CITY OF PRESCOTT

Everybody's Hometown

2018-114

Phase 2 Drilling and Testing Program-
Big Chino Sub-basin Data Collection and Monitoring Plan

Project Specifications
and
Contract Documents

DESCRIPTION:	This project generally consists of drilling, construction, and aquifer testing of up to seven (7) monitoring wells in the Paulden, Arizona area.
SPONSOR:	CITY OF PRESCOTT, ARIZONA
PROJECT NUMBER:	18-7112230-8418-90147
BID OPENING:	November 2, 2017 at 2:00 PM Prescott City Council Chambers 201 S. Cortez Street, Prescott, Arizona 86303
PREPARED BY:	Public Works Department

October 2017

Table of Contents

SPECIAL NOTICE 5

BID DOCUMENTS 5

NOTICE INVITING BIDS 6

INFORMATION FOR BIDDERS 7

BIDDING SCHEDULE 11

SUBCONTRACTORS LIST BID FORM 12

INSTRUCTIONS FOR PREPARING PROPOSAL 13

PROPOSAL 14

PROPOSED STAGING LOCATIONS 17

BIDDERS AFFIDAVIT 18

INSURANCE REQUIREMENTS 19

CONSTRUCTION CONTRACT 22

CONTRACTOR'S AFFIDAVIT REGARDING SETTLEMENT OF CLAIMS 27

AND CERTIFICATION OF COMPLETION OF WARRANTIES 27

GENERAL CONDITIONS 28

COMMENCEMENT, PROSECUTION AND PROGRESS 29

PRECONSTRUCTION CONFERENCE 29
COMMENCEMENT 29
PUBLIC NOTICE 29
SUBCONTRACTORS 30
CONTRACTOR'S REPRESENTATIVE AND EMERGENCIES 30
CONTRACTOR AND SUBCONTRACTOR RECORDS 30
ADDENDA, REVISIONS AND SUPPLEMENTARY DRAWINGS 31
ERROR AND OMISSIONS 31
CHARACTER OF WORKMEN 31
SUSPENSION OF WORK 31
DELAYS AND EXTENSION OF TIME 32
PAYMENT FOR DELAY 33
TERMINATION FOR BREACH OF CONTRACT 33
METHODS AND EQUIPMENT 33
DATE OF ACTUAL COMPLETION 33
FINAL ACCEPTANCE 33
SAFETY, HEALTH AND SANITATION PROVISIONS 34
TRAFFIC CONTROL 34
WATER 34
PROTECTION OF WORK 35
CLEANUP AND DUST CONTROL 35
GUARANTEE OF WORK 35
CONTINGENCIES 35
NOTICE AND SERVICE THEREOF 35

PROJECT MEETINGS 35
CONSTRUCTION SCHEDULE 36
ACCIDENT PREVENTION 36
CONSTRUCTION FACILITIES 37
TEMPORARY FACILITIES 37
WARNING DEVICES AND BARRICADES 37
HAZARDS IN PUBLIC RIGHT-OF-WAY 37
HAZARDS IN PROTECTED AREAS 37
PROTECTION OF EXISTING ITEMS 37
PROJECT SECURITY 37
FIRE EXTINGUISHER 37
OFF-SITE ROADS 37
NOISE ABATEMENT 38
DRAINAGE CONTROL 38
PROJECT CLOSE-OUT 38
WASTE DISPOSAL, GRADING AND MATERIAL STORAGE 38
PROJECT RECORD DOCUMENTS 39

CONTROL OF WORK 39

ABBREVIATIONS 39
AUTHORITY AND DUTIES OF INSPECTOR 40
INSPECTION 40
AUTHORITY OF THE ENGINEER 40
PLANS 40
CONFORMITY WITH PLANS AND ALLOWABLE DEVIATIONS 41
COORDINATION AND INTERPRETATION OF PLANS AND SPECIFICATIONS 41
ORDER OF WORK 41
CONSTRUCTION STAKES, LINES AND GRADES 41
REMOVAL OF UNACCEPTABLE AND/OR UNAUTHORIZED WORK 41
MAINTENANCE DURING CONSTRUCTION 41
COOPERATION BETWEEN CONTRACTORS 41
COORDINATION OF WORK 42
LINES AND GRADES 42

MATERIALS AND WORKMANSHIP 42

GENERAL 42
SUBSTITUTION OF MATERIAL OR EQUIPMENT 43
FABRICATED MATERIALS AND SHOP DRAWINGS 43
MATERIALS FURNISHED BY THE CITY 43
STORAGE AND HANDLING OF MATERIALS 43
REJECTED MATERIALS 43
UTILITIES 43
DRIVEWAYS AND WALKS 43
ROADS AND FENCES 44
TREES AND SHRUBBERY 44
IRRIGATION DITCHES AND STRUCTURES 44
SUBMITTALS 44
MATERIALS AND EQUIPMENT SCHEDULES 44
QUALITY CONTROL 45
SAMPLES AND TESTS 45

LEGAL RELATIONS AND RESPONSIBILITY 45

LAWS TO BE OBSERVED 45
ALIEN LABOR 45
COMPLIANCE WITH FEDERAL AND STATE LAWS 45
EMPLOYMENT PROVISIONS 46
INDEPENDENT CONTRACTOR STATUS 46
NONDISCRIMINATION 46

AMERICANS WITH DISABILITIES ACT 47
PERMITS, TAXES AND LICENSES 47
PATENTED DEVICES, MATERIALS AND PROCESSES 47
SURVEY LAND MONUMENTS 47
PROTECTION OF PERSON AND PROPERTY 47
PROTECTION OF ANTIQUITIES 48
PERSONAL LIABILITY OF PUBLIC OFFICIALS 48
NON-RESPONSIBILITY OF THE CITY 48
NO WAIVER OF LEGAL RIGHTS 48
PROPERTY RIGHTS IN MATERIAL 48

PAYMENT TO CONTRACTORS 48

GENERAL 48
PARTIAL PAYMENT 48
PAYMENT 49
PAYMENT OF ITEMS IN PROPOSAL 49
CHANGES IN THE WORK 50
FORCE ACCOUNT 50
EXTRA WORK 51
CONTRACT AMENDMENT 51
CLAIMS FOR EXTRA WORK 52
PARTIAL ACCEPTANCE OF WORK 53
NOTIFICATION OF CHANGED CONDITIONS, FORMAL PROTEST AND DISPUTE RESOLUTION 53
PUBLICITY RELEASES 54

SCOPE OF WORK 54

ATTACHMENTS:

TECHNICAL SPECIFICATIONS: April 18, 2017 Revision

SPECIAL PROVISIONS

SPECIAL NOTICE

BIDS WILL BE RETURNED UNOPENED IF NOT SUBMITTED PROPERLY SEALED AND PRIOR TO THE TIME SET FORTH IN THE NOTICE INVITING BIDS. ADDENDA SHALL BE ATTACHED INSIDE THE FRONT COVER OF THIS BOOKLET.

BIDS SHALL BE ENCLOSED IN SEALED ENVELOPES, ADDRESSED TO THE CITY OF PRESCOTT AND MARKED ON THE OUTSIDE LOWER RIGHT-HAND CORNER INDICATING:

1. The Bidder's Name;
2. The Project Title;
3. Bid Opening Date and Time;
4. Acknowledgment of Addenda received, if applicable.

BID DOCUMENTS

ALL BIDS MUST BE ACCOMPANIED BY THE FOLLOWING COMPLETED FORMS PROVIDED HEREIN:

1. Bidding Schedule (page 11)
2. Subcontractors List Bid Form (page 12)
3. Proposal (pages 14-16)
4. Proposed Staging Locations Form (page 17)
5. Bidder's Affidavit (page 18)
6. Bid Security
7. Acknowledgement of Addenda

Failure to complete and sign (where required), and return the above documents with your bid may render it irregular. It is not necessary to return a complete copy of the Notice Inviting Bids, Project Specifications and Contract Documents, other than the forms noted above.

QUESTIONS PERTAINING TO THIS PROJECT PRIOR TO AWARD OF THE CONTRACT SHALL BE DIRECTED TO: City of Prescott, Public Works Department, 433 N. Virginia Street, Prescott, AZ 86301; Phone (928) 777-1130; TDD (928) 777-1100; Fax (928) 771-5929.

NOTICE INVITING BIDS

PROJECT: Phase 2 Drilling and Testing Program- Big Chino Sub-basin Data Collection and Monitoring Plan

DESCRIPTION: This project generally consists of drilling, construction, and aquifer testing of up to seven (7) monitoring wells in the Paulden, Arizona area.

BID OPENING: Thursday, November 2, 2017, at 2:00 PM

MANDATORY PRE-BID MEETING: Wednesday, October 18, 2017, at 10:00 AM, City of Prescott Public Works Department

Sealed bids will be received at the Office of the City Clerk, addressed to the attention of the City Clerk, City of Prescott, 201 S. Cortez Street, Prescott, AZ 86303, before 2:00 PM on November 2, 2017, for furnishing all plant, materials, and labor and performing work for construction of the Phase 2 Drilling and Testing Program- Big Chino Sub-basin Data Collection and Monitoring Plan Project.

Bids will be opened and read aloud at the noted date and time in the Prescott City Hall Council Chambers. Any bid received at or after 2:00 PM on the above stated date will be returned unopened. The City of Prescott reserves the right to accept or reject any or all bids, and/or some or all of the alternates bid, and waive any informality deemed in the best interest of the City and to reject the bids of any persons who have been delinquent or unfaithful to any contract with the City of Prescott.

Copies of the Plans, Project Specifications and Contract Documents are available for public inspection at the Public Works Department, 433 N. Virginia Street, Prescott, Arizona, 86301, (Phone: (928) 777-1130; TDD: 777-1100) or on the City's website at http://www.prescott-az.gov/business/bids/. Those interested in having individual sets of the Plans and Documents may obtain them free of charge on the City's website or by payment of $31.00 per set from Public Works, of which cost is non-refundable. An additional fee of $10.00 will be required for mailing, if so desired.

Candace Manibusan, Contract Specialist
PUBLISHED: 2TC October 8 and October 15, 2017

INFORMATION FOR BIDDERS

PROPOSAL. All standard specifications and details referenced unless otherwise noted shall conform to all the City of Prescott (hereinafter "City") Standard Specifications and Detail Drawings, most current revision, and to the most current edition of the Uniform Standard Specifications and Details for Public Works Construction by the Maricopa Association of Governments, Arizona, including revisions thereto.

ADDENDA. MAG Specifications, Sections 102.1 through 102.13, including: Any Addenda issued during the time of bidding, forming a part of the documents issued to the bidder for the preparation of his bid, shall be covered in the bid and shall be made a part of the contract. Addenda may be issued until noon on the Monday prior to the bid opening date. It is the prospective bidder's responsibility to check for Addenda related to this procurement. Addenda will be posted on the City's website at http://www.prescott-az.gov/business/bids/. Addenda may also be emailed to registered plan rooms and attendees of the mandatory pre-bid meeting, if applicable.

BIDDING REQUIREMENTS AND CONDITIONS. MAG Specifications, Sections 102.1 through 102.13, including: Bids shall be delivered to the office of the City Clerk, City of Prescott, Arizona, before the day and hour set for the submittal of bids in the Notice Inviting Bids as published. Bids shall be enclosed in a sealed envelope bearing the title of the work and the name of the bidder. It is the SOLE responsibility of the bidder to see that his bid is received in proper time. Any bids received after the scheduled closing time for receipt of bids will be returned to the bidder unopened.

IRREGULAR PROPOSALS. MAG Specifications, Section102.7, including: (f) if the bid is mathematically unbalanced, and (g) if the bid is materially unbalanced.

CONFIRMATION OF BID. At any time after the opening of the bids the Public Works Director may require any bidder on the project to confirm such bid in writing prior to contract award. The following certification language shall be submitted as requested by the Public Works Director:

"I, the undersigned hereby certify the prices bid for the Phase 2 Drilling and Testing Program- Big Chino Sub-basin Data Collection and Monitoring Plan Project have been reviewed and I hereby confirm work can be completed in accordance with the requirements of the contract documents, plans and specifications in the total bid amount of $0.00 as stated in the Bidding Schedule."

EXPERIENCE AND QUALIFICATIONS. When requested by the City, the Bidder shall supply a list of all public projects begun within the previous three (3) years prior to contract award. The project list shall contain all public projects entered into by the Bidder and shall include the project name and location, original and final contract amounts, project status and a contact name and information. The Bidder shall provide a description and explanation for any projects that were not completed successfully. Failure to provide complete and factual information may be grounds for rejection of the bid in accordance with City Procurement Code Section 1-27-1.18(K).

SUBCONTRACTORS LIST BID FORM. The Subcontractors List Bid Form must be completed, attached and submitted along with the Bidding Schedule.

BID SECURITY. A certified check, cashier's check or bid bond in the amount of TEN PERCENT (10%) of the bid shall be required at the time the bid or proposal is submitted, in accordance with A.R.S. § 34-201(A)(3).

WITHDRAWAL OF BID. Any bidder may withdraw his bid, either personally, telegraphic, or by written request, at any time prior to the scheduled closing time for receipt of bids.

INTERPRETATION OF PLANS AND DOCUMENTS. MAG Specifications, Section 102.4, including: If any person contemplating submitting a bid for the proposed Contract is in doubt as to the true meaning of any part of the Plans, specifications, or other proposed Contract Documents, or finds discrepancies in or omissions from the Plans or Specifications, he shall submit to the City Public Works Director a written request for an interpretation or correction thereof no later than five working days before bid or proposal opening. The person submitting the request will be responsible for its prompt delivery. Any interpretation or correction of the proposed documents will be made or delivered to each person receiving a set of such documents. Interested bidders may call or visit the office of the City Public Works Director with any questions up to 5:00 PM on the last Thursday prior to the bid opening date. The City will no longer address or interpret any general questions or comments after 5:00 PM on the last Thursday prior to the bid opening date. Comments or questions received after the above referenced time will not be given consideration by the Department. Should any issue be determined significant to the project by the Public Works Director, appropriate action will be taken. Voice: (928) 777-1130; TDD (928) 777-1100.

PRE-AWARD CONFERENCE. The City may require the apparent low bidder to attend a Pre-award conference in order to establish that the Contractor fully understands the scope, complexity and expectations of the project as described in the Contract Documents; to discuss issues, concerns, risk areas and how to minimize them within the bounds of the contract; and to determine that the apparent low bidder is the most responsible and/or most qualified bidder in accordance with City Procurement Code Section 1-27-1.18(K).

The purpose of the Pre-award Conference is to ensure that all participants are apprised of their responsibilities and obligations regarding all applicable laws, rules, regulations and Ordinances contained in the contract documents prior to entering into a contract.

AWARD AND EXECUTION OF CONTRACT. MAG Specifications, Section 103.1 through 103.8, Award of Contract, first paragraph, 103.1, to be revised as follows:

The Contract will be awarded to the lowest qualified bidder complying with these instructions and with the Notice Inviting Bid. The City, however, reserves the right to accept or reject any or all bids if it deems it best for the public good, and to waive any informality in the bids received. The award, if made, will be within sixty (60) calendar days after the opening of bids.

ASSIGNMENT OF CONTRACT. No partial or full assignment by the Contractor of any contract to be entered into hereunder, or any part thereof, or of funds to be received there under by the Contractor, will be recognized by the City unless such assignment has had prior written approval of the City and the surety has been given due notice of such assignment in writing and has consented thereto in writing.

PLANS AND SPECIFICATIONS TO SUCCESSFUL BIDDER. The successful bidder may obtain six (6) sets of Plans and Specifications for this project at no extra cost. If he desires more than the six (6) sets, he may purchase additional sets of Plans and Specifications from the Public Works Director at the cost set forth in the Notice Inviting Bids.

NOTICE TO PROCEED. The Contractor or subcontractor shall not work on any part of the project or incur any expenses or obligations until a Notice to Proceed has been issued by the City. The Notice to Proceed will be sent to the Contractor by first class mail or delivered to him in person.

ASSIGNMENT OF PAYMENTS. MAG Specifications, Section 109.3, including assignment of contract clause included in the "Information for Bidders" in this set of specifications.

NON-PERFORMANCE OF WORK TASKS BY THE CONTRACTOR. If the Contractor fails, neglects, or refuses to perform work tasks necessary for the completion of the total job; replace defective work; to repair or resurface, in a manner that is acceptable to the City and Engineer, public rights-of-way disturbed by his work which are a nuisance, hazard, impedes or endangers vehicular traffic and the public; the City may serve written notice upon the Contractor of its intention to have the work performed by others. Unless, within three (3) calendar days after the service of such notice, the Contractor has made such arrangement and scheduled the accomplishment of said work tasks to the satisfaction of the City and Engineer, the City will proceed to have the work accomplished by others or by itself and deduct the costs thereof from amounts due to the Contractor.

INDEMNIFICATION OF CITY AGAINST LIABILITY. The Contractor shall defend, indemnify and hold harmless the City, its departments, officers, officials, agents, and employees (hereinafter referred to as "Indemnitee") from and against any and all claims, actions, liabilities, damages, losses, or expenses (including court costs, attorneys' fees and costs of claim processing, investigation and litigation) (hereinafter referred to as "Claims") for bodily injury or personal injury (including death), or loss or damage to tangible or intangible property caused, or alleged to be caused, in whole or in part, by the negligent or willful acts or omissions of the Contractor or any of its owners, officers, directors, agents, employees or subcontractors. This indemnity includes any claim or amount arising out of or recovered under Worker's Compensation Law or arising out of failure of such contractor to conform to any federal, state or local law, statue, ordinance, rule, regulation or court decree. It is the specific intentions of the parties that the Indemnitee shall, in all instances, except for Claims arising solely from the negligent or willful acts of Indemnitee, be indemnified by Contractor from and against any and all claims. In consideration of the award of this contract, the Contractor agrees to waive all rights of subrogation against the City, its departments, officers, officials, agents, and employees for losses arising from the work performed by the Contractor for the City.

DEFINITIONS. According to MAG Specifications, Section 101.2, including:

A. AWARD: The formal action of the governing body in accepting a proposal.

B. BID SECURITY: Refers to the certified check, cashier's check, or surety bond, which is required to be submitted with the proposal to insure execution of the contract and the furnishing of the required bonds.

C. CITY: City of Prescott

D. CITY'S REPRESENTATIVE: The authorized representative of the City, which may be an individual or a firm, or his assistants assigned to the project work, the project site, or any part thereof during the performance of the work by the Contractor and until final acceptance.

E. PUBLIC WORKS DIRECTOR: The City of Prescott Public Works Director or his designee, representative or assistants.

F. DESIGN ENGINEER: The firm or person and his properly authorized assistants, designated by the City to prepare Plans and Specifications for the work.

G. NOTICE TO BIDDERS: Refers to the standard forms inviting proposals or bids.

H. MATERIALLY UNBALANCED BID: A bid that generates a reasonable doubt that award to the bidder submitting a mathematically unbalanced bid will result in the lowest ultimate cost to the City.

I. MATHEMATICALLY UNBALANCED BID: A bid containing lump sum or unit bid prices that do not reflect reasonably anticipated actual costs plus a reasonable proportionate share of the bidder's anticipated profit, overhead costs, and other indirect costs.

BID SCHEDULE

Phase 2 Drilling and Testing Program

Big Chino Sub-basin Data Collection and Monitoring Plan

ITEM	SPEC	PAY ITEM	QTY	UNIT	COST	TOTAL
1	109.10	Mobilization/Demobilization	7	EA	$25,550.00	$178,850.00
2	109.11	Contract Allowance	1	AL	$ 200,000.00	$ 200,000.00
3	SP 7.2	Surface Casing Installed (18-inch)	200	LF	$440.00	$88,000.00
4	SP 7.2	Surface Casing Installed (12-inch)	22	LF	$415.00	$9,130.00
5	SP 7.2	Surface Casing Installed (6-inch)	88	LF	$286.00	$25,168.00
6	SP 7.3.1	Borehole Drilling (16-inch)	2,400	LF	$60.00	$144,000.00
7	SP 7.3.1	Borehole Drilling (12-inch)	1,230	LF	$64.00	$78,720.00
8	SP 7.3.1	Borehole Drilling (6-inch)	1,720	LF	$32.00	$55,040.00
9	SP 7.4.1	PVC Casing Installed (4-inch)	2,250	LF	$8.00	$18,000.00
10	SP 7.4.1	LCS Blank Casing Installed (12-inch)	2,600	LF	$35.00	$91,000.00
11	SP 7.4.1	LCS Slotted Casing Installed (8-inch)	800	LF	$60.00	$48,000.00
12	SP 7.4.3	Cement Grout Installation	72	CY	$1,210.00	$87,120.00
13	SP 7.5	Well Development	4	EA	$3,350.00	$13,400.00
14	109.10; SP 8.0	Mobe/Demob Pumping Equipment	3	EA	$9,000.00	$27,000.00
15	SP 8.0	Discharge Piping with Auxillary Pump	5,600	LF	$6.00	$33,600.00
16	SP 8.0	Pumping Period	540	HR	$255.00	$137,700.00
17	SP 2.2	Optional Sound Panels	360	LF	$50.00	$18,000.00
18	SP 6.4	Lost Circulation	24	HR	$525.00	$12,600.00
19	SP 7.3.5	Rig Hourly Rate With Crew	84	HR	$525.00	$44,100.00
20	SP 7.3.6	Well Abandonment	50	CY	$1,210.00	$60,500.00
				TOTAL BID AMOUNT	$ 1,369,928.00----------	

One Million, Three hundred sixty-nine thousand, nine hundred twenty-eight ----------Dollars

(Total Bid Amount in Written Words)

Signature of Company Official	Operations Manager Title
Yellow Jacket Drilling Services, LLC Company Name	602-453-3252 Phone No.
P O Box 801 Address	richard@yjdrilling.com Email
Gilbert, AZ City/State	85299 Zip Code

Note: Quantities are not guaranteed. Final payment will be based on actual quantities. If the required quantities of the items listed above are increased or decreased by Change Order, the adjustment unit prices set forth above shall apply to such increased or decreased quantities.Although lost circulation and well abandonment are not expected, unit prices are requested for bidding purposes in the event they occur. Payment for these items will not be made without prior written authorization by ENGINEER and CITY.

City of Prescott Public Works Department

SUBCONTRACTORS LIST BID FORM

Phase 2 Drilling and Testing Program- Big Chino Sub-basin Data Collection and Monitoring Plan Project

	Company Name and License Number	Mailing Address	Phone Number	Bid Item(s)	Total Sub-Contract Amount
1	None	N/A	N/A	N/A	$ N/A
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
	Total Sub-Contract Amount				**$**

INSTRUCTIONS FOR PREPARING PROPOSAL

Payment for all work performed under this Contract shall be based on the units as shown in the Bidding Schedule. Payment of the bid items as stated in the Contractor's proposal for the completed work, shall be compensation in full for the furnishing of all overhead, labor, materials, devices, equipment and appurtenances included in the work as are necessary to complete the total work under this Contract in a good, neat, and satisfactory manner as indicated on the Plans, as described in the Specifications, and as otherwise implied or required to fulfill the objective of the work. It is the intent of the contract that maximum payment shall not exceed the agreed unit price without duly authorized contract amendments. Each item, fixture, piece of equipment, work, etc., as indicated on the Plans, or specified anywhere in these Documents shall be completed with all necessary connections and appurtenances for the satisfactory use and operation of said item, and the total system or systems.

Any and all patents, license fees, insurance premiums, etc., for the right to use equipment or processes included in this Contract shall be included in the total bid price.

Cost of testing, and other incidental operations, profit and overhead cost, including the cost of supervision, temporary field offices, move-in, move-out, insurance, taxes, equipment not a permanent part of the job, and other incidental items, shall be included in the total bid price.

The "Total Amount of Bid" must be filled out by the bidder. In case of any discrepancy between the price in figures and price in written words, as written or corrected, the price in written words shall be presumed to be correct unless obviously in error, and shall be considered as the Contractor's correct and intended bid.

Bids shall not contain any recapitulations of the work to be done. Alternative proposals will not be considered unless called for. If anyone is in doubt as to the true meaning of any part of the Plans, Specifications, or other Contract Documents, or finds discrepancies in or omissions from the Plans or Specifications, he must submit to the Engineer a written request for an interpretation or correction thereof. The person submitting the request will be responsible for its prompt delivery.

Any interpretation or correction of the Contract Documents will be made only by an Addendum duly issued by the City and a copy of such Addendum will be available on the City's website at http://www.prescott-az.gov/business/bids/. The City will not be responsible for any other explanations or interpretations of the Documents.

If the Proposal is made by an individual, it shall be signed and his full name and address shall be given. If it is made by a partnership, it shall be signed with the partnership name and by a general partner of the firm who shall also sign his own name, and the name and address of each partner shall be given; and, if it is made by a corporation, the name of the corporation shall be signed by its duly authorized officer or officers.

The required forms as requested on page 5 must be completed, attached and submitted along with the Bidding Schedule.

PROPOSAL

Place: Phoenix, Arizona

Date: 11-01-17

Proposal of Yellow Jacket Drilling Services, LLC

(Name)

Corporation organized and existing under the laws of the State of Arizona; a partnership consisting

of _____ or an individual trading as

_____.

TO THE HONORABLE MAYOR AND COUNCIL
CITY OF PRESCOTT
PRESCOTT, ARIZONA

Ladies and Gentlemen:

The Undersigned hereby proposes and agrees to furnish any and all required labor, material, construction equipment, transportation, and services for completion of the Phase 2 Drilling and Testing Program- Big Chino Sub-basin Data Collection and Monitoring Plan Project, in strict conformity with the plans and specifications, at the total bid price of:

One Million, Three hundred sixty-nine thousand, nine hundred twenty-eight ---------- Dollars

($ 1,369,928.00 ----------).

The Undersigned hereby declares that he has visited the site and has carefully examined the Contract Documents relating to the work covered by the above bid or bids.

The Bid Security (Certified Check, Cashier's Check, or Bid Bond) attached, payable to the City of Prescott in the sum of not less than ten percent (10%) of the total bid price bid for the complete project, to insure that the undersigned, if his bid is accepted, shall enter into contract and give the bonds and certificates of insurance required. In the event that the contract and bonds and certificates of insurance required are not furnished to the City within the time required, then and in that event the City may retain from the bid bond an amount, not to exceed the amount of the bid bond, representing the difference between the amount specified in the proposal or bid, and such larger amount that the City in good faith contracts with another party to perform the work covered by the proposal or bid.

The project shall be completed within one hundred fifty (150) calendar days after the starting date set forth in the NOTICE TO PROCEED.

The undersigned hereby declares, as bidder, that the only persons or parties interested in this PROPOSAL as principals are those named herein; that no elected official or employee of the City is in any manner interested directly or indirectly in this PROPOSAL or in the profits to be derived from the Contract proposed to be taken, other than as permitted by law; that this bid is made without any connection with any other person or persons making a separate bid for the same purpose; that the bid is in all respects fair and without collusion or fraud; that he has read the NOTICE INVITING BIDS

and the INFORMATION FOR BIDDERS hereto attached, and as more fully described in the attached contract and specifications, and agrees to furnish the items and perform the work called for in accordance with the provisions of said form of Contract and the Specifications and to deliver the same within the time stipulated herein, and that he will accept in full payment therefore the total bid price named in this Proposal.

The bidder shall be an A-General Engineering contractor properly licensed at the time of bidding to perform construction in connection with fixed works, including streets, roads, power and utilities plants, dams, hydroelectric plants, sewage and waste disposal plants, bridges, tunnels, and overpasses and shall also be licensed to perform work within residential and commercial property lines, or shall be properly licensed to sub-contract residential or commercial work, as may be required in the Scope of Work.

Any bid submitted without the proper contracting license to perform the required work shall be considered non-responsive and rejected.

The bidder further agrees that, upon receipt of written notice of the acceptance of this PROPOSAL, he will execute the Contract in accordance with the PROPOSAL as accepted and furnish the required bonds TEN (10) days from the date of mailing of said notice of award to him at his address as given below, or within such additional time as may be allowed by the City; and that upon his failure or refusal to do so within said time, then the certified or cashier's check or bid bond accompanying this bid shall be cashed or enforced and the money payable pursuant thereto shall be forfeited to and become the property of the City as liquidated damages for such failure or refusal; provided that if said bidder shall execute the Contract and furnish the required bonds within the aforesaid time, his certified or cashier's check, if furnished, shall be returned to him within three (3) days thereafter, and the bid bond, if furnished, shall become void.

Bidder understands and agrees that the City reserves the right to reject any or all bids and to waive any informality in the bidding.

The bidder agrees that this bid shall be good and may not be withdrawn for a period of sixty (60) calendar days after the scheduled closing time for receiving bids.

Bidder acknowledges receipt of the following Addenda: none

The undersigned is the holder of Arizona State Contractor's License No(s). and Classification(s):

218848, A-4

Respectfully submitted,

Yellow Jacket Drilling Services, LLC

Bidder

By: R. LeBlanc. Richard LeBlanc

Title: Operations Manager

Bidder's Contact Information:

Address: PO Box 801, Gilbert, AZ 85299

Telephone No: 602-453-3252

Fax No: 602-453-3258

Email: richard@yjdrilling.com

Names and addresses of all members of the firm or names and titles of all officers of the corporation:

Richard LeBlanc, Operations Manager

PROPOSED STAGING LOCATIONS

PROJECT NAME: PHASE 2 DRILLING AND TESTING PROGRAM- BIG CHINO SUB-BASIN DATA COLLECTION AND MONITORING PLAN

BID DATE: NOVEMBER 2, 2017

CONTRACTOR NAME: Yellow Jacket Drilling Services, LLC

Proposed Location No. 1	
General Description:	Parcel No:
	Physical Address:
Legal Owner:	Zoning District:

Proposed Location No. 2	
General Description:	Parcel No:
	Physical Address:
Legal Owner:	Zoning District:

**A map of each location may be attached to this form*

If no staging areas are proposed, please check here and sign below: ☒ **No Areas Proposed**

By signing below, I ("Contractor") certify that no staging areas are required for the above named project. If necessary staging area(s) are later determined, I understand that any associated costs shall be furnished by the Contractor and will be considered incidental without additional compensation from the City.

R. LeBlanc. — Richard LeBlanc, Operations Manager — 11-01-17

Signature of Company Official — Date Signed

BIDDERS AFFIDAVIT

Phase 2 Drilling and Testing Program-
Big Chino Sub-basin Data Collection and Monitoring Plan Project

State of Arizona)
) ss.
County of Maricopa)

Richard LeBlanc, being first duly sworn, deposes and says:

That he/she is Operations Manager (Title) of Yellow Jacket Drilling Services, LLC (Bidder).

who submits herewith to the City of Prescott, Arizona, a proposal:

That all statements of fact in such proposal are true;

That said proposal was not made in the interest of or on behalf of any undisclosed person, partnership, company, association, organization or corporation;

That said bidder has not, directly or indirectly by agreement, communication or conference with anyone attempted to induce action prejudicial to the interest of the City of Prescott, Arizona, or of any bidder or anyone else interested in the proposed contract; and further,

That prior to the public opening and reading of proposal, said bidder:

1. Did not directly or indirectly, induce or solicit anyone else to submit a false or sham proposal;
2. Did not directly or indirectly collude, conspire, connive or agree with anyone else that said bidder or anyone else would submit a false or sham proposal, or that anyone should refrain from bidding or withdraw his proposals;
3. Did not in any manner, directly or indirectly, seek by agreement, communication or conference with anyone to raise or fix the proposal price of said bidder or of anyone else, or to raise or fix any overhead, profit or cost element of his proposal price, or of that of anyone else;
4. Did not, directly or indirectly, submit his proposed price or any breakdown thereof, or the contents thereof, or divulge information or data relative thereto, to any corporation, partnership, company, association organization, bid depository or to any member or agent thereof, or to any individual or group of individuals, except the City of Prescott, Arizona, or to any person or persons who have a partnership or other financial interests with said bidder in his business.

By: R. LeBlanc. Richard LeBlanc
Operations Manager

SUBSCRIBED AND SWORN to before me by Richard LeBlanc

this 1st day of November, 2017.

Notary Public

3/23/21
Commission Expires

BID BOND

The makers of this bond are, Yellow Jacket Drilling Services, LLC, as Principal, and AMCO Insurance Company, as Surety and are held and firmly bound unto the City of Prescott, hereinafter called the District, in the penal sum of TEN PERCENT (10%) OF THE TOTAL BID PRICE of the Principal submitted to DISTRICT for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted the accompanying bid dated November 2, 2017, for the Phase 2 Drilling and Testing Program - Big Chino Sub-basin Date Collection and Monitoring Plan.

If the Principal does not withdraw its bid within the time specified in the Contract Documents; and if the Principal is awarded the Contract and provides all documents to the District as required by the Contract Documents; then this obligation shall be null and void. Otherwise, this bond will remain in full force and effect.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents shall in affect its obligation under this bond, and Surety does hereby waive notice of any such changes.

In the event a lawsuit is brought upon this bond by the District and judgment is recovered, the Surety shall pay all litigation expenses incurred by the District in such suit, including reasonable attorneys' fees, court costs, expert witness fees and expenses.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this 30th day of October, 2017, the name and corporate seal of each corporation.

(Corporate Seal)

Yellow Jacket Drilling Services, LLC
Principal

By Richard LeBlanc

Title Principal

(Corporate Seal)

AMCO Insurance Company
Surety

By Richard B. Usher

Title Attorney-In-Fact

(Attach Attorney-in-Fact Certificate)

Power of Attorney

KNOW ALL MEN BY THESE PRESENTS THAT:

Nationwide Mutual Insurance Company, an Ohio corporation
National Casualty Company, an Ohio corporation

AMCO Insurance Company, an Iowa corporation
Allied Property and Casualty Insurance Company, an Iowa corporation

hereinafter referred to severally as the "Company" and collectively as "the Companies" does hereby make, constitute and appoint:

RICHARD B. USHER **TAYLOR B. USHER** **DEBORAH STREETER**

PHOENIX AZ

each in their individual capacity, its true and lawful attorney-in-fact, with full power and authority to sign, seal, and execute on its behalf any and all bonds and undertakings, and other obligatory instruments of similar nature, in penalties not exceeding the sum of

ONE MILLION FIVE HUNDRED THOUSAND AND NO/100 DOLLARS **$ 1,500,000.00**

and to bind the Company thereby, as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Company; and all acts of said Attorney pursuant to the authority given are hereby ratified and confirmed.

This power of attorney is made and executed pursuant to and by authority of the following resolution duly adopted by the board of directors of the Company:

"RESOLVED, that the president, or any vice president be, and each hereby is, authorized and empowered to appoint attorneys-in-fact of the Company, and to authorize them to execute and deliver on behalf of the Company any and all bonds, forms, applications, memorandums, undertakings, recognizances, transfers, contracts of indemnity, policies, contracts guaranteeing the fidelity of persons holding positions of public or private trust, and other writings obligatory in nature that the business of the Company may require; and to modify or revoke, with or without cause, any such appointment or authority; provided, however, that the authority granted hereby shall in no way limit the authority of other duly authorized agents to sign and countersign any of said documents on behalf of the Company."

"RESOLVED FURTHER, that such attorneys-in-fact shall have full power and authority to execute and deliver any and all such documents and to bind the Company subject to the terms and limitations of the power of attorney issued to them, and to affix the seal of the Company thereto; provided, however, that said seal shall not be necessary for the validity of any such documents."

