

ARIZONA DEPARTMENT OF WATER RESOURCES
3550 North Central Avenue, Second Floor
Phoenix, Arizona 85012

VARIANCE GRANTED

NOTICE! This well is located in or near an area of groundwater contamination (WQARF/CERCLA/DOD or Other). Be advised that special requirements may apply.

THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILLING OPERATIONS

WELL REGISTRATION NO: **55-224107**

AUTHORIZED DRILLER: **CORRPRO COMPANIES, INC.**

LICENSE NO: **810**

NOTICE OF INTENTION TO DRILL SPCL - CATHODIC PROTECTION WELL(S) HAS BEEN FILED WITH THE DEPARTMENT BY:

WELL OWNER: **CITY OF PHOENIX 200 W. WASHINGTON ST ATTN: AIMEE CONROY, DEPUTY DIRECTOR PHOENIX, AZ, 85003**

THE WELL(S) IS/ARE TO BE LOCATED IN THE:

SE 1/4 of the SE 1/4 of the SE 1/4 Section 9 Township 1.0 NORTH Range 2.0 EAST

NO. OF WELLS IN THIS PROJECT: **1**

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE DAY OF **November 6, 2015**

GROUNDWATER PERMITTING AND WELLS

THE DRILLER MUST FILE A LOG OF THE WELL WITHIN 30 DAYS OF COMPLETION OF DRILLING.



ARIZONA DEPARTMENT of WATER RESOURCES

3550 North Central Avenue, Second Floor

Phoenix, Arizona 85012

602-771-8500

azwater.gov

4/27/2015



CITY OF PHOENIX
200 W. WASHINGTON ST
ATTN: AIMEE CONROY, DEPUTY DIRECTOR
PHOENIX, AZ 85003

DOUGLAS A. DUCEY
Governor

THOMAS BUSCHATZKE
Director

Registration No.: 55- 224107

File Number: A(1-2) 9 DDD

Dear Well Applicant:

Enclosed is a copy of the Notice of Intention to Drill and Abandon (NOI) an Exploration/Specialty Well which you or your driller recently filed with the Department of Water Resources. This letter is to inform you that the Department has approved the NOI and has mailed, or made available for download, a drilling authorization card to your designated well drilling contractor. The driller may not begin drilling until he/she has received the authorization, and must keep it in their possession at the well site during drilling.

Well drilling activities must be completed within one year after the date the NOI was filed with the Department. If drilling is not completed within one year, a new NOI must be filed and authorization from this Department received before proceeding with drilling. If the well cannot be successfully completed as initially intended (dry hole, cave in, lost tools, etc.), the well must be properly abandoned and a Well Abandonment Completion Report must be filed by your driller [as required by A.A.C. R12-15-816(F)].

If you change drillers, you must notify the Department of the new driller's identity on a Request to Change Well Information (form 55-71A). Please ensure that the new driller is licensed by the Department to drill the type of well you require. A new driller may not begin drilling until he/she receives a new drilling authorization card from the Department.

If you find it necessary to change the location of the proposed well(s), you may not proceed with drilling until you file an amended NOI with the Department. An amended drilling authorization card will then be issued to the well drilling contractor, which must be in their possession before drilling begins.

State statute requires the drilling contractor to file a complete and accurate Well Drillers Report and Well Log (form 55-55) within 30 days after completion of drilling. A Well Abandonment Completion Report (form 55-58) must also be completed by the drilling contractor for geotechnical wells that are drilled and abandoned. Blank report forms were provided to your driller with the drilling authorization card. If a well must be abandoned during the drilling, a Well Abandonment Completion Report (form 55-58) must be completed and submitted to the Department. You should insist and ensure that all of the required reports are accurately completed and timely filed with the Department.

Please be advised that Arizona statute [A.R.S. § 45-593(C)] requires a registered well owner to notify the Department of a change in ownership of the well and/or information pertaining to the physical characteristics of the well in order to keep this well registration file current and accurate. Any change in well information or a request to change well driller must be filed on a Request to Change Well Information form (form 55-71A) that may be downloaded from the ADWR Internet website at www.azwater.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "David Clark", is written over a horizontal line.

Groundwater Permitting and Wells Section



Arizona Department of Water Resources
 Water Management Division
 P.O. Box 36020 Phoenix, Arizona 85057-6020
 (602) 771-8500 • (602) 771-8690
 www.azwater.gov

Notice of Intent to
 Drill and Abandon an
 Exploration / Specialty Well

\$150 FEE

- Review instructions prior to completing form in black or blue ink.
 - You **must** include with your Notice:
 - \$150 check or money order for the filing fee. Only one Notice of Intent to Drill is required for all wells that are drilled by or for the same person to obtain geophysical, mineralogical or geotechnical data within a single section of land.
 - Well construction diagram showing all proposed well construction features listed in Section 5 and the proposed abandonment specifications listed in Section 6.
 - Authority for fee: A.R.S. § 45-113 and A.A.C. 12-15-104
- ** PLEASE PRINT CLEARLY ****

City / NA	B	SB
Phoenix	Phc	4
RECEIVED	DATE	WS
11-7-2014	07	
ISSUED	DATE	WGARP
4/27/15	1209	CERCLA

FILE NUMBER
A(1-29000)
WELL REGISTRATION NUMBER
55-224107

SECTION 1: REGISTRY INFORMATION								
Well Type:		Location of Well						
CHECK ONE		WELL LOCATION ADDRESS (IF ANY) Public right of way adjacent to 4302 W. Buckeye Rd						
<input type="checkbox"/> Mineral Exploration <input type="checkbox"/> Geotechnical <input type="checkbox"/> Heat Pump <input checked="" type="checkbox"/> Cathodic Protection <input type="checkbox"/> Grounding <input type="checkbox"/> Other (please specify):		GPS 33.436913 -112.155017 APN 104-22-004F						
		TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE	Number of Wells (notes) per 10-acre location
		1N	2E	9	SE 1/4	SE 1/4	SE 1/4	1
		Use additional boxes to the right to list 160,40,10 acre descriptions for multiple wells drilled to obtain geophysical or geotechnical data on different 10-acre parcels within a single section of land (160, 40, 10 acre descriptions are not required for mineralogical exploration wells).			1/4	1/4	1/4	
					1/4	1/4	1/4	
					1/4	1/4	1/4	
					1/4	1/4	1/4	
COUNTY WHERE WELL(S) ARE LOCATED		Maricopa						

SECTION 2: OWNER INFORMATION			
Well Owner		Landowner (if different from Well Owner)	
FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL City of Phoenix-Water Services Dept.		FULL NAME OF COMPANY, GOVERNMENT AGENCY, OR INDIVIDUAL City of Phoenix	
MAILING ADDRESS 200 W. Washington Street		MAILING ADDRESS 200 W. Washington St	
CITY / STATE / ZIP CODE Phoenix, az. 85003		CITY / STATE / ZIP CODE Phoenix AZ 85003	
CONTACT PERSON NAME AND TITLE Aimee D. Conroy - Deputy Water Services Director		CONTACT PERSON NAME AND TITLE	
TELEPHONE NUMBER 602-534-5813	FAX	TELEPHONE NUMBER	FAX

SECTION 3. DRILLING AUTHORIZATION			
Drilling Firm		Consultant (if applicable)	
NAME Corpro Companies Inc.		CONSULTING FIRM	
DWR LICENSE NUMBER 810	ROC LICENSE CATEGORY 262664	CONTACT PERSON NAME	
TELEPHONE NUMBER 562-944-1636	FAX 562-946-5634	TELEPHONE NUMBER	FAX
Paul Kim 562-254-8865 Javier Dena 562-455-3462		E-MAIL ADDRESS	

SECTION 4.			
Questions	Yes	No	If Yes:
1. Is the proposed well site within 100 feet of a septic tank system, sewer disposal area, landfill, hazardous materials or petroleum storage area or tank?		X	You must submit a letter requesting a variance from the 100-foot setback requirement (A.A.C. R12-15-818). However, if the proposed well is a geotechnical well that will be abandoned before the drilling leaves the well site, a variance may be requested by simply checking the box below. <input type="checkbox"/> I request a variance from the 100-foot setback requirement for a geotechnical well
2. If applicable, are you requesting a variance to use thermoplastic casing in lieu of steel in the surface seal?		X	The wells must be constructed in a vault as defined in A.A.C. R12-15-801(27)
3. Is there another well name or identification number associated with this well? (e.g., Silver Well #1, CP-2, etc.)	X		PLEASE STATE Deep Anode well - Station 158+98

Notice of Intent to Drill and Abandon an Exploration / Specialty Well

Provide a well construction diagram showing all existing well construction features listed in Section 5 and the proposed abandonment specifications listed in Section 6. Please submit additional sheets (page 2) and additional well construction diagrams if multiple wells are to be drilled and construction or abandonment details vary.

