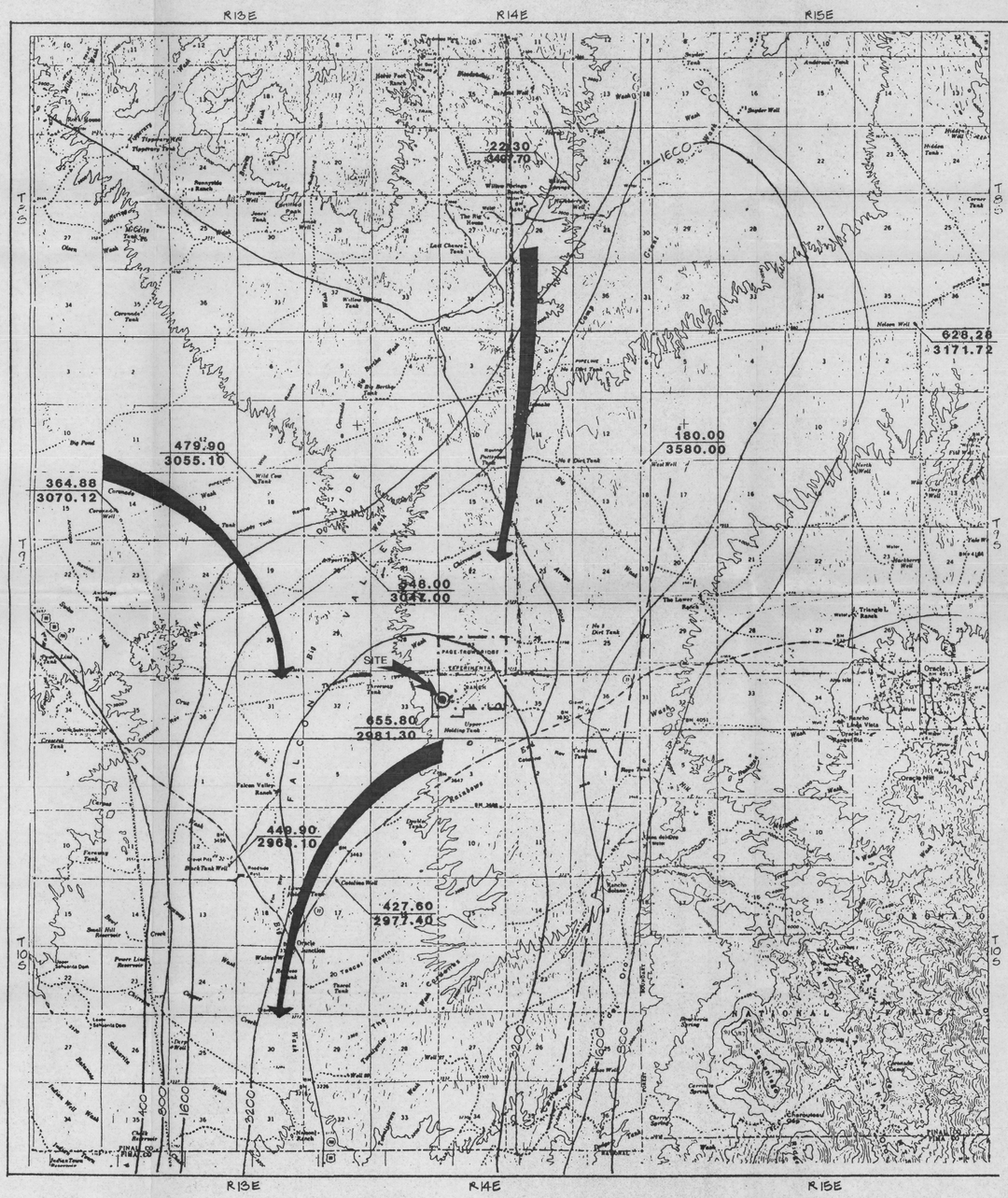
TITLE: TOPOGRAPHIC MAP

PROJECT NO.: A00377
REVISION NO. A
DATE: NOV 2011
DRAWING NO.: FIGURE 1R
SHEET NO.: _ of _

www.amec.com/earthandenvironmental

FIGURE A-2

GROUNDWATER FLOW MAP



LEGEND

- BEDROCK ELEVATION BELOW LAND SURFACE
- APPROXIMATE LOCATION OF PIRATE FAULT
- STATIC WATER LEVEL
- WELL
- ALTITUDE OF GROUNDWATER
- GROUNDWATER FLOW DIRECTION