This power of attorney is signed and sealed under and by the following bylaws duly adopted by the board of directors of the Company.

Execution of Instruments. Any vice president, any assistant secretary or any assistant treasurer shall have the power and authority to sign or attest all approved documents, instruments, contracts, or other papers in connection with the operation of the business of the company in addition to the chairman of the board, the chief executive officer, president, treasurer or secretary; provided, however, the signature of any of them may be printed, engraved, or stamped on any approved document, contract, instrument, or other papers of the Company.

IN WITNESS WHEREOF, the Company has caused this instrument to be sealed and duly attested by the signature of its officer the 1st day of May, 2017.

Antonio C. Albanese, **Vice President** of Nationwide Mutual Insurance Company, National Casualty Company, AMCO Insurance Company, Allied Property and Casualty Insurance Company

ACKNOWLEDGMENT

STATE OF NEW YORK, COUNTY OF NEW YORK: ss
On this 1st day of May, 2017, before me came the above-named officer for the Company aforesaid, to me personally known to be the officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, deposes and says, that he is the officer of the Company aforesaid, that the seal affixed hereto is the corporate seal of said Company, and the said corporate seal and his signature were duly affixed and subscribed to said instrument by the authority and direction of said Company.

BARRY T. BASSIS
Notary Public, State of New York
No. 02BA4656400
Qualified in New York County
Commission Expires April 30, 2019

Notary Public
My Commission Expires
April 30, 2019

CERTIFICATE

I, Laura B. Guy, Assistant Secretary of the Company, do hereby certify that the foregoing is a full, true and correct copy of the original power of attorney issued by the Company; that the resolution included therein is a true and correct transcript from the minutes of the meetings of the boards of directors and the same has not been revoked or amended in any manner; that said Antonio C. Albanese was on the date of the execution of the foregoing power of attorney the duly elected officer of the Company, and the corporate seal and his signature as officer were duly affixed and subscribed to the said instrument by the authority of said board of directors; and the foregoing power of attorney is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of said Company this 30th day of October, 2017.

This power of attorney expires **April 30, 2019**

Assistant Secretary

BDJ 1(05-17)00

22330

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

On this 30th day of October, in the year 2017, before me, Jamez R. Prudlick, a Notary Public in and for said state, personally appeared Richard B. Usher, known to me to be the person whose name is subscribed to the within instrument as the Attorney-In-Fact of the (Surety) acknowledged to me that he subscribed the name of the AMCO Insurance Company (Surety) thereto and his own name as Attorney-In-Fact.

Notary Public in and for said State

(SEAL)

JAMEZ RONALD PRUDLICK
NOTARY PUBLIC, ARIZONA
MARICOPA COUNTY
My Commission Expires
September 17, 2018

Commission expires: 09/17/2018

NOTE: A copy of the Power-of-Attorney to local representatives of the bonding company must be attached hereto.

VERN CHRISTENSEN

PROFESSIONAL EXPERIENCE

2010 – Present	Field Operations Manager, Yellow Jacket Drilling
2002 – 2010	Field Operations Manager, WDC Exploration & Wells
1996 – 2002	Supervisor / Driller, THF Drilling
1986 – 1996	Driller, EnviroDrill

EQUIPMENT EXPERIENCE

- Mud Rotary
- Reverse-Circulation
- 94 Millimeter Coring
- Submersible Pumps
- Directional Drilling
- Hollow Stem Auger
- Hydropunch
- Backhoes
- High Capacity/Pressure Cement
- Dual Rotary
- Bucket Auger
- Dual Tube Rotary
- Simulprobe
- Cranes
- Air Rotary
- Tractor/Trailer
- Forklift
- Video Logging Equipment
- Charged Perforating Systems
- Air Rotary Casing Hammer
- Down Hole Hammer
- Continuous Auger Drilling
- Dual Tube Percussion
- Diamond Coring Equipment
- Slurry Pump Equipment

SPECIAL INSTALLATIONS:

Large Production Wells
Injection/Extraction Wells
West Bay Well Installation
Cathodic Protection
Flute Well Installation
Multiple Nested Well Installation

TRAINING / CERTIFICATIONS

- OSHA HAZWOPER Supervisor Training
- OSHA HAZWOPER 40-hour trained
- Annual 8-hour update requirements
- Drilling Fluids Engineering Training and Weighted Fluid Systems Engineering Training (2000)
- Adult CPR – First Aid Training
- MSHA Certified
- Licensed Well Driller in Nevada
- API Worksafe
- Loss Prevention System (LPS)
- Defensive Driving (Smith System)

CHARLES "EDDIE" JOHNSON

PROFESSIONAL EXPERIENCE

2015 – Present Supervisor, Yellow Jacket Drilling Services
2014 – 2015 Lead Driller, Robert Irrigation
2011 – 2014 Lead Driller, Ag Well Company
2009 - 2011 Lead Driller, Robert Irrigation
2001 – 2009 Lead Driller, Boart Longyear

EQUIPMENT EXPERIENCE

- Mud Rotary
- Air Rotary
- Dual Tube Rotary
- Forklift
- High Capacity/Press Cement
- Submersible Pumps
- Cranes
- Backhoes
- Tractor/Trailer
- Hollow Stem Auger
- Slurry Pump Equipment
- Perforating Systems
- Down Hole Tools
- Down Hole Hammer

SPECIAL INSTALLATIONS:

Multiple Nested Well Installation
Municipal Water Supply Well Installation
Extraction Wells
Monitoring Wells

TRAINING / CERTIFICATIONS

- OSHA HAZWOPER Supervisor trained
- OSHA HAZWOPER 40-hour trained
- Annual 8-hour update requirements
- Baroid Mud School
- Adult CPR – First Aid Training
- MSHA Certified
- API Worksafe
- Loss Prevention System (LPS)
- Defensive Driving – Smith Systems
- United States Marine Corps 1996-2000

DAVID MESSINA

PROFESSIONAL EXPERIENCE

2011-Present Health and Safety Officer, Yellow Jacket Drilling Services

2007-2011 Crew Supervisor, Yellow Jacket Drilling Services

2004 – 2007 Driller, Yellow Jacket Drilling Services, Phoenix, AZ

January 2004 - David started his professional drilling career with Yellow Jacket Drilling Services, LLC. Has since been promoted to Driller, Crew Supervisor and now Health & Safety Officer of the company.

EQUIPMENT EXPERIENCE

- Hollow Stem Auger
- Dual Tube Rotary
- Continuous Auger
- Air Rotary
- Mud Rotary
- Backhoe
- Forklift
- HQ/NQ Wireline Coring
- Dual Rotary
- Down Hole Hammer
- Hydropunch
- Simulprobe
- Cranes
- Down Hole Tools
- Tractor/Trailer

SPECIAL INSTALLATIONS:

Various Environmental Well Installation
Multiple Nested Well Installation
Industrial Well Installation
Various Down Hole Sampling Techniques

_TRAINING / CERTIFICATIONS

- B.S. degree in Organizational Management – Magna Cum Laude
- NSC Certified CPR/First Aid Instructor
- Authorized MSHA Instructor – Part 46/Part 48
- Authorized OSHA Outreach Instructor (General Industry /Construction)
- OSHA HAZWOPER 40-hour trained
- Adult CPR – First Aid Training
- MSHA Certified
- API Worksafe
- Loss Prevention System (LPS)
- Defensive Driving (Smith System)
- State of Nevada Licensed Driller

STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES

Let it be known to all that, pursuant to A.R.S. § 45-595,

YELLOW JACKET DRILLING SERVICES, LLC

is hereby issued Arizona Well Driller's License Number 78
The requirements for this certificate have been met by:

RICHARD LeBLANC

who may act as the company's qualifying party in the following drilling categories:

AIR ROTARY

MUD ROTARY

REVERSE ROTARY

BORING AND AUGERING

ADDITIONAL TRADE EXAMINATIONS PASSED INCLUDE:

MONITORING WELL CONSTRUCTION

LICENSE ISSUED ON JUNE 20, 2017 AND EXPIRING ON JUNE 30, 2018

MICHAEL I. BALL
COMPLIANCE ENFORCEMENT OFFICER
WATER PLANNING & PERMITTING DIVISION

STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES

Let it be known to all that, pursuant to A.R.S. § 45-595,

YELLOW JACKET DRILLING SERVICES, LLC

is hereby issued Arizona Well Driller's License Number 78
The requirements for this certificate have been met by:

DAMON JOHN TRUAX

who may act as the company's qualifying party in the following drilling categories:

AIR ROTARY

MUD ROTARY

BORING AND AUGERING

REVERSE CIRCULATION ROTARY

ADDITIONAL TRADE EXAMINATIONS PASSED INCLUDE:

MONITORING WELL CONSTRUCTION

LICENSE AMENDED ON JUNE 20, 2017 AND EXPIRING ON JUNE 30, 2018

MICHAEL I. BALL
COMPLIANCE ENFORCEMENT OFFICER
WATER PLANNING & PERMITTING DIVISION

STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES

Let it be known to all that, pursuant to A.R.S. § 45-595,

YELLOW JACKET DRILLING SERVICES, LLC

is hereby issued Arizona Well Driller's License Number **78**
The requirements for this certificate have been met by:

ERIC JOHN BRUE

who may act as the company's qualifying party in the following drilling categories:

AIR ROTARY

MUD ROTARY

REVERSE ROTARY

AUGERING AND MONITORING

ADDITIONAL TRADE EXAMINATIONS PASSED INCLUDE: NONE

LICENSE ISSUED ON JUNE 20, 2017 AND EXPIRING ON JUNE 30, 2018

MICHAEL I. BALL
COMPLIANCE ENFORCEMENT OFFICER
WATER PLANNING & PERMITTING DIVISION

IMPORTANT NOTICE
YOU MUST:

1.) REPORT DISASSOCIATION OF QUALIFYING PARTY **IN WRITING** WITHIN 15 DAYS. [SEE A.R.S. § 32-1154(A)(18)]
2.) REPORT A CHANGE OF ADDRESS **IN WRITING** WITHIN 30 DAYS. [SEE A.R.S. § 32-1122(B)(1)]
3.) REPORT ANY TRANSFER OF OWNERSHIP OF 50% OR MORE IMMEDIATELY [SEE A.R.S. § 32-1151.01]
4.) REPORT ANY CHANGE IN LEGAL ENTITY, SUCH AS ANY CHANGE OF THE OWNERSHIP IN A SOLE PROPRIETORSHIP OR CHANGE OF A PARTNER IN A PARTNERSHIP OR THE CREATION OF A NEW CORPORATE ENTITY. [SEE A.R.S. § 32-1124(B)(F) § RULE R-4-9-110]

Yellow Jacket Drilling Services LLC

Po Box 801
Gilbert, AZ 85299-0801

THIS IS YOUR IDENTIFICATION CARD
DO NOT DESTROY

LICENSE EFFECTIVE THROUGH: 04/30/2018
STATE OF ARIZONA
Registrar of Contractors CERTIFIES THAT

Yellow Jacket Drilling Services LLC

CONTRACTORS LICENSE NO. 218848 CLASS A-4

Drilling

THIS CARD MUST BE PRESENTED UPON DEMAND

JEFF FLEETHAM, DIRECTOR

IMPORTANT NOTICE
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Yellow Jacket Drilling Services LLC

Po Box 801
Gilbert, AZ 85299-0801

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Yellow Jacket Drilling Services LLC

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Drilling

THIS CARD MUST BE PRESENTED UPON DEMAND

JEFF FLEETHAM, DIRECTOR

YELLOW JACKET
DRILLING SERVICES

List of Project References – Reverse Circulation/Dual Rotary Drilling Method

Client: Los Alamos National Laboratories
Contact: Mark Everett Phone (505) 667-5931
Address: PO Box 1663, Los Alamos, New Mexico 87545
Email Address: meverett@lanl.gov
Project: Los Alamos National Laboratory – Drilling & Installation of Wells R-59, R-62, R-65, R-66, SCI-3 and R10i.
Job Description: Drilling & installation of six (6) 6" diameter stainless steel environmental remedial wells to depths exceeding 1,200' bgs. Provide pumping services for well development, pump installation & aquifer testing, with in a highly secure and sensitive federal installation.
Location: Los Alamos, New Mexico
Period of Performance: September 2011 – January 2012
Contract Amount: $3,100,000

Client: Tetra Tech, Inc.
Contact: Forest Switzer Phone (928) 474-4636
Address: 431 S Beeline Highway, Payson, Arizona 85541
Email Address: forest.switzer@tetratech.com
Additional Contact: Phillip Paski, Hydro Systems, Inc., 480-517-9050
phil@hydrosystems-inc.com
Project: Town of Payson Aquifer Storage & Recovery Project, Phase II
Job Description: Drilling & installation of three (3) 8" diameter municipal water supply wells, to depths of 800' bgs. Provide pump & aquifer testing services. All sites located through neighborhood streets.
Location: Payson, Arizona
Period of Performance: December 2011 – January 2012
Contract Amount: $653,000

Client: Los Alamos National Laboratories
Contact: Mark Everett Phone (505) 667-5931
Address: PO Box 1663, Los Alamos, New Mexico 87545
Email Address: meverett@lanl.gov
Project: Los Alamos National Laboratory – Drilling & Installation of Well CrEx-1
Job Description: Drilling & installation of an 8" diameter well to 1,200' bgs.
Location: Los Alamos, New Mexico
Period of Performance: July – October, 2014
Contract Amount: $1,400,000

Client: Fluid Solutions
Contact: Norm Fain, PE Phone# (602) 707-7801
Address: 2727 N. 3rd Street, Suite 300, Phoenix, AZ 85004
Email Address: nfain@flusol.com
Job Description: Drill and install one 16"'/12" water supply well to a depth of 700 feet.
Provide and install line-shaft turbine pumping assembly
Location: Town of Gila Bend, Arizona.
Period of Performance: April – May, 2014
Contract Amount: $442,000

Client: Fann Contracting, Inc.
Contact: Abe Geupel Phone (928) 778-0170
Address: 1403 Industrial Way, Prescott, AZ 86301
Email Address: abe@fanncontracting.com
Job Description: Drill and install one (1) 8" water supply well to a depth of 2,200'.
Location: ADOT Sunset Point Rest Area, MP 251, Cordes Junction Hwy (I-17).
Period of Performance: September 2012-November 2012
Contract Amount: $980,000

Client: City of Carlsbad.
Contact: Wyatt Kartchner (Consultant - Moltzen Corbin) Phone (575) 522-0049
Address: 101 N. Halagueno St., Carlsbad, N.M. 88220
Email Address: wkartchner@molzencorbin.com
Job Description: Drill and install one (1) 18" water supply well to a depth of 800'.
Location: Sheeps Draw Well #6, Carlsbad, NM
Period of Performance: December 2015-March 2016
Contract Amount: $1,227,092

Client: Rosedale Rio Bravo Water Storage District
Contact: Dan Bartel Phone (661) 589-6045
Address: 849 Allen Road, Bakersfield, CA 93390
Email Address: dbartel@rrbwsd.com
Job Description: Drill and install one (1) 20" HSLA well to a depth of 200'.
Location: Onyx Irrigation Wells
Period of Performance: May 2015-August 2015
Contract Amount: $209,960

Client: Village of Ruidoso
Contact: Roger Peery (John Shomaker & Assoc.) Phone (505) 345-3407
Address: 313 Cree Meadows, Ruidoso, NM 88345
Email Address: rpeery@shomaker.com
Job Description: Drill and install one (1) 14" well to a depth of 1,500'.
Location: River B Well Replacement
Period of Performance: June 2015-August 2015
Contract Amount: $1,117,798

YELLOW JACKET
DRILLING SERVICES

List of Recent Municipal Projects

Client: Eastern Municipal Water District
Contact: John Daverin daverin@emwd.org
Address: 2270 Trumble Rd., Perris, CA 92572
Phone# (951) 928-3777 X 4584
Job Description: Well 64 Drilling: Drill and Install Three 18" x 430' Production Well
Period of Performance: 2015
Contract Amount: $ 836,000

Client: Antelope Valley East Kern Water Agency – West Avenue H Wellfield Well Drilling
Contact: Peter Murphy with Kennedy/Jenks petermurphy@kennedyjenks.com
Address: 3210 El Camino Real, Suite 150, Irvine, CA 92692
Phone# (949) 261-1577
Description: Drill and Install Three 14" x 500' Production Wells
Period of Performance: 2015
Contract Amount: $1.8M

Client: Lake Hemet Municipal Water District
Contact: Mike Gow mgow@lhmwd.org
Address: 26385 Fairview Avenue, Hemet, CA 92544
Contact Office# (951) 658-3241 X 238
Job Description: Well #17 - Drill and install a 16" well to 1,300 feet
Period of Performance: Jan-May, 2016
Contract Amount: $1,049,500

Client: City of Tucson – Tucson Water
Contact: Chuck Faas chuck.faas@tucsonaz.gov
Address: 255 W. Alameda St., Tucson, AZ 85726
Contact Office# (520) 837-2231
Job Description: SAVSARP; Drill and install three 20" stainless steel wells to 920 feet
Period of Performance: Feb-July, 2016
Contract Amount: $2,492,272

Client: City of Phoenix
Contact: Marvin Glotfelty (Clear Creek Associates) mglotfelty@clearcreekassociates.com
Address: 6155 E. Indian School Rd., Suite 200, Scottsdale, AZ 85251
Contact Office# (480) 659-7131
Job Description: 91st Avenue Waste Water Treatment Plant – Four 18" Dewatering Wells to +/-300'
Period of Performance: Oct, 2016- April, 2017
Contract Amount: $1,690,171

STATEMENT OF QUALIFICATIONS

Yellow Jacket Drilling
1-888-4YJDRIL (1-888-495-3745)
yjdrilling.com

YELLOW JACKET
DRILLING SERVICES

Yellow Jacket Drilling Services (YJD) has built its reputation throughout the Southwest as being a premier provider of high quality, safe and cost effective drilling services. YJD's corporate office is located in Phoenix, Arizona. The projects that we service are supported from offices located in Arizona, California, and Colorado.

As a qualified small business enterprise; we are able to offer several innovative techniques and solutions for your drilling needs — many of which were previously only available from our larger business competitors.

YJD specializes in, but is not limited to, providing drilling services to the Environmental, Geotechnical, Mining, Water Supply and Energy market sectors. Some of our available drilling methodologies include; Direct Push, Hollow-Stem Auger, Air Rotary, Mud Rotary, Sonic, Dual Wall Reverse Circulation (RC), Air Rotary Casing Hammer (ARCH), Under-Reaming Casing Advancement (Tubex/Stratex), Flooded Reverse, Conventional and Wireline Coring.

Our diverse fleet of equipment includes multiple Hollow-Stem Auger, Sonic and Rotary drill rigs. With our fleet we have the capability to do everything from drilling in excess of 200' with hollow stem auger, to drilling depths beyond 2,000' using rotary techniques. Some of our specialized rigs allow us the ability to drill in difficult access settings such as under a service station canopy, in a building, on a barge, or on a remote hillside. Our fleet is maintained through a preventative maintenance program that enables us to operate at peak performance at all times.

Safety is our number one priority and all YJD employees maintain numerous industry certifications including; 40-hour OSHA, MSHA, Smith Defensive Driving, as well as certification and participation in multiple safety programs such as API and LPS. Annual refreshers and medical monitoring are mandatory, as well as daily tailgate and all hands monthly safety meetings. We believe that our EMR rating is reflective of our efforts (2016 = 0.75).

YJD is committed to maintaining the highest quality workmanship, reliability, professionalism, and efficiency in the industry. Our personnel is extremely knowledgeable and have years of experience. We understand our clients' needs, and want every customer to be completely satisfied with our work. Each and every employee at YJD is willing to go the extra step to ensure we meet that goal. With such a dedicated group, you can be certain we will get the job done properly, safely, cost-effectively, and on time.

AN ATTITUDE OF EXCELLENCE

It plays a role in everything we do - whether it concerns safety, our customers, equipment, or drill methods.

WE NEVER PROMISE MORE THAN WE CAN DELIVER

By placing a strong emphasis on safety, maintenance, high quality equipment, and proper scheduling practices, we provide maximum efficiency and flexibility to meet your ever-changing project needs.

WE VALUE LASTING PARTNERSHIPS WITH OUR CUSTOMERS

Maintaining an honest dialogue and keeping close personal contact with all involved is our way of ensuring your needs will be met. You benefit from high performance, a hassle-free job, and above standard results.

OUR GOAL IS YOUR COMPLETE SATISFACTION

Yellow Jacket Drilling has become known throughout the Southwest for providing high quality, safe, and cost effective drilling services.

YELLOW JACKET DRILLING SERVICES

As one of the most respected names in the industry, Yellow Jacket Drilling stands to become one of your most trusted service providers.

Yellow Jacket Drilling Services, LLC

Southwest	West Coast	Rocky Mountain
(602)453-3252	(909)989-8563	(303)243-5011

Foremost **DR24HD**

Yellow Jacket Drilling
1-888-4YJDRIL (1-888-495-3745)
yjdrilling.com

The Foremost DR24HD is the latest model Dual Rotary (DR) rig to be introduced by Foremost Industries. DR rigs have been working successfully around the world since 1979. Over the years, the DR method has earned an enviable reputation for exceptional drilling performance in overburden and unconsolidated formations. DR rigs are regularly used to drill and case through up to hundreds of feet of tough overburden were Air Rotary Casing Hammer (ARCH), Dual Wall Percussion Hammer (Becker), Under-reaming Systems (i.e. STRATEX, TUBEX..), and Sonic rigs have struggled or been unsuccessful; and when Mud Rotary is just not an option. The DR24HD also performs excellent in a variety of open-hole drilling applications, making it one of the most versatile, powerful, and truly unique machines in the drilling industry.

The most distinguishing feature of the DR24HD is the powerful lower rotary drive that is used to advance welded or threaded steel casing through overburden and unconsolidated formations. Rotational forces (208,330 ft-lbs of torque) are transmitted to the casing (6" up to 24" diameter) via power-operated jaws. A carbide-studded shoe, attached to the end of the first piece of casing, enables the casing to cut its way through the unconsolidated formation. A top drive rotary head simultaneously handles a drill string equipped with either a down-hole-hammer, or tri-cone bit to drill the center.

With minimal reconfiguration time the DR24HD can also be used to perform direct circulation air/mud rotary, dual tube reverse-circulation, flooded reverse circulation, and 94mm wireline coring methods.

rigspecs

Mast

Heavy duty design – fabricated of rectangular steel tubing to withstand torque of top and lower drive. Height 39 ft to provide clear top head travel of 26 ft. Equipped with a weather-proof lighting system for night operations.

Tophead Rotary

Ruggedly constructed tilting top drive. Rotation is controlled from main panel and is infinitely variable from 0 to 113 RPM with a maximum torque of 12,500 ft-lbs.

Pulldown/Holdback

The tophead drive is raised and lowered via directly connected hydraulic cylinders; connected directly between the tophead and the base of the mast. Benefits of this design include a high pullback to weight ratio, and zero load on the mast's crown. Pulldown force provides 25,900 lbs; Holdback force provides 84,000 lbs.

Foremost **DR24HD** rig**specs**

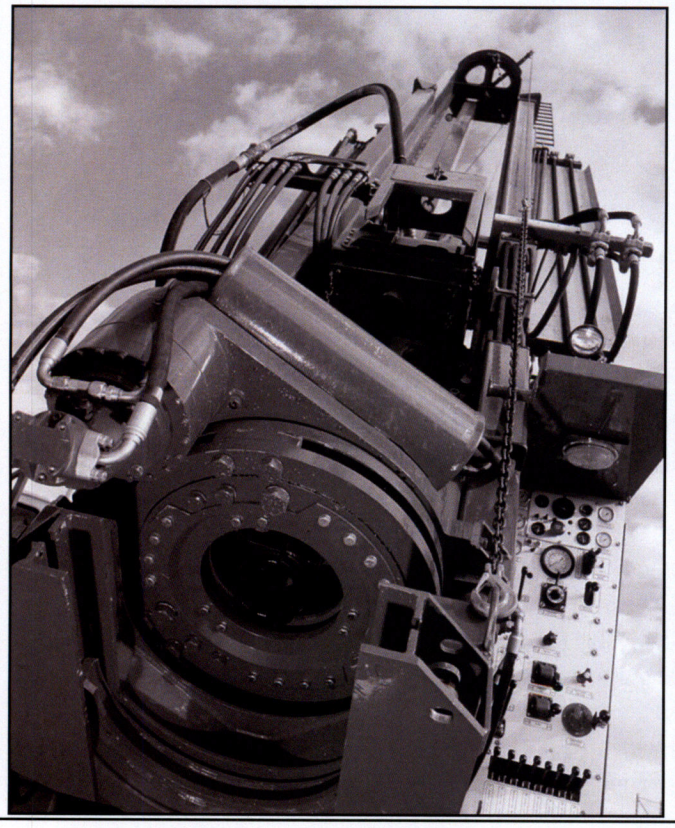
Casing Handling
Tilting tophead drive enables semi-automatic loading and unloading of the drill pipe and casing simultaneously, quickly and safely. The rig is also equipped with a quick tripping attachment, which doubles the speed of the tophead hoist to 108 ft-min; for tripping in and out of the hole and setting casing and pipes of a maximum diameter of up to 24" to the desired depth.

Casing Drive by Lower Rotary Table
Table opening: 24.7", Stroke: 12', Pull back: 117,000 lbs or 201,000 lbs (combined with top-head), Pull down: 42,000 lbs, Rotation: 0-10 RPM, Torque: 208,330 ft-lbs.

Air Compressor
Ingersoll Rand 2 stage, rotary screw-type, rated at 900 CFM with a maximum pressure of up to 350 PSI. The compressor is environmentally protected which helps to provide lower operating noise levels, has a high temperature safety shut down, and is powered by the carrier engine.

Service Winch
Hydraulically powered with 120 ft of 1/2" cable having a single line pull of 6,000 lbs.

Sandline Winch
Hydraulically powered with 120 ft of 1/2" cable having a single line pull of 6,000 lbs.



Water Injection Pump
Hydraulically powered FMC – Bean triplex pump, equipped with a variable speed control for rated output of up to 20 GPM and 600 PSI.

Hydraulic Breakout
Lower rotary drive is used as both a breakout and spinner wrench with torques up to 208,330 ft-lbs., and up to 10 RPM.

Cyclone
Outside shell constructed of 3/16" structural steel, and hardened liner for abrasion; and equipped with a heavy-duty 5" discharge hose.

Hydraulic Leveling Jacks
For optimum stability the rig is equipped with four (4) leveling jacks that provide 36" of travel, and are hydraulically locked for safety.

Truck
Kenworth Model T-800 – Tridem rear axles, equipped with a Cummins model ISX diesel engine rated at 525 Horsepower. 20,000 lb rated front axle; and a tridem rear axle with a 58,000 lb rating.

INSURANCE REQUIREMENTS

INSURANCE: Contractor and subcontractors shall procure and maintain until all of their obligations have been discharged, including any warranty periods under this Contract are satisfied, insurance against claims for injury to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or subcontractors.

The insurance requirements herein are minimum requirements for this Contract and in no way limit the indemnity covenants contained in this Contract.

The City in no way warrants that the minimum limits contained herein are sufficient to protect the Contractor from liabilities that might arise out of the performance of the work under this Contract by the Contractor, his agents, representatives, employees, or subcontractors. Contractor is free to purchase such additional insurance as may be determined necessary.

ADDITIONAL INSURANCE REQUIREMENTS: The policies shall include, or be endorsed to include, the following provisions:

1. On insurance policies where the City of Prescott is named as an additional insured, the City of Prescott shall be an additional insured to the full limits of liability purchased by the Contractor even if those limits of liability are in excess of those required by this Contract.
2. The Contractor's insurance coverage shall be primary insurance and non-contributory with respect to all other available sources.

NOTICE OF CANCELLATION: With the exception of a ten (10) day notice of cancellation for non-payment of premium, any changes material to compliance with this contract in the insurance policies above shall require a thirty (30) day written notice.

ACCEPTABILITY OF INSURERS: Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A-VII, unless otherwise approved by the City. General liability, automobile liability, and worker's compensation insurance is to be placed with an insurer admitted in the state in which operations are taking place.

VERIFICATION OF COVERAGE:

A. Contractor shall furnish the City with certificates of insurance (ACORD form or equivalent approved by the City) as required by this Contract. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf.

   All certificates and any required endorsements are to be received and approved by the City before work commences. Each insurance policy required by this Contract must be in effect at or prior to commencement of work under this Contract and remain in effect for the duration of the project and warranty period as set forth in Paragraph 3 of the "Contractor's Affidavit Regarding Settlement of Claims and Certification of Completion of Warranties". Failure to maintain the insurance policies as required by this Contract or to provide evidence of renewal is a material breach of contract.

   All certificates required by this Contract shall be sent directly to the Public Works Department, 433 N. Virginia Street, Prescott, AZ 86301. The City project/contract number and project description shall be noted on the certificate of insurance. The City reserves the right to require complete, certified copies of all insurance policies required by this Contract at any time.

B. MAG Specifications, Sections 103.1 through 103.8, including: Unless otherwise specifically required by the Special Conditions, the minimum limits of public liability and property damage liability shall be as follows:

C. Contractor shall provide coverage with limits of liability not less than those stated below. An excess liability policy or umbrella liability policy may be used to meet the minimum liability requirements provided that the coverage is written on a following form basis.

Commercial General Liability – Occurrence Form –

Policy shall include bodily injury, property damage, broad form contractual liability and XCU coverage.

• General Aggregate	$ 3,000,000
• Products – Completed Operations Aggregate	$ 3,000,000
• Personal and Advertising Injury	$ 1,000,000
• Each Occurrence	$ 1,000,000
• Fire Legal Liability (Damage to Rented Premises) (if applicable)	$ 100,000

The policy shall be endorsed to include the following additional insured language:

"The Contractor agrees to endorse the City of Prescott as an Additional Insured on the Commercial General Liability with the following Additional Insured endorsement, or similar endorsement providing equal or broader Additional Insured coverage, the CG 2010 10 01 Additional Insured - Owners, Lessees, or Contractors, or CG2010 07 04 Additional Insured – Owners, Lessees, or Contractors – Scheduled Person or Organization endorsement in combination with the additional endorsement of GC2037 10 01 Additional Insured – Owners, Lessees, or Contractors – Completed Operations shall be required to provide back coverage for the contractor's "your work" as defined in the policy and liability arising out of the products-completed operations hazard."

Business Automobile Liability: Bodily Injury and Property Damage for any owned, hired, and/or non-owned vehicles used in the performance of this Contract.

Combined Single Limit (CSL) $ 1,000,000

The policy shall be endorsed to include the following additional insured language:

"The City of Prescott shall be named as additional insured with respect to liability arising out of the activities performed by or on behalf of the Contractor, involving automobiles, owned, leased, hired, or borrowed by the Contractor."

Worker's Compensation and Employer's Liability

Workers' Compensation	Statutory
Employer's Liability	
Each Accident -	$1,000,000
Disease – each employee -	$1,000,000
Disease – policy limit -	$1,000,000

Policy shall contain a waiver of subrogation against the City of Prescott for losses arising from work performed by or on behalf of the Contractor.

Professional Liability (Errors and Omissions Liability) – *if applicable*

Each Claim	$ 1,000,000
Annual Aggregate	$ 2,000,000

1. In the event that the professional liability insurance required by this Contract is written on a claims-made basis, Contractor warrants that any retroactive date under the policy shall precede the effective date of this Contract and that either continuous coverage will be maintained or an extended discovery period will be exercised for a period of two (2) years at the time work under this contract is completed.

2. The policy shall cover professional misconduct or lack of ordinary skill for those positions defined in the Scope of Work of this contract.

   Notice of Cancellation: With the exception of a ten (10) day notice of cancellation for non-payment of premium, any changes material to compliance with this contract in the insurance policies above shall require a thirty (30) day written notice.

D. Such policy shall not exclude coverage for the following:

1. Injury to or destruction of any property arising out of the collapse of/or structural injury to any building or structure due to grading of land, excavation, borrowing, filling, backfilling, tunneling, pile driving, cofferdam work or caisson work.

2. Injury to or destruction of wires, conduits, pipes, mains, sewers, or other similar property or any apparatus in connection therewith, below the surface of the ground, if such injury or destruction is caused by and occurs during the use of mechanical equipment for the purpose of grading of land, paving, excavating, drilling; or injury to or destruction of any property at any time resulting there from.

3. Injury to or destruction of any property arising out of blasting or explosion.

4. Motor vehicle public liability and property damage insurance to cover each automobile, truck, and other vehicle used in the performance of the Contract in an amount of not less than $1,000,000.00 for one person, and $1,000,000.00 for more than one person, and property damage in the sum of $1,000,000.00 resulting from any one accident which may arise from the operations of the Contractor in performing the work provided for herein.

E. The Contractor shall carry and maintain fire and extended coverage with an endorsement for vandalism and malicious mischief in Contractor's name and also in the name of the City in an amount of at least ONE HUNDRED PERCENT (100%) of the Contract amount (if applicable).

F. The Contractor shall secure "all risk"-type builder's risk insurance for work to be performed. Unless specifically authorized by the City, the amount of such insurance shall not be less than ONE HUNDRED PERCENT (100%) of the contract price. Such policy shall include coverage for earthquake, landslide, flood, collapse, or loss due to the results of faulty workmanship, during the contract time and until final acceptance of work by the City (if applicable).

CONSTRUCTION CONTRACT

Phase 2 Drilling and Testing Program-
Big Chino Sub-basin Data Collection and Monitoring Plan Project
Contract No. 2018-114

THIS AGREEMENT, made and entered into this 12th day of December, 2017, by and between Yellow Jacket Drilling Services, LLC of the city of Gilbert, county of Maricopa, state of Arizona, hereinafter designated "Contractor", and the City of Prescott, a municipal corporation, organized and existing under and by virtue of the laws of the State of Arizona, hereinafter designated "City".

WITNESSETH: That the said Contractor, for and in consideration of the sum to be paid him by the said City, and of the other covenants and agreements herein contained, and under the penalties expressed in the bonds provided, hereby agrees, for himself, his heir, executors, administrators, successors and assigns as follows:

ARTICLE I - SCOPE OF WORK: The Contractor shall furnish any and all labor, materials, equipment, transportation, utilities, services and facilities, required to perform all work for the construction of the project described as City of Prescott: Phase 2 Drilling and Testing Program- Big Chino Sub-basin Data Collection and Monitoring Plan Project and install the material therein for the City, in a good and workmanlike and substantial manner and to the satisfaction of the City through its Engineers and under the direction and supervision of the Public Works Director, or his properly authorized agents and strictly pursuant to and in conformity with the Plans and Specifications prepared by the engineers for the City, and with such written modifications of the same and other documents that may be made by the City through the Public Works Director or his properly authorized agents, as provided herein.

ARTICLE II - CONTRACT DOCUMENTS: The Notice Inviting Bids, Plans, Technical Specifications, Special Provisions, Addenda, if any, Proposal and Insurance Requirements as accepted by the Mayor and Council per Council Minutes of December 12, 2017, Performance Bond, Payment Bond, Bid Bond, Certificate of Insurance and Contract Amendments, if any, are by this reference made a part of this Contract to the same extent as if set forth herein in full.