WELL REGISTRATION NUMBER
55 - 229107

SECTION 5: PROPOSED WELL CONSTRUCTION PLAN (attach additional page if needed)

DATE CONSTRUCTION TO BEGIN

** Required Information **

Borehole			Casing* (if applicable)												
DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)	DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE (T)			PERFORATION TYPE (T)					SLOT SIZE IF ANY (inches)	
FROM (feet)	TO (feet)		FROM (feet)	TO (feet)		STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS KNIFE		SLOTTED
0	200	10"	0	200	1"	X							X	Vent Pipe	.006

Annular Material												
DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE (T)							FILTER PACK			
FROM (feet)	TO (feet)	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	BENTONITE			IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	SAND	GRAVEL	SIZE
						GROUT	CHIPS	PELLETS				
0	20			X								
20	75								3/8" Pea Gravel			
75	200								Coke Backfill RS3			

Per Ken Kawamoto

SECTION 6: PROPOSED WELL ABANDONMENT DESIGN (Refer to ADWR'S Well Abandonment Handbook for additional information.)

DEPTH FROM SURFACE		Casing Treatment* (if applicable)				DEPTH FROM SURFACE		Sealing or Fill Material										
FROM (feet)	TO (feet)	TYPE (T)				FROM (feet)	TO (feet)	GROUT TYPE (T)					HIGH SOLIDS BENTONITE		SAND	MIXING RATIO by (check one) <input type="checkbox"/> Weight <input type="checkbox"/> Volume	ESTIMATE VOLUME OF MATERIAL (cubic feet)	
		SONAR JET	BRUSH OR SCRAPE	MILLS KNIFE	CASING REMOVAL (explain in Remarks)			IF OTHER TYPE, DESCRIBE OR IF CASING IS TO BE PERFORATED, DESCRIBE SPACING AND SIZE OF PERFORATIONS TO BE ADDED	NEAT CEMENT	CONCRETE	SAND-CEMENT GROUT	CEMENT-BENTONITE GROUT	SAND-BENTONITE GROUT	GROUT				CHIPS

<p>Proposed Abandonment Method (See Well Abandonment Handbook)</p> <p>CHECK ONE</p> <input type="checkbox"/> Standard Method <input type="checkbox"/> Alternative 1 <input type="checkbox"/> Alternative 2 <input type="checkbox"/> Alternative 3 <input type="checkbox"/> Alternative 4 <input type="checkbox"/> Variance Option * <input type="checkbox"/> Alternative 5 <input type="checkbox"/> Variance Option 1* <input type="checkbox"/> Variance Option 2*	<p>Other (please specify):</p> <p>* requires a letter requesting a variance</p>	<p>Emplacement Method of Sealing or Fill Material</p> <p>CHECK ONE</p> <input type="checkbox"/> Gravity <input type="checkbox"/> Pressure Grouting <input checked="" type="checkbox"/> Tremie Pumped <input type="checkbox"/> Other (please specify):
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REMARKS To be abandoned at a later date

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.

TYPE OR PRINT NAME AND TITLE

Signature of Well Owner or Exploration Firm: *Hyle Stephens - Rep*

Signature of Landowner, if applicable (see instructions): *Chenee O. Conway*

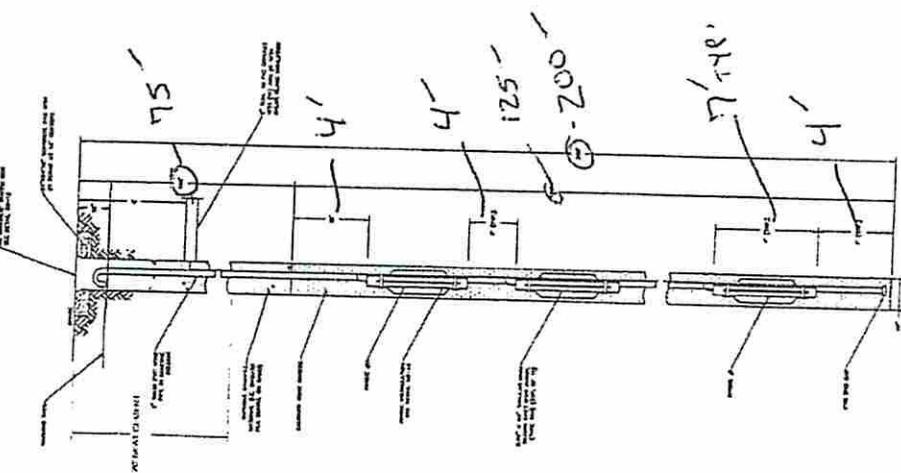
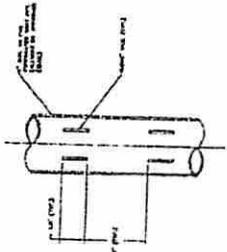
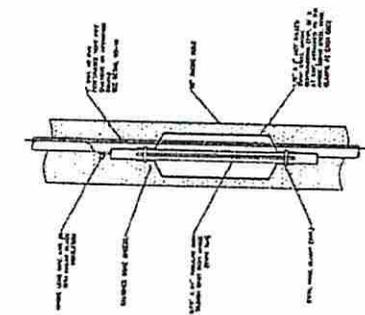
DATE: 11/2/14

DATE: 4/16/2015

PROJECT NO.	100-100-100
DATE	10/15/10
SCALE	AS SHOWN
BY	W. J. BROWN
CHECKED BY	W. J. BROWN
APPROVED BY	W. J. BROWN
DATE	10/15/10



NO.	SECTION	DETAIL	TYPE
1	11-1	11-1	11-1
2	11-2	11-2	11-2
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100	11-100	11-100	11-100



RECORD DRAWING CERTIFICATION

I HEREBY CERTIFY THAT THIS "RECORD DRAWING" WAS PREPARED BY ME OR UNDER MY CLOSE PERSONAL SUPERVISION AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT ACCURATELY REPRESENTS THE WORK SHOWN THEREON.

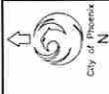
REGISTERED PROFESSIONAL ENGINEER (P.E.) DATE: 10/15/10

RECORDING NO.:

CITY OF PHOENIX, ARIZONA
WATER UTILITIES DEPARTMENT

CORROSION CONTROL DETAILS

NO.	REVISION BY	DATE
1	W. J. BROWN	10/15/10
2		
3		
4		
5		
6		
7		
8		
9		
10		



CONSTRUCTION NOTES
 1 STA 158+00 TO STA 162+00
 36" WATER TRANSMISSION MAIN
 REMOVE & REPLACE
 ADD 3" STD DET C-05.10, TYPE G
 REMOVE & REPLACE
 CONCRETE SIDEWALK
 COP STD DET P1230
 STA 158+98, 13' RT
 RECONSTRUCT SIDEWALK
 159+98, 43' RT
 IMPRESSED CURRENT CATHODIC
 PROTECTION RECTIFIER
 STA 159+00, 41' RT
 STA 159+00, 41' RT
 STA 159+01, 44' RT
 3" CLEAR FROM RECTIFIER UNIT
 MAG STD DET 140
 ELECTRICAL SERVICE TO METER & RECTIFIER
 CONTRACTOR SHALL PROVIDE TRENCH
 & CONDUIT PER SSP REQUIREMENTS
 REFER TO SSP ELECTRICAL SERVICE
 SPECIFICATIONS

REFERENCE NOTES
 (E) PUBLIC COX COMMUNICATIONS CITY
 FOP UTIL PERMITS: 13109433
 (B) COX COMMUNICATIONS CITY
 COP UTILITY PERMIT NO. 13109433

RECORD DRAWING CERTIFICATION
 I HEREBY CERTIFY THAT THIS "RECORD DRAWING" WAS
 MADE UNDER MY SUPERVISION OR AS NOTED AND ARE
 CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.
 REGISTERED PROFESSIONAL ENGINEER (CWA) DATE
 REGISTRATION NO.