GROUNDWATER FLOW VELOCITY AT THE FACILITY ESTIMATED TO BE 10 TO 100 FEET PER YEAR (OSTERKAMP, 1974)

N

0 2 miles

SOURCE: ENVIRONMENTAL ENGINEERING CONSULTANTS. INC., FEBRUARY, 1989

REV.	DATE	DESCRIPTION	CK. BY

SHEET TITLE: GROUNDWATER FLOW DIRECTION AND RATE

PROJECT TITLE: PAGE-TROWBRIDGE RANCH LANDFILL RCRA PART B POST CLOSURE PERMIT APPLICATION (EPA I.D. AZ98066584)

CLIENT: UNIVERSITY OF ARIZONA
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SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
2702 N. 44TH ST. SUITE 1059 PHOENIX, AZ 85008
PH. (602) 840-2596 FAX (602) 224-0572

PROJ. NO. 01P5014.03 | DWN. BY: JCB | Q/A RVW. BY: JZ
DSN. BY: JCB | CHK. BY: JZ | APP. BY: JZ

CADD FILE: 9503403D

DATE: 12/12/97

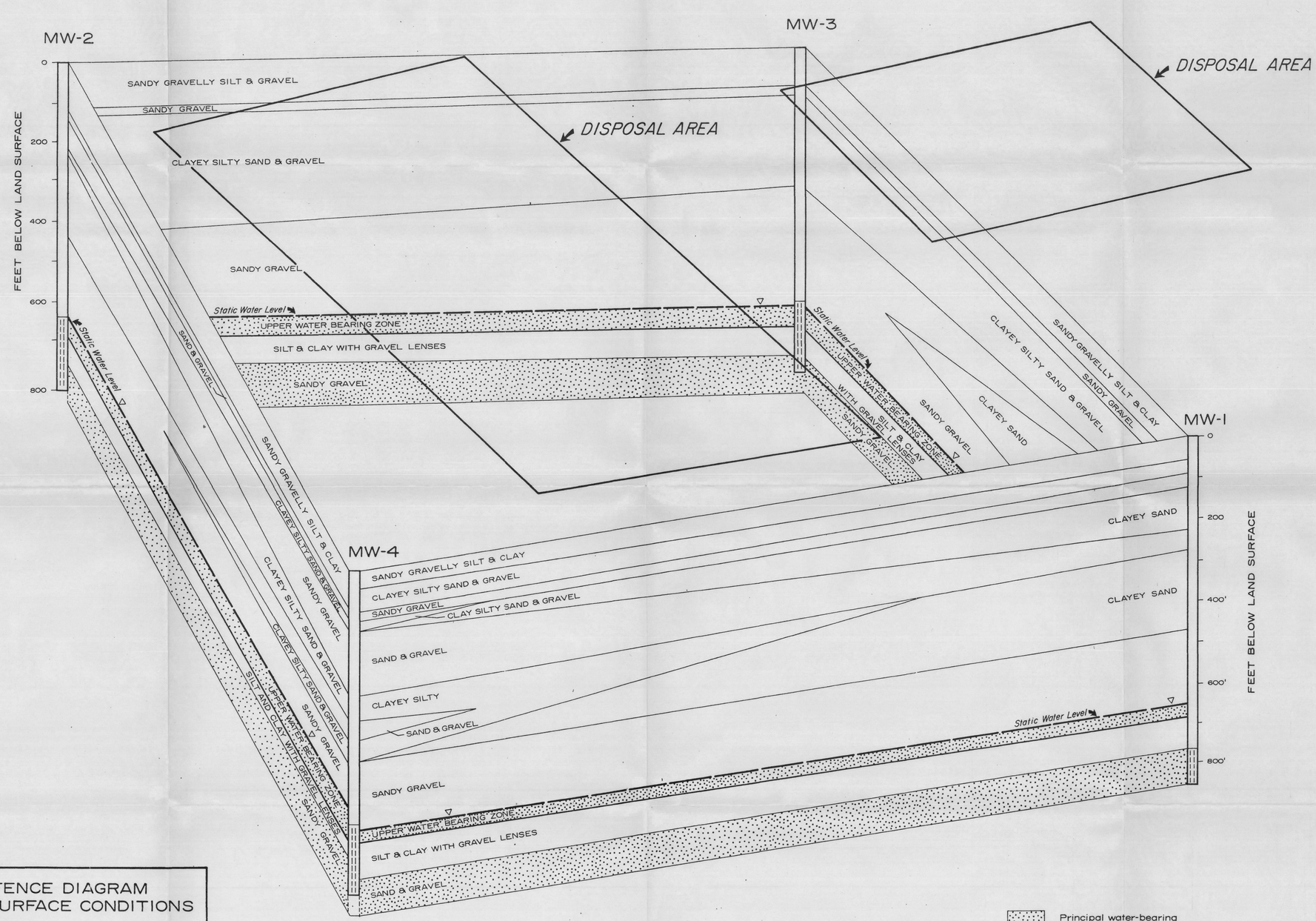
SCALE: AS SHOWN

FIGURE NO. 2

Reproduced from UA, 1997

FIGURE A-3

SUBSURFACE CONDITIONS



GENERALIZED FENCE DIAGRAM
SHOWING SUBSURFACE CONDITIONS
BENEATH
PAGE-TROWBRIDGE RANCH
DISPOSAL FACILITY

SOURCE: ENVIRONMENTAL ENGINEERING CONSULTANTS, INC., FEBRUARY, 1989

SHEET TITLE: SUBSURFACE CONDITIONS

PROJECT TITLE: PAGE-TROWBRIDGE RANCH LANDFILL
RCRA PART B POST CLOSURE PERMIT
APPLICATION (EPA I.D. AZ98066584)

CLIENT: UNIVERSITY OF ARIZONA
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PROJ. NO. 1905034.03	DWN. BY KCB	S/A PM BY JZ	
DSN. BY KCB	CHK. BY JZ	APP. BY JZ	