ARTICLE III - TIME OF COMPLETION: The Contractor hereby agrees to commence work on or before the tenth (10th) day after written notice to do so, and to fully complete the same within one hundred fifty (150) calendar days after the date of the written notice to commence work, subject to such extensions of time as are provided by the General Conditions.

ARTICLE IV - COMPENSATION: Contractor shall be paid, pursuant to the provisions as set forth in the Contract documents, the total sum of one million three hundred sixty nine thousand nine hundred twenty eight Dollars and no Cents ($1,369,928.00), plus any approved contract amendments, for the full and satisfactory completion of all work as set forth in the Project Specifications and Contract Documents. Retention shall be in accordance with A.R.S. § 34-221.

ARTICLE V - CONFLICT OF INTEREST: Pursuant to A.R.S. § 38-511, the City may cancel this contract, without penalty or further obligation, if any person significantly involved in initiating, negotiation, securing, drafting or creating the contract on behalf of the City is, at any time while the contract or any extension of the contract is in effect, an employee or agent of any other party to the contract in any capacity or a consultant to any other party of the contract with respect to the subject matter of the contract. In the event of the foregoing, the City further elects to recoup any fee or commission paid or due to any person significantly involved in initiating, negotiation, securing, drafting or creating this contract on behalf of the City from any other party to the contract, arising as a result of this contract.

ARTICLE VI - AMBIGUITY: This Agreement is the result of negotiations by and between the parties. Although it has been drafted by the Prescott City Attorney, it is the result of the negotiations between the parties. Therefore, any ambiguity in this Agreement is not to be construed against either party.

ARTICLE VII - NONDISCRIMINATION: The Contractor, with regard to the work performed by it after award and during its performance of this contract, will not discriminate on the grounds of race, color, national origin, religion, sex, disability or familial status in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The Contractor will not participate either directly or indirectly in the discrimination prohibited by or pursuant to Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Section 109 of the Housing and Community Development Act of 1974, the Age Discrimination Act of 1975, the Americans With Disability Act (Public Law 101-336, 42 U.S.C. 12101-12213) and all applicable federal regulations under the Act, and Arizona Governor Executive Orders 99-4, 2000-4 and 2009-09 as amended.

ARTICLE VIII - INDEPENDENT CONTRACTOR STATUS: It is expressly agreed and understood by and between the parties that the Contractor is being retained by the City as an independent contractor, and as such the Contractor shall not become a City employee, and is not entitled to payment or compensation from the City or to any fringe benefits to which other City employees are entitled other than that compensation as set forth in Article IV - Compensation above. As an independent contractor, the Contractor further acknowledges that he is solely responsible for payment of any and all income taxes, FICA, withholding, unemployment insurance, or other taxes due and owing any governmental entity whatsoever as a result of this Agreement. As an independent contractor, the Contractor further agrees that he will conduct himself in a manner consistent with such status, and that he will neither hold himself out nor claim to be an officer or employee of the City by reason thereof, and that he will not make any claim, demand or application to or for any right or privilege applicable to any officer or employee of the City, including but not limited to workmen's compensation coverage, unemployment insurance benefits, social security coverage, or retirement membership or credit.

ARTICLE IX - CITY FEES: Prior to final payment to the Contractor, the City shall deduct therefrom any and all unpaid privilege, license and other taxes, fees and any and all other unpaid moneys due the City from the Contractor, and shall apply to those moneys to the appropriate account. Contractor shall provide to the City any information necessary to determine the total amount(s) due.

ARTICLE X - LIQUIDATED DAMAGES: All time limits stated in the contract documents are of the essence and should the Contractor fail to complete the work required to be done on or before the time of completion as set forth in these contract documents, including any authorized extension of time, it is mutually agreed and understood by and between the parties that the public will suffer great damages; that such damages, from the nature of the project, will be extremely difficult and

impractical to fix; that the parties hereto wish to fix the amount of said damages in advance; and that the sum of $710.00 per day for each and every day's delay in completion and acceptance of the work required to be done by the Contractor subsequent to the time of completion, including any authorized extensions of time, is the nearest and most exact measure of damages for such breach that can be fixed now or could be fixed at or after such breach and that, therefore, the Owner and Contractor agree to fix said sum of $710.00 per day for each and every said day's delay as liquidated damages, and not as a penalty or forfeiture for the breach of the agreement to complete the work required to be done by the Contractor on or before the time of completion and acceptance and, in the case of such breach, the Owner shall deduct said amount from the amount due the Contractor under the contract. In the event the remaining balance due the Contractor is insufficient to cover the full amount of assessed liquidated damages, then the Contractor or the surety on the bonds shall pay the difference due the Owner.

ARTICLE XI - OTHER WORK IN PROJECT AREA: The City, any other contractors, whether under contract with the City, a third party, and/or utilities, may be working within the project area while this Contract is in progress. The Contractor herein acknowledges that delays and disruptions may, and in all likelihood, will occur due to other work. The Contractor's bid shall be deemed to have recognized and included costs arising from and associated with other work in the project area disclosed by the Contract Documents or which would be apparent to an experienced contractor exercising due diligence during inspection of the project documents, the question and answer session in the pre-bid process or during site inspection. No payment will be made for any delays or disruptions in the work schedule that are wholly the fault of the contractor, its agents, employees or any of the contractor's subcontractors. In the event that the contractor encounters delay or disruption in the project schedule due to factors not wholly the fault of the contractor or within the contractors control then the Contract may be adjusted pursuant to the Delay's and Extension of Time provisions of this Contract and a timely request submitted for Contract Amendment. Failure to submit a timely request for Contract Amendment shall be deemed a waiver of any entitlement to additional compensation.

ARTICLE XII - BONDS:

A. On or before the execution of the contract, the Contractor shall obtain in an amount equal to the full contract price a performance bond pursuant to A.R.S. § 34-222, conditioned upon the faithful performance of this contract in accordance with the plans, specifications and conditions herein. Such bond shall be solely for the protection of the City. A copy of this bond shall be filed with the Prescott City Clerk.

B. Contractor shall also obtain a payment bond, pursuant to the provisions of A.R.S. § 34-222, in an amount equal to this full contract price herein, said bond to be solely for the protection of claimants supplying labor or materials to the Contractor or his subcontractors in the prosecution of the work provided for in this contract. A copy of this bond shall be filed with the Prescott City Clerk.

C. All bonds must be written by an insurance company authorized to do business in the State of Arizona, to be evidenced by a Certificate of Authority as defined in A.R.S. § 20-217, a copy of which certificate is to be attached to the applicable bid bond, payment bond and performance bond. In addition, depending upon the nature of the contract and amount thereof, the City Manager may also require insurance companies and/or bonding companies to have an "A" rating or better with Moody's or A.M. Best Company, and/or to be included on the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as

Acceptable Reinsuring Companies" as published in Circular 570 (as amended) by the audit staff, Bureau of Accounts, US Treasury Department.

ARTICLE XIII - MISCELLANEOUS:

A. The parties hereto expressly covenant and agree that in the event of a dispute arising from this Agreement, each of the parties hereto waives any right to a trial by jury. In the event of litigation, the parties hereby agree to submit to a trial before the Court. The Contractor further agrees that this provision shall be contained in all subcontracts related to the project, which is the subject of this Agreement.

B. The parties hereto expressly covenant and agree that in the event of litigation arising from this Agreement, neither party shall be entitled to an award of attorney fees, either pursuant to the Contract, pursuant to A.R.S. § 12-341.01 (A) and (B), or pursuant to any other state or federal statute, court rule, case law or common law. The Contractor further agrees that this provision shall be contained in all subcontracts related to the project that is the subject of this Agreement.

C. Any notices to be given by either party to the other must be in writing, and personally delivered or mailed by prepaid postage, at the following addresses:

Public Works Director City of Prescott 433 N. Virginia Street Prescott, AZ 86301	Yellow Jacket Drilling Services, LLC PO Box 801 Gilbert, Arizona 85299 (602) 453-3252

D. This Agreement shall be construed under the laws of the State of Arizona.

E. This Agreement represents the entire and integrated Agreement between the City and the Contractor and supersedes all prior negotiations, representations or agreements, either written or oral. This Agreement may be amended only by written instrument signed by both the City and the Contractor. Written and signed amendments shall automatically become part of the Agreement, and shall supersede any inconsistent provision therein; provided, however, that any apparent inconsistency shall be resolved, if possible, by construing the provisions as mutually complementary and supplementary.

F. In the event any provision of this Agreement shall be held to be invalid and unenforceable, the remaining provisions shall be valid and binding upon the parties. One or more waivers by either party of any provision, term, condition or covenant shall not be construed by the other party as a waiver of a subsequent breach of the same by the other party.

G. No oral order, objection, claim or notice by any party to the other shall affect or modify any of the terms or obligations contained in this Agreement, and none of the provisions of this Agreement shall be held to be waived or modified by reason of any act whatsoever, other than by a definitely agreed waiver or modification thereof in writing. No evidence of modification or waiver other than evidence of any such written notice, waiver or modification shall be introduced in any proceeding.

H. In the event of a discrepancy between this Agreement and other documents incorporated into this Agreement, this Agreement shall control over Exhibit "A".

I. Non-Availability of Funds: Fulfillment of the obligation of the City under this Agreement is conditioned upon the availability of funds appropriated or allocated for the performance of such obligations. If funds are not allocated and available for the continuance of this Agreement, this Agreement may be terminated by the City at the end of the period for which the funds are

available. No liability shall accrue to the City in the event this provision is exercised, and the City shall not be obligated or liable for any future payments as a result of termination under this paragraph.

IN WITNESS WHEREOF, three (3) identical counterparts of this Contract, each of which shall for all purposes be deemed an original thereof, have been duly executed by the parties herein above named, on the date and year first above written.

ATTEST:

_____	R. LeBlanc.
Witness, if Contractor is an Individual	Yellow Jacket Drilling Services, LLC
	By: Richard LeBlanc
	Title: Operations Mgr.
	City of Prescott, a municipal corporation:
	_____
	Greg L. Mengarelli, Mayor
Attest:	Approved as to Form:
_____	_____
Maureen Scott, City Clerk	Jon M. Paladini, City Attorney

YELLO-2 OP ID: DS

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 12/27/2017

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Hill & Usher LLC
Insurance. Bonds. Benefits.
3033 North 44th Street, #300
Phoenix, AZ 85018
Steve R. Shields

CONTACT NAME: Commercial Service Team
PHONE (A/C, No, Ext): 602-956-4220 FAX (A/C, No): 602-956-4418
E-MAIL ADDRESS: doccontrol@hillusher.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Travelers Property Casualty Co	25674
INSURER B : Travelers Property Casualty Co	25674
INSURER C : Travelers Indemnity Co	25658
INSURER D : Homeland Insurance Co of NY	34452
INSURER E :	
INSURER F :	

INSURED
Yellow Jacket Drilling Services LLC
Richard LeBlanc DBA
Yellow Jacket Drilling
PO Box 801
Gilbert, AZ 85299-0801

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS		
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY X PRO-JECT LOC OTHER:			DT-CO-2J407688-PHX-17	04/01/2017	04/01/2018	EACH OCCURRENCE	$	1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$	50,000
							MED EXP (Any one person)	$	5,000
							PERSONAL & ADV INJURY	$	1,000,000
							GENERAL AGGREGATE	$	2,000,000
							PRODUCTS - COMP/OP AGG	$	2,000,000
								$	
B	AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS			DT-810-2J354550-TIL-17	04/01/2017	04/01/2018	COMBINED SINGLE LIMIT (Ea accident)	$	1,000,000
							BODILY INJURY (Per person)	$	
							BODILY INJURY (Per accident)	$	
							PROPERTY DAMAGE (Per accident)	$	
								$	
B	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION $ 10000			CUP-2J444660-17-26	04/01/2017	04/01/2018	EACH OCCURRENCE	$	10,000,000
							AGGREGATE	$	10,000,000
								$	
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N Y (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		UB-2J440716-17-26	04/01/2017	04/01/2018	X PER STATUTE OTH-ER		
							E.L. EACH ACCIDENT	$	1,000,000
							E.L. DISEASE - EA EMPLOYEE	$	1,000,000
							E.L. DISEASE - POLICY LIMIT	$	1,000,000
B	Equipment Floater			6601367M582	04/01/2017	04/01/2018	Insd equi		as sched
D	POLL/PROF			7930060860000	04/01/2017	04/01/2018	Occ/Agg		10,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE:PHASE 3 DRILLING AND TESTING PROGRAM CONTRACT #2018-114
ADDITIONAL INSURED FORMS CGD246 & CAT353 ATTACHED. WAIVER OF SUBROGATION FORMS CGD316,CAT353 & WC000313 ATTACHED.

CERTIFICATE HOLDER

CITYPR2

CITY OF PRESCOTT
PUBLIC WORKS DEPARTMENT
433 N VIRGINIA STREET
PRESCOTT, AZ 86301

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY

BLANKET ADDITIONAL INSURED (CONTRACTORS)

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

1. WHO IS AN INSURED – (Section II) is amended to include any person or organization that you agree in a "written contract requiring insurance" to include as an additional insured on this Coverage Part, but:
   a) Only with respect to liability for "bodily injury", "property damage" or "personal injury"; and
   b) If, and only to the extent that, the injury or damage is caused by acts or omissions of you or your subcontractor in the performance of "your work" to which the "written contract requiring insurance" applies. The person or organization does not qualify as an additional insured with respect to the independent acts or omissions of such person or organization.
2. The insurance provided to the additional insured by this endorsement is limited as follows:
   a) In the event that the Limits of Insurance of this Coverage Part shown in the Declarations exceed the limits of liability required by the "written contract requiring insurance", the insurance provided to the additional insured shall be limited to the limits of liability required by that "written contract requiring insurance". This endorsement shall not increase the limits of insurance described in Section **III** – Limits Of Insurance.
   b) The insurance provided to the additional insured does not apply to "bodily injury", "property damage" or "personal injury" arising out of the rendering of, or failure to render, any professional architectural, engineering or surveying services, including:
      i. The preparing, approving, or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders or change orders, or the preparing, approving, or failing to prepare or approve, drawings and specifications; and
      ii. Supervisory, inspection, architectural or engineering activities.
   c) The insurance provided to the additional insured does not apply to "bodily injury" or "property damage" caused by "your work" and included in the "products-completed operations hazard" unless the "written contract requiring insurance" specifically requires you to provide such coverage for that additional insured, and then the insurance provided to the additional insured applies only to such "bodily injury" or "property damage" that occurs before the end of the period of time for which the "written contract requiring insurance" requires you to provide such coverage or the end of the policy period, whichever is earlier.
3. The insurance provided to the additional insured by this endorsement is excess over any valid and collectible "other insurance", whether primary, excess, contingent or on any other basis, that is available to the additional insured for a loss we cover under this endorsement. However, if the "written contract requiring insurance" specifically requires that this insurance apply on a primary basis or a primary and non-contributory basis, this insurance is primary to "other insurance" available to the additional insured which covers that person or organization as a named insured for such loss, and we will not share with that "other insurance". But the insurance provided to the additional insured by this endorsement still is excess over any valid and collectible "other insurance", whether primary, excess, contingent or on any other basis, that is available to the additional insured when that person or organization is an additional insured under such "other insurance".
4. As a condition of coverage provided to the additional insured by this endorsement:
   a) The additional insured must give us written notice as soon as practicable of an "occurrence" or an offense which may result in a claim. To the extent possible, such notice should include:

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i. How, when and where the "occurrence" or offense took place;

ii. The names and addresses of any injured persons and witnesses; and

iii. The nature and location of any injury or damage arising out of the "occurrence" or offense.

b) If a claim is made or "suit" is brought against the additional insured, the additional insured must:

i. Immediately record the specifics of the claim or "suit" and the date received; and

ii. Notify us as soon as practicable.

The additional insured must see to it that we receive written notice of the claim or "suit" as soon as practicable.

c) The additional insured must immediately send us copies of all legal papers received in connection with the claim or "suit", cooperate with us in the investigation or settlement of the claim or defense against the "suit", and otherwise comply with all policy conditions.

d) The additional insured must tender the defense and indemnity of any claim or "suit" to any provider of "other insurance" which would cover the additional insured for a loss we cover under this endorsement. However, this condition does not affect whether the insurance provided to the additional insured by this endorsement is primary to "other insurance" available to the additional insured which covers that person or organization as a named insured as described in paragraph **3.** above.

5. The following definition is added to SECTION V. – DEFINITIONS:

"Written contract requiring insurance" means that part of any written contract or agreement under which you are required to include a person or organization as an additional insured on this Coverage Part, provided that the "bodily injury" and "property damage" occurs and the "personal injury" is caused by an offense committed:

a. After the signing and execution of the contract or agreement by you;

b. While that part of the contract or agreement is in effect; and

c. Before the end of the policy period.

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

CONTRACTORS XTEND ENDORSEMENT

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

GENERAL DESCRIPTION OF COVERAGE – This endorsement broadens coverage. However, coverage for any injury, damage or medical expenses described in any of the provisions of this endorsement may be excluded or limited by another endorsement to this Coverage Part, and these coverage broadening provisions do not apply to the extent that coverage is excluded or limited by such an endorsement. The following listing is a general coverage description only. Limitations and exclusions may apply to these coverages. Read all the provisions of this endorsement and the rest of your policy carefully to determine rights, duties, and what is and is not covered.

A. Aircraft Chartered With Pilot

B. Damage To Premises Rented To You

C. Increased Supplementary Payments

D. Incidental Medical Malpractice

E. Who Is An Insured – Newly Acquired Or Formed Organizations

F. Who Is An Insured – Broadened Named Insured – Unnamed Subsidiaries

G. Blanket Additional Insured – Owners, Managers Or Lessors Of Premises

H. Blanket Additional Insured – Lessors Of Leased Equipment

I. Blanket Additional Insured – States Or Political Subdivisions – Permits

J. Knowledge And Notice Of Occurrence Or Offense

K. Unintentional Omission

L. Blanket Waiver Of Subrogation

M. Amended Bodily Injury Definition

N. Contractual Liability – Railroads

PROVISIONS

A. AIRCRAFT CHARTERED WITH PILOT

The following is added to Exclusion **g.**, **Aircraft, Auto Or Watercraft,** in Paragraph **2.** of **SECTION I – COVERAGES – COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY**:

This exclusion does not apply to an aircraft that is:

(a) Chartered with a pilot to any insured;

(b) Not owned by any insured; and

(c) Not being used to carry any person or property for a charge.

B. DAMAGE TO PREMISES RENTED TO YOU

1. The first paragraph of the exceptions in Exclusion **j.**, **Damage To Property**, in Paragraph **2.** of **SECTION I – COVERAGES – COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY** is deleted.

2. The following replaces the last paragraph of Paragraph **2.**, **Exclusions**, of **SECTION I – COVERAGES – COVERAGE A. BODILY INJURY AND PROPERTY DAMAGE LIABILITY**:

Exclusions **c.** and **g.** through **n.** do not apply to "premises damage". Exclusion **f.(1)(a)** does not apply to "premises damage" caused by:

a. Fire;

b. Explosion;

c. Lightning;

d. Smoke resulting from such fire, explosion, or lightning; or

e. Water;

unless Exclusion **f.** of Section **I** – Coverage **A** – Bodily Injury And Property Damage Liability is replaced by another endorsement to this Coverage Part that has Exclusion – All Pollution Injury Or Damage or Total Pollution Exclusion in its title.

A separate limit of insurance applies to "premises damage" as described in Paragraph **6.** of **SECTION III – LIMITS OF INSURANCE.**

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3. The following replaces Paragraph **6.** of **SECTION III – LIMITS OF INSURANCE**:

   Subject to **5.** above, the Damage To Premises Rented To You Limit is the most we will pay under Coverage **A** for damages because of "premises damage" to any one premises. The Damage To Premises Rented To You Limit will apply to all "property damage" proximately caused by the same "occurrence", whether such damage results from: fire; explosion; lightning; smoke resulting from such fire, explosion, or lightning; or water; or any combination of any of these causes.

   The Damage To Premises Rented To You Limit will be:

   a. The amount shown for the Damage To Premises Rented To You Limit on the Declarations of this Coverage Part; or

   b. $300,000 if no amount is shown for the Damage To Premises Rented To You Limit on the Declarations of this Coverage Part.

4. The following replaces Paragraph **a.** of the definition of "insured contract" in the **DEFINITIONS** Section:

   a. A contract for a lease of premises. However, that portion of the contract for a lease of premises that indemnifies any person or organization for "premises damage" is not an "insured contract";

5. The following is added to the **DEFINITIONS** Section:

   "Premises damage" means "property damage" to:

   a. Any premises while rented to you or temporarily occupied by you with permission of the owner; or

   b. The contents of any premises while such premises is rented to you, if you rent such premises for a period of seven or fewer consecutive days.

6. The following replaces Paragraph **4.b.(1)(b)** of **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS**:

   (b) That is insurance for "premises damage"; or

7. Paragraph **4.b.(1)(c)** of **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS** is deleted.

C. INCREASED SUPPLEMENTARY PAYMENTS

1. The following replaces Paragraph **1.b.** of **SUPPLEMENTARY PAYMENTS – COVERAGES A AND B** of **SECTION I – COVERAGE**:

   b. Up to $2,500 for the cost of bail bonds required because of accidents or traffic law violations arising out of the use of any vehicle to which the Bodily Injury Liability Coverage applies. We do not have to furnish these bonds.

2. The following replaces Paragraph **1.d.** of **SUPPLEMENTARY PAYMENTS – COVERAGES A AND B** of **SECTION I – COVERAGES**:

   d. All reasonable expenses incurred by the insured at our request to assist us in the investigation or defense of the claim or "suit", including actual loss of earnings up to $500 a day because of time off from work.

D. INCIDENTAL MEDICAL MALPRACTICE

1. The following is added to the definition of "occurrence" in the **DEFINITIONS** Section:

   "Occurrence" also means an act or omission committed in providing or failing to provide "incidental medical services", first aid or "Good Samaritan services" to a person.

2. The following is added to Paragraph **2.a.(1)** of **SECTION II – WHO IS AN INSURED**:

   Paragraph **(1)(d)** above does not apply to "bodily injury" arising out of providing or failing to provide:

   (i) "Incidental medical services" by any of your "employees" who is a nurse practitioner, registered nurse, licensed practical nurse, nurse assistant, emergency medical technician or paramedic; or

   (ii) First aid or "Good Samaritan services" by any of your "employees" or "volunteer workers", other than an employed or volunteer doctor. Any such "employees" or "volunteer workers" providing or failing to provide first aid or "Good Samaritan services" during their work hours for you will be deemed to be acting within the scope of their employment by you or performing duties related to the conduct of your business.

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3. The following is added to Paragraph **5.** of **SECTION III – LIMITS OF INSURANCE**:

   For the purposes of determining the applicable Each Occurrence Limit, all related acts or omissions committed in providing or failing to provide "incidental medical services", first aid or "Good Samaritan services" to any one person will be deemed to be one "occurrence".

4. The following exclusion is added to Paragraph **2.**, **Exclusions**, of **SECTION I – COVERAGES – COVERAGE A BODILY INJURY AND PROPERTY DAMAGE LIABILITY**:

   Sale Of Pharmaceuticals

   "Bodily injury" or "property damage" arising out of the willful violation of a penal statute or ordinance relating to the sale of pharmaceuticals committed by, or with the knowledge or consent of, the insured.

5. The following is added to the **DEFINITIONS** Section:

   "Incidental medical services" means:

   a. Medical, surgical, dental, laboratory, x-ray or nursing service or treatment, advice or instruction, or the related furnishing of food or beverages; or

   b. The furnishing or dispensing of drugs or medical, dental, or surgical supplies or appliances.

   "Good Samaritan services" means any emergency medical services for which no compensation is demanded or received.

6. The following is added to Paragraph **4.b.**, **Excess Insurance**, of **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS**:

   The insurance is excess over any valid and collectible other insurance available to the insured, whether primary, excess, contingent or on any other basis, that is available to any of your "employees" or "volunteer workers" for "bodily injury" that arises out of providing or failing to provide "incidental medical services", first aid or "Good Samaritan services" to any person to the extent not subject to Paragraph **2.a.(1)** of Section II – Who Is An Insured.

E. WHO IS AN INSURED – NEWLY ACQUIRED OR FORMED ORGANIZATIONS

The following replaces Paragraph **4.** of **SECTION II – WHO IS AN INSURED**:

4. Any organization you newly acquire or form, other than a partnership, joint venture or limited liability company, of which you are the sole owner or in which you maintain the majority ownership interest, will qualify as a Named Insured if there is no other insurance which provides similar coverage to that organization. However:

   a. Coverage under this provision is afforded only:

      (1) Until the 180th day after you acquire or form the organization or the end of the policy period, whichever is earlier, if you do not report such organization in writing to us within 180 days after you acquire or form it; or

      (2) Until the end of the policy period, when that date is later than 180 days after you acquire or form such organization, if you report such organization in writing to us within 180 days after you acquire or form it, and we agree in writing that it will continue to be a Named Insured until the end of the policy period;

   b. Coverage **A** does not apply to "bodily injury" or "property damage" that occurred before you acquired or formed the organization; and

   c. Coverage **B** does not apply to "personal injury" or "advertising injury" arising out of an offense committed before you acquired or formed the organization.

F. WHO IS AN INSURED – BROADENED NAMED INSURED – UNNAMED SUBSIDIARIES

The following is added to **SECTION II – WHO IS AN INSURED**:

Any of your subsidiaries, other than a partnership, joint venture or limited liability company, that is not shown as a Named Insured in the Declarations is a Named Insured if you maintain an ownership interest of more than 50% in such subsidiary on the first day of the policy period.

No such subsidiary is an insured for "bodily injury" or "property damage" that occurred, or "personal injury" or "advertising injury" caused by an offense committed after the date, if any, during the policy period, that you no longer maintain an ownership interest of more than 50% in such subsidiary.

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G. BLANKET ADDITIONAL INSURED – OWNERS, MANAGERS OR LESSORS OF PREMISES

The following is added to **SECTION II – WHO IS AN INSURED**:

Any person or organization that is a premises owner, manager or lessor and that you have agreed in a written contract or agreement to include as an additional insured on this Coverage Part is an insured, but only with respect to liability for "bodily injury", "property damage", "personal injury" or "advertising injury" that:

a. Is "bodily injury" or "property damage" that occurs, or is "personal injury" or "advertising injury" caused by an offense that is committed, subsequent to the execution of that contract or agreement; and

b. Arises out of the ownership, maintenance or use of that part of any premises leased to you.

The insurance provided to such premises owner, manager or lessor is subject to the following provisions:

a. The limits of insurance provided to such premises owner, manager or lessor will be the minimum limits which you agreed to provide in the written contract or agreement, or the limits shown on the Declarations, whichever are less.

b. The insurance provided to such premises owner, manager or lessor does not apply to:

(1) Any "bodily injury" or "property damage" that occurs, or "personal injury" or "advertising injury" caused by an offense that is committed, after you cease to be a tenant in that premises; or

(2) Structural alterations, new construction or demolition operations performed by or on behalf of such premises owner, lessor or manager.

c. The insurance provided to such premises owner, manager or lessor is excess over any valid and collectible other insurance available to such premises owner, manager or lessor, whether primary, excess, contingent or on any other basis, unless you have agreed in the written contract or agreement that this insurance must be primary to, or non-contributory with, such other insurance, in which case this insurance will be primary to, and non-contributory with, such other insurance.

H. BLANKET ADDITIONAL INSURED – LESSORS OF LEASED EQUIPMENT

The following is added to **SECTION II – WHO IS AN INSURED**:

Any person or organization that is an equipment lessor and that you have agreed in a written contract or agreement to include as an insured on this Coverage Part is an insured, but only with respect to liability for "bodily injury", "property damage", "personal injury" or "advertising injury" that:

a. Is "bodily injury" or "property damage" that occurs, or is "personal injury" or "advertising injury" caused by an offense that is committed, subsequent to the execution of that contract or agreement; and

b. Is caused, in whole or in part, by your acts or omissions in the maintenance, operation or use of equipment leased to you by such equipment lessor.

The insurance provided to such equipment lessor is subject to the following provisions:

a. The limits of insurance provided to such equipment lessor will be the minimum limits which you agreed to provide in the written contract or agreement, or the limits shown on the Declarations, whichever are less.

b. The insurance provided to such equipment lessor does not apply to any "bodily injury" or "property damage" that occurs, or "personal injury" or "advertising injury" caused by an offense that is committed, after the equipment lease expires.

c. The insurance provided to such equipment lessor is excess over any valid and collectible other insurance available to such equipment lessor, whether primary, excess, contingent or on any other basis, unless you have agreed in the written contract or agreement that this insurance must be primary to, or non-contributory with, such other insurance, in which case this insurance will be primary to, and non-contributory with, such other insurance.

I. BLANKET ADDITIONAL INSURED – STATES OR POLITICAL SUBDIVISIONS – PERMITS

The following is added to **SECTION II – WHO IS AN INSURED**:

Any state or political subdivision that has issued a permit in connection with operations performed by you or on your behalf and that you are required

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by any ordinance, law or building code to include as an additional insured on this Coverage Part is an insured, but only with respect to liability for "bodily injury", "property damage", "personal injury" or "advertising injury" arising out of such operations.

The insurance provided to such state or political subdivision does not apply to:

a. Any "bodily injury," "property damage," "personal injury" or "advertising injury" arising out of operations performed for that state or political subdivision; or

b. Any "bodily injury" or "property damage" included in the "products-completed operations hazard".

J. KNOWLEDGE AND NOTICE OF OCCURRENCE OR OFFENSE

The following is added to Paragraph **2.**, **Duties In The Event of Occurrence, Offense, Claim or Suit**, of **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS**:

e. The following provisions apply to Paragraph **a.** above, but only for the purposes of the insurance provided under this Coverage Part to you or any insured listed in Paragraph **1.** or **2.** of Section **II** – Who Is An Insured:

(1) Notice to us of such "occurrence" or offense must be given as soon as practicable only after the "occurrence" or offense is known by you (if you are an individual), any of your partners or members who is an individual (if you are a partnership or joint venture), any of your managers who is an individual (if you are a limited liability company), any of your "executive officers" or directors (if you are an organization other than a partnership, joint venture or limited liability company) or any "employee" authorized by you to give notice of an "occurrence" or offense.

(2) If you are a partnership, joint venture or limited liability company, and none of your partners, joint venture members or managers are individuals, notice to us of such "occurrence" or offense must be given as soon as practicable only after the "occurrence" or offense is known by:

(a) Any individual who is:

(i) A partner or member of any partnership or joint venture;

(ii) A manager of any limited liability company; or

(iii) An executive officer or director of any other organization;

that is your partner, joint venture member or manager; or

(b) Any "employee" authorized by such partnership, joint venture, limited liability company or other organization to give notice of an "occurrence" or offense.

(3) Notice to us of such "occurrence" or of an offense will be deemed to be given as soon as practicable if it is given in good faith as soon as practicable to your workers' compensation insurer. This applies only if you subsequently give notice to us of the "occurrence" or offense as soon as practicable after any of the persons described in Paragraphs **e. (1)** or **(2)** above discovers that the "occurrence" or offense may result in sums to which the insurance provided under this Coverage Part may apply.

However, if this Coverage Part includes an endorsement that provides limited coverage for "bodily injury" or "property damage" or pollution costs arising out of a discharge, release or escape of "pollutants" which contains a requirement that the discharge, release or escape of "pollutants" must be reported to us within a specific number of days after its abrupt commencement, this Paragraph **e.** does not affect that requirement.

K. UNINTENTIONAL OMISSION

The following is added to Paragraph **6.**, **Representations**, of **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS**:

The unintentional omission of, or unintentional error in, any information provided by you which we relied upon in issuing this policy will not prejudice your rights under this insurance. However, this provision does not affect our right to collect additional premium or to exercise our rights of cancellation or nonrenewal in accordance with applicable insurance laws or regulations.

L. BLANKET WAIVER OF SUBROGATION

The following is added to Paragraph **8.**, **Transfer Of Rights Of Recovery Against Others To Us**, of **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS**:

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If the insured has agreed in a contract or agreement to waive that insured's right of recovery against any person or organization, we waive our right of recovery against such person or organization, but only for payments we make because of:

a. "Bodily injury" or "property damage" that occurs; or

b. "Personal injury" or "advertising injury" caused by an offense that is committed;

subsequent to the execution of that contract or agreement.

M. AMENDED BODILY INJURY DEFINITION

The following replaces the definition of "bodily injury" in the **DEFINITIONS** Section:

3. "Bodily injury" means bodily injury, mental anguish, mental injury, shock, fright, disability, humiliation, sickness or disease sustained by a person, including death resulting from any of these at any time.

N. CONTRACTUAL LIABILITY – RAILROADS

1. The following replaces Paragraph **c.** of the definition of "insured contract" in the **DEFINITIONS** Section:

c. Any easement or license agreement;

2. Paragraph **f.(1)** of the definition of "insured contract" in the **DEFINITIONS** Section is deleted.

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COMMERCIAL AUTO

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

BUSINESS AUTO EXTENSION ENDORSEMENT

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE FORM

GENERAL DESCRIPTION OF COVERAGE – This endorsement broadens coverage. However, coverage for any injury, damage or medical expenses described in any of the provisions of this endorsement may be excluded or limited by another endorsement to the Coverage Part, and these coverage broadening provisions do not apply to the extent that coverage is excluded or limited by such an endorsement. The following listing is a general coverage description only. Limitations and exclusions may apply to these coverages. Read all the provisions of this endorsement and the rest of your policy carefully to determine rights, duties, and what is and is not covered.

A. BROAD FORM NAMED INSURED

B. BLANKET ADDITIONAL INSURED

C. EMPLOYEE HIRED AUTO

D. EMPLOYEES AS INSURED

E. SUPPLEMENTARY PAYMENTS – INCREASED LIMITS

F. HIRED AUTO – LIMITED WORLDWIDE COVERAGE – INDEMNITY BASIS

G. WAIVER OF DEDUCTIBLE – GLASS

H. HIRED AUTO PHYSICAL DAMAGE – LOSS OF USE – INCREASED LIMIT

I. PHYSICAL DAMAGE – TRANSPORTATION EXPENSES – INCREASED LIMIT

J. PERSONAL PROPERTY

K. AIRBAGS

L. NOTICE AND KNOWLEDGE OF ACCIDENT OR LOSS

M. BLANKET WAIVER OF SUBROGATION

N. UNINTENTIONAL ERRORS OR OMISSIONS

PROVISIONS

A. BROAD FORM NAMED INSURED

The following is added to Paragraph **A.1.**, **Who Is An Insured**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

Any organization you newly acquire or form during the policy period over which you maintain 50% or more ownership interest and that is not separately insured for Business Auto Coverage. Coverage under this provision is afforded only until the 180th day after you acquire or form the organization or the end of the policy period, whichever is earlier.

B. BLANKET ADDITIONAL INSURED

The following is added to Paragraph **c.** in **A.1.**, **Who Is An Insured**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

Any person or organization who is required under a written contract or agreement between you and that person or organization, that is signed and executed by you before the "bodily injury" or "property damage" occurs and that is in effect during the policy period, to be named as an additional insured is an "insured" for Covered Autos Liability Coverage, but only for damages to which this insurance applies and only to the extent that person or organization qualifies as an "insured" under the Who Is An Insured provision contained in Section **II**.

C. EMPLOYEE HIRED AUTO

1. The following is added to Paragraph **A.1.**, **Who Is An Insured**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

   An "employee" of yours is an "insured" while operating an "auto" hired or rented under a contract or agreement in an "employee's" name, with your permission, while performing duties related to the conduct of your business.