THE CITY OF PHOENIX CITY CODE CHAPTER 2,
 SECTION 2-2-20, THESE PLANS ARE FOR OFFICIAL USE
 ONLY AND ARE NOT TO BE USED FOR ANY OTHER PURPOSES
 UNLESS SPECIFICALLY AUTHORIZED BY THE CITY ENGINEERS
 OF YOUR CONTRACT WITH THE CITY OF PHOENIX.
 SOUTHWEST ZONE 1 WATER TRANSMISSION MAIN
 BUCKEYE ROAD - 87TH AVENUE TO 35TH AVENUE
 CITY OF PHOENIX, ARIZONA
 WATER SERVICES DEPARTMENT
 BUCKEYE ROAD
 STA 158+00 TO STA 162+00
 W855000385

NO.	DESCRIPTION	REV BY	CHK BY	DATE

NO.	DESCRIPTION	REV BY	CHK BY	DATE

NO.	DESCRIPTION	REV BY	CHK BY	DATE

NO.	DESCRIPTION	REV BY	CHK BY	DATE

NO.	DESCRIPTION	REV BY	CHK BY	DATE

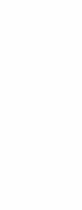
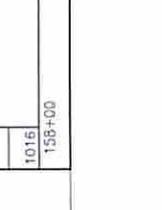
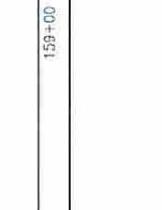
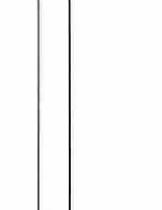
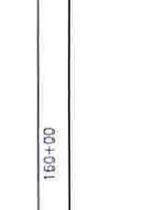
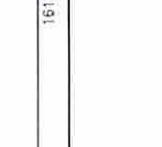
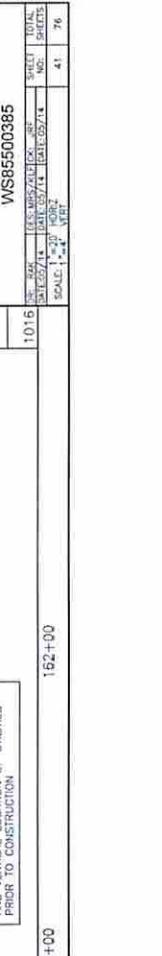
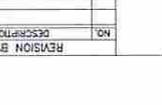
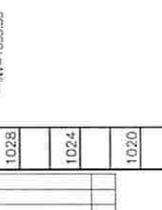
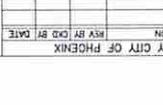
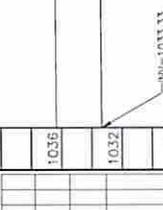
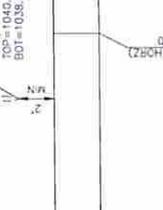
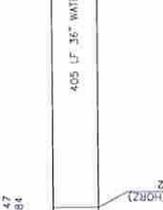
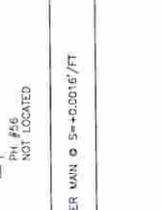
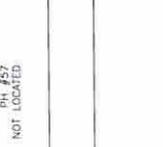
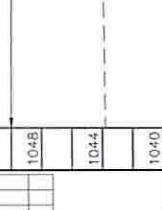
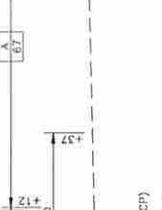
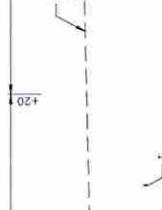
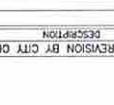
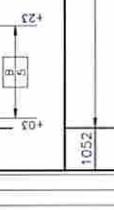
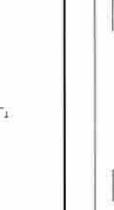
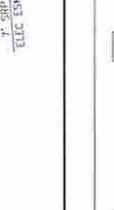
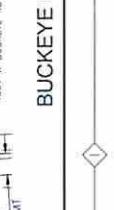
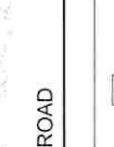
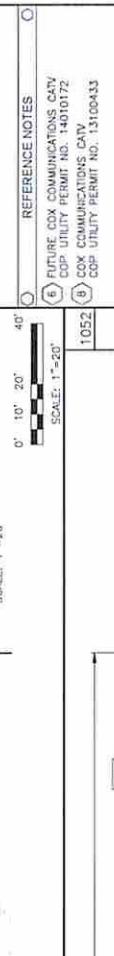
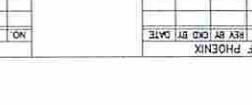
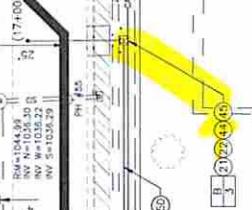
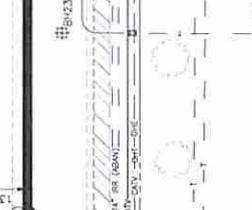
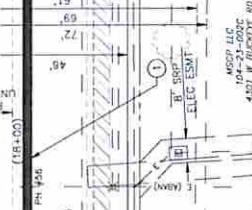
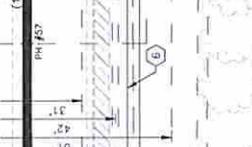
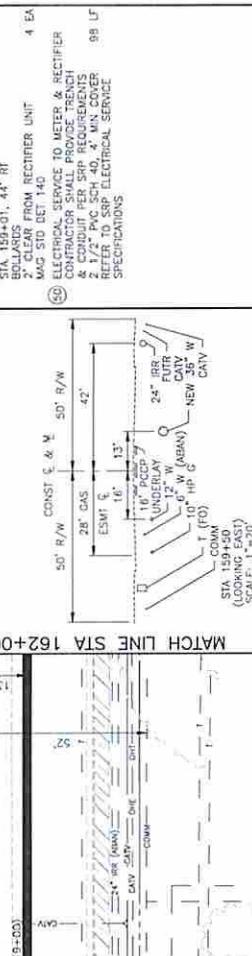
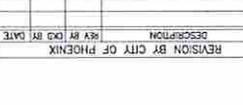
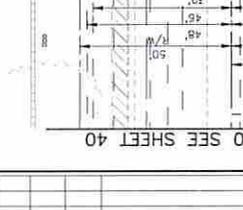
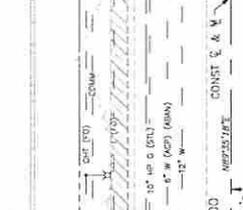
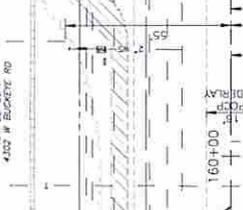
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158+00	160+00	161+00	162+00						



Google earth

feet
meters



Kevin J. Crego

From: Ken Kawamoto <kkawamoto@achen.com>
Sent: Tuesday, April 21, 2015 7:48 AM
To: Kevin J. Crego
Cc: Jay Horak (horakjay@stanleygroup.com); Dan Broderick
Subject: Well Detail for 224107 and 224108
Attachments: 2014-0721_WS85500385_Construct Plans_11X17 small file - Copy 70.pdf; Anode Wells Work plan.pdf

Kevin:

I have looked at the full sized drawings for the project and this is what I was able to determine regarding the page titled Corrosion Control Details (lower right corner of that sheet).

- The hand annotation of 200' refers to the change in overall depth from the original of 300'.
- The hand annotation of 125' refers to the change in overall depth of calcined coke breeze backfill from the original of 175'.
- The hand annotation of 75' refers to the change in overall depth of 3/8" pea gravel backfill from the original of 125'.

As we thought, these changes are solely a result of the change in overall depth from 300' to 200'. I have attached a copy of the plan sheet 70 which shows the original well dimensions. I have also attached the Work Plan for monitoring the well drilling operations.

Thank you again for your assistance Kevin and please contact me if you have any further questions.