CADD. FILE: 9503403C

DATE: 12/12/97

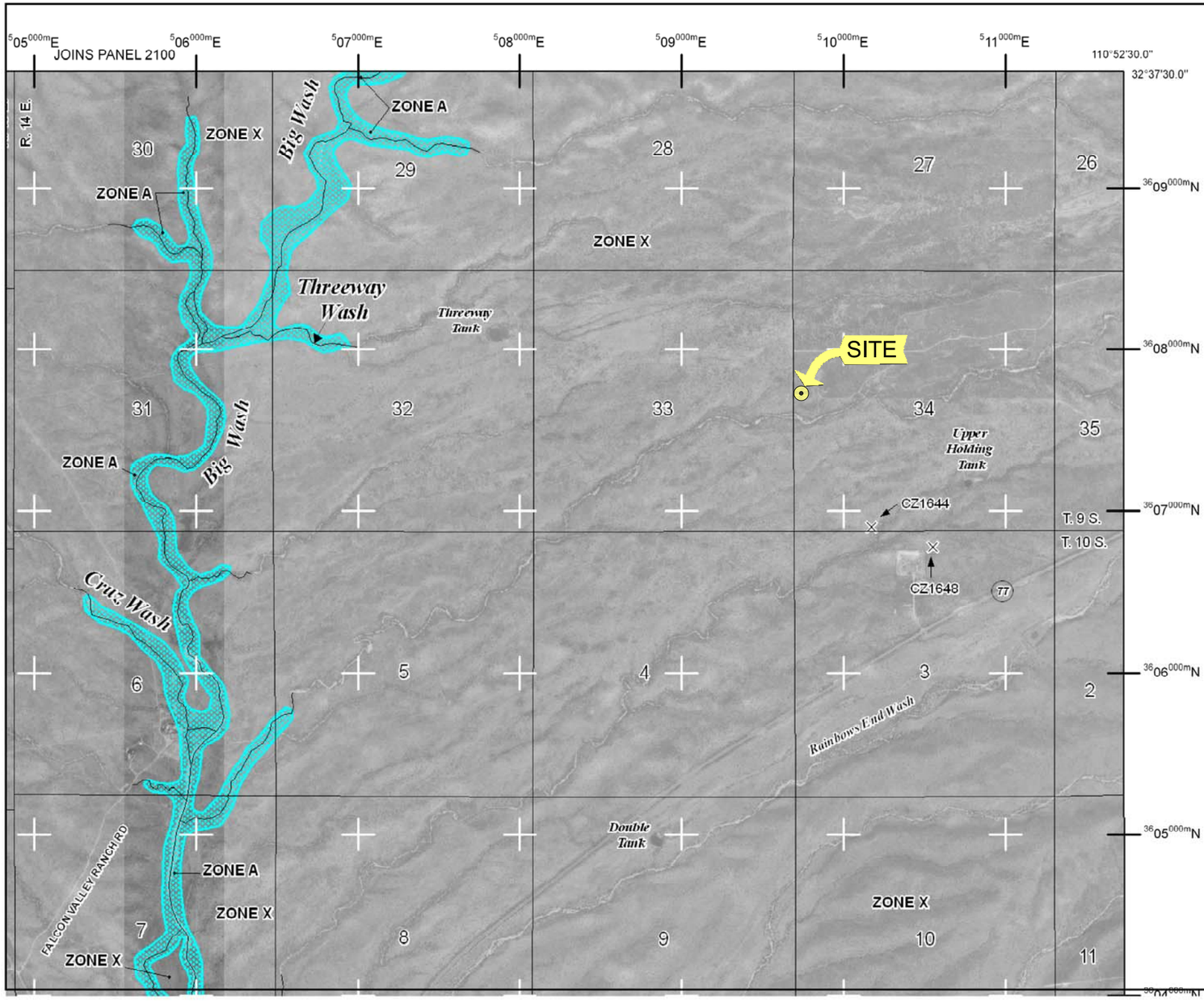
SCALE: AS SHOWN

FIGURE NO. 3

Reproduced from UA, 1997

FIGURE A-4

100 YEAR FLOOD MAP



1000 0 2000 4000 FEET

0 600 1200 METERS

NFIP

PANEL 2475E

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

PINAL COUNTY, ARIZONA

AND INCORPORATED AREAS

PANEL 2475 OF 2575

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PINAL COUNTY, UNINCORPORATED AREAS	040077	2475	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
04021C2475E

EFFECTIVE DATE
DECEMBER 4, 2007

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

SOURCE: http://map1.msc.fema.gov/idms

CLIENT LOGO

CLIENT: UNIVERSITY OF ARIZONA
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Tempe, AZ, U.S.A. 85284-1016

DWN BY:	APS
CHK'D BY:	SM
DATUM:	--
PROJECTION:	--
SCALE:	AS SHOWN

PROJECT: PAGE - TROWBRIDGE RANCH LANDFILL
RCRA PART B POST CLOSURE PERMIT APPLICATION
(EPA ID AZ98066584)

TITLE: 100 YEAR FLOOD MAP

DATE:	JUNE 2011
PROJECT NO:	A00377
REV. NO.:	A
FIGURE No.	FIGURE 4

S:\AMEC-Offices\Tempe\11201\CAD\PTRL RCRA TopoMap_061511.dwg - FIGURE 4 - Jun. 15, 2011 9:32am - adam.stenberg