2. The following replaces Paragraph **b.** in **B.5.**, **Other Insurance**, of **SECTION IV – BUSINESS AUTO CONDITIONS**:

   b. For Hired Auto Physical Damage Coverage, the following are deemed to be covered "autos" you own:

   (1) Any covered "auto" you lease, hire, rent or borrow; and

   (2) Any covered "auto" hired or rented by your "employee" under a contract in an "employee's" name, with your

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permission, while performing duties related to the conduct of your business.

However, any "auto" that is leased, hired, rented or borrowed with a driver is not a covered "auto".

D. EMPLOYEES AS INSURED

The following is added to Paragraph **A.1., Who Is An Insured**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

Any "employee" of yours is an "insured" while using a covered "auto" you don't own, hire or borrow in your business or your personal affairs.

E. SUPPLEMENTARY PAYMENTS – INCREASED LIMITS

1. The following replaces Paragraph **A.2.a.(2)**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

   (2) Up to $3,000 for cost of bail bonds (including bonds for related traffic law violations) required because of an "accident" we cover. We do not have to furnish these bonds.

2. The following replaces Paragraph **A.2.a.(4)**, of **SECTION II – COVERED AUTOS LIABILITY COVERAGE**:

   (4) All reasonable expenses incurred by the "insured" at our request, including actual loss of earnings up to $500 a day because of time off from work.

F. HIRED AUTO – LIMITED WORLDWIDE COVERAGE – INDEMNITY BASIS

The following replaces Subparagraph **(5)** in Paragraph **B.7., Policy Period, Coverage Territory**, of **SECTION IV – BUSINESS AUTO CONDITIONS**:

(5) Anywhere in the world, except any country or jurisdiction while any trade sanction, embargo, or similar regulation imposed by the United States of America applies to and prohibits the transaction of business with or within such country or jurisdiction, for Covered Autos Liability Coverage for any covered "auto" that you lease, hire, rent or borrow without a driver for a period of 30 days or less and that is not an "auto" you lease, hire, rent or borrow from any of your "employees", partners (if you are a partnership), members (if you are a limited liability company) or members of their households.

(a) With respect to any claim made or "suit" brought outside the United States of America, the territories and possessions of the United States of America, Puerto Rico and Canada:

(i) You must arrange to defend the "insured" against, and investigate or settle any such claim or "suit" and keep us advised of all proceedings and actions.

(ii) Neither you nor any other involved "insured" will make any settlement without our consent.

(iii) We may, at our discretion, participate in defending the "insured" against, or in the settlement of, any claim or "suit".

(iv) We will reimburse the "insured" for sums that the "insured" legally must pay as damages because of "bodily injury" or "property damage" to which this insurance applies, that the "insured" pays with our consent, but only up to the limit described in Paragraph **C.**, Limits Of Insurance, of SECTION II – COVERED AUTOS LIABILITY COVERAGE.

(v) We will reimburse the "insured" for the reasonable expenses incurred with our consent for your investigation of such claims and your defense of the "insured" against any such "suit", but only up to and included within the limit described in Paragraph **C.**, Limits Of Insurance, of SECTION II – COVERED AUTOS LIABILITY COVERAGE, and not in addition to such limit. Our duty to make such payments ends when we have used up the applicable limit of insurance in payments for damages, settlements or defense expenses.

(b) This insurance is excess over any valid and collectible other insurance available to the "insured" whether primary, excess, contingent or on any other basis.

(c) This insurance is not a substitute for required or compulsory insurance in any country outside the United States, its territories and possessions, Puerto Rico and Canada.

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You agree to maintain all required or compulsory insurance in any such country up to the minimum limits required by local law. Your failure to comply with compulsory insurance requirements will not invalidate the coverage afforded by this policy, but we will only be liable to the same extent we would have been liable had you complied with the compulsory insurance requirements.

(d) It is understood that we are not an admitted or authorized insurer outside the United States of America, its territories and possessions, Puerto Rico and Canada. We assume no responsibility for the furnishing of certificates of insurance, or for compliance in any way with the laws of other countries relating to insurance.

G. WAIVER OF DEDUCTIBLE – GLASS

The following is added to Paragraph **D., Deductible**, of **SECTION III – PHYSICAL DAMAGE COVERAGE**:

No deductible for a covered "auto" will apply to glass damage if the glass is repaired rather than replaced.

H. HIRED AUTO PHYSICAL DAMAGE – LOSS OF USE – INCREASED LIMIT

The following replaces the last sentence of Paragraph **A.4.b., Loss Of Use Expenses**, of **SECTION III – PHYSICAL DAMAGE COVERAGE**:

However, the most we will pay for any expenses for loss of use is $65 per day, to a maximum of $750 for any one "accident".

I. PHYSICAL DAMAGE – TRANSPORTATION EXPENSES – INCREASED LIMIT

The following replaces the first sentence in Paragraph **A.4.a., Transportation Expenses**, of **SECTION III – PHYSICAL DAMAGE COVERAGE**:

We will pay up to $50 per day to a maximum of $1,500 for temporary transportation expense incurred by you because of the total theft of a covered "auto" of the private passenger type.

J. PERSONAL PROPERTY

The following is added to Paragraph **A.4., Coverage Extensions**, of **SECTION III – PHYSICAL DAMAGE COVERAGE**:

Personal Property

We will pay up to $400 for "loss" to wearing apparel and other personal property which is:

(1) Owned by an "insured"; and

(2) In or on your covered "auto".

This coverage applies only in the event of a total theft of your covered "auto".

No deductibles apply to this Personal Property coverage.

K. AIRBAGS

The following is added to Paragraph **B.3., Exclusions**, of **SECTION III – PHYSICAL DAMAGE COVERAGE**:

Exclusion **3.a.** does not apply to "loss" to one or more airbags in a covered "auto" you own that inflate due to a cause other than a cause of "loss" set forth in Paragraphs **A.1.b.** and **A.1.c.**, but only:

a. If that "auto" is a covered "auto" for Comprehensive Coverage under this policy;

b. The airbags are not covered under any warranty; and

c. The airbags were not intentionally inflated.

We will pay up to a maximum of $1,000 for any one "loss".

L. NOTICE AND KNOWLEDGE OF ACCIDENT OR LOSS

The following is added to Paragraph **A.2.a.**, of **SECTION IV – BUSINESS AUTO CONDITIONS**:

Your duty to give us or our authorized representative prompt notice of the "accident" or "loss" applies only when the "accident" or "loss" is known to:

(a) You (if you are an individual);

(b) A partner (if you are a partnership);

(c) A member (if you are a limited liability company);

(d) An executive officer, director or insurance manager (if you are a corporation or other organization); or

(e) Any "employee" authorized by you to give notice of the "accident" or "loss".

M. BLANKET WAIVER OF SUBROGATION

The following replaces Paragraph **A.5., Transfer Of Rights Of Recovery Against Others To Us**, of **SECTION IV – BUSINESS AUTO CONDITIONS**:

5. Transfer Of Rights Of Recovery Against Others To Us

We waive any right of recovery we may have against any person or organization to the extent required of you by a written contract signed and executed prior to any "accident" or "loss", provided that the "accident" or "loss" arises out of operations contemplated by

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such contract. The waiver applies only to the person or organization designated in such contract.

N. UNINTENTIONAL ERRORS OR OMISSIONS

The following is added to Paragraph **B.2., Concealment, Misrepresentation, Or Fraud**, of **SECTION IV – BUSINESS AUTO CONDITIONS**:

The unintentional omission of, or unintentional error in, any information given by you shall not prejudice your rights under this insurance. However this provision does not affect our right to collect additional premium or exercise our right of cancellation or non-renewal.

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TRAVELERS

ONE TOWER SQUARE
HARTFORD, CT 06183

WORKERS COMPENSATION
AND
EMPLOYERS LIABILITY POLICY

ENDORSEMENT WC 00 03 13 (00) - 01

POLICY NUMBER: UB-2J440716-17-43-G

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

This agreement shall not operate directly or indirectly to benefit any one not named in the Schedule.

SCHEDULE

DESIGNATED PERSON:

DESIGNATED ORGANIZATION:

ANY PERSON OR ORGANIZATION FOR WHICH THE INSURED HAS AGREED BY WRITTEN CONTRACT EXECUTED PRIOR TO LOSS TO FURNISH THIS WAIVER.

DATE OF ISSUE: 04/01/2017 ST ASSIGN:

Bond Number BDA749157

PERFORMANCE BOND

The Owner, City of Prescott, (the "Owner") and the Contractor, Yellow Jacket Drilling Services, LLC, (the "Contractor") have entered into a Contract (the "Contract") dated December 12, 2017 for Phase 2 Drilling and Testing Program - Big Chino Sub-basin Date Collection and Monitoring Plan (the "Project"). The Contract is incorporated by reference into this Performance Bond (the "Bond").

By virtue of this Bond, the Contractor as Principal and AMCO Insurance Company as Surety ("Surety"), are bound to the Owner as Obligee in the maximum amount of One Million,three hundred sixty-nine thousand,nine hundred twenty-eight dollars and 00/100 Dollars ($ 1,369,928) (the "Bond Sum"). The Contractor and Surety hereby bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein.

1. GENERAL CONDITIONS It is the condition of this Bond that if the Contractor performs its Contract obligations (the "Work"), the Surety's obligations under this Bond are null and void. Otherwise the Surety's obligations shall remain in full force and effect. The Surety waives any requirement to be notified of alterations or extensions of time made by the Owner in the Contract. The Owner may not invoke the provisions of this Bond unless the Owner has performed its obligations pursuant to the Contract. Upon making demand on this Bond, the Owner shall make the Contract Balance (the total amount payable by the Owner to the Contractor pursuant to the Contract less amounts properly paid by the Owner to the Contractor) available to the Surety for completion of the Work.

2. SURETY OBLIGATIONS If the Contractor is in default pursuant to the Contract and the Owner has declared the Contractor in default, the Surety promptly may remedy the default or shall:

   a. Complete the Work, with the consent of the Owner, through the Contractor or otherwise;

   b. Arrange for the completion of the Work by a Contractor acceptable to the Owner and secured by performance and payment bonds equivalent to those for the Contract issued by a qualified surety. The Surety shall make available as the Work progresses sufficient funds to pay the cost of completion of the Work less the Contract Balance up to the Bond Sum; or

   c. Waive its right to complete the Work and reimburse the Owner the amount of its reasonable costs, not to exceed the Bond Sum, to complete the Work less the Contract Balance.

3. DISPUTE RESOLUTION All disputes pursuant to this Bond shall be instituted in any court of competent jurisdiction in the location in which the Project is located and shall be commenced within two years after default of the Contractor or Substantial Completion of the Work, whichever occurs first. If this provision is prohibited by law, the minimum period of limitation available to sureties in the jurisdiction shall be applicable.

This Bond is entered into as of 12/26/2017

SURETY AMCO Insurance Company (seal)

By: Richard B Usher

Attach Power of Attorney)

Name: Richard B. Usher Title: Attorney-In-Fact

ATTEST: Deborah Streeter

CONTRACTOR Yellow Jacket Drilling Services, LLC (seal)

By: R. LeBlanc

Name: Richard LeBlanc Title: Principal

ATTEST: Anne Estes

Bond Number BDA749157

PAYMENT BOND

The Owner, City of Prescott, (the "Owner ") and the Contractor, Yellow Jacket Drilling Services,LLC, (the "Contractor ") have entered into a Contract (the "Contract") dated December 12, 2017 for Phase 2 Drilling and Testing Program-Big Chino Sub-basin Date Collection and Monitoring Plan (the "Project"). The Contract is incorporated by reference into this Payment Bond (the "Bond").

By virtue of this Bond, the Contractor as Principal and AMCO Insurance Company as Surety ("Surety"), are bound to the Owner as Obligee in the maximum amount of One Million,three hundred sixty-nine thousand,nine hundred twenty-eight dollars and 00/100 Dollars ($ 1,369,928) (the "Bond Sum"). The Contractor and Surety hereby bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein.

1. GENERAL CONDITIONS It is the condition of this Bond that if the Contractor promptly makes payment of all sums for all labor, materials, and equipment furnished for use in the performance of the work required by the Contract, the Surety's obligations pursuant to this Bond are null and void. Otherwise the Surety's obligations shall remain in full force and effect. The Surety waives any requirement to be notified of alterations or extensions of time made by the Owner in the Contract.

2. SURETY OBLIGATION Every Claimant who has not been paid in full before the expiration of a period of ninety (90) Days after such Claimant provided or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, may have a right of action on this Bond. The Surety's obligation to the Claimant(s) shall not exceed the Bond Sum.

3. LIMITATION OF ACTION No suit or action shall be commenced on this Bond by any Claimant:

   a. Unless Claimant, other than one having a direct Contract with the Contractor, shall have given written notice to the Contractor, the Owner and the Surety within ninety (90) Days after the Claimant provided or performed the last of the work or labor, or furnished the last of the materials for which the claim is made, stating with substantial accuracy the amount claimed and the name of the Party to whom the materials were furnished, or for whom the work or labor was provided or performed. Such notice shall be served by any means which provides written third party verification of delivery to the Contractor at any place it maintains an office or conducts business, or served in any manner in which legal process may be served in the state in which the Project is located.

   b. After the expiration of one (1) year from the date on which the Claimant last performed labor or furnished materials or equipment on the Project. If this provision is prohibited by law, the minimum period of limitation available to sureties in the jurisdiction shall be applicable.

   c. Other than in any court of competent jurisdiction in the location in which the Project is located.

4. CLAIMANT A Claimant is defined as an individual or entity having a direct contract with the Contractor or having a contract with a subcontractor having a direct contract with the Contractor to furnish labor, materials or equipment for use in the performance of the Contract.

This Bond is entered into as of 12/26/2016

SURETY AMCO Insurance Company (seal)

By: Richard B Usher (Attach Power of Attorney)

Name: Richard B. Usher Title: Power-Of-Attorney

ATTEST: Deborah Streeter

CONTRACTOR Yellow Jacket Drilling Services,LLC (seal)

By: R. LeBlanc.

Name: Richard LeBlanc Title: Principal

ATTEST: Anne Sites

Power of Attorney

KNOW ALL MEN BY THESE PRESENTS THAT:

Nationwide Mutual Insurance Company, an Ohio corporation
National Casualty Company, an Ohio corporation
AMCO Insurance Company, an Iowa corporation
Allied Property and Casualty Insurance Company, an Iowa corporation

hereinafter referred to severally as the "Company" and collectively as "the Companies" does hereby make, constitute and appoint:

RICHARD B. USHER **TAYLOR B. USHER** **DEBORAH STREETER**

PHOENIX AZ

each in their individual capacity, its true and lawful attorney-in-fact, with full power and authority to sign, seal, and execute on its behalf any and all bonds and undertakings, and other obligatory instruments of similar nature, in penalties not exceeding the sum of

ONE MILLION FIVE HUNDRED THOUSAND AND NO/100 DOLLARS **$ 1,500,000.00**

and to bind the Company thereby, as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Company; and all acts of said Attorney pursuant to the authority given are hereby ratified and confirmed.

This power of attorney is made and executed pursuant to and by authority of the following resolution duly adopted by the board of directors of the Company:

"RESOLVED, that the president, or any vice president be, and each hereby is, authorized and empowered to appoint attorneys-in-fact of the Company, and to authorize them to execute and deliver on behalf of the Company any and all bonds, forms, applications, memorandums, undertakings, recognizances, transfers, contracts of indemnity, policies, contracts guaranteeing the fidelity of persons holding positions of public or private trust, and other writings obligatory in nature that the business of the Company may require; and to modify or revoke, with or without cause, any such appointment or authority; provided, however, that the authority granted hereby shall in no way limit the authority of other duly authorized agents to sign and countersign any of said documents on behalf of the Company."

"RESOLVED FURTHER, that such attorneys-in-fact shall have full power and authority to execute and deliver any and all such documents and to bind the Company subject to the terms and limitations of the power of attorney issued to them, and to affix the seal of the Company thereto; provided, however, that said seal shall not be necessary for the validity of any such documents."

This power of attorney is signed and sealed under and by the following bylaws duly adopted by the board of directors of the Company:

Execution of Instruments. Any vice president, any assistant secretary or any assistant treasurer shall have the power and authority to sign or attest all approved documents, instruments, contracts, or other papers in connection with the operation of the business of the company in addition to the chairman of the board, the chief executive officer, president, treasurer or secretary; provided, however, the signature of any of them may be printed, engraved, or stamped on any approved document, contract, instrument, or other papers of the Company.

IN WITNESS WHEREOF, the Company has caused this instrument to be sealed and duly attested by the signature of its officer the 1st day of May, 2017.

Antonio C. Albanese, **Vice President** of Nationwide Mutual Insurance Company, National Casualty Company, AMCO Insurance Company, Allied Property and Casualty Insurance Company

ACKNOWLEDGMENT

STATE OF NEW YORK, COUNTY OF NEW YORK: ss
On this 1st day of May, 2017, before me came the above-named officer for the Company aforesaid, to me personally known to be the officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, deposes and says, that he is the officer of the Company aforesaid, that the seal affixed hereto is the corporate seal of said Company, and the said corporate seal and his signature were duly affixed and subscribed to said instrument by the authority and direction of said Company.

BARRY T. BASSIS
Notary Public, State of New York
No. 02BA4656400
Qualified in New York County
Commission Expires April 30, 2019

Notary Public
My Commission Expires
April 30, 2019

CERTIFICATE

I, Laura B. Guy, Assistant Secretary of the Company, do hereby certify that the foregoing is a full, true and correct copy of the original power of attorney issued by the Company; that the resolution included therein is a true and correct transcript from the minutes of the meetings of the boards of directors and the same has not been revoked or amended in any manner; that said Antonio C. Albanese was on the date of the execution of the foregoing power of attorney the duly elected officer of the Company, and the corporate seal and his signature as officer were duly affixed and subscribed to the said instrument by the authority of said board of directors; and the foregoing power of attorney is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of said Company this 26th day of December, 2017.

This power of attorney expires: **April 30, 2019**

Assistant Secretary

BDJ 1(05-17)00

22330

CONTRACTOR'S AFFIDAVIT REGARDING SETTLEMENT OF CLAIMS AND CERTIFICATION OF COMPLETION OF WARRANTIES

PROJECT: Phase 2 Drilling and Testing Program- Big Chino Sub-basin Data Collection and Monitoring Plan

To the City of Prescott, Arizona

Gentlemen:

1. This is to certify that all lawful claims for materials, rental of equipment and labor used in connection with the construction of the above project, whether by subcontractor or claimant in person, have been duly discharged.
2. The undersigned, for the consideration of $_____ (total project price) as set out in the final pay estimate, as full and complete payment under the terms of the Contract, hereby waives and relinquishes any and all further claims or right of lien under, in connection with, or as a result of the above-described project. The undersigned further agrees to indemnify and save harmless the City of Prescott against any and all liens, claims of liens, suits, actions, damages, charges and expenses whatsoever, which said City may suffer arising out of the failure of the undersigned to pay for all labor performance and materials furnished for the performance of said project.
3. This is to further certify that the project is completed to acceptable standards as defined in the plans and specifications for said Project Contract Agreement. Any changes to the plans have been noted on the Construction As-built Mylar Drawings certified by the Engineer of Record, which As-built Drawings have been delivered to the Public Works Director. All materials used and workmanship performed are expressly warranted to be free of defects for a period of twenty-four (24) months from the date of final acceptance by the City of Prescott.

Signed and dated this _____ day of _____, 2017.

_____

Contractor

By: _____

Title: _____

State of _____)
) ss.
County of _____)

SUBSCRIBED AND SWORN to before me by _____

this _____ day of _____, 2017.

_____ Notary Public

_____ Commission Expires

GENERAL CONDITIONS

COMMENCEMENT, PROSECUTION AND PROGRESS

PRECONSTRUCTION CONFERENCE

Within 15 days of the date of the Notice of Award, the Contractor is required to attend a Pre-construction Conference. The City will contact the Contractor to schedule a specific date, time and location for the Pre-construction Conference. The purpose of the meeting is to outline specific construction items and procedures and to address items, which require special attention on the part of the Contractor. The Contractor may also present proposed variations in procedures, which the Contractor believes may be of benefit to the project, reduce cost, or will reduce inconvenience to the public. Communication and coordination issues will be also addressed during the Pre-construction Conference. The Contractor will be required to provide five sets of the following information at the Pre-construction Conference:

A. Names and emergency telephone number of key personnel involved in the project.

B. A copy of each subcontractor's contract or purchase order agreement for each and every item of work under subcontract on the project.

C. The Construction Schedule as defined elsewhere in the General Conditions.

D. A payment schedule showing the estimated dollar volume of work for each calendar month during the life of the project.

E. The Traffic Control and access management plan providing for continuous access to residents and businesses affected by the project.

F. The Contractor's Company Safety Plan.

G. The Contractor's Quality Control Plan.

H. An itemized list of shop drawings, materials, mix designs, equipment submittals and a schedule indicating the dates each of these items will be transmitted to the Public Works Director for review.

Each of the above items is subject to review and approval by the Public Works Director.

COMMENCEMENT

The Contractor shall commence work on or before the tenth (10th) calendar day after receiving the Notice to Proceed, and shall complete all work under the Contract within the period of time specified in the Special Conditions. The City reserves the right to issue Notice to Proceed at any time between zero (0) and sixty (60) days after contract award. Notice to Proceed will be issued not later than sixty (60) calendar days after the Contract has been awarded unless otherwise agreed upon in writing, or as may be specified in the Special Conditions. In addition, Contractor shall not commence work until all required documents, bonds, plans and schedules have been received and approved by the City. These submittals will not affect the issuance of Notice to Proceed by the City.

PUBLIC NOTICE

A. Contractor shall issue written notification to those residents affected by the Phase 2 Drilling and Testing Program- Big Chino Sub-basin Data Collection and Monitoring Plan Project. This notification shall contain at a minimum: (1) Type of Work; (2) Contractor; (3) Contractor's Phone Number and Point of Contact; (4) Duration of Project; (5) Date Project Commences; (6) Description of Project Site; (7) Contractor's After-hours Point of Contact and Phone Number.

B. The Contractor is required to post public notification signs at all entrances to the project specifying the following information: (1) Project Name/Description (2) Construction Calendar (3) Contractor Name/Phone Number Day and Night (4) City Public Works (928) 777-1130.

C. The sign size and legend shall be appropriate for the intended purpose and be easily read. Sign background shall be blue with white letters. The sign size and legend content shall be approved by the Public Works Department prior to sign manufacture. All signs shall be posted prior to commencement of any work on the project. Signs will be removed by the contractor upon final acceptance of the project. No direct payment shall be made for said signs, cost of such shall be considered incidental to the contract.

SUBCONTRACTORS

MAG Specifications, Section 108.2, including the following:

A. All subcontractors and purchase orders for equipment shall state and establish guaranteed delivery dates, at such times as determined by the Contractor, which will allow the Contractor to complete the project within the Contract time.

B. The Contractor shall perform more than forty percent (40%) of the work (by total contract amount) involved in this project with his own forces. Total subcontracted amounts shall be limited to less than sixty percent (60%) of the total contract amount. For purposes of this requirement, materials purchased directly from suppliers and installed by the Contractor's own forces shall be included in the Contractor's total and materials installed by subcontractors, regardless of who originally purchased them, will be included in the Subcontractors totals.

C. The Contractor shall furnish the form list of subcontractors with his bid including the estimated amount of each subcontract. Additionally, a duplicate copy of each subcontract, including lower tier subcontracts, shall be delivered to the Public Works Director upon award of the project and prior to the issuance of the Notice to Proceed.

CONTRACTOR'S REPRESENTATIVE AND EMERGENCIES

MAG Specifications, Section 105.5, including: Plans and specifications to successful bidder clause in the "Information for Bidders" in this set of specifications.

CONTRACTOR AND SUBCONTRACTOR RECORDS

A. The Contractor shall keep at the work site a copy of the Contract Documents and shall at all times give the Public Works Director access thereto.

B. The Notice Inviting Bids, Information for Bidders, Special Conditions, Specifications, Plans, and all supplementary documents are intended to be complete and complementary and to prescribe a complete work. If any omissions are made of information necessary to carry out the full intent and meaning of the contract documents, the Contractor shall immediately call the matter to the attention of the Public Works Director for furnishing of detailed instructions. In case of discrepancies, the Specifications shall govern over the plans. Figured dimensions shall govern over scaled dimensions.

C. Any drawings or plans listed anywhere in the Specifications or Addenda thereto shall be regarded as a part thereof and of the Contract. Anything mentioned in these Specifications and not indicated on the plans, or anything indicated on the plans and not mentioned in these Specifications, shall be in the same force and effect as if indicated or mentioned in both.

D. The Contractor, subcontractors and all suppliers shall keep and maintain all books, papers, records, files, accounts, reports, bid documents with back-up data, including electronic data, and all other material relating to the contract and project for three years following completion and acceptance of the work. All records shall be accurately maintained in accordance with generally accepted accounting principles and practices uniformly and consistently applied in a format that will permit audit. The Public Works Director or his authorized representative(s) shall have access at all reasonable times to all applicable records of the Contractor and the records of the Contractor's subcontractors.

The Contractor and Subcontractors shall preserve all such materials for a period of three years after all payments to the Contractor or subcontractors, or until the final resolution of all claims made by the Contractor or subcontractor on this contract, whichever is later. The Contractor and subcontractors shall make all of the above materials available to the Public Works Director for auditing, inspection and copying and shall produce such materials upon written request at the office of the Public Works Director located at 433 N. Virginia St., Prescott Arizona.

The Contractor shall insert the above requirement in each subcontract, purchase order, lease agreement, or other document under which goods or services are provided for the performance of this contract and shall also include in all subcontracts a clause requiring subcontractors to include the above requirement in any lower-tier subcontract, purchase order, lease agreement or document under which goods or services are provided for the performance of this contract.

ADDENDA, REVISIONS AND SUPPLEMENTARY DRAWINGS

A. The work shall conform to such other drawings relating thereto as may be furnished by the City prior to the opening of proposals, and to such drawings in the explanation of details or minor modifications as may be furnished from time to time during construction, including such minor modifications as the Public Works Director may consider necessary during the prosecution of the work.

B. Scaled dimensions shall not be used in the construction of the work.

ERROR AND OMISSIONS

The written dimensions, calculations and quantities on the plans are presumed to be correct, but the Contractor shall be required to check carefully all dimensions, calculations and quantities before beginning work. If any errors or omissions are discovered, the Public Works Director shall be so advised in writing and will make the proper corrections. If the Contractor claims that any such errors or omissions should change the cost of any Pay Item or the construction as identified in the plans, the Contractor shall also submit to the Public Works Director a written proposed Contract Amendment. Any such adjustments made by the Contractor that are claimed to change the cost of any Pay Item or the construction as identified in the plans, without prior review and acceptance of a proposed Contract Amendment, shall be at the Contractor's own risk. The settlement of any complications or disputed expenses arising from a Contractor's adjustment shall be borne by the Contractor at his own expense.

CHARACTER OF WORKMEN

MAG Specifications, Section 108.6.

SUSPENSION OF WORK

A. The Public Works Director shall have the authority to suspend the work wholly or in part, for such period as he may deem necessary, due to unsuitable weather, or to such other conditions as

are considered unfavorable for the suitable prosecution of the work, or for such time as he may deem necessary due to the failure on the part of the Contractor to carry out orders given, or to perform any provisions of the Contract. The Contractor shall immediately comply with the written order of the Public Works Director to suspend work wholly or in part. The suspended work shall be resumed when conditions are favorable and methods are corrected, as reviewed and accepted in writing by the Public Works Director.

B. In case of suspension of work for any cause whatsoever, the Contractor shall be responsible for all materials and shall properly store them if necessary and shall provide suitable drainage and erect temporary structures where necessary.

C. If the performance of all or any portion of the work is suspended or delayed by the Public Works Director in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and the contractor believes that additional compensation and/or contract time is due as a result of such suspension or delay, the contractor shall submit to the Public Works Director, in writing, a request for an adjustment within seven (7) calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.

D. Upon receipt, the Public Works Director will evaluate the contractor's request. If the Public Works Director agrees that the cost and/or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the contractor, its suppliers, or subcontractors at any approved tier, and not caused by weather, the Public Works Director will make an adjustment (excluding profit) and modify the contract in writing accordingly. The contractor will be notified of the Public Works Director's determination whether or not an adjustment of the contract is warranted. In the event an adjustment of the contract is warranted a contract amendment shall be executed by both parties evidencing mutual agreement to same.

E. No contract adjustment will be allowed unless the contractor has submitted the request for adjustment within the time limits prescribed.

F. No contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided or excluded under any other term or condition of this contract.

DELAYS AND EXTENSION OF TIME

MAG Specifications, Section 108.7, including:

A. It is the Contractors responsibility to establish construction methods and a construction schedule, which will facilitate the completion of work required by this Contract within the contract period and with full consideration for the season during which the work is scheduled. Judgment as to hazardous conditions shall be made by the Public Works Director.

B. To receive consideration for an extension of time, a request must be made in writing to the Public Works Director stating the reason for said request, and such request must be received by the Public Works Director as soon as reasonably practicable when the contractor has knowledge or should have known of the delay causing event, condition or circumstances, but in no event later than immediately following the end of the delay-causing condition. The extension of time allowed shall be as determined by the Public Works Director and approved by the City. In setting the Contract time, it has been assumed that up to five (5) working days may be lost as a result of weather conditions which will slow down the normal progress of work; therefore no extensions

in contract time will be allowed for the first five (5) working days lost due to bad weather conditions. An extension of time may be granted by the City after the expiration of the time originally fixed in the Contract or as previously extended, and the extension so granted shall be deemed to commence and be effective from the date of such expiration.

C. Any extension of time shall not release the sureties upon any bond required under the Contract. Extensions of time in and of themselves will not be a basis for a request of additional compensation by the Contractor.

D. Any delays in this project, or extensions of time which may be granted, shall not entitle the Contractor to any additional compensation or monies whatsoever, including but not limited to compensation for loss of anticipated profits, extended overhead, unabsorbed home office overhead, or any other payments, unless expressly agreed to by the City in a duly executed and approved contract amendment.

PAYMENT FOR DELAY

MAG 109.8 except as modified hereafter:

109.8.2, (B) Any compensation paid to the Contractor shall be in accordance with the General Conditions, Payment to Contractors, section of this Contract.

109.8.3 Extension of Contract Time: For any such delays, the contract time will be adjusted in accordance with the General Conditions, Delays and Extension of Time, section of this Contract.

TERMINATION FOR BREACH OF CONTRACT

MAG Specifications, Sections 108.10 and 108.11, including: The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to the City.

METHODS AND EQUIPMENT

MAG Specifications, Section 108.6, including: The methods and equipment adopted by the Contractor shall be such as will secure a satisfactory quality of work and will enable the Contractor to complete the work in the time agreed upon. The selection and use of these methods and equipment is the responsibility of the Contractor.

DATE OF ACTUAL COMPLETION

The date upon which the project will be considered as complete shall be that date upon which the work is accepted by the City.

FINAL ACCEPTANCE

MAG Specifications, Section 105.15 (B), including:

A. After all work under the Contract has been completed, as determined by the Public Works Director, the Public Works Director will recommend in writing to the City that final acceptance of the entire work under this Contract be made as of the date of the Public Works Director final inspection. The City will make final acceptance promptly after receiving the Public Works Director's recommendation.

B. Partial Acceptance may be given upon substantial completion of the work at the sole discretion of the Public Works Director in accordance MAG 105.15 and the paragraph entitled PARTIAL ACCEPTANCE OF WORK in these General Conditions.

C. For the purpose of this section, Substantial Completion shall mean that stage in the progress of the Work where the Work or designated portion is sufficiently complete in accordance with the

Contract Documents so that the Owner can occupy or utilize the Work for its intended use with only minor work items or cleanup items remaining to be accomplished. Partial Acceptance shall not be given for incomplete major work items nor minor work items affecting public health and safety.

D. Contract Time accounting and/or Assessment of Liquidated Damages shall be suspended on the date of Partial Acceptance and the Contractor shall complete all remaining work items necessary for Final Acceptance within 30 calendar days of the date of Partial Acceptance. The City shall withhold release of retention until all items under the contract have been completed and Final Acceptance has been issued.

SAFETY, HEALTH AND SANITATION PROVISIONS

MAG Specifications, Section 107.5, including:

A. The Contractor shall provide suitable and adequate sanitary conveniences for the use of all persons employed on the project. All sanitary conveniences shall conform to the regulations of the public authority having jurisdiction over such matters. At the completion of the project, all such sanitary conveniences shall be removed and the premises left in a sanitary condition.

B. On all projects, with respect to sanitation facilities, for which Federal funds are allocated, the Contractor shall cooperate with and follow directions of representatives of the Public Health Service and the State. State and County public health service representatives shall have access to the work wherever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and inspection.

TRAFFIC CONTROL

Traffic control is the responsibility of the Contractor and shall be in accordance with MAG Specifications, Section 401. The Contractor shall submit to the City, for approval, a traffic control plan for all activities connected with the proposed work.

WATER

A. The Contractor shall supply adequate, pure cool drinking water with individual drinking cups for the use of employees on this construction. The quality of drinking water shall meet the "Standards for Public Water Supplies" specified in the State Health Department Code.

B. It shall be the responsibility of the Contractor to provide and maintain, at his own expense, an adequate supply of water for his use for construction and to install and maintain necessary supply connections and piping for same. Before final acceptance of the completed project, all temporary connections and piping installed by the Contractor shall be removed.

C. The Contractor shall apply for a fire hydrant meter for all construction water used if the Contractor desires to obtain water from the City distribution system at any point. All contractors requesting construction water from the City must submit a Construction Water Meter Application to the Water Distribution Department. A $1,000 deposit will be required for hydrant meters. If construction water use occurs during the months of May through September the Contractor shall also include a dust abatement program. Potable water may not be allowed for dust abatement during these months. Potable water can be used to process embankment fill and base materials year round. However, contractors are encouraged to use treated effluent for construction activities. The City has two outlets for effluent, the Sundog Wastewater Treatment Plant and the Airport Wastewater Treatment Plant. The City will provide metered standpipes for effluent at both plants. The Contractor will be required to estimate daily and total potable/effluent water

usage for the project as identified on the Construction Water Meter application. The Contractor will be responsible for all costs associated with obtaining and delivering construction water.

PROTECTION OF WORK

MAG Specifications, Section 107.10.

CLEANUP AND DUST CONTROL

MAG Specifications, Sections 104.1.3 and 104.1.4, including: Salvage material shall be stored at areas designated by the Public Works Director.

GUARANTEE OF WORK

MAG Specifications, Section 108.8, shall apply, but modify: Guarantee period is two (2) years. During the two year guarantee period, should the Contractor fail to remedy defective material and/or workmanship, or to make replacements within five (5) calendar days after written notice by the City, it is agreed that the City may make such repairs and replacements and the actual cost of the required labor and materials shall be chargeable to and payable by the Contractor.

CONTINGENCIES

All loss or damage arising from obstruction or difficulties which may be encountered in the prosecution of the work, from the action of the elements, or from any act or omission on the part of the Contractor or any person or agent employed by him shall be borne by the Contractor.