Regards,

Ken

KEN KAWAMOTO
Project Manager

Office: 480.403.9487 | Cell: 602.397.7348 | Email: kkawamoto@achen.com

ACHEN-GARDNER CONSTRUCTION
550 South 79th Street | Chandler, AZ 85226
2425 West Wave Hill Court | Tucson, AZ 85705
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DOUGLAS A. DUCEY
Governor

THOMAS BUSCHATZKE
Director

ARIZONA DEPARTMENT of WATER RESOURCES
3550 North Central Avenue, Second Floor
Phoenix, Arizona 85012-2105
602.771.8500
azwater.gov

March 19, 2015

Achen-Gardner Construction
Attn: Gary Irwin
550 South 79th Street
Chandler, AZ 85226

Re: Well Registry Number: 55-224107
File (Location) Number: A(1-2)9DDD

Dear Applicant:

On November 7, 2014, the Department of Water Resources (Department) received the above-referenced, Notice of Intent to Drill and Abandon an Exploration /Specialty Well application. The application was suspended due to the need for additional information. Enclosed is a copy of the letter sent November 17, 2014 outlining the outstanding issues related to the application. To date, our office has not received the additional information requested in the letter.

Please advise the Department within 30 days what action you intend to take on this well application. It is the Department's intent to deny this application unless the requested information is received within 30 days.

Please contact Stella Murillo at 602-771-8549 or by email at samurillo@azwater.gov, or contact me at 602-771-8609 or by email at kjcrego@azwater.gov if you have any questions.

Sincerely,

Kevin Crego
Groundwater Permitting and Wells
Arizona Department of Water Resources



JANICE K. BREWER
Governor

MICHAEL J. LACEY
Director

ARIZONA DEPARTMENT of WATER RESOURCES
3550 North Central Avenue, Second Floor
Phoenix, Arizona 85012-2105
602.771.8500
azwater.gov

November 17, 2014

Achen-Gardner Construction
Attn: Gary Irwin
550 South 79th Street
Chandler, AZ 85226

Re: Notice of Intent to Drill Cathodic Protection Well Registration Number 55-224107

Dear Applicant:

The Arizona Department of Water Resources (Department) has reviewed the above referenced application to determine if the application meets the substantive requirements of A.R.S. § 45-596. Pursuant to A.R.S. § 41-1074 the Department has determined that additional information is required. The following information must be submitted before the Department can complete the application review:

Section 6, Signature: The landowner must also sign the signature block of the NOI form or attach a copy of an access agreement or a letter indicating the approval of the proposed action.

Section 6, Abandonment Design: The Proposed abandonment design is blank. Please clarify the proposed abandonment design.

The Department's administrative review time frame is suspended until all of the requested information is provided. Failure to submit the information requested within 60 days may result in the denial of the application.

I am enclosing a copy of the application for your reference. Please submit the information to my attention and let me know if you have any questions or need further assistance by contacting me at 602.771.8609.

Sincerely,

Kevin Crego
Groundwater Permitting and Wells
Arizona Department of Water Resources

Kevin J. Crego

From: Kevin J. Crego
Sent: Monday, April 13, 2015 8:12 AM
To: 'Ken Kawamoto'
Subject: RE: Well Registry Numbers 55-224107 and 55-224108

They can send a letter or email authorization. Any of them would be fine.

Thanks

Kevin Crego

Groundwater Permitting and Wells Unit
Arizona Department of Water Resources
602.771.8609



PROTECTING ARIZONA'S
WATER SUPPLIES
for ITS NEXT CENTURY

From: Ken Kawamoto [<mailto:kkawamoto@achen.com>]
Sent: Monday, April 13, 2015 8:11 AM
To: Kevin J. Crego
Subject: RE: Well Registry Numbers 55-224107 and 55-224108

Kevin:

Yes, I would expect I can get someone to sign. I guess I misunderstood our conversation from last week...I told the City that for the Land Owner portion they could send a letter or email expressing authorization and consent for the construction in their Right of Way. I do believe that someone there will sign the NOI as well though. I will head down there later this morning.

Thanks,

Ken

KEN KAWAMOTO
Project Manager

Office: 480.403.9487 | Cell: 602.397.7348 | Email: kkawamoto@achen.com

ACHEN-GARDNER CONSTRUCTION

550 South 79th Street | Chandler, AZ 85226
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From: Kevin J. Crego [<mailto:kjcrego@azwater.gov>]
Sent: Monday, April 13, 2015 8:02 AM
To: Ken Kawamoto
Subject: RE: Well Registry Numbers 55-224107 and 55-224108

Hello,

Do you have someone that will be signing the applications from the City of Phoenix?

Thanks

Kevin Crego

Groundwater Permitting and Wells Unit
Arizona Department of Water Resources
602.771.8609



PROTECTING ARIZONA'S
WATER SUPPLIES
for ITS NEXT CENTURY

From: Ken Kawamoto [<mailto:kkawamoto@achen.com>]
Sent: Monday, April 13, 2015 6:40 AM
To: Kevin J. Crego
Cc: jami.erickson@phoenix.gov; Jay Horak (horakjay@stanleygroup.com); Dan Broderick
Subject: Well Registry Numbers 55-224107 and 55-224108

Kevin:

Attached please find the revised submittals for the above referenced Registry Numbers and the associated Notices of Intent to Drill and Abandon an Exploration/Specialty Well Applications. I will also deliver copies to your office.

If you have any further questions or comments please contact me directly and I will attend to your inquiry at once.

Thank you for your assistance.

Ken

KEN KAWAMOTO
Project Manager

Office: 480.403.9487 | Cell: 602.397.7348 | Email: kkawamoto@achen.com

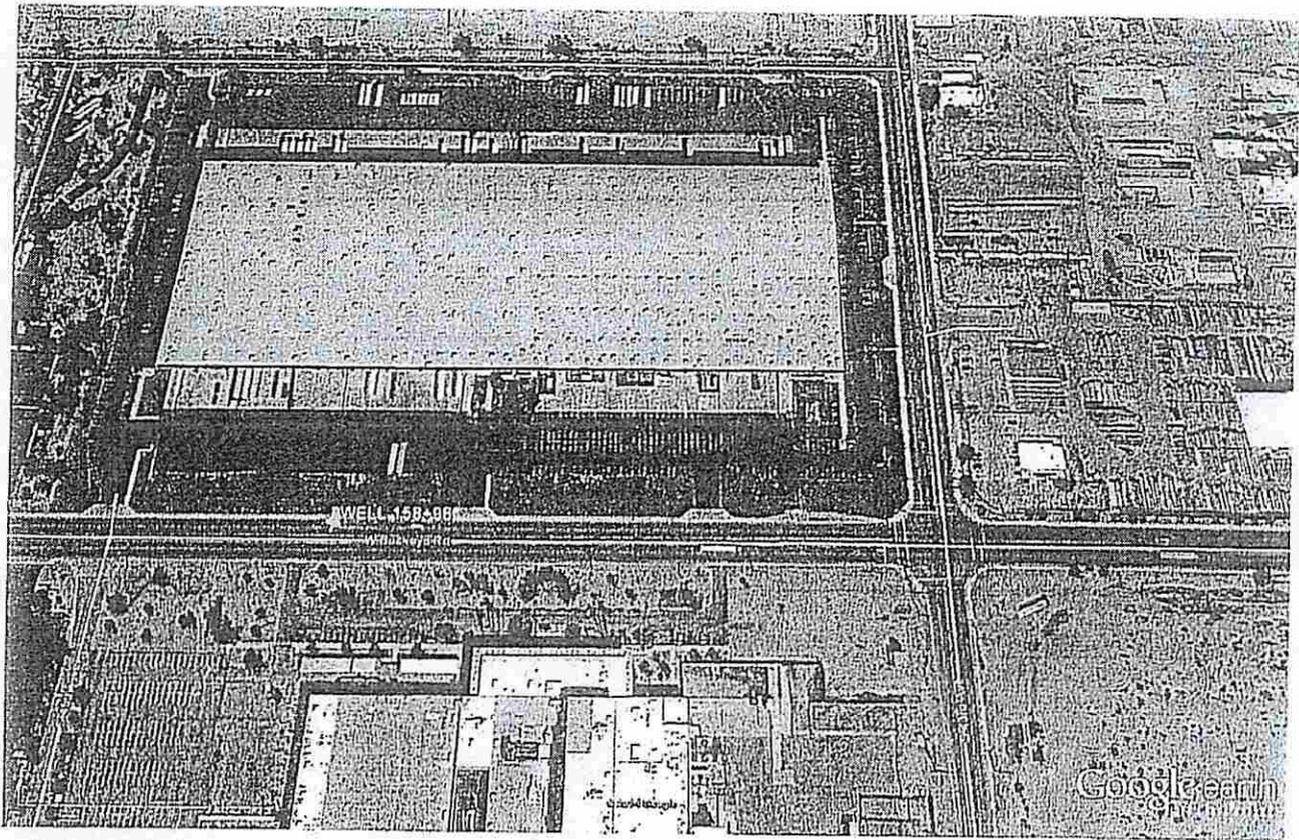
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Google earth



Well Reg. Number

55-224107 — Per Ken Kawamoto

Sta. 158+98

Buckeye Rd. west of 43 rd Ave.