NOTICE AND SERVICE THEREOF

Any notice to the Contractor from the City relative to any part of this Contract shall be in writing and considered delivered and the service thereof completed when said Notice is posted, by first class mail, to the said Contractor at his last given address, or delivered in person to said Contractor or his authorized representative on the work.

PROJECT MEETINGS

A. It shall be the responsibility of the Contractor to conduct weekly meetings to be attended by representatives of Subcontractors, utilities, the Public Works Director and other interested parties for the purpose of keeping the project on schedule and to provide for necessary coordination of the work of the various parties. The Contractor shall take minutes at each meeting for distribution to all attendees the following week. The minutes shall be of sufficient detail to accurately recount the meeting discussion, including but not limited to progress, work schedule, submittals and certifications, utilities, construction issues, contract changes, safety and traffic control, action items, resolved and unresolved issues.

B. Additionally the Contractor shall furnish the Public Works Director with written weekly project status reports at the beginning of each weekly project meeting. The report shall cover the work of the preceding work week and shall include the following for each week.

   1. A comprehensive daily list of the Contractor's men and equipment performing the work on the jobsite.

   2. A comprehensive daily list of Contractor's subcontractors' men and equipment, if any, performing the work on the jobsite.

   3. A brief description of the work performed by the Contractor and Contractor's subcontractors, if any.

4. The estimated percentage of each portion of the work performed for the period together with the total percentage of each portion of the work performed to the date of the report.
5. A detailed summary of each work stoppage, if any, occasioned by the City, other contractors, or other designated reasons, which were beyond the contractor's control.
6. Comments or exceptions to prior weekly meeting minutes shall be addressed at each subsequent construction meeting.

CONSTRUCTION SCHEDULE

Per MAG Specifications, Section 108.4 and Section 108.5, including:

A. The Construction schedule shall indicate the time of starting and completing each major phase of the project and such intermediate phases as will serve for well-defined control points. The schedule shall be of sufficient detail to define the Critical Path for project completion. It shall also indicate the scheduled receipt of major items of equipment and the items of equipment installation dates of which is critical to the scheduled progress of the project. Two week look-ahead schedules will be provided by the contractor at each weekly construction meeting. The comprehensive project schedule shall be updated and submitted monthly. Such updates shall include and accurately reflect additional work, changes in the work, delays to individual items of work and reasons therefore along with the extent of delay and any other items affecting the progress of the project.

B. Failure by the contractor to provide the weekly/monthly updates will result in the City withholding an amount equal to 5% of the monthly pay estimate relative to the billing period in which the schedule updates are to be provided. Said 5% withholding will be retained by the City until the required schedule updates are submitted by the Contractor, reviewed by the City and found to be current. When the schedule updates are determined to be in conformance with the provisions herein the 5% retainer will be released with the next monthly payment.

C. The construction schedule shall serve as an index of progress prosecution as contemplated by the Contractor. In the event the actual construction progress varies substantially from the scheduled progress, the Public Works Director will require and the Contractor shall be required, within ten (10) calendar days written notice, to provide a revised construction schedule, giving in detail the particular changes in production as estimated by the Contractor to complete the work within the specified Contract Time. Time is of the essence in this regard.

ACCIDENT PREVENTION

MAG Specifications, Section 107.5 and 107.6 including:

A. Machinery, equipment and other hazards shall be guarded or eliminated in accordance with the safety provisions of the Manual of Accident Prevention in Construction published by the Associated General Contractors of America, and the requirements of the Occupational Safety and Health Administration.

B. First aid facilities and information posters conforming at least to the minimum requirements of the Occupational Safety and Health Administration shall be provided in a readily accessible location or locations.

C. The Contractor shall make all reports as are, or may be, required by the Engineer or any authority having jurisdiction, and permit all safety inspections of the work being performed under this Contract. Before proceeding with any construction work, the Contractor shall take all the necessary action to comply with all provisions for safety and accident prevention. In the event the

Contractor fails to comply with said safety provisions or directions of the Public Works Director, the Public Works Director without prejudice to any other rights of the City, may issue an order stopping all or any part of the work.

D. Thereafter, a start order for resumption of the work may be issued at the discretion of the Public Works Director when in his opinion the defection from safety requirements has been corrected. The Contractor shall make no claim for an extension of time or for compensation or damages by reason of or in connection with such work stoppage.

CONSTRUCTION FACILITIES

All construction hoists, elevators, scaffolds, stages, shoring, and similar temporary facilities shall be of ample size and capacity to adequately support and/or move the loads to which they will be subjected. All railings, enclosures, safety devices, and controls required by law or for adequate protection of life and property shall be provided.

TEMPORARY FACILITIES

The Contractor shall provide all temporary facilities and utilities required for prosecution of the work; protection of employees and the public; protection of the work from damage by fire, weather or vandalism; and such other facilities as may be specified or required by any legally applicable law, ordinance, rule, or regulation.

WARNING DEVICES AND BARRICADES

Per MAG Specifications, Section 107.7.

HAZARDS IN PUBLIC RIGHT-OF-WAY

Per MAG Specifications, Section 107.7.

HAZARDS IN PROTECTED AREAS

Excavations on project sites from which the public is to be excluded shall be marked or guarded in a manner appropriate for the hazard.

PROTECTION OF EXISTING ITEMS

The Contractor shall protect all existing structures, trees, shrubs, and other items on the project site that are to be preserved, by substantial barricades or other devices commensurate with the hazard, from injury or destruction by vehicles, equipment, workmen, or other agents.

PROJECT SECURITY

The Contractor shall make adequate provision, subject to the approval of the Public Works Director, to protect the project and Contractor's facilities from fire, theft, and vandalism, and the public from unnecessary exposure to injury.

FIRE EXTINGUISHER

At least one (1) fire extinguisher, rated at least 2A, shall be provided on the job site.

OFF-SITE ROADS

Except as otherwise shown or specified, off-site access roads shall be adequately maintained, graded-earth roads. Such roads shall be built only in the public right-of-way or easements obtained by the City. If the Contractor elects to build along some other alignment, he shall obtain, without additional cost to the City, necessary rights-of-way or easements.

NOISE ABATEMENT

In inhabited areas, particularly residential, operations shall be performed in a manner to minimize unnecessary noise generation. Particular consideration shall be given to noise generated by repair and service activities during the night hours in residential areas. No repair or service activities shall be conducted between the hours of 6:00 p.m. and 7:00 a.m.

DRAINAGE CONTROL

In excavation, fill, and grading operations, care shall be taken to disturb the pre-existing drainage pattern as little as possible. Particular care shall be taken not to direct drainage water onto private property or into streets or drainage ways inadequate for the increased flow.

PROJECT CLOSE-OUT

It is the intent of these Specifications and Contract Documents that the Contractor shall deliver a complete and operable facility capable of performing its intended functions and ready for use. The City shall withhold Final Payment and release of retention until ALL of the following items have been completed:

A. Completion of all work, including punch-list items and Final Acceptance of the work by the City.

B. Submittal by Contractor of final pay estimate, which shall show the amount of work performed according to the Contract and approved by the City.

C. Submittal by the Contractor of all Project Record Documents, including As-Built drawings, operation and maintenance manuals, and other records as referenced herein.

D. Submittal by Contractor of CONTRACTOR'S AFFIDAVIT REGARDING SETTLEMENT OF CLAIMS AND CERTIFICATION OF COMPLETION AND WARRANTIES.

E. Closeout of any and all permits issued to the Contractor by the City or any other agency for the work included in the project.

F. Submittal by Contractor of EPA SWPPP Notice of Termination (if applicable).

WASTE DISPOSAL, GRADING AND MATERIAL STORAGE

A. The Contractor shall provide for the disposal of all surplus materials, waste products, debris, etc., and shall make necessary arrangements for such disposal. The Contractor shall obtain written permission from property owners(s) prior to disposing of any surplus materials, waste products, debris, etc., on private property, and shall also obtain the approval of the Public Works Director prior to such disposal.

B. The Public Works Director will not approve the filling of ditches, washes, drainage ways, etc., which may in his opinion create water control problems.

C. The Public Works Director will not approve disposal operations, which will, in his opinion, create unsightly and/or unsanitary nuisances.

D. The Contractor shall maintain the disposal site(s) in a reasonable condition of appearance and safety during the construction period as required by the Public Works Director. Prior to final acceptance of the project, the Contractor shall have completed the leveling and cleanup of the disposal site(s) to the satisfaction of the Public Works Director.

E. The Contractor shall obtain a grading permit or any other permit required by the City, Yavapai County or any other county, or State or federal rules, regulations, laws, ordinances, or any other

regulatory authority for all construction operations of the Project, including but not limited to the following:

1. Areas disturbed by the Contractor, including staging areas, borrow areas, waste areas, or material storage areas, located within the City limits that are subject to any requirements of the City Code or City Land Development Code, including but not limited to Section 6.7 – Site Disturbance, Grading and Restoration Standards, of the City Land Development Code; Section 9.6 – Site Disturbance and Grading Permit, or Chapter 16-2: DRAINAGE REGULATIONS;
2. Areas outside of the City limits that are subject to the requirements of Yavapai County for any activities described in this section, "WASTE DISPOSAL";
3. The disposal of waste material on private property dependent upon site specific conditions at the waste area(s) and characteristics of the fill in accordance with Paragraph 1. The fees for a permit for this activity shall not be waived; said fees are incidental to the appropriate bid item(s);
4. The staging or material storage area(s) that:
   a. Are not City owned property on the project, or
   b. Require clearing or grubbing in excess of 10,000 sf.

   Fees for a permit(s) for this activity shall not be waived; said costs are incidental to the appropriate bid item(s).
5. Site disturbances for infrastructure improvements on City owned property not within the right-of-way for which the disturbance is greater than 50 cubic yards of material or in excess of 10,000 square feet. The associated fees for grading permits for this activity on City owned property shall be waived.

PROJECT RECORD DOCUMENTS

A. The Contractor shall maintain at the site, available to the City and Engineer, one (1) copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change of Orders, and other modifications in good order and marked to record all changes made during construction. These shall be delivered to the City upon completion of the Project or the earlier termination of the parties' contract.

B. The contractor shall maintain any and all documentation to substantiate all costs on the project, including but not limited to those items included in "Force Account" computations, computations reflecting the actual cost of work on the project and computations substantiating any claimed increases or additional costs incurred in the project by the contractor, and shall make those records available to the City (or provide copies thereof to the City) within 24 hours of request by the City. The failure of the Contractor to maintain and produce the foregoing documentation will preclude the Contractor from being entitled to any additional payments for any additional work in question.

CONTROL OF WORK

ABBREVIATIONS

MAG Specifications, Section 101.1, including abbreviations as shown on the Plans.

AUTHORITY AND DUTIES OF INSPECTOR

Per MAG Specifications, Section 105.9, including:

A. An inspector is to be assigned to the project by the City to monitor the project and to keep the Public Works Director informed as to the progress of the work and the manner in which it is being done. Additionally, the inspector will call the Contractor's attention to any non-conformance with the Plans and Specifications. He will not be authorized to approve or accept any portion of the work or to act as foreman for the Contractor. Inspection will be done on an as needed or on-call basis.

B. The inspector will exercise such additional authority only as may from time to time be delegated to him by the Public Works Director.

INSPECTION

MAG Specifications, Section 105.10, including:

Inspection is to be done by the City Public Works Department. The Contractor shall furnish the Public Works Director with every reasonable facility for ascertaining whether or not the work as performed is in accordance with the requirements and intent of the Specifications and Contract. If the Public Works Director requests it, the Contractor at any time before acceptance of the work shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standards required by the Specifications. Should the work thus exposed or examined prove acceptable, the uncovering or removing and the replacing of the covering or making good of the part removed will be paid for as provided under CHANGES IN THE WORK, but should the work so exposed or examined prove unacceptable, the uncovering or removing and the replacing of the covering or making good of the parts removed shall be at the Contractor's expense. Inspection or supervision by the Public Works Director shall not be considered as direct control of the individual workman and his work. The direct control shall be solely the responsibility of the Contractor's foreman and superintendent.

AUTHORITY OF THE ENGINEER

MAG Specifications, Section 105.1 with the following exception: References to "the Engineer" shall mean Public Works Director.

PLANS

A. The Contract Plans consist of general drawings. These indicate such details as are necessary to give a comprehensive idea of the construction contemplated. All authorized alterations affecting the requirements and information given on the Contract Plans shall be in writing. The Contract Plans shall be supplemented by such working or shop drawings prepared by the Contractor as are necessary to adequately control the work. No change shall be made by the Contractor in any working or shop drawing after it has been accepted by the Public Works Director.

B. The Contractor shall keep a copy of the Plans and Specifications at the job site, and shall at all times give the Public Works Director access thereto. Any drawings or plans listed in the Detailed Specifications shall be regarded as a part thereof and the Public Works Director will furnish from time to time such additional drawings, plans, profiles, and information as he may consider necessary for the Contractor's guidance.

C. All authorized alterations affecting the requirements and information given on the accepted plans shall be in writing. No changes shall be made of any plan or drawing after the same has been

accepted by the Public Works Director except by consent of the Public Works Director in writing.

CONFORMITY WITH PLANS AND ALLOWABLE DEVIATIONS

MAG Specifications, Section 105.3.

COORDINATION AND INTERPRETATION OF PLANS AND SPECIFICATIONS

MAG Specifications, Section 105.4, including:

A. In the event of any doubt or question arising regarding the true meaning of these Specifications, Special Provisions, or the Plans, reference shall be made to the Public Works Director, whose decision thereon shall be final. In the event of any discrepancy between any drawing and the figures written thereon, the figures shall be taken as correct.

B. In the event of there being a conflict between one contract document and any of the other contract documents the document highest in precedence shall control and supersede the document which is contrary to it. The order of precedence of the contract documents is as follows:

1. Supplemental Agreements, the last in time being the first in precedence.
2. The formal Contract.
3. Notice Inviting Bids.
4. Information for Bidders.
5. Special Provisions.
6. Technical Specifications.
7. Plans.
8. General Conditions.
9. Contractor Proposal.

ORDER OF WORK

A. When required by the Contract Documents, the Contractor shall follow the sequence of operations as set forth therein.

B. Full compensation for conforming to such requirements will be considered as included in the prices paid for contract items of work and no additional compensation will be allowed therefore.

CONSTRUCTION STAKES, LINES AND GRADES

MAG Specifications, Section 105.8.

REMOVAL OF UNACCEPTABLE AND/OR UNAUTHORIZED WORK

MAG Specification, Section 105.11.

MAINTENANCE DURING CONSTRUCTION

MAG Specifications, Section 105.12.

COOPERATION BETWEEN CONTRACTORS

The City reserves the right at any time to contract for and perform other additional work on or near the work covered by the contract.

When separate contracts are let within the limits of any one project, each contractor shall conduct his work so as not to interfere with or hinder the progress or completion of the work being performed by other Contractors. Contractors working on the same project shall cooperate with each other as directed.

The Contractor shall arrange his work and shall place and dispose of the materials being used so as not to interfere with the operations of the other Contractors within the limits of the same project. He shall join his work with that of others in an acceptable manner and shall perform it in proper sequence to that of others.

The City will not honor any claim for extra compensation due to delays, extra work, or extension of time caused by any other Contractors working within the limits of the same project.

COORDINATION OF WORK

A. Prior to starting construction, the Contractor shall submit their construction schedule to the Public Works Director for approval.

B. It shall be the responsibility of the Contractor to maintain overall coordination of the project. Based on the general contract construction schedule prepared in accordance with these Specifications, the Contractor shall obtain from each of his Subcontractors a similar schedule and shall be responsible for all parties maintaining these schedules or for coordinating changes necessitated by unforeseen difficulties.

LINES AND GRADES

All work under this Contract shall be built in accordance with the detailed scope of work.

MATERIALS AND WORKMANSHIP

GENERAL

MAG Specifications, Section 106.1, including:

A. Where equipment, materials, or articles are referred to in the Specifications as "or equal", or "equal to" any particular standard, the Public Works Director shall decide the question of equality.

B. Wherever any standard published specification is referred to, the latest edition or revision, including all contract amendments, shall be used unless otherwise specified. Materials of a general description shall be the best of their several kinds, free from defects, and adapted to the use for which provided. The physical characteristics of all materials not particularly specified shall conform to the latest standards published by the American Society for Testing and Materials, where applicable. All material shall be new and of the specified quality and equal to the accepted samples, if samples have been submitted.

C. All work shall be done and completed in a thorough, workmanlike manner notwithstanding any omission from these Specifications or from the Plans; and it shall be the duty of the Contractor to call the Public Works Director's attention to apparent errors or omissions and request instructions before proceeding with the work. The Public Works Director may, by appropriate instructions, correct errors and supply omissions, which instructions shall be binding upon the Contractor as though contained in the original Specifications or Plans.

SUBSTITUTION OF MATERIAL OR EQUIPMENT

MAG Specifications, Section 106.4, including: Requests relative to substitutions for materials or equipment specifically designated on the Plans or in the Specifications shall be made in writing, and such requests shall be accompanied by complete data on which the Public Works Director can make determination on the merits of the proposed substitution. The written request shall state how the product proposed for a substitution compares with or differs from the designated product in composition, size, arrangement, performance, etc., and in addition, the request shall be accompanied by documentary evidence of equality in price and delivery or evidence of difference in price and delivery. Data on price shall be in the form of certified quotations from suppliers of both the designated and proposed items. All items accepted for substitution shall be subject to all applicable provisions of the Specifications. Should substitution be allowed under the foregoing provisions, and should the item subsequently prove to be defective or otherwise unsatisfactory for the service for which it was intended, the Contractor, shall without cost to the City, and without obligation on the part of the Public Works Director, replace the item with the material originally specified.

FABRICATED MATERIALS AND SHOP DRAWINGS

Fabricated materials and shop drawings shall be handled as set forth in the Special Conditions.

MATERIALS FURNISHED BY THE CITY

MAG Specifications, Section 106.8.

STORAGE AND HANDLING OF MATERIALS

MAG Specifications, Section 106.5 and 106.6, including: Protection of materials and equipment stored on the site shall be the responsibility of the Contractor. The City reserves the right to direct the Contractor to provide proper means of protection for materials if such is deemed advisable by the Public Works Director; however, the exercise of or failure to exercise this right shall not be deemed to relieve the Contractor of his primary responsibility for protecting the material and equipment. The Contractor shall provide suitable warehouses or other adequate means of protection for such if the materials and equipment require storage and protection. The Contractor shall store and care for the materials and equipment in the most suitable manner to protect them from distortion, rain, dust, or other damage. The cost of replacing any material or equipment damaged in storage shall be borne by the Contractor, and the fact that material or equipment has been damaged after partial payment has been made shall not relieve the Contractor of his primary responsibility. No motor shall be left uncovered or unprotected.

REJECTED MATERIALS

MAG Specifications, Section 106.7.

UTILITIES

MAG Specifications, Section 107.11.

DRIVEWAYS AND WALKS

Inconvenience caused by digging across driveways and sidewalks shall be kept to a minimum by restoring the serviceability of the drive or sidewalk as soon as possible. Before blocking driveways, the Contractor shall notify the property owner. The Contractor shall replace or repair any damage done to driveways and walks to not less than the condition existing prior to the Contractor's work. If it is necessary to leave an excavation open across driveways or sidewalks, the Contractor shall provide temporary relief in the form of steel plates over the excavation. Direct access shall be

provided at all times to fire engine houses, fire hydrants, hospitals, police stations, and at all other agencies or services where emergencies may require immediate access to same.

ROADS AND FENCES

Streets and roads subjected to interference by the prosecution of this work shall be kept open and maintained by the Contractor until the work is completed.

TREES AND SHRUBBERY

A. All trees and shrubbery within the right-of-way or easements shall be protected by the Contractor insofar as practicable.

B. In the event shrubbery or trees must be trimmed, or removed, the Contractor shall notify the property owner to do so within a reasonable time prior to construction. All shrubbery or trees not removed by the property owner shall be trimmed or removed by the Contractor and hauled from the job at the Contractor's expense.

C. All trees, shrubs, hedges, brush, etc. designated on the Plans, or by the Public Works Director for removal, shall be completely removed and disposed of as indicated on the Plans or as specified by the Public Works Director.

IRRIGATION DITCHES AND STRUCTURES

The Contractor shall contact the owners of any ditches, irrigation lines, and appurtenances, which interfere with the work and shall make arrangements for dry- up or scheduling of water deliveries. The Contractor shall be liable for any damage due to irrigation facilities damaged by his operations and shall repair such damaged facilities to an "equal or better than" original condition.

SUBMITTALS

Per MAG Specifications, Section 105.2, including:

A. In ample time for each to serve its proper purpose and function, the Contractor shall submit to the Public Works Director such schedules, reports, drawings, lists, literature samples, instructions, directions, and guarantees as are specified or reasonably required for construction, operation, and maintenance of the facilities to be built and/or furnished under this Contract.

B. Shop drawings and data shall be submitted to the Public Works Director in such number of copies as will allow him to retain four (4) copies of each submittal. The submittal shall clearly indicate the specific area of the Specifications or Plans for which the submittal is made. The additional copies received by him will be returned to the Contractor's representative at the job site. The Public Works Director's notations of the action, which he has taken, will be noted on one (1) of these returned copies.

C. The above drawings, lists, prints, samples, and other data shall become a part of the Contract and a copy of the same shall be kept with the job site plans and the fabrications furnished shall be in conformance with the same.

MATERIALS AND EQUIPMENT SCHEDULES

Drawings of minor or incidental fabricated materials and/or equipment may not be required by the Public Works Director. The Contractor shall furnish the Public Works Director tabulated lists of such fabrications, showing the names of the manufacturers and catalog numbers, together with samples of general data as may be required to permit determination by the Public Works Director as to their acceptability for incorporation in the work.

QUALITY CONTROL

A. All material shall be of the specified quality and equal to the approved samples, if samples have been submitted. All work shall be done and completed in a thorough, workmanlike manner, notwithstanding any omission from these Specifications or from the Plans; and it shall be the duty of the Contractor to call the Public Works Director's attention to apparent errors or omissions and request instructions before proceeding with the work. The Public Works Director may, by appropriate instructions, correct errors and supply omissions, which instructions shall be as binding upon the Contractor as though contained in the original Specifications or Plans.

B. Materials which will require testing and inspection at the place of origin shall not be shipped prior to such testing and inspection.

SAMPLES AND TESTS

Per MAG Specifications, Sections 106.2 and 106.3, including:

A. At the option of the Public Works Director, the source of supply of each of the materials shall be approved by him before the delivery is started and before such material is used in the work. Representative preliminary samples of the character and quality prescribed shall be submitted by the Contractor or producer of all materials to be used in the work for testing or examination as desired by the Public Works Director.

B. Sieves used in determining the grading of samples of aggregates, select material, and other graded materials, shall conform to ASTM Designation E 11-81.

LEGAL RELATIONS AND RESPONSIBILITY

LAWS TO BE OBSERVED

MAG Specifications, Section 107.1.

ALIEN LABOR

The Contractor shall comply with the Immigration Reform and Control Act of 1996.

COMPLIANCE WITH FEDERAL AND STATE LAWS

The Contractor understands and acknowledges the applicability to it of the Americans with Disabilities Act, the Immigration Reform and Control Act of 1986 and the Drug Free Workplace Act of 1989. The following is only applicable to construction contracts: The Contractor must also comply with A.R.S. §34-301, "Employment of Aliens on Public Works Prohibited", and A.R.S. §34-302, as amended, "Residence Requirements for Employees".

Under the provisions of A.R.S. §41-4401, Contractor hereby warrants to the City that the Contractor and each of its subcontractors ("Subcontractors") will comply with, and are contractually obligated to comply with, all Federal Immigration Laws and regulations that relate to their employees and A.R.S. §23-214(A) (hereinafter "Contractor Immigration Warranty").

A breach of the Contractor Immigration Warranty Shall constitute a material breach of this Contract and shall subject the Contractor to penalties up to and including termination of this Contract at the sole discretion of the City.

The City retains the legal right to inspect the papers of any Contractor or Subcontractors employee who works on this Contract to ensure that the Contractor or Subcontractor is complying with the

Contractor Immigration Warranty. Contractor agrees to assist the City in regard to any such inspections.

The City may, at its sole discretion, conduct random verification of the employment records of the Contractor and any of the subcontractors to ensure compliance with Contractor Immigration Warranty. Contractor agrees to assist the City in regard to any random verification performed.

Neither the Contractor nor any of the Subcontractors shall be deemed to have materially breached the Contractor Immigration Warranty if the Contractor or Subcontractor establishes that it has complied with the employment verification provisions prescribed by Sections 274A and 274B of the Federal Immigration and Nationality Act and the E-Verify requirements prescribed by A.R.S. §23-214, Subsection A.

The provisions of this Article must be included in any contract the Contractor enters into with any and all of its subcontractors who provide services under this Contract or any subcontract. "Services" are defined as furnishing labor, time or effort in the State of Arizona by building or transportation facility or improvement to real property.

EMPLOYMENT PROVISIONS

Subject to existing law, and regulations, illegal or undocumented aliens will not be employed by the Contractor for any work or services to be performed pursuant to this contract. The Contractor will ensure that this provision is expressly incorporated into any and all Subcontracts or subordinate agreements issued in support of this contract. Contractor agrees to comply with the provisions of Section 274A(a)(1)(A) and 274A(a)(2) of the Immigration and Nationality Act (8 U.S.C. 1324a(a)(1)(A), 1324a(a)(2)) (the "INA employment provisions"), and any amendments thereto, prohibiting the unlawful employment of illegal or undocumented aliens. Under the terms of this agreement, the contractor shall not knowingly hire or employ for any work performed pursuant to this contract any workers or employees not lawfully authorized to work under the provisions of the Immigration and Nationality Act or any other applicable federal or state laws. Violation of the provisions of this section shall be deemed a material breach of this contract.

INDEPENDENT CONTRACTOR STATUS

It is expressly agreed and understood by and between the parties that the Contractor is being retained by the City as an independent contractor, and as such the Contractor shall not become a City employee, and is not entitled to payment or compensation from the City or to any fringe benefits to which other City employees are entitled. As an independent contractor, the Contractor further acknowledges that he is solely responsible for payment of any and all income taxes, FICA, withholding, unemployment insurance, or other taxes due and owing any governmental entity whatsoever as a result of this Agreement. As an independent contractor, the Contractor further agrees that he will conduct himself in a manner consistent with such status, and that he will neither hold himself out nor claim to be an officer or employee of the City by reason thereof, and that he will not make any claim, demand or application to or for any right or privilege applicable to any officer or employee of the City, including but not limited to workmen's compensation coverage, unemployment insurance benefits, social security coverage, or retirement membership or credit.

NONDISCRIMINATION

The Contractor, with regard to the work performed by it after award and during its performance of this contract, will not discriminate on the grounds of race, color, national origin, religion, sex, disability or familial status in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The Contractor will not participate either directly or indirectly in

the discrimination prohibited by or pursuant to Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Section 109 of the Housing and Community Development Act of 1974, the Age Discrimination Act of 1975, the Americans with Disabilities Act (Public Law 101-336, 42 U.S.C. 12101-12213) and all applicable federal regulations under the Act, and Arizona Governor Executive Orders 99-4, 2000-4 and 2009-09 as amended.

AMERICANS WITH DISABILITIES ACT

Contractor shall comply with all federal, state and local nondiscrimination statues in the operation, implementation and delivery of, including state and federal civil rights and disabilities laws. In particular the contractor shall ensure that the City 's obligations for program, facility and service accessibility in Title II of the Americans with Disabilities Act are complied with in all activities arising under this contract, and shall hold harmless the City for any and all loss, including but not limited to damages, costs or expenses, incurred or arising from any alleged violations of the Americans with Disabilities Act under the auspices of this contract unless resulting from an intentional or actual negligent act of the City and its employees. Failure to comply with the nondiscrimination or accessibility requirements herein shall be construed as nonperformance and may result in termination of funding, civil action or both.

PERMITS, TAXES AND LICENSES

MAG Specifications, Section 107.2, including: Except as otherwise provided in the Specifications, it is the duty of the Contractor to procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work. All applicable permits, licenses and taxes are the responsibility of the Contractor.

PATENTED DEVICES, MATERIALS AND PROCESSES

MAG Specifications, Section 107.3.

SURVEY LAND MONUMENTS

Survey land monuments and property marks shall not be moved or otherwise disturbed by the Contractor until an authorized agent of the agency having jurisdiction over the land monuments or property marks setting, has witnessed or otherwise referenced their location, and only then in accordance with the requirements of the agency having jurisdiction. Any monuments displaced by the Contractor shall be replaced at the Contractors expense.

PROTECTION OF PERSON AND PROPERTY

MAG Specifications, Sections 107.5 through 107.10, including:

The Contractor shall confine all aspects of his operations within the construction limits as identified in the project plans. Should the Contractor contemplate the use of any private property adjacent to the project, beyond the project limits, for materials and equipment storage or to perform any work, he shall first obtain the written permission of the property owner. The Contractor shall provide a copy of the owner's permission to enter the property and for what purpose to the Public Works Director prior to entering the property. The Contractor will be fully and solely responsible for any and all adverse impacts and / or damages caused by his operations on private property and the settlement of all claims pertaining thereto. Upon completion of his operations the Contractor shall obtain a signed release from the property owner pertaining to his activities on the owner's property and provide a copy of that document to the Public Works Director. The failure of the Contractor to comply with these provisions will result in the retention of some portion of Contractor funds, payable under the contract, until such claims are resolved.

PROTECTION OF ANTIQUITIES

MAG Specifications, Section 107.4.

PERSONAL LIABILITY OF PUBLIC OFFICIALS

MAG Specifications, Section 107.13.

NON-RESPONSIBILITY OF THE CITY

Indebtedness incurred for any cause in connection with this work must be paid by the Contractor, and the City is hereby relieved at all times from any indebtedness or claim other than payments under terms of the Contract.

NO WAIVER OF LEGAL RIGHTS

MAG Specifications, Section 107.14.

PROPERTY RIGHTS IN MATERIAL

Nothing in the Contract shall be construed as vesting in the Contractor any right of property in materials used after they have been attached or affixed to the work or the soil and accepted. All such materials shall become the property of the City upon being so attached or affixed and accepted.

PAYMENT TO CONTRACTORS

GENERAL

A. The basis of payment for construction of this project shall be unit prices for all work actually performed in accordance with the Specifications and Scope of work, and shall include all labor and materials incorporated in the completed work.

B. Upon final inspection and acceptance of the work, the City will pay the Contractor the amount earned under the Contract, as provided herein.

PARTIAL PAYMENT

A. Once each month, the City Project Inspector and the Contractor's Superintendent shall meet or as necessary to jointly measure all work items under the contract to determine pay quantities for each pay period. Quantities of work items shall be documented on the respective plan sheets and separately in tabular fashion with Station to Station measurements noted to assure there is no duplication of payment for work performed. Measurements will be for work actually completed. No projections for expected completion of work will be allowed.

B. Contractor shall submit partial payment requests in a format approved by Public Works together with the City of Prescott Pay Request Application and Certification for Payment (form provided by Public Works) or equal, subject to approval by the Public Works Director.

C. The City will retain ten percent (10%) of the amount of each such estimate to insure full and faithful compliance with the terms of these contract documents. After fifty percent (50%) of the work on this project has been completed, one half (½) of the amount retained shall be paid to the Contractor provided the Contractor is making satisfactory progress on the contract and there is no specific clause or claim requiring a greater amount to be retained. After the contract is fifty percent (50%) completed, only five percent (5%) of the amount of any subsequent progress payments made under the contract shall be retained provided the Contractor is making satisfactory progress on the project, except that if at any time the City determines satisfactory

progress is not being made, ten percent (10%) retention shall be reinstated for all progress payments made under the contract subsequent to the determination.

D. The Contractor shall furnish a detailed breakdown showing unit prices and quantities for use in preparing the monthly estimate. No partial payment will be made until this breakdown is presented by the Contractor and has been reviewed and accepted by the Public Works Director. Green-lined plan sheets shall be submitted with each monthly pay request illustrating the line item quantities constructed for the period. The green-lined plan sheets and pay estimate spreadsheets must reconcile with one another.

E. No partial payment for job site delivered material will be made.

PAYMENT

For and in consideration of the faithful performance of the work, the City will pay to the Contractor the amount earned less retention as computed from the actual quantities of work performed under the Contract and to make such payment in the manner and at the time(s) specified, as follows:

A. After final completion under the Contract, the Contractor shall render to the City a final estimate, which shall show the amount of work performed according to the Contract.

B. Before the final payment will be made, the Contractor shall satisfy the City by affidavit that all bills for labor and materials incorporated in the work have been paid. See CONTRACTOR'S AFFIDAVIT REGARDING SETTLEMENT OF CLAIMS AND CERTIFICATION OF COMPLETION OF WARRANTIES, page 27. Additionally, the Contractor shall furnish lien waivers for all completed labor and materials consumed during the project.

C. Final payment constituting the entire unpaid balance of the Contract sum (including all retained moneys) shall be paid by the City to the Contractor within sixty (60) days after completion of the work or filing the Notice of Completion of the Contract unless a specific written finding by the City of the reasons justifying the delay in payment is provided to the Contractor, and further provided that all work has been completed, the Contract fully performed, and any final certificate has been issued by the City's architect, if any. Prior to the final payment to the Contractor, the City shall deduct therefrom any and all unpaid privilege, license and other taxes, fees and any and all other unpaid moneys due the City from the Contractor, and shall apply to those moneys to the appropriate account. Contractor shall provide to the City any information necessary to determine the total amount(s) due. The quantities appearing in the Bidding Schedule are approximate only, and are prepared for the comparison of bids. Payment to the Contractor will be made only by actual quantities of work performed and accepted in accordance with the requirements of the Contract. Only the items listed in the Bidding Schedule are pay items. The scheduled quantities of work to be done and materials to be furnished may each be increased, decreased or omitted.

D. **Final project As-built plans shall verify line item quantities constructed for the project by individual plan sheet.** Contractor shall submit final payment request in a format approved by Public Works together with the City of Prescott Pay Request Application and Certification for Payment (form provided by Public Works).

PAYMENT OF ITEMS IN PROPOSAL

A. Only those items listed in the Proposal under Bidding Schedule are pay items.

B. Compensation for all work necessary for the completion of the project or improvement shall be included by the bidder in the price bid for the items shown in the Proposal.

CHANGES IN THE WORK

A. The City, without invalidating the Contract, may order extra work, make changes by altering, or delete any portion of the work as specified herein, or as deemed necessary or desirable by the Public Works Director. All such work shall be executed under the conditions of the original Contract except that any claim for extension of time and additional cost caused thereby shall be adjusted at the time of ordering such change or extra work.

B. Extra work shall be that work not indicated or detailed on the Plans and not specified. Such work shall be governed by all applicable provisions on the Contract Document.

C. In giving instructions, the Public Works Director shall have authority to make minor changes in the work, not involving extra cost, and not inconsistent with the purposes of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Public Works Director, and no claim for an addition to the total amount of the Contract shall be valid unless so ordered. It is mutually understood that it is inherent in the nature of municipal construction that some changes in the Plans and Specifications may be necessary during the course of construction to adjust them to field conditions, and that it is of the essence of the Contract to recognize a normal and expected margin of change. The Public Works Director shall have the right to make such changes, from time to time, in the Plans, in the character of the work, and in the termination of the completion of the work in the most satisfactory manner without invalidating the Contract.