Printed: 11/7/2014 2:03:46 PM

Arizona Department of Water Resources

3550 N Central Ave.
Phoenix AZ 85012

Customer:
PAUL KWANGBOK KIM
2531 CYPRESS POINT DR
FULLERTON, CA 92833-2016

Receipt #: 15-36557
Office: MAIN OFFICE
Receipt Date: 11/07/2014
Sale Type: IN_PERSON
Cashier: WRPXA

Item No.	Index	AOBJ	Description	Ref ID	Qty	Unit Price	Ext Price
67488	15245	4439-TT	Notice of intention to drill a well other than a well described in subsection (A)(1)(h) of this Section	224107	1	150.00	150.00
RECEIPT TOTAL:							150.00

Payment type: CHECK

Amount Paid: \$150.00

Payment Received Date: 11/07/2014

Notes: FROM TTA.

Check #	1173
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Arizona Department of Water Resources

3550 N Central Ave.
Phoenix AZ 85012

Customer:

PAUL KWANGBOK KIM
2531 CYPRESS POINT DR
FULLERTON, CA 92833-2016

Receipt #: 15-36557
Office: MAIN OFFICE
Receipt Date: 11/07/2014
Sale Type: IN_PERSON
Cashier: WRPXA

Item No.	Index	AOBJ	Description	Ref ID	Qty	Unit Price	Ext Price
67488	15245	4439-TT	Notice of intention to drill a well other than a well described in subsection (A)(1)(h) of this Section	224107	1	150.00	150.00
RECEIPT TOTAL:							150.00

Payment type: CHECK

Amount Paid: \$150.00

Payment Received Date: 11/07/2014

Check #	1173
---------	------

Notes: FROM TTA.

David G. Christiana

From: Scott R. Green <Green.Scott@azdeq.gov>
Sent: Monday, April 27, 2015 8:39 AM
To: David G. Christiana
Subject: RE: NOI to Drill Cathodic Wells - West Van Buren

Then I have no objection to the NOIs. Thanks. :)

SRG

AZDEQ-RPU
(602)771-1612

-----Original Message-----

From: David G. Christiana [mailto:dgchristiana@azwater.gov]
Sent: Monday, April 27, 2015 6:30 AM
To: Scott R. Green
Subject: RE: NOI to Drill Cathodic Wells - West Van Buren

Hi Scott,

Cathodic protection wells are not really "wells". They are borings in which a sacrificial anode is placed and packed with conductive material, usually to the a certain depth and grouted to the surface. No opening generally occurs. No water is extracted, no pumps installed. The anode directs current away from an underground utility, such as a water or gas pipeline.

Any question, please let me know.

Regards,
Dave Christiana

-----Original Message-----

From: Scott R. Green [mailto:Green.Scott@azdeq.gov]
Sent: Saturday, April 25, 2015 3:02 PM
To: David G. Christiana
Cc: Tina LePage
Subject: RE: NOI to Drill Cathodic Wells - West Van Buren

Yes, but how do they work? Why are they called cathodic protection wells? Are they permanent or temporary installations? Do they pump water and what do they do with the water? Just asking.

My concern lies in the one well that is shown within the West Van Buren plume boundary.

SRG

AZDEQ-RPU
(602)771-1612

-----Original Message-----

From: David G. Christiana [mailto:dgchristiana@azwater.gov]
Sent: Friday, April 24, 2015 11:33 AM
To: Scott R. Green
Subject: Re: NOI to Drill Cathodic Wells - West Van Buren

These NOIs were given to me the other day. They are for cathodic protection of COP water transmission lines.

Dave

> On Apr 23, 2015, at 11:03, Scott R. Green <Green.Scott@azdeq.gov> wrote:

>
> David do you know what these wells are for? You can call me if you need to. Thanks.

>
> SRG

>
> AZDEQ-RPU
> (602)771-1612

>
> -----Original Message-----

> From: Tina LePage
> Sent: Wednesday, April 22, 2015 3:39 PM
> To: Scott R. Green
> Subject: FW: NOI to Drill Cathodic Wells - West Van Buren

>
> See below - thanks,

>
> Tina Le Page, Manager
> Remedial Projects Section
> Arizona Department of Environmental Quality
> 1110 West Washington Street
> Phoenix, Arizona 85007
> 602-771-4293
> lepage.tina@azdeq.gov

>
>
>
> -----Original Message-----

> From: David G. Christiana [mailto:dgchristiana@azwater.gov]
> Sent: Wednesday, April 22, 2015 11:30 AM
> To: Tina LePage
> Cc: Kevin J. Crego
> Subject: NOI to Drill Cathodic Wells - West Van Buren

>
> Tina,

>
> Attached are two NOIs to drill cathodic protection wells in and near the West Van Buren WQARF site. A map is also attached. Please let me know whether or not ADEQ has any comments or concerns regarding these wells by April 29, 2015, or sooner, if possible.

>

> Regards,
> Dave Christiana
>
>
> David Christiana. R.G.
> Groundwater Permitting and Wells
> Arizona Department of Water Resources
> 602.771.8548
> www.azwater.gov

> *****
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> <55-224108.pdf><55-224107.pdf><55-224107-8AreaMap.pdf>

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Adams and Wendt

February 17, 2015

Mr. Ken Kawamoto
Project Director/Project Manager
Achen-Gardner Construction
550 South 79th Street
Chandler, Arizona 85226

**Re: Work Procedure
Cathodic Protection System Deep Well Installation
43rd Ave/63rd Ave
Buckeye, Arizona
Adams and Wendt Project No. 1501017**

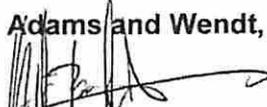
Dear Mr. Kawamoto:

Based on the information provided by Achen-Gardner Construction regarding the above referenced project, Adams and Wendt, Inc. have prepared a work plan indicating the minimum procedures to be utilized for this project.

If you have any questions concerning the specified project requirements presented above, please contact us at our office. Adams and Wendt appreciate the opportunity to provide professional consulting services to Achen-Garden Construction.

Sincerely,

Adams and Wendt, Inc.



Kent B. Adams
Project Manager



Thomas Kallio, CIH
Project Principal

C: Gary Irwin, Project Engineer (Achen-Gardner)

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3.0 TRAINING, PERSONNEL PROTECTION AND MONITORING.....	11

SECTION 1 - INTRODUCTION

Statement of Work and Policy Statement

This Work Plan has been developed upon the request of Achen-Gardner to address certain concerns associated with potential contaminated soil and groundwater that may be encountered during the drilling of two transmission main cathodic protection system borings. Achen-Gardner is the General Contractor for the City of Phoenix for the installation of a transmission main cathodic protection system. The installation requires the drilling of two (2) approximately 200 foot deep borings for the installation of the cathodic protection system. Achen-Gardner has retained the services of Corrpro® to drill and install these systems. The borings are located on West Buckeye Road with the first boring located between 43rd and 47th Avenues and the second boring located between 59th and 63rd Avenues.

It is the commitment of Achen-Gardner that all work performed at this site will be conducted in compliance with all applicable environmental, health and safety regulations. Mandatory compliance with applicable regulatory requirements and this work/health and safety plan extends to all parties present at the subject work site.