D. Any change ordered by the Public Works Director which involves installation of work essential to complete the Contract, but for which no basis of payment is provided for herein, said payment therefore shall be subject to agreement prior to said work being performed.

E. The prices agreed upon and any agreed upon adjustment in Contract time shall be incorporated in the written order issued by the Public Works Director, which shall be written so as to indicate acceptance on the part of the Contractor as evidenced by his signature. In the event prices cannot be agreed upon, the City reserves the right to terminate the Contract as it applies to the items in questions and make such arrangements as it may deem necessary to complete the work, or it may direct the Contractor to proceed with the items in question to be reimbursed pursuant to the unit prices in the Contractor's bid or on a force account basis as provided hereinafter, at the City's option.

FORCE ACCOUNT

The compensation for force account work performed by the Contractor shall be approved by the Public Works Director in the following manner:

A. LABOR: The Contractor shall provide monthly certified payroll reports for all labor and for foremen in direct charge of the specific operations. The Contractor will be compensated as follows:

   1. The actual cost of wages paid by him but at rates not to exceed those for comparable labor currently employed on the project as determined by Public Works Director.

   2. The actual cost of social security taxes and unemployment compensation insurance. There will be no payment for Fringe Benefits unless mandated by Federal Law on Federally funded projects.

   3. An amount equal to fifteen percent (15%) of the actual cost of wages and other costs listed above to cover the Contractor's profit and overhead.

4. In case work is performed by a subcontractor, the said fifteen percent (15%) will be added only once to the actual cost of the work, however, the Contractor may add five percent (5%) to the Subcontractor's price to cover his own overhead and supervision.

B. TOOLS AND EQUIPMENT: For any special or heavy equipment, the use of which has been authorized by the Public Works Director, except for small tools and manual equipment, the Contractor shall be reimbursed his actual cost of rental, not to exceed the latest Schedule of Equipment Rental Rates published by the Arizona Department of Transportation. In the event that any of the equipment to be used is not shown in said schedule, the rental rate for such equipment shall be as agreed upon in writing before the work is started. No percentage shall be added to equipment rental rates. In the event said special or heavy equipment is owned by the Contractor, he shall be compensated only for the actual hours said equipment is required for the work under Force Account on the job site, at a rate not to exceed the latest ADOT. Schedule of Equipment Rental Rates.

C. MATERIALS: For all materials accepted by the Public Works Director and used in the work the Contractor shall be paid the actual cost of such material, including transportation charges, to which cost shall be added a sum equal to fifteen percent (15%) thereof.

D. SUPERVISION OVERHEAD AND HOME OFFICE OVERHEAD: No allowance shall be made for general superintendence. The cost of supervision and all overhead is presumed to be included in the fifteen percent (15%) added in accordance with the above.

E. RECORDS: The Contractor's representative and the Public Works Director shall compare the records of the work performed as ordered on a force account basis at the end of each day on which such work is performed. Copies of these records shall be made on suitable forms provide for this purpose and signed by both the Public Works Director and the Contractor's representative. All claims for work done on a force account basis shall be certified and submitted to the Public Works Director by the Contractor, and such statements shall be filed with the Public Works Director not later than the fifth (5th) day of the month following that in which the work was actually performed.

F. BONDS AND INSURANCE: The Contractor shall be paid the actual cost for additional bonding and insurance pertaining to Force Account work when the Contractor can provide evidence of additional payment for premiums on required payment and performance bonds. No duplication of payment for Contractors costs associated with labor costs above will be allowed.

G. The Public Works Director authorized representative is in charge of Force Account Work and has the authority to direct which labor and equipment will be used, to suspend operations, and to refuse to pay for any labor or equipment, which he feels is not doing productive work.

EXTRA WORK

New or additional work will be classed as extra work when determined by the Public Works Director that such work is not covered by the Contract.

CONTRACT AMENDMENT

The value of such work or change shall be determined and paid for with a Contract Amendment in one of the following ways according to the Contract Amendment Procedure set down by the Public Works Department, City of Prescott, and at the option of the City:

A. As may be mutually agreed upon by the City and the Contractor.

B. By unit prices in accordance with the Contractor's bid.

C. By lump sum based upon the Contractor's estimate and the Public Works Director's review and acceptance of the estimate.

D. By Force Account in accordance with the requirements of that section.

E. The Contractor shall do such extra work and furnish material and equipment therefore upon receipt of an accepted Contract Amendment or other written order of the Public Works Director. In no case shall work be undertaken without written notice from the Public Works Director to proceed with the work. In absence of such Contract Amendment or other written order of the Public Works Director, the Contractor shall not be entitled to payment for any extra work. All contract amendments must be approved by the Public Works Director. Contract Amendments over $10,000.00 must be approved by City Council.

F. In the event that the Contractor and the City cannot agree on the compensation to be paid to the Contractor prior to the issuance of a Contract Amendment, then and in that event the City has the option of terminating the Contract with the Contractor or directing the Contractor to proceed and to receive compensation pursuant to the Force Account provisions herein. In the event that this Contract is terminated by the City pursuant to this subsection, the Contractor shall only be paid for those services performed to date of the City's Notice of Termination, said payment to be based upon the unit prices as set forth in the Contractor's bid. In no event shall the Contractor be entitled to additional compensation for lost profits, mobilization or de-mobilization costs, loss of anticipated profits, extended overhead, unabsorbed home office overhead, or any other payments other than for work actually performed as based upon unit prices. In the event that there are no unit prices pertaining to work in question, then and in that event the Contractor's compensation for early termination pursuant to this subsection shall be based upon Force Account as here-in-before described.

G. It is expressly agreed that in the event of a Contract Amendment, any compensation due the Contractor shall be set forth in the Contract Amendment, and shall be considered full and complete payment (if any) for any and all work related costs, including but not limited to labor, materials, equipment, supervision, field office overhead, extended home office overhead, unabsorbed home office overhead, taxes, bonds, insurance and profits. Additionally, the Contractor shall not be entitled to any additional compensation based upon a Contract Amendment (or the accumulation of contract amendments) unless specifically set forth in that Contract Amendment.

H. In the event that the contractor submits a proposed Contract Amendment, the Public Works Director shall have ten (10) days after receipt of the Contractor's written proposed Contract Amendment to either accept or agree to the Contract Amendment under the above provisions or deny such proposed Contract Amendment. If necessary to assess the proper purpose and function of a Contractor's proposed Contract Amendment, because of the proposed Contract Amendment's complexity or scope, the Public Works Director may either accept and agree to the Contract Amendment of deny such proposed Contract Amendment under the above provisions beyond such ten (10) day period and for an additional reasonable period commensurate with the nature of the proposed Contract Amendment. The failure of any party to take any action within the time periods or in the manner specified in the subparagraph shall be deemed a waiver of that party's right to recover for such delay in acting.

CLAIMS FOR EXTRA WORK

If the Contractor claims that any instructions involve extra cost under this Contract, he shall give the Public Works Director written notice thereof within forty-eight (48) hours after the receipt of such

instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property, and the procedure shall then be as provided for under CHANGES IN THE WORK. No such claim shall be valid unless so made.

PARTIAL ACCEPTANCE OF WORK

A. After completion of certain units of work under this Contract, including all testing and other preparation necessary for operation of the unit by the City as herein specified, but prior to final project completion, provisions may be made for partial acceptance in writing by the City for these certain units only. The units to be included for partial acceptance prior to final project completion will be noted at the time of the pre-construction conference in accordance with Contractor's schedule, or by written notice to the Contractor at the earliest possible time.

B. The guarantee period for these units shall commence with the date of final acceptance of the entire project by the City. Full payment for these units will not be made until final acceptance of the total work is made.

C. Acceptance of any portion of the project prior to acceptance of the whole shall not be construed as absolving the Contractor of responsibility for any item of construction or incidental work included in the original Contract.

NOTIFICATION OF CHANGED CONDITIONS, FORMAL PROTEST AND DISPUTE RESOLUTION

MAG 110 as modified herein:

110.2.2(A) and 110.3.2, add the following: "In providing the information required by this section, the Contractor shall provide specific factual detail as to each item and show the methods of calculating each item."

110.3.1 shall be amended as follows:

Level I shall mean the Public Works Project Manager as appointed by the Public Works Director

Level II shall mean the Public Works Division Manager as appointed by the Public Works Director

Level III shall mean the Public Works Director

In the event of litigation, the parties hereby agree to submit to a trial before the Court. The Contractor further agrees that this provision shall be contained in all subcontracts related to the project, which is the subject of this Agreement.

The parties hereto expressly covenant and agree that in the event of litigation arising from this Agreement, neither party shall be entitled to an award of attorney fees, either pursuant to the Contract, pursuant to A.R.S. § 12-341.01 (A) and (B), or pursuant to any other state or federal statute. The Contractor further agrees that this provision shall be contained in all subcontracts related to the project that is the subject of this Agreement.

110.4 The last sentence of the first paragraph shall read: "The arbitration of claims shall be conducted either in Prescott or Phoenix, Arizona as agreed to by the parties, or if the parties cannot agree, to be determined by the arbitrator, taking into consideration the convenience and costs to the parties and their witnesses."

Delete the last two sentences of the section and replace with: "The decision or award of the arbitrator shall be nonbinding."

Any resolution of a dispute in accordance with the applicable sections of MAG110 and this Contract which causes the Contract amount to be exceeded by $10,000.00 or more shall not be final until approved by the City Council.

PUBLICITY RELEASES

The Contractor and their subcontractors and their suppliers, if any, shall not reveal to others through literature, brochures, or other types of publicity releases any information regarding the work or the Contractors activities or participation on the project without prior written approval from the City Public Works Director. Any and all jobsite photographs taken by the Contractor, subcontractor or others must be processed in duplicate form with copies provided to the Public Works Director. No project photographs shall be released to others without prior written approval of the Public Works Director.

SCOPE OF WORK

INTENT OF PLANS AND SPECIFICATIONS

A. The intent of the Specifications and Scope of Work is to prescribe a complete work for the CITY OF PRESCOTT: Phase 2 Drilling and Testing Program- Big Chino Sub-basin Data Collection and Monitoring Plan Project which the Contractor shall perform in a manner acceptable to the City Public Works Director and in full compliance with the terms of the Contract.

B. Unless otherwise specified in the Special Conditions, the Contractor shall furnish all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature, and incidentals, including, but not limited to, dust and traffic control measures, and to perform all work involved in executing the contract in a satisfactory and workmanlike manner within the specified time.

PROJECT DESCRIPTION AND LOCATION

This project generally consists of drilling, construction, and aquifer testing of up to seven (7) monitoring wells in the Paulden, Arizona area.

TIME OF COMPLETION

A. The Contractor shall commence the work under this contract on or before the tenth (10th) calendar day after receiving written Notice to Proceed from the Owner. The Contractor shall fully complete all work under this contract within one hundred fifty (150) calendar days beginning with the calendar day of receipt of the Notice to Proceed. The Contractor shall at all times during the continuance of the Contract prosecute the work with such work force and equipment as is sufficient to complete the project within the time specified.

B. Project Milestones are estimated to be as follows:

Award of Contract	December 12, 2017
Pre-Construction Meeting	January 8, 2018
Notice to Proceed	Week of January 22, 2018
Expected Completion Date	June 21, 2018

All milestones are "earliest" dates for planning purposes only, and shall not represent any contractual commitment whatsoever on the part of the City.

SUPPLEMENT TO THE MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION

Technical Specifications

April 18, 2017

City of Prescott Public Works
433 N. Virginia Street, Prescott, Arizona 86301
Ph: 928.777.1130 | TDD: 928.777.1100 | Fax: 928.771.5929

TABLE OF CONTENTS

NEW 4/18/17 REVISIONS **9**
PREVIOUS CHANGES 10
PART 100 – GENERAL CONDITIONS **12**
SECTION 100: GENERAL CONDITIONS 12
100.2 STANDARD SPECIFICATIONS AND DRAWINGS 12
100.3 GENERAL NOTES 12
SECTION 101: ABBREVIATIONS AND DEFINITIONS 14
101.2 DEFINITIONS AND TERMS 14
SECTION 104: SCOPE OF WORK 14
104.1.3 Water Supply 14
104.1.4 Cleanup and Dust Control 15
104.1.5 Final Cleaning Up 15
SECTION 105: CONTROL OF WORK 15
105.6 COOPERATION WITH UTILITIES 15
105.8 CONSTRUCTION STAKES, LINES AND GRADES 16
105.16 RECORD DRAWING PREPARATION AND COORDINATION 18
SECTION 106: CONTROL OF MATERIALS 23
106.1 SOURCE OF MATERIALS AND QUALITY 23
106.2 SAMPLES AND TESTS OF MATERIALS 23
106.9 QUALITY ACCEPTANCE TESTING 26
SECTION 107: LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC 27
107.6 PUBLIC CONVENIENCE AND SAFETY 27
107.9 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE 28
107.15 PUBLIC RELATIONS 28
107.16 STORMWATER POLLUTION PREVENTION PLAN (SWPPP) 30
SECTION 108: COMMENCEMENT, PROSECUTION AND PROGRESS 32
108.4 CONTRACTOR'S CONSTRUCTION SCHEDULE 32
SECTION 109: MEASUREMENTS AND PAYMENTS 32
109.10 PAYMENT FOR MOBILIZATION/DEMOBILIZATION 32
109.11 CONTRACT ALLOWANCE 33
PART 200 – EARTHWORK **33**
SECTION 200: DEWATERING AND BYPASS PUMPING 33
200.1 DEWATERING 33
200.2 BYPASS PUMPING 34
SECTION 201: CLEARING AND GRUBBING 36
201.1 DESCRIPTION 36
201.3 CONSTRUCTION METHODS 36
SECTION 205: ROADWAY EXCAVATION 37
205.1.1 General 37
205.2 UNSUITABLE MATERIAL 37

205.6 SURPLUS MATERIAL 38
205.7 MEASUREMENT 38
205.8 PAYMENT 38
SECTION 206: STRUCTURE EXCAVATION AND BACKFILL 38
206.4.2 Structure Backfill for Earth Retaining Structures 38
206.4.4 Structure Backfill for Structures within Paved Areas 39
SECTION 211: FILL CONSTRUCTION 39
211.1 DESCRIPTION 39
211.2 PLACING 39
211.3 COMPACTING 39
211.4 TESTS 40
211.5 MEASUREMENT 40
211.6 PAYMENT 40
PART 300 – STREETS AND RELATED WORK 40
SECTION 300: SAW CUT 40
300.1 DESCRIPTION 40
SECTION 301: SUBGRADE PREPARATION 41
301.1 DESCRIPTION 41
301.2.1 41
301.3 RELATIVE COMPACTION 41
301.7 MEASUREMENT 41
301.8 PAYMENT 42
SECTION 306: MECHANICALLY STABILIZED SUBGRADE – GEOGRID REINFORCEMENT 42
306.2 MATERIALS 42
306.8 PAYMENT 42
SECTION 310: PLACEMENT AND CONSTRUCTION OF AGGREGATE BASE COURSE 42
310.1 DESCRIPTION 42
310.1.1 Reclaimed Asphalt Pavement (RAP) 42
310.2 PLACEMENT AND CONSTRUCTION 43
310.2.1 Quality Control Testing 43
310.3 COMPACTION 43
310.5 PAYMENT 43
SECTION 317: ASPHALT MILLING 43
317.2 CONSTRUCTION REQUIREMENTS 43
317.2.1 Quality Control 44
317.2.2 Paving 45
317.2.3 Macrotexture Milling 45
317.3 MEASUREMENT AND PAYMENT 46
SECTION 321: PLACEMENT AND CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT 47
321.3 WEATHER AND MOISTURE CONDITIONS 47
321.4 APPLICATION OF TACK COAT 47
321.6 MIX PRODUCTION 47
321.8 PLACEMENT 48
321.8.4 Compaction; Asphalt Base Course and Surface Course 49

321.8.5 Smoothness 50
321.9 QUALITY CONTROL 50
321.12 MEASUREMENT 53
321.13 PAYMENT 53
SECTION 329: TACK COAT 53
329.3 APPLICATION 53
329.6 MEASUREMENT 53
329.7 PAYMENT 53
SECTION 336: PAVEMENT MATCHING AND SURFACING REPLACEMENT 54
336.1 DESCRIPTION 54
336.2.1 Pavement Widening or Extensions 54
336.2.3 Temporary Pavement Replacement 54
336.2.4.1 Permanent Asphalt Pavement Replacement 54
336.3 TYPES AND LOCATIONS OF TRENCH SURFACE REPLACEMENT 55
336.4 MEASUREMENT 55
336.5 PAYMENT 55
SECTION 340: CONCRETE CURB, GUTTER, SIDEWALK, CURB RAMPS, DRIVEWAY AND ALLEY ENTRANCE 55
340.2 MATERIALS 56
340.2.1 Detectable Warnings 56
340.3.1 Subgrade Preparation 56
340.3.3.1 Concrete Curb, Gutter, and Curb Terminations 56
340.3.3.1a Single Curb 56
340.3.3.2 Concrete Sidewalk, Sidewalk Landing, and Ramp 56
340.3.3.3 Concrete Driveway Entrances and 6" Concrete Slabs 57
340.3.3.4 Concrete Valley Gutter 57
340.3.10 Deficiencies 57
340.5 MEASUREMENT 57
340.6 PAYMENT 58
SECTION 345: ADJUSTING FRAMES, COVERS AND VALVE BOXES 58
345.1 DESCRIPTION 58
345.3 ADJUSTING FRAMES 58
345.4 ADJUSTING VALVE BOXES 59
345.4.1 Adjusting Meter Boxes 59
345.5 ADJUSTING MANHOLE AND VALVE COVERS WITH ADJUSTMENT RINGS 59
345.6 MEASUREMENT 60
345.7 PAYMENT 60
SECTION 350: REMOVAL OF EXISTING IMPROVEMENTS 61
350.1 DESCRIPTION 61
350.2 CONSTRUCTION REQUIREMENTS 61
350.3 REMOVAL OF PAVEMENT 61
350.4 REMOVAL OF STORM PIPE AND CULVERTS 62
350.5 REMOVAL OF MISCELLANEOUS CONCRETE 62
350.6 REMOVAL OF UTILITIES 62
350.6.1 Removal and Disposal of Asbestos Cement Pipe 63

350.7 REMOVAL OF SIGNS AND DELINEATORS 65
350.8 REMOVAL OF FENCE 65
350.9 REMOVAL OF GUARDRAIL 65
350.10 MEASUREMENT AND PAYMENT 65
PART 400 – RIGHT-OF-WAY AND TRAFFIC CONTROL 66
SECTION 401: TRAFFIC CONTROL 66
401.1 DESCRIPTION 66
401.2 TRAFFIC CONTROL DEVICES 66
401.3 FLAGMEN OR PILOT CARS 67
401.6 MEASUREMENT 67
401.7 PAYMENT 67
401.8 MEASUREMENT AND PAYMENT 67
SECTION 402: PAVEMENT MARKINGS AND STRIPING 68
402.2 THERMOPLASTIC PAVEMENT MARKINGS 68
402.3 TEMPORARY STRIPING 69
402.4 PERMANENT PAVEMENT MARKINGS 69
402.4 MEASUREMENT AND PAYMENT 69
SECTION 403: PERMANENT SIGNING, SIGN POSTS AND DELINEATORS 69
403.1 DESCRIPTION 69
403.2 GENERAL SIGNING GUIDELINES 69
403.3 SIGN POSTS 70
403.4 MEASUREMENT AND PAYMENT 71
SECTION 404: LOOP DETECTORS 71
404.1 QUADRUPOLE LOOP DETECTORS 71
404.2 MEASUREMENT AND PAYMENT 71
SECTION 405: SURVEY MONUMENTS 71
405.1 DESCRIPTION 71
405.2 MATERIALS 72
405.3 CONSTRUCTION 72
405.5 PAYMENT 72
SECTION 430: LANDSCAPING AND PLANTING 72
430.3.2 Seeding 72
430.3.2 Seeding (Hydraulic) 72
SECTION 431: LANDSCAPE ROCK 76
431.1 REMOVE AND REPLACE LANDSCAPE ROCK 76
PART 500 – STRUCTURES 76
SECTION 505: CONCRETE STRUCTURES 76
505.1.1 Minor Structures 76
505.6.2 Adverse Weather Concreting 77
505.12 PAYMENT 77
PART 600 – WATER, SEWER, STORM DRAIN AND IRRIGATION 77
SECTION 601: TRENCH EXCAVATION, BACKFILLING AND COMPACTION 77
601.1 DESCRIPTION 77
601.2.3 Trench Grade 78

601.2.5 Over-excavation 78
601.2.11 Rock Excavation for Utility and/or Drainage Construction 78
601.4.2 Bedding 79
601.4.4 Initial Backfill 80
601.4.5 Final Backfill 80
601.4.5 Backfill 80
601.4.6 Compaction Densities 80
601.4.7 Water Consolidation 80
601.7 PAYMENT 80
601.8 MEASUREMENT AND PAYMENT 80
SECTION 610: WATER LINE CONSTRUCTION 81
610.1 DESCRIPTION 81
610.3 MATERIALS 81
610.4.1 Trenching/Cover 82
610.4.3 Blocking and Restraints 83
610.4.5 Testing 83
610.5.1 General 83
610.9 FIRE HYDRANTS 83
610.11 CONNECTION TO EXISTING MAINS 83
610.13 METER SERVICE CONNECTIONS 84
610.16 MEASUREMENT AND PAYMENT 86
SECTION 611: WATER, SEWER AND STORM DRAIN TESTING 86
611.1 HYDROSTATIC TESTING 86
611.2 DISINFECTING WATER MAINS 87
611.3 SEWER LINE TESTING 87
611.5 PAYMENT 90
SECTION 612: TEMPORARY WATER MAINS (FLY LINES) 90
612.1 DESCRIPTION 90
SECTION 615: SANITARY SEWER LINE CONSTRUCTION 92
615.2 MATERIALS 92
615.8 SANITARY SEWER SERVICE TAPS 93
615.10 MANHOLES 93
615.16 MEASUREMENT AND PAYMENT 94
SECTION 618: STORM DRAIN CONSTRUCTION 94
618.1 DESCRIPTION 94
618.2 MATERIALS 94
618.3 CONSTRUCTION METHODS 94
618.6 PAYMENT 95
SECTION 625: MANHOLE CONSTRUCTION AND DROP SEWER CONNECTIONS 95
625.1.1 Manholes 95
625.1.2 Sanitary Drop Sewer Connections 95
625.2 MATERIALS 95
625.3 CONSTRUCTION METHODS 95
625.3.1 Manholes 95
625.3.2 Sanitary Sewer Drop Connections 96

625.3.3 Sanitary Sewer Manhole Testing 97
625.4 MEASUREMENT 97
625.5 PAYMENT 97
SECTION 626: MANHOLE COATINGS 97
626.1 DESCRIPTION 98
626.2 MATERIALS 99
626.3 COATING 100
626.4 DEFECT REPAIR 101
626.5 WARRANTY 101
626.6 MEASUREMENT AND PAYMENT 102
SECTION 630: TAPPING SLEEVES, VALVES AND VALVE BOXES ON WATER LINES 102
630.3.1 General 102
630.3.2 Supplements Specifically Relating to Valve Sizes 103
630.4 TAPPING SLEEVES AND VALVES 103
630.4.1 Tapping Valves 103
630.5 BUTTERFLY VALVES 104
630.6 AIR RELEASE AND VACUUM VALVES 104
630.6.1 Blow Off Installation 105
630.8 MEASUREMENT 105
630.9 PAYMENT 105
SECTION 650: ABANDONMENT AND REMOVAL OF WATER MAIN 106
650.1 WATER MAIN ABANDONMENT 106
650.2 WATER MAIN REMOVAL 106
650.3 MEASUREMENT 107
650.4 PAYMENT 107
SECTION 651: ABANDONMENT AND REMOVAL OF SANITARY SEWER 107
651.1 SANITARY SEWER ABANDONMENT 107
651.1.1 Sanitary Sewer Mains 107
651.1.2 Manholes, Vaults and Wet Wells 108
651.2 SANITARY SEWER REMOVAL 108
651.3 MEASUREMENT 109
651.4 PAYMENT 109
PART 700 – MATERIALS 110
SECTION 701: AGGREGATE 110
701.4 RECLAIMED CONCRETE MATERIAL (RCM) 110
701.5 RECLAIMED ASPHALT PAVEMENT (RAP) 110
SECTION 710: ASPHALT CONCRETE 110
710.2.1 Asphalt Binder 110
710.3.2 Mix Design Criteria 110
710.3.2.1 Marshall Mix Design 110
SECTION 725: PORTLAND CEMENT CONCRETE 111
725.1 GENERAL 111
725.1.1 Adverse Weather Concreting 111
725.5 ADMIXTURES AND ADDITIVES 112

725.8.1 Field Sampling and Tests 112
725.8.2 Concrete Cylinder Test: 113

NEW 4/18/17 REVISIONS

New Specifications:

- 340.3.10 Deficiencies
- 401.3 Flagmen or Pilot Cars

Specifications Rewritten, or with Major Updates:

- 101.2 Definitions and Terms
- 104.1.3 Water Supply
- 104.1.4 Cleanup and Dust Control
- 104.1.5 Final Cleaning Up
- 107.6 Public Convenience and Safety
- 107.16 Stormwater Pollution Prevention Plan (SWPPP) (formerly 107.15)
- 301.8 Payment
- Section 340 Concrete Curb, Gutter, Sidewalk, Curb Ramps, Driveway and Alley Entrance
- 345.5 Adjusting Manhole and Valve Covers with Adjustment Rings
- Section 403 Permanent Signing, Sign Posts and Delineators
- Section 405 Survey Monuments
- Section 610 Water Line Construction
- Section 611 Water, Sewer and Storm Drain Testing
- Section 612 Temporary Water Mains (Fly Lines)
- Section 615 Sanitary Sewer Line Construction
- Section 625 Manhole Construction and Drop Sewer Connections

Specifications with Minor Updates:

- 100.3 General Notes
- 105.6 Cooperation with Utilities
- 105.8 Construction Stakes, Lines and Grades
- 106.1 Source of Materials and Quality
- 107.9 Protection and Restoration of Property and Landscape
- 107.15 Public Relations (formerly 100.4)
- Section 300 Saw Cut
- 317.2 Construction Requirements
- 317.2.3 Macrotexture Milling
- 317.3 Measurement and Payment
- 336.2.4.1 Permanent Asphalt Pavement Replacement
- 336.3 Types and Locations of Trench Surface Replacement
- Section 401 Traffic Control
- Section 402 Pavement Markings and Striping
- Section 404 Loop Detectors430.3.2 Seeding (Hydraulic)
- Section 431 Landscape Rock

- 505.1.1 Minor Structures
- Section 601 Trench Excavation, Backfilling and Compaction
- Section 618 Storm Drain Construction
- Section 626 Manhole Coatings
- 630.3.2 Supplements Specifically Relating to Valve Sizes
- 651.3 Measurement

Specifications that have been Deleted:

- 100.1 Scope of Work
- 100.4 Public Relations (Moved to 107.15)
- 201.5 Measurement and Payment, Clearing and Grubbing
- 301.8 Payment
- 630.4.3 Tapping and Associated Fees

Details that have been Updated:

- none

PREVIOUS CHANGES

New Specifications:

- 612 Temporary Water Mains (Fly Lines)

Specifications Rewritten, or with Major Updates:

- 105.8 Construction Staking
- 105.16 Record Drawing Preparation and Coordination
- 106.2 Samples and Tests of Materials
- 300.1 Saw Cut (300 Streets and Related Work)
- 301.1 Description (301 Sub-Grade Preparation)
- 301.7 Measurement (301 Sub-Grade Preparation)
- 301.8 Payment (301 Sub-Grade Preparation)
- 310.5 Measurement and Payment (310 Placement and Construction of Aggregate Base Course)

Specifications with Minor Updates:

- 101.2 Definitions and Terms
- 105.8 Construction Staking
- 106 Control of Materials
- 405.1 Description (405 Monuments)
- 405.4 Installation (405 Monuments)

Specifications that have been Deleted:

- none

Details that have been Updated:

- All references to COP Standard Details for adoption of new Quad City General Engineering Standards

PART 100 – GENERAL CONDITIONS

ADD the following section to Part 100- General Conditions:

SECTION 100: GENERAL CONDITIONS

100.2 STANDARD SPECIFICATIONS AND DRAWINGS

(A) Standard details and specifications for this project shall be the Maricopa Association of Governments Standard Specifications and Details (MAG Standards), latest revision, and the City of Prescott Supplement to the Maricopa Association of Governments Uniform Standard Specifications for Public Works, latest revisions, in conjunction with the City of Prescott Standard Details, latest revisions, except as modified in the plans.

(B) Other standard specifications and details will be incorporated within the plans, project documents and technical specifications by reference, as necessary. These may include references to Maricopa Association of Governments Uniform Standard Details for Public Works Construction (MAG Standard Details, Arizona Department of Transportation Standard Specifications and Standard Drawings for Road and Bridge Construction (ADOT Specifications or ADOT Standard Details), and others.

100.3 GENERAL NOTES

(A) All construction shall conform to the Maricopa Association of Governments Standard Specifications and Details (MAG Standards), latest revisions, and City of Prescott Supplement to MAG Specifications (COP Specifications) and City of Prescott (COP) Standard Details, latest revisions, unless specifically modified on the plans.

(B) It shall be the Contractor's responsibility to obtain copies of MAG, and COP Standards and Specifications, as well as all other standards and specifications necessary to completely and accurately interpret the plans.

(C) All plans signed by the Public Works Director are null and void one year from date of signature if construction has not started.

(D) All quantities shown on plans are not verified by the Engineer. The Contractor shall verify all quantities shown and make his bid based upon those verifications. If any discrepancy in quantities is found, Contractor shall notify the Engineer of such no later than 24 hours prior to bid opening.

(E) A Public Works Department permit will be required for all off-site construction and construction within the public right-of-way.

(F) It is the sole responsibility of the Contractor to obtain, at his own expense, such permits as are required from the appropriate agencies.

(G) The Public Works Department shall be notified a minimum of 24 hours prior to beginning any construction in the public right-of-way at (928) 777-1176.

(H) Inspection is to be done by the Public Works Department.

(I) Any work performed without the knowledge of the City inspector or his representative is subject to removal and replacement of same, to be done at the Contractor's expense.

(J) All work and materials, which do not conform to the specifications, are subject to removal and replacement at the Contractor's expense.

(K) Approval of a portion of the work in progress does not guarantee its final acceptance. Testing and evaluation may continue until the written final acceptance of a complete and workable unit.

(L) The City may suspend the work by written notice when, in its judgment, progress is unsatisfactory, work being done is unauthorized or defective, weather conditions are unsuitable, or there is a danger to the public health and safety.

(M) The Contractor shall provide sufficient men and equipment on the job at all times during construction to comply with specifications and to complete work.

(N) The Contractor shall be responsible for construction surveying and layout.

(O) The Contractor shall notify Arizona 811 (formerly Arizona Blue Stake) at 1-800-STAKE-IT (1-800-782-5348) between 6 a.m. and 5 p.m. Arizona time, Monday-Friday (excluding state holidays), at least 48 hours prior to construction.

(P) It is the Contractor's responsibility to locate all underground pipelines, telephone and electric conduits and structures in advance of any construction and will observe all possible precautions to avoid any damage to such. The Engineer and/or City will not guarantee any locations as shown on these plans, or those omitted from it.

(Q) The Contractor is to uncover all existing lines being tied into and verify grades, pipe material, and pipe diameter before material submittals and planned construction activities.

(R) Arizona Department of Environmental Quality Requirements shall be complied with.

(S) All water lines shall be provided with 14 AWG HS-CCS wire. Trace wire shall be subject to traceability test. Testing is to be by the Contractor and witnessed by the City representative and at no extra cost to the City.

(T) Water/sewer separation shall be pursuant to AAC R-18-5-502C and City specifications.

(U) Water mains shall be subject to a pressure and leakage test in accordance with AWWA C-600 Standard.

(V) Water mains shall be disinfected in accordance with ADEQ Engineering Bulletin No. 8 "Disinfection of Water Systems".

(W) Operation of valves to be done by City personnel only.

(X) All pipeline materials shall be installed per manufacturer's requirements unless superseded by City specifications.

(Y) All materials for water line construction shall meet AAC R-18-4-119.

(Z) Arizona Department of Environmental Quality requirements will apply when more stringent than MAG Standard Specifications; more specifically where they pertain to maximum allowable sewer line/pressure sewer line exfiltration-infiltration rates.

(AA) Sewer line low-pressure air tests shall be done on 100 percent of all sanitary sewer lines.

(BB) Sewer manholes exfiltration tests shall be done on 100 percent of all manholes. Vacuum testing in accordance with City Standards may be used in lieu of exfiltration test.

(CC) Sewer line deflection tests shall be done on 100 percent of all pipes.

(DD) Prior to project acceptance, the Contractor shall be responsible for providing the City with a video (i.e. DVD) of the entire sewer main installed including service laterals. The video will be previewed and deemed acceptable by the City prior to project release.

(EE) Acceptance of the completed water/sewer system will not be given until 3 ml photo Mylar or Xerox graphic "as-built" reproducible plans and all required digital files have been submitted by a Registered Professional Engineer and approved by the Engineer.

(FF) The Contractor shall warrant all work for a minimum of 2 years after formal acceptance of the work.

SECTION 101: ABBREVIATIONS AND DEFINITIONS

101.2 DEFINITIONS AND TERMS

REVISE and ADD the following:

Agency/City/Contracting Agency/Owner: The City of Prescott, a municipal corporation, organized and existing under and by virtue of the laws of the State of Arizona (hereinafter referred to as "City"), unless otherwise noted; and meant as the governmental agency/legal entity for which the work is being done, either by permit or contract.

County: Yavapai County, organized and existing under and by virtue of the laws of the State of Arizona.

Director: The City of Prescott Public Works Director, or his designee, representative or assistants, unless otherwise noted.

Engineer: The duly authorized person, or his designees, employed by or contracted with the City of Prescott who is responsible for all aspects of the project and with the authority to make revisions to and approve the changes to the plans or specifications.

Engineer of Record: The Engineer of Record is a Civil Engineer registered in the State of Arizona by the Board of Technical Registration and is responsible for design, calculations and preparation of contract documents. The Engineer of Record shall provide field observation, compile, review and comment on project documentation, material testing reports and prepare 'as-built' drawings.

SECTION 104: SCOPE OF WORK

104.1.3 Water Supply

ADD the following:

All contractors requesting construction water from the City must submit a Construction Water Meter Application. A $1,000.00 deposit will be required for hydrant meters. Contractors are encouraged to use treated effluent for construction activities. The City has two outlets for effluent, the Sundog Wastewater Treatment Plant and the Airport Wastewater Reclamation Facility. The City will provide metered standpipes for effluent at both locations. The Contractor will be required to estimate daily and total potable/effluent water usage for the project as identified on the Construction Water Meter application. The Contractor will be responsible for all costs associated with obtaining and delivering construction water.

104.1.4 Cleanup and Dust Control

REMOVE in its entirety and REPLACE with the following:

Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work area clean and free from rubbish, excess materials and debris generated by Construction Activities. At disposal sites and storage sites, other than agency landfills, the Contractor shall be responsible for all required dust control measures. This includes temporary yard or staging areas.