Site Description/Background

The borings are located within the Arizona Department of Environmental Quality (ADEQ) West Van Buren Study Area (WVBA) Water Quality Assurance Revolving Fund (WQARF) site. The WVBA extends from approximately 7th Avenue west to 75th Avenue and from Buckeye Road north to Interstate 10. In addition, a finger shaped plume exists between 7th Avenue and 27th Avenue between Buckeye Road and Lower Buckeye Road. The WVBA is the areal projection of the western portion of a large commingled plume of contaminated groundwater in Phoenix, Arizona

Contributors to this commingled plume include industrial facilities and contaminated groundwater from the east, as regional groundwater flow is generally westward. The initial primary contaminants of concern (COCs) comprising the commingled WVBA plume included the following volatile organic compounds (VOCs): tetrachloroethene (PCE), trichloroethene (TCE), 1,1,1-trichloroethane (TCA), cis 1,2-dichloroethene (cis 1,2-DCE), 1,1-dichloroethane (1,1-DCA), and 1,1-dichloroethene (1,1-DCE). To a limited extent, chromium is also considered a COC. Benzene, toluene, ethylbenzene, and xylenes (BTEX) may also be present at various locations throughout the WVBA plume.

The borings are currently planned for a total depth of 200 feet below ground surface which indicates that the boring will be terminated in the Upper Alluvial Aquifer (UAA) of the Salt River Basin. Groundwater in the vicinity of the planned boring locations is anticipated to be encountered at approximately 100 feet below ground surface. However, historical records have indicated that groundwater may have been as high as 60 feet below ground surface in the planned boring areas in the 1980s and 1990s. Contaminated groundwater may have caused impacts to soils by the COCs during the slow decline of groundwater levels (smear effect). As such, it is anticipated that VOC impacted soils may be present below 60 feet below ground surface and VOC impacted groundwater and soil may be present below 100 feet below ground surface.

All wastes generated as part of this project, including drilling cuttings, muds and liquids will require characterization prior to disposal.

Scope of Work

The scope of work covered under this Work Plan includes the concurrent safety of worksite personnel and the protection of the environment and the proper handling the wastes generated during the drilling and cathodic protection equipment installation. Other equipment or project specific safety measures, drilling procedures and methods, and associated project activities (e.g. traffic control, coordination of efforts, contractual, etc.) are not included in this work plan unless there is a potential for encountering hazardous or regulated materials associated with the WVBA plume. Work activities can be divided into Pre-Drilling, Drilling and Post Drilling activities as specified below.

Pre-Drilling Activities

Pre-drilling activities includes those tasks that are required prior to initiation of drilling activities.

General Coordination Meetings

General and coordination meetings will be required during the project to coordinate work activities and to discuss analytical results. A minimum of one pre-construction planning meeting between Adams and Wendt, Achen-Gardner and the drilling contractor personnel shall be conducted to discuss staging of equipment, handling of waste materials, sampling activities and scheduling.

Permitting and Notifications

The drilling contractor shall obtain all permits and authorizations required for the drilling activities from the Arizona Department of Water Resources (ADWR), including receipt of authorizations for drilling into groundwater and installation of cathodic protection equipment. The drilling contractor will be required to obtain the permits and pay the applicable fees. Additionally, the drilling contractor will notify the ADEQ of the intent to drill into groundwater within the WVBA. Both notifications are required.

Pre-Job Submittals

The following minimum submittals shall be available to the City of Phoenix and Adams and Wendt a minimum of one week prior to start of excavation activities.

- Copy of Drillers License
- Copy of Authorized Well Permits
- Authorization of Waste Disposal Facility Notification
- Training Record for Drillers (24 Hour, 29 CFR 1910.120)
- Schedule of Drilling Activities
- Drawing of the planned staging of equipment
- Proposed temporary storage area for waste soils and liquids
- Proposed plan of action to contain wastes and potentially contaminated materials

Utility Location

Arizona Bluestake will be notified a minimum of two days prior to start of excavation activities in accordance with Arizona regulations. The drilling contractor will confirm that all utilities have been cleared in drilling locations prior to start of excavation activities.

Stormwater Precautions

The drilling contractor will conduct a site evaluation at each drilling area to identify the presence and location of storm drain facilities, dry wells or other features that typically handle stormwater. During the drilling activities, the stormwater drains and dry wells (if present) will be sealed in the case of a release of drilling fluids during the drilling activities. The seals will include impermeable materials that effectively create a watertight seal for each stormwater feature. Daily inspections of the seals will be conducted during the drilling operations. If stormwater runoff were to become a factor while the drilling is being performed, drilling operations will be halted and temporary seals removed so as not to increase storm water runoff flow challenges in the immediate area. If a release of drilling fluids occurs, appropriate measures such as vacuuming the released materials, will be employed to assure that there is no impact to the stormwater systems in the vicinity of the drilling operations.

Plan for Equipment Staging

The drilling contractor will prepare a plan for each drilling site that outlines the planned location and equipment staging areas for the work activities, including but not limited to stormwater drain, drill equipment (drill rig & support vehicles), waste bins, and other support facilities. A copy of the plan will be kept on site during the drilling activities.

Site Safety Plans

Prior to performing site activities, the drilling contractor will prepare a site specific health and safety plan (SSP) for the drilling activities to outline the scope of work and the potential health risks involved with the work activities. The SSP will include a review of the Safety Data Sheets for the known contaminants that could be encountered in the performance of the scope of work. The SSP will review potential on-site physical hazards, chemical hazards, monitoring procedures, emergency procedures, and evacuation routes. Personnel who will be on-site during the investigative activities are required to review and sign the SSP prior to commencing the field activities.

Drilling Personnel Training Requirements

All personnel will be required to possess a minimum 24 hrs of training as required by 29 CFR 1910.120. Each person that may come in contact with contaminated wastewater and waste soils will be required to understand the nature of the chemistries that may be encountered, hazardous associated with the chemistries, emergency procedures and decontamination procedures for the work activities.

Drilling Activities

Drilling activities will include initial excavation, drilling above groundwater and drilling below groundwater sub-tasks. Because of the potential for encountering soil and groundwater contaminated with VOC from the WVBA plume, precautions for the potential generation and disposition of contaminated drilling wastes will be required. In general, each boring will require waste bins for non-impacted wastes (areas typically above 60 feet below ground surface) and waste bins for potentially impacted wastes (areas typically below 60 feet below ground surface). All waste materials generated will be screened for VOCs as outlined below to assist in determining placement of waste drilling cuttings into either bin.

Initial Excavation

Sawcutting or coring of the asphalt roadway will be conducted prior to drilling activities. The drilling contractor will then either hand excavate or use Air Knife technologies to excavate to approximately five feet below ground surface or to the depth of the deepest utility in the vicinity of the borehole. Waste soils will be placed in the non-impacted disposal bin for subsequent characterization and disposal.

Drilling Above Groundwater

Drilling activities conducted above groundwater are not anticipated to encounter contaminated soils or groundwater until approximately 60 feet below ground surface. Below this depth, soils may have residual contamination associated with higher groundwater levels in the 1990s.

Adams and Wendt will be present on-site during the drilling activities and will continuously monitor volatile organic compound (VOC) concentrations in the workspace air, the borehole, and the waste stream discharge locations during the drilling operations using a Photo Ionization Detector (PID) with a 11.7 EV Lamp. If concentrations of VOCs in any of these areas start to be elevated, the drilling operations will cease and a new waste bin for impacted wastes will be moved into place to accept drilling wastes.

All waste will be contained in a leak proof bin and will be stored at a pre-arranged location until receipt of the analytical results from waste characterization activities that are presented later in this Work Plan.

Drilling Below Groundwater

Drilling activities conducted below groundwater are anticipated to encounter contamination from VOCs. Adams and Wendt will be present on-site during the drilling activities and will continuously monitor volatile organic compound (VOC) concentrations in the workspace air, the borehole, and the waste stream discharge locations during the drilling operations using a Photo Ionization Detector (PID) with a 11.7 EV Lamp. If concentrations of VOCs in any of these areas start to be elevated, the drilling operations will cease and a new waste bin for impacted wastes will be moved into place to accept drilling wastes.

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All waste will be contained in a leak proof containers and will be stored at a pre-arranged location until receipt of the analytical results from waste characterization activities that are presented later in this Work Plan.

Decontamination of Equipment

If VOCs are detected by the PID during drilling screening activities described above, drilling equipment will require decontamination prior to use at the other locations. Drilling rods, bits, and discharge hose/tubes will be pressure washed at a designated wash site prior to re-use. All liquids produced during this activity will be controlled as all other waste utilizing the vacuum truck and will be discharged into the leak proof container and disposed of properly when the waste characterization analysis is received.

Waste Characterization Activities

After completion of the drilling activities, samples of both "Impacted" and "Non-Impacted" drilling wastes, (potentially including wastewater, slurry and soil) will be sampled individually by Adams and Wendt to determine applicable disposal requirements.