The Contractor shall take whatever steps, procedures or means required preventing any dust nuisance due to his construction operations. The dust control measures shall be maintained at all times to the satisfaction of the Engineer or his/her representative. In addition, the Contractor shall be responsible for sweeping the project no less than 4 times a week, or more as deemed necessary by the Engineer or his/her representative, to suppress dust, pick up dirt, soil, and construction debris so it does not travel to a water body or the City's storm drain system. A street sweeping plan documenting the frequency of sweeping, time and dates, route and type of sweeper that will be utilized shall be submitted to the City at first pre-construction meeting. The Street sweeper shall be a mechanical sweeper with water applying equipment. No brooms, mechanical brooms mounted on drivable construction equipment or regenerative air sweepers will be accepted without approval from the City.

Failure of the Contractor to comply with the Engineer or his/her representative may result in an order to suspend work until the condition is corrected. No additional compensation or time will be allowed as a result of such suspension and the Engineer has the authority to take such other measures as may be necessary to remedy the situation. Subsection 104.2.5 applies.

No measurement or payment will be made for street sweeping, unless otherwise provided for in the special provisions or proposal. The cost of street sweeping will be deemed incidental and the cost included in the proposal price for the construction operation to which dust control is incidental or appurtenant.

104.1.5 Final Cleaning Up

ADD the following:

Upon completion of construction and before final acceptance can be made by the Engineer, the Contractor shall clean up each individual construction area to the satisfaction of the Engineer. Small trees, weeds, and brush, which were removed as part of construction work, shall be removed from the project site and properly disposed of. All debris including but not limited to broken pipe, concrete and other construction debris shall be removed from the project site and properly disposed.

Existing landscape improvements, drainage ditches, etc., shall be restored in "like kind" so that the improvement is put back in as close to its prior state as possible. Restoration of incidental items impacted by construction activity shall be in accordance with Sections 104.1.3 and 104.1.4. The Contractor shall restore each individual work site to grades existing before construction work. No separate payment will be made for restoration of items impacted by the Contractor's construction operation and the cost of these items shall be included in the unit prices in the bid schedule.

SECTION 105: CONTROL OF WORK

105.6 COOPERATION WITH UTILITIES

ADD the following:

Location of Underground Utilities

(A) The Contractor shall contact Arizona 811 (formerly Arizona Blue Stake) within the time frame specified under Arizona law and request field location of underground utilities on public and private property. The Contractor shall employ private locating companies for private utilities not found by Arizona 811. At the time these locations have been marked and prior to the commencement of excavation within the affected area, the Contractor shall at his expense manually determine the exact location of all buried facilities.

(B) The Contractor shall notify all affected utilities prior to the start of construction and shall ascertain the location of the various underground utilities either shown on the plans and/or as may be brought to his attention.

(C) The Contractor shall perform all operations in accordance with Arizona 811.

(D) Utility locations shown on the plans are approximate and based on drawings furnished by the respective utility. It shall be the Contractor's responsibility to protect all existing utilities. Should a utility conflict occur, the Contractor shall cooperate with the said utility to resolve the conflict. No claim for extra costs shall be made against the City for delays due to any utility conflict.

(E) If performance of the Contractor's work is delayed because the utility owners fail to relocate or adjust their facilities in a timely manner, the Contractor may file for an extension of time. To receive consideration, this request shall contain specific information as to the nature of the delay and the actual loss of time involved.

(F) The Contractor shall assume full responsibility for damage to all marked utilities due to his operations and shall repair the damaged utilities in accordance with regulatory authority requirements at his own expense.

(G) Measurement and Payment: No separate measurement and payment shall be made for the location of underground utilities. This work shall be considered incidental and included in the unit price bid for construction or installation of the appropriate contract pay items.

105.8 CONSTRUCTION STAKES, LINES AND GRADES

ADD the following:

(A) Construction staking shall be the responsibility of the Contractor. The control for the project is provided in the contract documents. The Contractor shall be held responsible for preservation of control monumentation. If any of the control monumentation have been carelessly or willfully destroyed or disturbed by the Contractor, the cost of replacing them will be charged against him and will be deducted from the payment of work.

(B) The Contractor shall not retain the Engineer of Record for construction staking due to conflict of interest.

(C) Staking shall be performed and certified by a Registered Land Surveyor in good standing with the Arizona State Board of Technical Registration.

(D) The staking shall be performed in such a manner and frequency that the Contractor is able to construct the project in accordance with the plans and specifications. At a minimum, staking shall include:

(1) Slope or limit stakes

(2) Limits of Temporary Construction Easements (TCE)

(3) Horizontal and vertical alignment of pipeline

(4) Valves, tees, horizontal and vertical bends, blow offs, air release valves, tracer wire stations, water meters and hydrant locations

(5) Tank and appurtenances

(6) Electrical, instrumentation and control facilities, including, but not limited to, antennae pole

(7) Site improvements including, but not limited to, retaining walls, curbs, fencing, drainage, chain link fence enclosures, protection posts, gates, etc. The original grade of all retaining walls shall be surveyed and established prior to beginning any earthwork.

(8) Cross-sections will be required, at no additional expense to the City, should quantity disputes arise pertaining to the following: Earthwork, Subgrade, ABC or Asphaltic Concrete.

(9) Curb stakes at all PC's, PT's, vertical PI's (grade breaks), transitions to and from super elevated sections and at 50 foot intervals

(10) Blue tops for subgrade and ABC at intervals specified for curb. Quarter crown blue tops shall be required when the typical section is 4 lanes or more without median curb.

(11) Other staking as needed to complete the work in conformance with the plans and specifications.

(E) The Engineer and the Contractor's superintendent shall meet monthly or as necessary to jointly measure all work items under the contract to determine pay quantities for each pay period. Quantities of work items shall be documented on the respective plan sheets and separately in tabular fashion with Station to Station measurements noted to assure there is no duplication of payment for work performed. Measurements will be for work actually completed. No projections for expected completion of work will be allowed. No payment shall be made for stored materials.

(F) All survey data will be referenced to the City Coordinate System in accordance with the City Survey Datum Requirements as noted below.

CITY OF PRESCOTT SURVEY DATUM REQUIREMENTS		
Coordinate Units	International Feet	
Distance Units	International Feet	
Height Units	International Feet	
Datum		
Geodetic (Horizontal) Datum	North American Datum of 1983 (1992), (NAD83 (1992)	
Coordinate System	Arizona Coordinate System (State Plane)	
Zone	Central (0202)	
Vertical Datum	North American Vertical Datum of 1988, (NAVD88)	
Geoid Model	GEOID99 (Conus)	
City of Prescott Coordinate System (COPCS) – Conversion from State Plane		
COPCS Northing	(State Plane Northing x 1.000329975) – 701,456.0090	
COPCS Easting	(State Plane Easting x 1.000329975) + 69,457.2499	
Note: Distances computed between COPCS coordinates approximate "ground" distances		
State Plane – Conversion from City of Prescott Coordinate System		
State Plane Northing	(COPCS Northing + 701,456.0090) x 0.999670134	
State Plane Easting	(COPCS Easting – 69,457.2499) x 0.999670134	
Example – City of Prescott Mingo Base		
Latitude	34°34'29.27969" N	
Longitude	112°28'48.72638" W	
Height	5582.412'	
State Plane Coordinates		**City of Prescott Coordinates**
Northing	1,301,026.703	600,000.0000
Easting	530,367.742	600,000.0000
Elevation	5,673.955'	5,673.955'

(G) Measurement and Payment: The quantity of construction staking measured for payment shall be the lump sum bid by the Contractor. The contract unit price per lump sum paid for construction staking shall be full compensation for all labor, materials, and equipment to perform the construction staking as described in this section.

Pay Item: 105.8 Construction Stakes, Lines and Grades

ADD the following subsection to Section 105- Control of Work:

105.16 RECORD DRAWING PREPARATION AND COORDINATION

(A) As-built field data collection and preparation of record drawings will be performed by the Engineer. The Contractor shall notify the Engineer as required in this section, provide access to the work, and cooperate with the Engineer to accurately depict the as-built conditions. During the construction phase and prior to any backfilling or covering, the Engineer will survey the work for the purpose of record drawing preparation. As-built measurements and surveying shall be performed and certified by a Registered Land Surveyor in good standing with the Arizona State Board of Technical Registration. The Engineer shall supply all horizontal and vertical as-built data in ASCII format, including a northing, easting, elevation and description of all work completed under this contract. The Contractor shall aid the Engineer in determining and providing this information. As-built data shall include, but not be limited to all items noted below.

(1) Grading and Drainage Plans

(a) Finished pad grades. An Average pad grade may be used if the pad is not flat. Pad elevations shall not exceed plus 0.5 feet tolerance (plus 0.2 feet if located adjacent to an existing development). Pad elevations shall not exceed minus 0.2 feet tolerance (0.1 feet if located in a floodplain or adjacent to a wash or channel).

(b) Flow line elevations of channels

(c) Hinge point elevations on all slopes and grade breaks

(d) Percentage of all slopes, flow lines and channels

(e) Catch basin grates elevation at top of grate

(f) Inverts of storm drain lines and headwalls

(g) As-built elevations shall be provided at all drainage control point (i.e. detention overflow point, tops and bottoms of detention basins, drain rims, valley gutters, curbs, curb openings, flow line elevations in swales, etc). As-built enough spot elevations to verify the design intentions are met (i.e. grade breaks, high/low points, scuppers, extreme outfall, etc). Show the direction of drainage flow to illustrate that design intent has been met.

(h) Provide calculations to verify that actual as-built volume of all detention facilities included on the as-builts, as well as a table which compares the as-built volumes with the approved, required volumes indicated on the design drawings or in the approved drainage report

(i) Detention calculations shall be revised to as-built condition by the Engineer of Record

(j) Flow line elevations and/or pipe inverts, grate elevations for catch basins, underground detention storage tanks, and all other drainage structures

(k) Top of flood walls, retaining walls, and cutoff walls

(l) Stations, offsets, and invert elevations for spillways and box culverts

(m) When storm drain lines and appurtenances are included in the grading and drainage drawings, the Contractor shall refer to the storm drain plan record drawing requirements for additional required items

(2) Water/Fire/Reclaimed Water Plans

(a) All fittings and appurtenances shall be surveyed, including but not limited to the following: valves, bends, tees, reducers blow offs, air release valves, tracer wire stations, water meters, and hydrant locations.

(i) Valves shall be measured on the nut and center of the cover. If extensions are used, the length of the extension shall be noted.

(ii) All fittings shall be measured at the middle of the fitting.

(iii) Air release valves shall be measured at the main connection, the air release box, and any major alignment changes between the two.

(b) Pipe sizes, lengths and materials

(c) Horizontal and vertical separation from existing and new utilities and drainage culverts/storm drain

(d) Street centerline station and offset dimension to:

(i) All fire hydrants and fittings (e.g. valves)

(ii) Main at all changes in alignment

(iii) All horizontal control points (e.g. centerline intersects, PC, PT)

(e) Centerline station and offset to each service tap; size of tap and meter

(f) Note centerline station, offset and elevations to all changes in vertical alignment (e.g. dips, bends, etc. required to avoid conflicts with other utilities). If the water main continues in a straight horizontal and vertical alignment for more than 100 feet, the water main will be surveyed every 100 feet. Sufficient survey measurements shall be taken on horizontal and vertical curves to establish an accurate alignment.

(g) The drawings must clearly indicate the specific points of reference. No dimensioning from points of curvature or tangency is acceptable for record drawing purposes. In all cases where the pipeline is constructed within, or parallel in close proximity with the right-of-way, all stationing and dimensioning must be from the nearest appropriate monument line and monument line intersection.

(h) When water services are not installed perpendicular to the water main, both the location of the tap at the main and the distance of the meter set from the nearest side property line of the lot must be shown.

(i) On phased projects, the phase lines must be clearly shown on the key map and on the plan and profile sheets, and their locations clearly identifiable. Actual pipe end locations relative to phasing lines must be shown by dimensioning or stationing.

(j) A complete list of all materials installed and abandoned must be shown. The specific size and material type of each pipeline installed must be shown at every construction reference to that pipe. Any changes to the record drawing must be reflected on the materials list.

(k) Water tank and appurtenances

(i) Required information for water tanks include, but are not limited to finished floor elevations, footing elevations, inlets, outlets, drains and overflow locations.

(ii) Required information for site piping and appurtenances shall follow the requirements of this section.

(iii) Manufacturer detail drawings for tanks shall be supplied and sealed by a Registered Engineer.

(3) Sewer Plans

(a) The alignments of the main(s) including all horizontal and vertical curves. If the sewer main continues in a straight horizontal and vertical alignment for more than 100 feet, the sewer main shall be surveyed every 100 feet. Sufficient survey measurements shall be taken on horizontal and vertical curves to establish an accurate alignment.

(b) All manholes, cleanouts, backwater valves, individual services, lift stations, and force main valves shall be surveyed. Structures shall have rim and invert elevations included.

(c) Pipe sizes and lengths

(d) Recalculated pipe slopes

(e) All valves at lift stations and line or isolation valves on force mains shall be measured on the nut and the center of the cover or vault lid.

(f) Separation from existing/newly installed water main and culverts

(g) Street centerline station and offset dimension from street centerline to main at manholes

(h) Sewer line stationing at centerline of each service tap at 90 degrees to main; if not installed at 90 degrees to main, station and offset to end of each service tap.

(i) New manholes built on existing lines require showing its station from the nearest existing downstream manhole and its distance to the nearest existing upstream manhole.

(j) Where construction begins with removal of an existing pipe plug or cleanout, 0+00 stationing always begins at the nearest existing downstream manhole. Pipe length measurement and stationing is always from the centerline of the downstream manhole to the centerline of the upstream manhole or cleanout. Do not give partial pipe lengths in plan or profile at match lines. Always indicate the distance between manholes or to cleanouts or pipe ends.

(k) All as-built adjustments to manhole, cleanout and pipe information shall be shown on both plan and profile, and repeated on every sheet that refers to the same information.

(l) A complete list of all materials installed and abandoned must be shown. The specific size and material type of each pipeline installed must be shown at every construction reference to that pipe. Any changes to the record drawing must be reflected on the materials list.

(m) On phased projects, the phase lines must be clearly shown on the key map and on the plan and profile sheets- and their locations clearly identifiable. Actual pipe end locations relative to phasing lines must be shown by dimensioning or stationing.

(4) Paving/Roadway Construction Plans

(a) Top of curb, flow line, and pavement centerline elevations at all grade breaks, Points of Tangency (PT), Points of Curvature (PC), Beginning Curb Return (BCR), and Ending Curb Return (ECR), valley gutters, spandrels at intersections, plus any other location necessary to adequately show drainage

(b) Percentage of slope

(c) ADA ramps including ramp slopes

(d) Edge of pavement on rural road sections

(e) Location of traffic signage, signals, poles and cabinets

(f) Station for all grade breaks

(g) Back of curb offset dimension at all changes in alignment

(h) Survey monuments - as-built installation and provide the City Northing/Easting to the hundredth of one foot. For street monuments, provide top of monument as-built elevation in addition.

(i) Distances from monument line to back/face of curb, edge of pavement, and sidewalk; show on plan view or typical detail for street section

(j) Beginning and ending stations and elevations for all traffic calming devices

(k) Stations, offsets, and invert elevations for spillways and box culverts

(l) Flow line elevations and/or pipe inverts, grate elevations for catch basins, underground detention storage tanks, and all other drainage structures

(5) Traffic Signal Plans

(a) Street centerline station and offset dimension to all fixture poles, cabinets, boxes, or other signal related furniture

(b) Horizontal location of conduit along with elevations to top of conduit

(6) Signing and Striping Plans

(a) Street centerline station and offset dimension to all signage, painted arrows, wording, and symbols

(b) Face of curb dimensions to all striping

(7) Storm Drain Plans

(a) Street centerline station and offset dimension to the main at all changes in alignment and/or changes in grade

(b) Street centerline station and offset dimension to all structures and changes in alignment

(c) Top and invert elevations for all structures

(d) Drainage pipe inverts

(e) Finish elevation for catch basins

(f) Invert elevations of box culverts

(g) Headwall data shall include top of wall/wingwall, footing elevations, inverts, and apron boundaries whether concrete or rip-rap

(h) Length of catch basin wings

(i) Drainage ditches, swales, and channels; the flow line and sufficient cross sections (minimum of 50 foot intervals) including grade changes, shall be provided

(8) Landscaping

(a) Revise as needed to reflect the addition, removal, relocation or change of irrigation main lines, plant materials or hardscape

(9) Street Light Plans

(a) Record drawings for street lights are required to have the Arizona Public Service (APS) ID number of each street light noted on the plan

(b) Street centerline stationing and offsets for street lights

(B) Prior to backfilling or covering any work, the Contractor shall notify the Engineer 48 hours in advance in writing for the item of work. The minimum 48 hours notice time shall not include weekends or holidays. The notification shall be via e-mail to both the City and Engineer.

(C) The Contractor must provide access for the Engineer to verify all as-built information prior to backfilling or covering. The Contractor shall not backfill or cover an item of work until verification has been completed by the Engineer. If the Contractor backfills or covers an item of work prior to being measured or

recorded by the Engineer, the Contractor at the direction of the Engineer shall uncover the item of work at no additional cost to the City.

(D) The Contractor shall maintain a redlined copy of the project plans including changes made in construction of the project on-site, and at all times. The redline copy shall be updated on a weekly basis in preparation for the weekly as-built field meeting. The Contractor shall provide the Engineer with a copy of the redline plans upon completion of the project.

(E) Weekly field meetings with the Contractor, Engineer and City shall occur to review As-Built information for conformance with the specifications. The Contractor shall provide the Engineer with a schedule of work items to be constructed in the upcoming 30 day period, including approximate dates of installation prior to backfilling or covering. The Contractor field redlines will be reviewed for notation of changes in the work. Missing, erroneous or deficient data must be corrected by the Contractor at no additional cost to the City.

(F) Measurement and Payment: No separate measurement and payment shall be made for record drawing preparation and coordination. This work shall be considered incidental and included in the unit price bid for construction or installation of the appropriate contract pay items.

SECTION 106: CONTROL OF MATERIALS

106.1 SOURCE OF MATERIALS AND QUALITY

ADD the following:

The Contractor shall submit in writing all materials to be used in the project in accordance with ADOT Specifications Sections 106 and 730-4.

106.2 SAMPLES AND TESTS OF MATERIALS

REMOVE in its entirety and REPLACE with the following:

(A) Quality control measures sufficient to produce materials and workmanship of acceptable quality are the responsibility of the Contractor. Upon request, the Contractor shall provide factory certificates of compliance or analysis or both to the Engineer. The Contractor shall provide full-time asphaltic concrete laydown compaction testing and adequate plant control for each paving day. The Contractor shall provide an independent geotechnical firm to perform all soils and concrete testing, as required, per these specifications.

(B) The weekly reports shall state the type of work performed during the report period and other process control measures taken to assure quality. Type of work must be identified by activity, location, station, and offset, purpose of test, and any other relevant information that the Engineer needs to identify or replicate the quality control testing. Results of all tests, corrective actions, re-tests, and control charts shall be attached to the weekly reports. Although hand written documentation can be included, the quality control report narrative and test results must be typed to ensure that clear reproductions of the documents can be made. The report period shall end at midnight each Friday and the report shall be submitted to the Engineer no later than 5:00 pm of the following Wednesday. Payment in the amount of $500.00 per report will be withheld for each individual report that is not delivered to the Engineer by the time and day specified above. Only ½ of the withheld payments will be returned on the next regular project progress payment when the delinquent reports have been turned in and all of the above requirements have been met. Any report turned in more than 10 business days beyond the Wednesday due date will not be eligible for withheld payments to be returned.

Table 1 – Quality Control Minimum Sampling Standard for ABC and Asphalt				
Standard MAG Spec Section	**Material**	**Type of Test(s) Required**	**Sampling Point**	**Minimum Sampling Frequency**
701, 702	Aggregate Base* (ABC)	Proctor Density	Roadway and Pipe Bedding	At start of production, then as material changes
		Compaction	Roadway and Pipe Bedding	One per 500ft, per lift, per lane pass
		Gradation, PI	Roadway and Pipe Bedding	One per project, or one per 1,000 tons of fraction thereof
321, 322, 323, 710	Hot In-Place Asphaltic Concrete	Oil Content and Gradation**	If no City Inspector is at plant, sample in-place	One per day or one per 500 tons or fraction thereof
321, 322	Hot In-Place Asphaltic Concrete	Mix Design Properties	If not City Inspector is at plant, sample in-place	One per day or one per 500 tons or fraction thereof
		Density/Nuke	Roadway	One per 500ft per lift, per lane pass
		Density/Core	Roadway	5 to 7 cores per mix/project** (additional cores to be taken if source or mix changes) per Engineer

Remarks:

*If Asphalt Millings are used for bedding, they shall meet the requirements of virgin aggregate base course, Asphalt Millings are not accepted as ABC for pavement cross-section.

**Asphalt deficient in oil content, at the direction of the City Inspector/Lab, will be cored 50ft on both sides of failed section. The results of these 2 cores will be averaged with the original test result. Also the cores for gauge calibration.

The City Inspector, on an as needed basis, may require additional tests.

Table 2- Quality Control Minimum Sampling Standard for Concrete				
Standard MAG Spec Section	**Material**	**Type of Test(s) Required**	**Sampling Point**	**Minimum Sampling Frequency**
505, 701, 702, 725	Concrete Flat Work, CIP, Structural	Compressive Strength	At Discharge	One set of three cylinders per 50 C.Y. or one per shift
		Slump, Air, Time and Temperature*	At Discharge	One per set of cylinders
		Thickness	Roadway	See Spec
	Structural Pre-cast** and Re-bar	Certification	Project	One per 100 LF of item. Re-bar size and heat number
701, 702, 725, 728	Lean Mix Concrete (Slurry)	Compressive Strength	At Discharge	One set of three cylinders per shift (per Engineer)

Remarks:

*Concrete spec for time is 90 minutes and temperature is 90 degrees.

**Manhole Shafts and Concrete Pipe need to have acceptance stamp on them and VCP need D-load test results from Certified Lab.

The City Inspector, on an as needed basis, may require additional tests.

Verification Packet should include the following:

All laboratories must submit a Verification Packet at the end of the project stating that the testing for the said project was in accordance to ASTM and/or AASHTO test procedures. This packet shall be sealed by an Engineer.

Sampling and testing was in accordance to the City of Prescott Acceptance Sampling Guide.

Testing was in accordance to MAG and the City of Prescott Supplements to MAG for Soils Subgrade and Trench Compaction, Aggregate Base Course and Asphalt sampling and compaction and concrete sampling and cylinder breaks.

Table 3- Quality Control Minimum Sampling Standard for Soil				
Standard MAG Spec Section	**Material**	**Type of Test(s) Required**	**Sampling Point**	**Minimum Sampling Frequency**
206, 601, 603, 205, 301	Soil Backfill or Trench Backfill	Proctor Density	In-Place	One per soil type
		Compaction	In-Place	One per 500ft, per lift
		Proctor Density	Roadway	One per soil type
	Subgrade	Compaction	Roadway	One per 500ft, per lift
		Gradation, PI	Roadway In-Place	One per soil type
	Manholes and Laterals	Compaction	In-Place	One per structure, pipe and lateral trench at various lifts
205, 601	Roadway, Excavation, Embankments	Proctor Density	In-Place	One per soil types
		Compaction	In-Place	One per 1,000 C.Y.
		Gradation, PI	In-Place or Source	One per soil type
211	Fill Construction	Compaction	In-Place	One per 500ft, per lift (MAG 211.3)

Remarks:

*All Compaction failures will be re-tested using a Sandcone. Any resulting failure will be re-worked before any re-tests are performed.

**The Nuclear Gauge shall be calibrated against the Sandcone at least every ten tests or per Engineer. Rock correction shall be used for any + #4 material to obtain Max Proctor Density.

The City Inspector, on an as needed basis, may require additional tests.

ADD the following subsection to Section 106- Control of Materials:

106.9 QUALITY ACCEPTANCE TESTING

(A) The Engineer may provide quality acceptance sampling and testing. The number of tests and location of each shall be determined by the Engineer. The expense of the initial sampling and testing shall be paid for by the City. Additional sampling and testing required due to failure of the initial test(s) shall be accomplished as provided by the City and these additional expenses shall be deducted from moneys due the Contractor.

(B) The Contractor and the Engineer's representative shall coordinate on a daily basis the following day's work schedule and any testing that may be necessary. The Engineer's quality acceptance testing will generally consist of (1) daily sampling and testing for asphalt extraction/gradation and Marshall density for each paving day; and (2) asphaltic concrete core drilling after placement to verify thickness and density. A minimum of one core per each 1,000 square yards of paving shall be randomly sampled by the Contractor's quality control lab after marking by the City inspector.

(C) Construction quality acceptance testing performed by the City does not relieve the Contractor or the manufacturer of materials produced for the Contractor, of the obligation to perform and document quality control testing of materials and workmanship.

(D) Measurement and Payment: No separate payment shall be made for Contractor Quality Control. This work shall be considered incidental and included in the unit price bid for construction or installation of the appropriate contract pay items. An independent geotechnical firm shall perform all quality control testing. The Contractor shall furnish copies of all test results to the City on a weekly basis.

No separate payment shall be made for Quality Acceptance Testing or any related work performed by the Contractor.

SECTION 107: LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

107.6 PUBLIC CONVENIENCE AND SAFETY

ADD the following:

(A) Maintenance of Traffic

(1) Unless otherwise provided, the road, while being improved shall be kept open to all traffic by the Contractor. When so requested by the Contractor and approved by the Engineer, the Contractor may by-pass traffic over an approved detour route. Regardless of whether it is through or local traffic, the Contractor shall keep the portion of the project being used by traffic in such condition that traffic will be adequately accommodated. A City approved traffic control plan/right-of-way permit is required prior to the detour.

(2) The Contractor shall also provide and maintain in a safe condition temporary approaches or crossings, intersections with trails, roads, streets, businesses, parking lots, driveways residences, garages and farms. The Contractor shall also be required to remove snow as directed by the Engineer.

(3) Before any detour is opened to traffic, the Engineer shall have been satisfied that traffic is able to proceed in a safe manner.

(4) The Contractor shall bear all expense of maintaining traffic over the road being improved as well as constructing, maintaining and subsequently removing the Contractor requested detours, approaches, crossings, intersections and other features as may be necessary without any direct compensation. The Contractor shall remove all unnecessary signage from the project area daily. If unnecessary signage is left, the City will contact the Contractor to remove it immediately. If the Contractor fails to remove the signage in a timely manner, the City will remove the signage at the Contractor's expense.

(5) Sidewalks shall be maintained to allow pedestrian foot traffic without obstruction. If a sidewalk must be closed, the Contractor shall maintain adequate prior warning for pedestrians to safely cross the street with as much advance notice as possible. Where sidewalk is not present, a City approved pedestrian detour shall be provided.

(B) Access to Businesses/Residences

The Contractor shall provide to all residents and businesses affected by the project, access to one of their driveways at all times except as modified by the following: If the Contractor finds it unavoidable to temporarily close off access for any time, the residents/businesses affected shall be contacted a minimum of 48 hours in advance and an alternate procedure for access mutually agreed to. The Contractor shall provide the Engineer with signed evidence of a mutually accepted agreement between the property owner/business manager/residential manager and the Contractor prior to said closure.

(C) Safety

(1) The safety and convenience of the general public and the residents along the project and the protection of persons and property shall be provided for by the Contractor in accordance with the requirements of this contract.

(2) The Contractor shall submit a safety plan to the Engineer at the preconstruction conference. The plan shall detail the procedures The Contractor will implement to satisfy OSHA and the State Occupational Safety Guidelines related to the worker as well as public safety in construction of excavations, structures and confined air spaces as identified by the Engineer. The Contractor's safety plan shall include the requirement that all workers and visitors must wear hard hats while within the project limits.

(3) The safety plan submitted by the Contractor shall include proposed methods to prevent unauthorized persons from gaining access to the work areas.

(4) In conjunction with the safety plan, the Contractor shall furnish and install 72 inch temporary chain link fencing, or approved equal satisfactory to the Engineer, around any unattended excavation deeper than 4 feet with slopes steeper than 2:1. Temporary fencing shall completely enclose the referenced construction activity and shall be secured after normal working hours to prevent unauthorized access.

(5) Unless otherwise approved in writing by the Engineer, open utility trenches shall be limited to 50 feet in length except for cast-in-place pipe installations and during non-working hours shall be covered with steel plate in a manner satisfactory to the Engineer. Appropriate warning signs shall be installed when steel plates are left during non-work hours. Any traffic control signing shall be included in the traffic control line item(s) for the project.

107.9 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE

ADD the following:

Mailboxes and traffic signs removed during construction shall be installed in "like kind" and shall be considered incidental to the unit prices for work included in the bid schedule, provided they are not in the bid schedule.

Existing landscape improvements, drainage ditches, etc., shall be restored in "like kind" so that the improvement is put back in as close to its prior state as possible.

The Contractor shall restore each individual work site to grades existing before construction work, including wheel ruts and other scarring.

Measurement and Payment: No separate payment will be made for restoration of items impacted by the Contractor's construction operation and the cost of these items shall be included in the unit bid prices in the bid schedule, unless specifically called out in the bid schedule as protection and restoration of property and landscape.

ADD the following subsection to Section 107- Legal Regulations and Responsibility to Public:

107.15 PUBLIC RELATIONS

The Contractor shall be required to furnish a private telephone line to be used solely for receiving incoming calls from local citizens with questions or complaints concerning construction operations or procedures. The Contractor shall be required to publish this telephone number and maintain a 24 hour answering service. The answering service shall be manned by the Contractor's personnel during all hours during the course of construction that there is work being performed on this project. The Contractor shall maintain a log of incoming calls, responses, and action taken, which shall be submitted to the Engineer weekly and upon request.

The Contractor shall retain the services of a community relations organization for this project. The Contractor shall submit for approval, to the Engineer, the resume of the proposed community relations organization. Included in the resume shall be the names and credentials of the staff. The community relations organization shall be proactive and knowledgeable in the means and effectiveness of various notification techniques. The Engineer will rely on the organization's experience and suggestions in the presentation of information to the public. The Engineer will review the resume and possibly interview the organization. The Engineer will notify the Contractor within 10 calendar days of the acceptability of the community relations organization. Upon notification by the Engineer of an acceptable community relations organization, the Contractor shall hire the organization.

The community relation organization's activities shall include, but not necessarily be limited to:

1. Printing and distribution of public notices
2. Providing media news releases after review by the Engineer
3. Planning and attending other public meetings as required by the Engineer
4. Planning or otherwise participating in the dedication ceremonies as requested by the Engineer
5. Possess the means for the development and fabrication of newsletters, notices, posters and demonstration boards
6. Providing telephone "Hot Line" 24 hour service

A pre-construction meeting will be scheduled between the Engineer and the Contractor to specifically address the hiring of a community relations organization. This meeting will be scheduled as soon as possible after the award of a contract. The intent is to have a community relations organization on board prior to the pre-construction meeting, a meeting in which the community relations organization will have an important participatory role.

The community relations organization shall develop a community relations program. The program shall include but not necessarily be limited to:

(A) Distributing a pre-construction information letter to all residents, businesses, schools and churches within an area determined by the Engineer, which shall contain, as a minimum, the following information:

1. Name of contractor
2. A 24 hour informational telephone number
3. Brief description of project
4. Names of project manager and superintendent (Contractor)
5. Name of project Engineer (Public Works Department)
6. Construction schedule including anticipated work hours
7. Traffic regulations including lane restrictions
8. Time and place for the pre-construction meeting. This notification shall be delivered a minimum of 5 working days prior to the meeting.

(B) Holding a pre-construction community meeting with affected neighbors, businesses, schools, churches, etc., as directed by the Engineer.

(C) Scheduling and conducting progress meetings, as required, with the affected business tenants and property owners.

(D) Printing and mailing of public notices and/or newsletters, including a list of the names, addresses and receipt of postage or delivery for recipients of these newsletters and/or notifications.

(E) Holding other public meetings as required by the Engineer.

(F) The community relations organization shall use the means (Items A through E) or others to inform the local citizens of operations which may create changes to the norm such as high noise levels, road closures, limited access, haul routes, changes to material delivery routes, unusual hours of construction, disruption of bus routes or changes to other passenger delivery/pick-up routes.

(G) Newsletters shall be distributed each month. A final draft shall be submitted to the Engineer for review and approved at least 2 days before the planned distribution. Each distribution area shall be approved by the Engineer. Each distribution shall include 12 copies for the Engineer.

(H) The community relations organization shall keep daily personnel time logs which shall include the name of the employee, date of work, amount of time worked, description of work performed and project number.

Measurement and Payment: The bid schedule includes an allowance for public relations for the purpose of encumbering funds to cover the cost of public relation services. The amount of the allowance is determined by the Engineer and is not subject to individual bid pricing. All bidders shall incorporate the amount pre-entered in the bid proposal and shall reflect the same in the total bid for this project.

It shall be understood that this allowance item is an estimate only. The allowance shall not be used without approval of the Engineer, and in no case shall exceed the allowance.

Reimbursement for public relations shall be based on the community relations organization invoice cost, plus an allowable markup to the prime Contractor of 15 percent, for those services approved by the Engineer.

Pay Item: 107.15 Public Relations

ADD the following subsection to Section 107- Legal Regulations and Responsibility to Public:

107.16 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

This project is subject to the Arizona Pollutant Discharge Elimination System (AZPDES) stormwater requirements for construction sites under the Environmental Protection Agency (EPA) delegation to the Arizona Department of Environmental Quality (ADEQ) for the Construction General Permit for Arizona. The following specifications shall apply:

(A) General Requirements

The Contractor shall comply with the Arizona Pollutant Discharge Elimination System (AZPDES) stormwater requirements for construction sites under the Arizona Department of Environmental Quality (ADEQ) Construction General Permit for Arizona. Under provisions of that permit, the Contractor shall be designated as permittee and shall be responsible for providing the necessary labor and materials, and for taking the appropriate measures to assure compliance with the AZPDES Construction General Permit for Arizona as well as other Federal, State and local requirements pertaining to stormwater discharges. As the permittee, the Contractor is responsible for completing, in a manner acceptable to ADEQ, all documents required by this regulation including the following:

(1) The SWPPP shall be sealed by a professional engineer licensed in the State of Arizona.

(2) The SWPPP for the project including certification form. The Contractor will be required to update and revise the SWPPP as necessary throughout the construction of the project in order to assure compliance with ADEQ permit requirements. The completed SWPPP shall be kept on the project site at all times during construction of the project.

(3) Notice of Intent (NOI) to be covered by AZPDES Construction General Permit for Arizona including certification of signature.

(4) Notice of Termination (NOT) of coverage under AZPDES Construction General Permit for Arizona (upon project completion).

Copies of necessary forms and guidance for preparing the SWPPP are available at ADEQ's website http://www.azdeq.gov/node/524.

(B) Submittals

(1) Preliminary copies of the NOI and SWPPP shall be submitted to the Engineer at the time of the preconstruction meeting. Any necessary revisions to the SWPPP shall be subject to review by the Engineer, prior to implementation.

(2) The Contractor shall submit completed, signed NOI forms to ADEQ at least 48 hours prior to the initial start of construction on the project. One copy of the completed, signed NOI form shall be submitted to Arizona Department of Environmental Quality at the following address: Stormwater Program - Water Permits Section/NOI, ADEQ (5415B-3), 1110 West Washington, Phoenix, AZ 85007. ADEQ has also created an online Smart NOI feature that allows for electronic application and termination, it can be found at https://ptl.az.gov/app/smartnoi/(S(nmcv0v3jgqecvssvemj0e45b))/default.aspx.