Liquid Wastes will be sampled and analyzed for the following analyses by an Arizona Department of Health Services (ADHS) Certified Laboratory for each analytical procedure in compliance with wastewater methods specified in 40 CFR 136.

- Priority Pollutant Metals (13) using EPA Method 6010B/200.7
- Total Cyanide by SM-4500-CN, C-E
- Volatile Organic Compounds (VOCs) using EPA Method 8260B
- pH using SW 846-9040
- Flashpoint by SW 846-1010
- Method 8082 (Organochlorine Pesticides)

Impacted and Non-Impacted Waste Solids will be sampled and analyzed for the following analyses.

- Method 8260B (Volatile Organic Compounds [VOC])
- Method 1311/6010B/7471B (TCLP RCRA 8 Metals)
- Method 8270 SIM (Selected Ion Monitoring [SIM] for Polynuclear Aromatic Hydrocarbons [PAH])

Analyses will be provided on a routine turn-around timeframe of approximately 2 weeks. Based on the analytical results, disposal recommendations will be provided.

Post Drilling Activities

Disposal of Soils

Drilling activities are anticipated to generate waste soils and slurry materials. Depending on the analytical results, disposition may be at the local landfill or at other regulated facilities. Upon receipt of the analytical results, Adams and Wendt will prepare a letter report for disposal of the

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wastes and limitations, thereof. Waste soils will be disposed in accordance with applicable Federal, State and Local regulations. If wastes are determined to be considered Hazardous, additional documentation and disposal procedures will apply.

Disposal of Liquids

Drilling activities are anticipated to potentially generate waste liquids that will be temporarily stored in a tank or container for characterization and disposal. If acceptable, disposition of the liquids will be by the City of Phoenix Sanitary System through a temporary permit to discharge. All discharge activities will be documented and included in the final report. If waste liquids are not acceptable to the City of Phoenix, alternative disposal methods will be evaluated and proposed, including disposal at the Liquid Environmental Services, facility in Phoenix, Arizona. The driller will acquire an approved discharge permit with the City of Phoenix for treatment and disposal of organic, oily and metal-laden wastewaters that maybe discharged to the proper manhole.

Manifest Documentation

Bills of Lading will be generated for each bin that contains non-regulated, non-hazardous wastes for disposal documenting the weight, time and location of disposal.

If waste materials are determined to be considered regulated or hazardous wastes, Achen-Gardner and/or Adams and Wendt will contact the City of Phoenix for coordination of manifest documentation for disposal of the wastes.

Post Drilling Inspections

After completion of drilling activities, Adams and Wendt will inspect the job sites for signs of environmental issues that may require further cleanup. Adams and Wendt will observe the stormwater features, ground and other surfaces for staining, debris or waste materials left at each site and will report a punch list of items, if any, to Achen-Gardner for rectification.

Reporting

Adams and Wendt will prepare and submit a report of findings for the work activities that will include the scope of work, observations, analytical results and disposal activities to document proper handling and disposal of all wastes for the project.

Project Team Organization and Responsibilities

Achen-Gardner

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Adams and Wendt

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Drilling Contractor

- TBD

SECTION 2 – HAZARD ANALYSIS

Site Hazards

Hazards associated with the mobilization and demobilization for this project include:

- Electrical shock from overhead power lines;
- Object striking the heads of field personnel; and
- General site hazards such as slips, trips and falls.

Methods of hazard mitigation are provided in Table 1 below.

Hazards associated with borehole drilling include:

- Electrical shock from overhead power lines;
- Electrical shock from underground utilities;
- Fire/explosion from ruptured underground gas lines;
- Objects striking the heads of field personnel;
- Rotating equipment;
- Noise;
- Potential contact with or inhalation of contaminants of concern; and
- General site hazards such as slips, trips and falls.

Methods of hazard mitigation are provided in Table 1 below.

Hazards associated with soil and groundwater collection and characterization include:

Potential contact with contaminants of concern; and
General site hazards such as slips, trips and falls.

Methods of hazard mitigation are provided in Table 1 below.

Table 1 – Hazard Sources and Hazard Mitigation Methods – WVBA

Hazard	Associated Task	Mitigation
Electrical Shock	Mobilization; Borehole drilling; De-mobilization	Underground utilities will be identified and marked prior to mobilization. Equipment will be spotted to avoid overhead utilities (minimum 20 ft clearance). Mast of drilling rig will not be raised/lowered without a designated spotter. All temporary power supplied to site will be properly outfitted with ground fault circuit interrupters.
Objects striking head	All	Hard hats will be worn within the work area.
Slips, trips and falls	All	Limit access to work area with signage and barricade tape. Continual housekeeping activities will keep the worksite free of conditions that can impact worker footing.
Flying particulate	All	Safety glasses with side shields will be worn while on the work site.
Rotating equipment	Borehole drilling	Isolate access to moving equipment parts
Explosion/Fire	All	Underground utilities (gas lines) will be identified and marked prior to mobilization. No open flame will be allowed in the work area (no smoking). All flammable liquids (fuel, etc.) will be stored in appropriate containers. Appropriate fire extinguishers will be readily available within the work area during site activities.

Contact with Contaminants of Concern	Borehole drilling; soil and groundwater characterization; De-mobilization	<p>Wear disposable nitrile inner gloves and outer gloves along with safety glasses with side shields or goggles when handling soils/groundwater.</p> <p>Monitor vicinity of borehole and collected soils/groundwater with a PID to assess potential for inhalation exposures of concern.</p> <p>Remain upwind of potential source of contaminants whenever possible.</p> <p>Decontamination of equipment shall be performed using appropriate decontamination solutions wearing inner/outer gloves and eye protection.</p> <p>No eating, drinking or smoking in the work area.</p>
Noise	Borehole drilling	Employ either ear plugs or ear muffs to modulate occupational exposure to noise.

Chemicals of Concern

The following table (Table 2) presents the identified chemicals of concern (CoC) in the groundwater at the site and their associated occupation exposure limits. Additionally, these contaminants may have impacted and be present in the soils in the vicinity of groundwater.

Permissible Exposure Limits (PELs) are promulgated by the Occupation Health and Safety Administration (OSHA) and are enforceable exposure limits designed to protect workers from health effects associated with exposure to hazardous substances. The PEL's may be measured as 8 hr time weighted average (TWA) exposures, 15 minute short term exposure limits (STELs), or maximum Ceiling concentrations (C). OSHA requires that employers implement control measures (engineering, PPE) when employees exposures exceed PELs.

The threshold limit values (TLVs) are guidelines published by the American Conference of Governmental Industrial Hygienist (ACGIH). While not based on regulation, TLVs in some instances reflect a more current understanding of potential hazards associated with exposure to a given substance and need to be considered when assessing the potential harm resulting from an occupational exposure to a particular substance.

Table 2 - Potential Chemical Contaminants of Concern (CoC)– WVBA

Substance / CAS # / Synonym	OSHA PEL		ACGIH TLV		Primary Health Hazard
	TWA	STEL	TWA	STEL	
tetrachloroethene (PCE) / 127-18-4 / tetrachloroethylene	100 ppm	200 ppm(c)	25 ppm	100 ppm	CNS depressions, liver damage, potential carcinogen
trichloroethene (TCE) / 79-01-6 / trichloroethylene	100 ppm	200 ppm(c)	10 ppm	25 ppm	CNS impacts, headache, liver damage, potential carcinogen

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1,1,1-trichloroethane (TCA) / 71-55-6 / methyl chloroform	350 ppm	NA	350 ppm	450 ppm	CNS depressions, liver damage
cis 1,2-dichloroethene (cis 1,2-DCE) / 156-59-2 / 1,2-dichloroethylene	200 ppm	NA	200 ppm	NA	CNS depression
1,1-dichloroethane (1,1-DCA) / 75-34-3 / ethylidene chloride	100 ppm	NA	100 ppm	NA	CNS depression, liver and kidney damage
1,1-dichloroethene (1,1-DCE) / 75-35-4 / 1,1-dichloroethylene	NA	NA	5 ppm	NA	Skin and respiratory irritant
Chromium IV	5 ug/m ³	NA	0.05 ug/m ³	NA	Lung cancer, dermatitis
benzene / 71-43-2 / mineral naphtha	1 ppm	5 ppm	0.5 ppm	2.5 ppm	CNS depression, anemia, known carcinogen
toluene / 108-88-3 / methylbenzene	200 ppm	300 ppm (c)	20 ppm	NA	CNS depression, eye irritation, liver and kidney damage
ethyl benzene / 100-41-4 / ethylbenzol	100 ppm	NA	20 ppm	NA	CNS depression, eye and mucus membrane irritation
xylene / 1330-20-7 / xylo	100ppm	NA	100 ppm	150 ppm	CNS depression, mucus membrane irritation

- Tetrachloroethene (PCE). PCE is a non-flammable colorless liquid with a sweet odor. It is used as a solvent in dry-cleaning and for degreasing metals. The International Agency for Research on Cancer (IARC) considers PCE probably carcinogenic to humans. PCE would enter the human body via inhalation or ingestion. (Agency for Toxic Substances and Disease Registry – ATSDR).
 - PCE has an ionization potential of 9.32 eV (reference for PID detection).
- Trichloroethene (TCE). TCE is a non-flammable colorless liquid with a sweet odor. It is used primarily as a degreasing solvent but is also found in paint removers and adhesives. IARC has linked TCE exposure to potential kidney cancer. TCE would enter the human body via inhalation, ingestion or dermal contact. (ATSDR).
 - TCE has an ionization potential of 9.45 eV.
- 1,1,1-trichloroethane (TCA). TCA is a flammable, colorless liquid with a sweet, sharp odor. It was used as a solvent in numerous products and as a degreaser. The domestic production of TCA was banned effective January 1, 2002 because of its impact on the

ozone layer. IARC has not established a link between exposure to TCA and cancer. TCA would enter the human body via inhalation, ingestion or dermal contact. (ATSDR).

- TCA has an ionization potential of 11.00 eV.
- cis 1,2-dichloroethene (cis 1,2-DCE). cis 1,2-DCE is a flammable colorless liquid with a sharp, harsh odor that is used in the production of numerous solvents. The EPA has determined that cis-1,2-DCE is not classifiable as to its human carcinogenicity. cis 1,2-DCE would enter the human body via inhalation, ingestion or dermal contact. (ATSDR).
 - cis 1,2-DCE has an ionization potential of 9.65 eV.
- 1,1-dichloroethane (1,1-DCA). 1,1-DCA is a colorless, oily liquid with a sweet odor that is used in the production of other chemicals and products including those to dissolve paints and varnishes. The EPA has determined that 1,1-DCA is a possible human carcinogen. 1,1-DCA would enter the human body via inhalation, ingestion or dermal contact. (ATSDR).
 - 1,1-DCA has an ionization potential of 11.06 eV.
- 1,1-dichloroethene (1,1-DCE). 1,1-DCE is a colorless liquid with a mild, sweet odor that is used in the production of certain plastics and flame retardant coatings. The EPA has determined that 1,1-DCE is a possible human carcinogen. 1,1-DCE would enter the human body via inhalation, ingestion or dermal contact. (ATSDR).
 - 1,1-DCE has an ionization potential of 10.00 eV.
- Hexavalent chromium (CrVI). CrVI is a solid at room temperature whose properties vary with the compound it is found within. It can be soluble in water. It is used to make stainless steel, as a wood preservative, and of corrosion resistance. IARC and EPA have determined that CrVI containing compounds are known human carcinogens. CrVI would enter the human body via inhalation, ingestion or dermal contact. (ATSDR).
 - Ionization potential not applicable.
- Benzene. Benzene is a flammable colorless liquid with a sweet odor that is used in the production of plastics, resins, dyes and pesticides. It is also a fraction in gasoline. The IARC has determined that benzene is carcinogenic. Benzene enters the human body primarily through inhalation with ingestion and dermal contact being minor secondary routes. (ATSDR).
 - Benzene has an ionization potential of 9.25 eV.
- Toluene. Toluene is a clear colorless liquid that is used in paint thinners, fingernail polish, adhesives and it is a fraction in gasoline. Toluene is not classified as a carcinogen. Toluene enters the human body via inhalation and ingestion. (ATSDR).
 - Toluene has an ionization potential of 8.82 eV.

- Ethyl benzene. Ethyl benzene is colorless flammable liquid with a gasoline like odor that is used in the production of inks, paints and insecticides. Ethyl benzene is also a fraction of gasoline. The IARC has determined that ethyl benzene is a possible human carcinogen. Ethyl benzene enters the human body via inhalation, ingestion and dermal contact. (ATSDR).
 - Ethyl benzene has an ionization potential of 8.76 eV.

- Xylene. Xylene is flammable colorless sweet smelling liquid used as a cleaning agent and thinner. It is also a fraction in gasoline. The EPA and IARC have determined that xylene is not classifiable as to its human carcinogenicity. Xylene enters the human body via inhalation, ingestion and dermal contact. (ATSDR).
 - Xylene has an ionization potential of 8.56 eV.

Traffic/Vehicle Operation

Since the work area incorporates a portion of a public roadway, lane closures and barriers will be employed to preclude the unintentional encroachment of public traffic. All motorized equipment within the work area will have functioning back-up alarms.

SECTION 3 – TRAINING, PERSONNEL PROTECTION AND MONITORING

Training

OSHA, through an interpretation, has stated: "Workers, such as utility workers, who must perform duties at a hazardous waste site that has not yet been characterized but where contamination is expected, do fall under the scope of 29 CFR 1910.120. These workers must work under the direction of an on-site supervisor and a site-specific safety and health plan, and must be fully trained and protected pursuant to the HAZWOPER standard. When additional information becomes available through site characterization which verifies that there is minimal or no risk of employee exposure to hazardous substances, a lesser degree of PPE and worker training may be acceptable." OSHA Archived Interpretation dated 9/8/92. While this is not a classified hazardous waste site, contamination has been identified and potential exposures have not been characterized. For this reason, all workers on site must possess a minimum of 24 hrs of instruction as outlined in 29 CFR 1910.120 (e). Note – these workers are not expected or trained to do hazardous waste cleanup and are not required to wear a respirator. If conditions change at the work site, and respirator use is mandatory to prevent an occupational exposure, training requirements will change to 40 hrs of instruction. 29CFR 1910.120 (e) (3) (iv).

Additional mandatory training will include a tailgate safety meeting discussing the contents of the site health and safety plan, prior to the start of on-site operations.

Personnel Protection

The initial level of personal protection to be utilized at the start of this work activity will be EPA Level D.

Level D protection will include the following personal protective equipment (PPE):

- Hard hats
- Coveralls/standard work clothing
- Safety glasses with side shields
- Steel toed boots
- Hearing protection (as needed)
- Nitrile gloves

If site conditions change, based on monitoring data obtained with a photo-ionization detector (PID), an upgrade in the level of protection may be warranted. Although not anticipated, elevated airborne levels of potential CoC could necessitate an upgrade to Level C respiratory protection (1/2 facepiece or full facepiece air purifying respirators with NIOSH approved combination organic vapor/acid gases/P-100 cartridges (yellow/magenta). NOTE – if respiratory protection becomes necessary, all personnel in the active work area employing respirators must be 40 hr trained (29CFR 1910.120) and medically cleared to wear a respirator.

Action Levels

Screening for the presence of the volatile CoC will be performed with a calibrated PID (11.7 eV). During any task with the potential for exposure to a CoC (borehole drilling and soil and groundwater collection/characterization), breathing zone concentrations of volatile organic compounds will be documented approximately every 15 minutes. These concentrations will be compared to the regulatory exposure limits found in Table 2. Any PID reading in excess of 5 ppm will trigger an automatic review of data by the site health and safety officer and a potential upgrade to PPE to Level C – air purifying respirator or a modification in work practices to reduce PID reading to background concentrations.

Medical Surveillance

The HAZWOPER standard requires employers to include in their medical surveillance program employees who are or may be exposed to hazardous substances or health hazards at or above permissible exposure levels for 30 days or more per year (1910.120(f)(2)(i)), who must wear a respirator for 30 days or more per year (1910.120(f)(2)(ii)), who are injured or become ill due to possible overexposures involving hazardous substances or health hazards from an emergency response or hazardous waste operation (1910.120(f)(2)(iii)), or who are members of HAZMAT teams (1910.120(f)(2)(iv)). (*OSHA interpretation letter 12/16/96*). It is the contractors responsibility to determine whether their employees fit into the requirements of the medical surveillance program.