(3) Failure by the Contractor (or any of its appropriate subcontractors) to submit the NOI forms within the required time frame shall result in delay of the start of construction. Any delay resulting from the Contractor failing to fulfill these requirements shall not extend the completion date of the contract unless authorized by the City. The Contractor shall submit a completed copy of the NOI prior to Notice to Proceed. A copy of the completed NOI shall be posted on the construction site and a copy of the SWPPP shall be kept on the construction site.

(C) Contractor Responsibilities

(1) It is the Contractor's responsibility to perform inspection of all stormwater pollution control devices on the project as required under the AZPDES Construction General Permit for Arizona.

(a) The site will be inspected a minimum of once every 7 calendar days, or

(b) The site will be inspected a minimum of once every 14 calendar days, and also within 24 hours of each storm event of 0.5 inches or greater in 24 hours; or

(c) The site will be inspected a minimum of once per month, but not within 14 calendar days of the previous inspection and within 24 hours of the occurrence of a storm event of 0.25 inches or greater.

The Contractor shall prepare reports on these inspections and retain these reports for a period of 3 years following project completion as required under the AZPDES Construction General Permit for Arizona. Inspection reports shall be submitted monthly to the contracting agency along with payment requests. The Contractor shall maintain all stormwater pollution control devices on the project in proper working order, including cleaning and/or repair during the duration of the project.

(2) No condition of either the AZPDES Construction General Permit for Arizona or the SWPPP shall release the Contractor from any responsibilities or requirements under other environmental statutes and regulations.

(D) Upon total project completion, acceptance, and de-mobilization, the Contractor shall submit a completed, signed NOT form to ADEQ with copies to the same agencies who received copies of the NOI, thereby terminating all AZPDES permit coverage for the project.

Measurement and Payment: Payment shall be at the lump sum unit price bid in the contract documents for all material, labor, and other incidental costs relating to the provision, installation, and maintenance of items relating to this permit during project construction. Such incidental costs shall include the Contractor's costs in order to assure proper operation of the pollution-control devices installed including all maintenance, cleaning, and disposal costs associated with clean-up and repair following storm events or other runoff or releases on the project.

Pay Item: 107.16 Stormwater Pollution Prevention Plan (SWPPP)

SECTION 108: COMMENCEMENT, PROSECUTION AND PROGRESS

108.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

ADD the following:

At the pre-construction meeting the Contractor shall submit for review by the Engineer a complete construction schedule as stated in the general conditions of these contract documents. Once this schedule has been accepted by the Engineer, the Contractor shall not deviate from it until a revised schedule has been submitted and accepted by the Engineer. The Engineer reserves the right to reject construction schedule submittals when in his opinion the schedule lacks the proper detail.

SECTION 109: MEASUREMENTS AND PAYMENTS

109.10 PAYMENT FOR MOBILIZATION/DEMOBILIZATION

REMOVE in its entirety and REPLACE with the following:

The Agency will compensate the Contractor for a single round trip mobilization/demobilization of the Contractor's personnel, equipment, supplies and incidentals, including establishment of offices, buildings and other facilities required for the performance of the work on the project, as well as preparatory work and operations prior to the commencement of the work on the project site.

Measurement and Payment: Mobilization will be measured for payment by the lump sum bid as a single complete unit of work. Payment for mobilization will be made as provided herein which shall be full compensation for supplying and furnishing all materials, facilities, and services and performing all the work involved as specified above. The total amount allowed for mobilization during the life of the contract shall not exceed 9 percent of the original contract amount. If the bid price exceeds this percentage the excess amount will be paid to the Contractor upon completion of the contract and 9 percent of the contract amount shall be used to determine partial payments. Partial payments under this item will be made in accordance with the following provisions:

(1) The first payment of 1/3 of the lump sum price for mobilization may be made provided that all submissions required under this section and the general conditions of the contract are submitted by the Contractor at the pre-construction conference to the satisfaction of the Engineer and when the Engineer has determined that a significant amount of equipment has been mobilized to the project site which will be used to perform portions of the project work.

(2) The second payment of 1/3 of the lump sum price for mobilization shall be made on the first estimate following completion of 13 percent of the contract.

(3) The third payment of 1/3 of the lump sum price for mobilization will be made on the first estimate following completion of 26 percent of the contract.

Pay Item: 109.10 Payment for Mobilization/Demobilization

ADD the following subsection to Section 109- Measurements and Payments:

109.11 CONTRACT ALLOWANCE

(A) Contract allowance items are provided for the purpose of encumbering funds to cover the costs of possible contract amendment work. The amount of the allowance item is determined by the Engineer and is not subject to individual bid pricing. All bidders shall incorporate the amount pre-entered in the bid proposal and shall reflect the same in the total amount bid for this project.

(B) This allowance item provides an estimated funding to cover unforeseen changes that may be encountered and corresponding extra work needed to complete the contract per plan. Unforeseen extra work, if any, shall be in accordance with the contract amendment section of the general conditions.

(C) It shall be understood that this allowance item is an estimate only and is based on contract amendment history of similar projects. It shall not be utilized without an approved contract amendment. It is further understood that authorized extra work, if any, may be less than the allowance item. The Contractor, by submittal of his bid, acknowledges that the total bid and individual bid items were prepared without anticipation of use of the contract allowance.

Pay Item: 109.11 Contract Allowance

PART 200 – EARTHWORK

ADD the following section to Part 200- Earthwork:

SECTION 200: DEWATERING AND BYPASS PUMPING

200.1 DEWATERING

(A) All water encountered during the work shall be disposed of by the Contractor in a manner such that it will not damage public or private property or create a public nuisance or health problem. The Contractor shall submit drawings and complete design data showing methods and equipment he proposes to utilize in dewatering prior to completing any dewatering work. This work shall consist of obtaining permits, furnishing equipment, materials, and labor necessary for the control and removal of water, the construction or installation of all facilities necessary to accomplish the work, and the subsequent removal of such facilities except when designated on the project plans or in the special provisions to remain in place.

(B) The Contractor shall keep, where appropriate, the rehabilitated pipe section free from water during rehabilitation. If groundwater is present in any excavation, the static groundwater level shall be drawn down a minimum of 1 foot below the bottom of excavations to maintain the undisturbed state of natural soils and allow the placement of any fill to the specified density. Disposal of water shall not damage property or create a public nuisance. The Contractor shall have on hand pumping equipment and machinery in good working

condition for emergencies and shall have workmen available for its operation. Dewatering systems shall operate continuously until backfill has been completed to 1 foot above the normal static groundwater level.

Groundwater shall be controlled to prevent softening of the bottom of excavations, or formation of "quick" conditions. Dewatering systems shall not remove natural soils. The Contractor shall control surface runoff to prevent entry or collection of water in excavations.

Release of groundwater to its static level shall be controlled to prevent disturbance of the natural foundation soils or compacted fill and to prevent flotation or movement of structures or pipelines.

Measurement and Payment: No separate measurement or payment shall be made for dewatering. This work shall be considered incidental and included in the unit price bid for construction or installation of the appropriate contract pay items.

200.2 BYPASS PUMPING

(A) Description

(1) Scope: This section specifies the requirements for temporary bypass pumping of sewers

(2) Requirements:

(a) The Contractor shall provide labor, materials, and supervision to temporarily bypass flow around the Contractor's work.

(b) The Contractor shall have the entire bypassing system in place and tested before bypassing any sewage.

(3) At the pre-construction conference, the Contractor shall submit drawings and complete design data showing methods and equipment he proposes to utilize in sewer bypassing for approval by the Engineer. The submittal shall include the following information:

(a) Drawings indicating the location of temporary sewer plugs and bypass discharge lines

(b) Capacities of pumps, prime movers, and standby equipment

(c) Design calculations providing adequacy of the system and selected equipment

(d) Standby power source

(e) Staffing plan

(f) Traffic control plan

(4) Flow Data: It is the responsibility of the Contractor for design, construction, and operation of an adequate and properly functioning bypass. It is also the responsibility of the Contractor to coordinate with the City to gather flow data.

(5) Protection: In areas where flows are bypassed, all bypass flow shall be discharged as approved by the Engineer. No bypassing to the ground surface, receiving waters, storm drains or bypassing which results in groundwater contamination or potential health hazards shall be permitted.

(6) Scheduling: The bypass system shall not be shut down between shifts, on holidays or weekends, or during work stoppages without written permission from the Engineer. Public advisory services will be required to notify all parties whose service laterals will be out of service and to advise against water usage until the main line is back in service.

(B) Materials

(1) The Contractor shall provide temporary pumps, conduits and other equipment to bypass the sewer flow. The Contractor shall furnish the necessary labor and supervision to set up and operate the pumping and bypass system. Engines shall be equipped with mufflers and/or enclosed to keep the noise level less than 50dB or 10dB above ambient noise levels when measured at the property line closest to the noise source. Pumps and bypass lines shall be of adequate capacity and size to handle the flows.

(2) The Contractor shall maintain on site sufficient equipment and materials to ensure continuous and successful operation of the bypass systems. Standby pumps shall be fueled and operational at all times. The Contractor shall maintain on site a sufficient number of valves, tees, elbows, connections, tools, sewer plugs, piping and other parts or system hardware to ensure immediate repair or modification to any part of the system as necessary.

(3) All piping, joints and accessories shall be designed to withstand at least twice the maximum system pressure, or 50 psi, whichever is greater. All hoses/pipes used for bypass pumping shall be ramped to allow for the ease of vehicular and pedestrian traffic. All hoses/pipes shall be color-coded for identification to prevent cross contamination of water and wastewater lines. Hose/pipes used for wastewater conveyance shall not be used for water conveyance.

(C) General

(1) During bypass pumping, sewage shall not be leaked, dumped or spilled outside the sewer system. When bypass pumping operations are complete, all piping shall be drained into the sanitary sewer prior to disassembly. In the event that sewage accidentally drains into the storm drainage system or the street, the Contractor shall immediately stop the overflow, notify the City and take the necessary action to clean up and disinfect the spillage to the satisfaction of the City. The Contractor shall submit their emergency spillage and cleanup action plan for all sewage spills to the Engineer for approval prior to beginning construction. It shall include but not be limited to a remediation plan that indicates what labor, equipment and resources will be used to restore the site to the condition prior to the spillage.

(2) The Contractor shall repair without cost to the City any damage that may result from this negligence, inadequate or improper installation, maintenance and operation of bypassing system including mechanical or electrical failures, regulatory infractions and penalties resulting from sewer spillage.

(D) Flow Control

(1) Complete stoppage or bypassing of flow is required during sewer line and manhole rehabilitation work.

(2) When the depth of flow at the upstream manhole of the sewer line section being worked is above the maximum allowable for television inspection, the flow shall be reduced to the level shown below by plugging or blocking of the flow, or by pumping and bypassing of the flow as specified.

(3) Plugging or Blocking: A sewer line plug shall be inserted into the line upstream of the section being worked. The plug shall be so designed that all or any portion of the sewage can be released. During TV inspection, flow shall be reduced to within the limits specified above. After the work has been completed, flow shall be restored to normal. Precautions shall be taken to prevent flooding damage. See flow precautions below.

(4) Pumping and Bypassing: When pumping and bypassing is required the Contractor shall supply the pumps, conduits and other equipment, to divert the flow of sewage around the manhole section in which work is to be performed. The bypass system shall be of sufficient capacity to handle existing flow plus additional flow that may occur during peak flow periods or from precipitation and shall be constructed of such material that will prevent leakage during the pumping operation. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate

the pumping and bypassing systems. All pump drivers shall have noise suppressor exhaust systems to reduce noise levels to less than 50dB, or 10dB above ambient noise levels, when measured at the closest property line.

(5) Flow Control Precautions: When flow in a sewer line is plugged, blocked or bypassed; sufficient precautions must be taken to protect the sewer lines from damage that might result from sewer surcharging. Further, precautions must be taken to ensure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewer involved. All piping(s), joints and accessories shall be designed to withstand at least twice the maximum system pressure or a minimum of 50 psi whichever is greater. During by-pass pumping sewage shall not be leaked, dumped or spilled onto any area outside the sewer system. When bypass pumping operations are complete all piping shall be drained into the sanitary sewer prior to disassembly. In the event sewage accidentally drains into the drainage system or street, the Contractor shall immediately stop the overflow, notify the Engineer and take the necessary action to clean up and disinfect the spillage to the satisfaction of the Engineer. If sewage is spilled onto public or private property, the Contractor shall wash down, clean up and disinfect the spillage to the satisfaction of the City. The Contractor shall report any and all overflows to the City.

(E) Measurement and Payment: Payment for bypass pumping shall be made at the lump sum bid by the Contractor.

Pay Item: 200.2 Bypass Pumping

SECTION 201: CLEARING AND GRUBBING

201.1 DESCRIPTION

REMOVE in its entirety and REPLACE with the following:

This work shall consist of removing objectionable material from the right-of-way, easements, all areas to be graded, and such other areas as may be specified in the special provisions. Clearing and grubbing shall be performed in advance of grading operations.

201.3 CONSTRUCTION METHODS

REMOVE the second paragraph in its entirety and REPLACE with the following:

All trees and shrubs found suitable for improvement and beautification, which will not interfere with excavation or embankment or cause disintegration of the improvements shall not be disturbed. In any event, the Contractor shall avoid injury to shrubbery, vines, plants, grasses and other vegetation growing outside of the clearing limits. The dragging and the piling of materials of various kinds and the performing of other work which may be injurious to vegetation shall be confined to areas which have no vegetation or which will be covered by embankment or disturbed by excavation during grading operations.

REMOVE the fourth paragraph in its entirety and REPLACE with the following:

From excavated areas, all stumps, roots and other obstructions 3 inches or over in diameter shall be grubbed to a depth of not less than 24 inches below finish grade.

REMOVE Table 201-1 in its entirety and REPLACE with the following:

TABLE 201-1	
EMBANKMENT CLEARING AND GRUBBING	
Height of Embankment Over Stump	**Height of Clearing and Grubbing**
0 Feet to 2 Feet	All stumps or roots 6 inches or over in diameter shall be grubbed to 24 inches below original grade. All others shall be cut flush with the ground.
2 Feet to 3 Feet	All stumps 1 foot and over in diameter shall be grubbed to 24 inches below original grade. All others shall be cut flush with the ground.
Over 3 Feet	All stumps shall be cut flush with the ground.

REMOVE the eighth paragraph in its entirety and REPLACE with the following:

All tree trunks, stumps, brush, limbs, roots, vegetation and other debris removed in clearing and grubbing shall be completely removed from the project and properly disposed of.

SECTION 205: ROADWAY EXCAVATION

ADD the following subsection to 205.1 Description:

205.1.1 General

The bidding schedule quantities for this item of work will be considered to be the final quantities for payment. Adjustments in the bidding schedule quantities for roadway excavation as contained in these specifications may be initiated by the Contractor or the Engineer if evidence indicates that the required quantity varies by an amount greater than 5 percent of the bidding schedule quantity. The Contractor shall advise the Engineer, in writing, submitting evidence in the form of a construction survey or photogrammetric survey with measurement for the proposed adjustment and requesting an adjustment in quantities. The Engineer will determine the amount of adjustment, if any. The quantity upon which payment will be based will be the bidding schedule quantity plus or minus only that portion of the adjustment that exceeds 5 percent of the bidding schedule quantity.

Variations caused by shrink/swell of materials shall not be considered for quantity adjustments.

Adjustments in roadway excavation quantities due to revisions ordered by the Engineer will be isolated by measurement or calculations. The bidding schedule quantities will be adjusted by the amount either measured or calculated, regardless of the 5 percent variation requirement above.

205.2 UNSUITABLE MATERIAL

REMOVE the third paragraph in its entirety and REPLACE with the following:

If material is encountered during excavation that the Engineer determines to be unsuitable, the following shall apply:

(1) Material which is located in a cut section at an elevation above finished subgrade shall not be utilized in construction but shall be removed and disposed of at a site secured by the Contractor.

(2) Material which is located below the finished subgrade elevation in excavation areas shall be removed to the limits as determined by the Engineer and the resultant cavity backfilled with aggregate base course (ABC) in accordance with Section 310.

205.6 SURPLUS MATERIAL

REMOVE the first paragraph in its entirety and REPLACE with the following:

Unless otherwise shown on the plans, addressed in the special provisions, or approved by the Engineer, no surplus excavated material shall be disposed of within the right-of-way. The Contractor shall make all arrangements for disposal of the material at off-site locations as may be approved by the Engineer. The Contractor shall provide to the Engineer copies of the written consent of the owner of the property upon which he intends to dispose of such material, and any permits that may be required by a governing agency for said disposal.

205.7 MEASUREMENT

REMOVE the first two paragraphs in their entirety and REPLACE with the following:

The following earthwork operations will be measured as roadway excavation for the quantities of material involved.

Excavating the roadway prism including public and private roadway approaches; excavating slides and slip-outs not resulting from overshooting; excavating excess material; excavating selected material and topsoil from within the limits of the project and removing such materials from stockpiles when stockpiling is ordered; and excavating ditches.

ADD the following:

Measurement for unsuitable material shall be to the nearest cubic yard as calculated in the field.

205.8 PAYMENT

ADD the following:

Payment for unsuitable material shall be at the contract unit price and shall include all excavation, hauling and disposal at a site secured by the Contractor, and backfilling with aggregate base course (ABC).

Pay Item: 205.1 Roadway Excavation

Pay Item: 205.2 Unsuitable Material

SECTION 206: STRUCTURE EXCAVATION AND BACKFILL

206.4.2 Structure Backfill for Earth Retaining Structures

REMOVE paragraph (A) in its entirety and REPLACE with the following:

(A) Shall conform to the material and the graduation requirements for Select Material, Type B in Table 702-1, unless otherwise approved by the Engineer.

206.4.4 Structure Backfill for Structures within Paved Areas

REMOVE in its entirety and REPLACE with the following:

Where a structure is located within an existing street, proposed street, or paved area:

All backfill material with the exception of controlled low strength material (CLSM) shall be compacted to 95 percent maximum dry density per ASTM D-698. Controlled low strength material shall be 1 sack material as specified in Sections 604 and 728.

SECTION 211: FILL CONSTRUCTION

211.1 DESCRIPTION

REMOVE in its entirety and REPLACE with the following:

Fill construction shall consist of constructing embankments except as may otherwise be specified, including the preparation of the areas upon which they are to be placed; including the construction of dikes.

The bidding schedule quantities for this item of work will be considered to be the final quantities for payment. Adjustments in the bidding schedule quantities for Fill Construction as contained in these specifications may be initiated by the Contractor or the Engineer if evidence indicates that the required quantity varies by an amount greater than 5 percent of the bidding schedule quantity. The Contractor shall advise the Engineer, in writing, submitting evidence in the form of a construction survey or photogrammetric survey with measurement for the proposed adjustment and requesting an adjustment in quantities. The Engineer will determine the amount of adjustment, if any. The quantity upon which payment will be based will be the bidding schedule quantity plus or minus only that portion of the adjustment that exceeds 5 percent of the bidding schedule quantity.

Variations caused by shrink/swell of materials shall not be considered for quantity adjustments.

Adjustments in Fill Construction quantities due to revisions ordered by the Engineer will be isolated by measurement or calculations. The bidding schedule quantities will be adjusted by the amount either measured or calculated, regardless of the 5 percent variation requirement above.

211.2 PLACING

REMOVE the first paragraph in its entirety and REPLACE with the following:

Rocks or other solid material which are larger than 4 inches in greatest dimension shall not be placed in fill areas. Broken concrete or asphalt shall not be placed in the fill.

211.3 COMPACTING

REMOVE the seventh paragraph in its entirety and REPLACE with the following:

The interstices around the rock in each layer shall be filled with earth or other fine material and compacted. Broken Portland cement concrete and bituminous pavement shall not be permitted in the fill.

211.4 TESTS

ADD the following:

Quality control testing frequency shall be one per soil type for proctor density testing and one per 500 feet per 8 inch lift for compaction testing.

211.5 MEASUREMENT

REMOVE the first paragraph in its entirety and REPLACE with the following:

The quantities of fill construction used to construct embankments or dikes will be those of the complete bid item within the limits of dimensions shown on the plans.

211.6 PAYMENT

ADD the following:

Pay Item: 211.1 Fill Construction

PART 300 – STREETS AND RELATED WORK

ADD the following section to Part 300- Streets and Related Work:

SECTION 300: SAW CUT

300.1 DESCRIPTION

(A) The work under this item shall consist of saw cutting the existing pavement where new asphalt concrete is to match existing bituminous surfaces with no provisions for overlaying the entire section. This item shall also include saw cutting of existing Portland cement concrete pavement, sidewalks, driveways and parking lots where new construction shall match the grade of existing surfaces that are to remain where called for on the project plans or where designated by the Engineer.

(B) Saw cuts shall be made to a full depth of the material to ensure a neat vertical joint. Portland cement concrete designated to remain that is damaged by the saw cutting shall be replaced in kind at the Contractor's expense.

(C) No separate measurement or payment will be made for saw cutting, being considered incidental to the cost for work for which saw cutting is required.

SECTION 301: SUBGRADE PREPARATION

301.1 DESCRIPTION

ADD the following:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for preparation of natural or excavated areas prior to the placement of any sub-base material, pavement, curbs and gutters, driveways, sidewalks or other structures. Unless provided for in another bid item, this work shall include the removal and disposal of all unsuitable material including existing pavement and other obstructions in accordance with Section 301. The Contractor shall be required to provide and pay for all quality control geotechnical testing in accordance with the MAG Specifications and the City's MAG Supplement.

301.2.1

REMOVE in its entirety and REPLACE with the following:

The Contractor shall not use asphalt concrete or other bituminous roadway surfacing materials as embankment fill.

Project earthwork quantities, when included as separate contract pay items, will include removed asphalt/bituminous material volumes, unless there is a pay item for asphalt removal or asphalt milling in the bid schedule or otherwise specified in the special provisions.

All unsuitable material and all excess material shall be disposed of in accordance with the requirements of Sections 205.2 and 205.6, respectively. When additional material is required for fill, it shall conform to Section 210.

301.3 RELATIVE COMPACTION

REMOVE paragraph (B) in its entirety and REPLACE with the following:

The subgrade shall be scarified and loosened to a depth of 8 inches.

(B)	Below detached sidewalk not subject to vehicular traffic	95 percent

Subgrade quality control testing shall be one per 500 linear feet per lane for compaction testing.

301.7 MEASUREMENT

REMOVE in its entirety and REPLACE with the following:

Measurement for subgrade preparation will be by the square yard, measured by the total accepted area of new pavements, including paved shoulders, tapers, turnouts and driveways that are paved or surfaced with an aggregate base material. The areas under concrete curb and gutter, sidewalk and concrete driveway entrances will not be included. Unless provided for in other separate bid items or unless otherwise specified; Clearing and Grubbing, Roadway Excavation, Rock Excavation, Borrow Excavation, and Fill Construction shall not be measured, in which case payment for these earthwork items, if required, shall be included in the unit price for subgrade preparation.

301.8 PAYMENT

ADD the following:

Pay Item: 301 Subgrade Preparation

SECTION 306: MECHANICALLY STABILIZED SUBGRADE – GEOGRID REINFORCEMENT

306.2 MATERIALS

ADD the following

Reinforcement Geogrid shall be Tensar BX1200 or approved equal.

306.8 PAYMENT

REMOVE in its entirety and REPLACE with the following:

Measurement of geogrid reinforcement shall be the surface area of accepted geogrid to the nearest square yard. No additional measurement or payment shall be made for geogrid overlap as required by the manufacturer.

Payment for geogrid reinforcement shall be per square yard installed complete and in place.

Pay Item: 306 Geogrid, Tensar BX1200

SECTION 310: PLACEMENT AND CONSTRUCTION OF AGGREGATE BASE COURSE

310.1 DESCRIPTION

REMOVE in its entirety and REPLACE with the following:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for the placement of an approved, imported aggregate base course material on top of a prepared subgrade per the required design thickness, grade, cross-section and compaction as specified on the project plan documents and in accordance with Sections 310, 701 and 702. Aggregate base course shall not be placed on a prepared subgrade until the Engineer or authorized representative has inspected and accepted the underlying subgrade. The Contractor shall be required to provide and pay for all quality control geotechnical testing in accordance with the MAG Specifications and the City's MAG Supplement. Use of Reclaimed Concrete Material (RCM) is not allowed.

ADD the following subsection to 310.1 Description:

310.1.1 Reclaimed Asphalt Pavement (RAP)

Use of Reclaimed Asphalt Pavement (RAP) aggregates or "millings" produced on-site for the intended use in the underlying base or subgrade material ***must be approved by the City Engineer or authorized***

representative. Imported or stockpiled RAP milling material allowed to be used in lieu of or blended with virgin aggregate base course material shall be screened and meet Sections 310, 701 and 702. RAP millings must be uniformly mixed with an imported virgin aggregate base course material.

310.2 PLACEMENT AND CONSTRUCTION

ADD the following:

Aggregate base course shall not be placed on excessively wet or frozen subgrade materials as determined by the Engineer.

ADD the following subsection to 310.2 Placement and Construction:

310.2.1 Quality Control Testing

Aggregate base course quality control testing frequency shall be as follows:

Resistance to Degradation and Abrasion: One at the start of production and again if source changes.

Fractured Faces, One Face, PI, and Gradation: One per shift.

310.3 COMPACTION

REMOVE the fifth paragraph in its entirety and REPLACE with the following:

For roadway construction, a minimum of one field density test shall be performed per 6 inch lift per 500 feet per lane. For other aggregate base course applications, a minimum of one field density test shall be performed for each 800 square yards.

REMOVE paragraphs (A), (B) and (C) in their entirety and REPLACE with the following:

Aggregate base course shall be compacted to 98 percent in all instances.

310.5 PAYMENT

REMOVE in its entirety and REPLACE with the following:

Measurement for aggregate base course material will be per ton furnished and placed. Copies of material delivery tickets will be required for quantity verification purposes. Payment shall be made at the unit price bid and shall be considered full compensation for this work item.

Pay Item: 310 Placement and Construction of Aggregate Base Course

SECTION 317: ASPHALT MILLING

317.2 CONSTRUCTION REQUIREMENTS

REMOVE in its entirety and REPLACE with the following:

When milling is specified, the existing asphaltic concrete shall be removed in accordance with the details shown on the project plans with equipment specifically designed to remove such material by means of grinding or chipping to a controlled line and grade. The equipment used shall be capable of removing the existing asphaltic concrete within 0.01 feet of the specified removal depth. The removal shall be accomplished in a manner which does not destroy the integrity of any asphaltic concrete pavement that remains and which does not result in a contamination of the milled asphaltic concrete with the underlying base material.

Pavement to be removed by milling, adjacent to manholes, valve boxes, small radius curbs and other fixed objects that produce confined areas shall be removed with milling equipment specifically designed to operate in restricted areas and capable of removing asphaltic concrete of the specified thickness without damage or displacement of the adjacent object. The removal of asphalt concrete pavement at the approaches to structures shall be accomplished in a manner approved by the City.

On projects with existing curb and gutter, any asphaltic concrete buildup in the gutter designated to be removed, shall be removed prior to the pavement removal operation by equipment and methods approved by the Engineer. The equipment and methods used shall be capable of removing the asphaltic concrete buildup without causing damage to the curb and gutter

Upon removal, all milled materials shall become the property of the Contractor. The City will not accept millings. The Contractor shall properly dispose of the millings away from the site. No additional compensation will be made for the disposal of millings.

Prior to milling and roadway excavation, all existing manholes, valve boxes, etc. shall be lowered and protected. All City facilities shall be protected from debris that may result from any adjustments and the Contractor shall be responsible for any maintenance activity resulting from debris related to the construction. No separate payment shall be made for lowering and protecting existing manholes, valve boxes, etc.

Under no circumstance shall the removal of existing asphaltic concrete begin until the mix design for replacement asphaltic concrete has been approved by the Engineer.

The extent of removal of existing asphaltic concrete must be in keeping with the Contractor's ability to produce, haul, place and compact replacement asphaltic concrete so that at all times the length of open "trench" is at a minimum. If the Contractor's production of replacement asphaltic concrete is stopped for any reason, the removal of asphaltic concrete shall either cease or shall be reduced. The Engineer will be the sole judge as to whether the removal shall cease or be reduced. The Engineer's decision will be based on the reason for the stoppage in asphaltic concrete production, the expected length of the stoppage, the type and depth of the material being removed, and the time of day.

ADD the following subsection to 317.2 Construction Requirements:

317.2.1 Quality Control

All milling shall be inspected and approved prior to paving. High spots in excess of the tolerances noted shall be milled until in conformance.

Low spots in excess of ½ inch shall have a leveling course placed prior to paving at no additional cost to the City.

ADD the following subsection to 317.2 Construction Requirements:

317.2.2 Paving

For mill and overlay areas, replacement asphaltic concrete shall be placed as soon as possible after milling has occurred and been approved. The surface on which the material is to be placed shall be uniform and free of loose material. Any exposed base material shall be compacted to the extent required by the Engineer.

The "trench" in which asphaltic concrete is being placed shall be filled before the end of each day's work and the lane shall be opened to traffic. The length of open "trench" at any one time shall not exceed 2 miles or ½ the length of the work, whichever is the lesser.

In the event of circumstances beyond the control of the Contractor, such as equipment breakdown, or if the production of the replacement asphaltic concrete has been stopped by the Engineer and the Contractor is unable to comply with the requirements in the preceding paragraph, the Contractor shall provide and maintain such traffic control devices that the Engineer deems necessary under the circumstances in order to provide safe and efficient passage through the work zone.

If the Engineer deems it to be warranted, the Contractor shall provide for the surface drainage of areas where the pavement surface has temporarily been removed.

ADD the following subsection to 317.2 Construction Requirements:

317.2.3 Macrotexture Milling

Macrotexture asphalt milling when included as a separate contract pay item shall be performed in accordance with the following:

Existing asphaltic concrete shall be removed by milling in accordance with the details shown on the project plans and as specified herein. The milling equipment shall be specifically designed to remove material to a controlled line and grade by means of grinding or chipping. The equipment used shall be capable of removing the existing asphaltic concrete uniformly throughout the milled area at the required cross-slope and within 1/8 inch of the specified removal depth. The specified removal depth of the existing bituminous pavement shall be as noted on the plans. The removal shall be accomplished in a manner which does not destroy the integrity of any pavement that remains. During production milling, the Contractor shall verify the actual depth of milling required to remove the desired underlying pavement surface. If it is determined by the Engineer that the required milling depth is greater than the specified milling depth, the additional material shall be completely removed to the desired underlying pavement surface, as approved, in accordance with Section 109.4. The milled material shall be removed and disposed of as specified by the City.

The milled surface shall have a maximum mean macrotexture depth of 4.50 millimeters, as determined in accordance with Arizona Test Method 742- Mean Macrotexture Depth of Milled Pavement.

At the start of the milling operation, the Contractor shall mill a 500 foot test section. The milled surface of the test section shall be evaluated by the Engineer for compliance with the maximum mean macrotexture depth requirement. If the milled surface is in compliance with the macrotexture requirement, the Contractor may begin production milling. If the milled surface is not in compliance with the macrotexture requirement, the Contractor shall make adjustments to the milling operation and then mill another test section.

During production milling, the mean macrotexture depth shall be determined at a minimum frequency of one test per ½ mile per lane. If, at any time, during the milling operation the Engineer determines that the macrotexture requirement is not being achieved, the Contractor shall stop milling. Milling shall not resume until the Engineer is satisfied that the macrotexture requirement can be met or until successful completion of another test section. The forward speed of the milling machine during production milling shall not exceed the speed used for the test section. The forward speed of the milling machine shall be checked throughout each production day, or at the discretion of the Engineer.

The profile of the milled surface, in both the longitudinal and transverse directions, shall not vary by more than 1/8 inch over a distance of 10 feet.

Under no circumstance shall the removal of existing asphaltic concrete begin until the mix design for replacement asphaltic concrete has been approved by the Engineer.

The extent of removal of existing asphaltic concrete must be in keeping with the Contractor's ability to produce, haul, place and compact replacement asphaltic concrete so that at all times the length of milled surface is at a minimum. If the Contractor's production of replacement asphaltic concrete is stopped for any reason, the removal of asphaltic concrete shall either cease of shall be reduced. The Engineer will be the sole judge as to whether the removal shall cease or be reduced. The Engineer's decision will be based on the reason for the stoppage in asphaltic concrete production, the expected length of the stoppage, the type and depth of the material being removed, and the time of day.

Asphaltic concrete shall be placed as soon as possible after the milling. The surface on which the material is to be placed shall be uniform and free of loose material.

The length of milled surface at any one time shall not exceed 2 miles, or ½ the length of the work, whichever is less. Asphaltic concrete shall be placed on the milled surface before the end of each day's work. The lane shall be opened to traffic at the end of each day's work.

In the event of circumstances beyond the control of the Contractor, such as equipment breakdown, or if the production of the replacement asphaltic concrete has been stopped by the Engineer and the Contractor is unable to comply with the requirements in the preceding paragraph, the Contractor shall provide and maintain such traffic control devices that the Engineer deems necessary under the circumstances in order to provide safe and efficient passage through the work zone.

If the Engineer deems it to be warranted, the Engineer will require that the Contractor provide for the surface drainage of areas where the pavement surface has temporarily been removed.

Pavement, to be removed by milling, adjacent to manholes, valve boxes, small radius curbs and other fixed objects that produce confined areas shall be removed with milling equipment specifically designed to operate in restricted areas and capable of removing asphaltic concrete of the specified thickness without damage or displacement of the adjacent object. Such areas may be excluded from macrotexture testing at the discretion of the Engineer.

On projects with existing curb and gutter, any asphaltic concrete buildup in the gutter designated to be removed, shall be removed prior to the pavement removal operation by equipment and methods approved by the Engineer. The equipment and methods used shall be capable of removing the asphaltic concrete buildup without causing damage to the curb and gutter.

317.3 MEASUREMENT AND PAYMENT

REMOVE in its entirety and REPLACE with the following:

Payment for milling shall be based on plan quantities at the unit bid price in the bid schedule to include milling and proper disposal of the millings away from the site.

Pay Item: 317 Asphalt Milling

Pay Item: 317.2.3 Macrotexture Milling

321.3 WEATHER AND MOISTURE CONDITIONS

REMOVE in its entirety and REPLACE with the following:

Asphalt concrete shall be placed only when the surface on which the material is to be placed is dry, unfrozen, the atmospheric temperature in the shade is at 40 degrees F and rising, and the temperature of the road surface or subsurface is at 50 degrees F and rising as measured in the shade. No asphalt concrete shall be placed when the weather is foggy or rainy, when precipitation is eminent, or when the base or sub base on which the material is to be placed is unstable. Asphalt concrete shall be placed only when the Engineer or his authorized representative determines that weather conditions are suitable and sub base conditions on which the material is to be placed are acceptable.

321.4 APPLICATION OF TACK COAT

REMOVE the first and second paragraphs in their entirety and REPLACE with the following:

A tack coat shall be applied to all existing and to each new course of asphalt concrete prior to the placing of a succeeding lift of asphalt concrete.

The application of the tack coat shall comply with Section 329. The grade of emulsified asphalt shall be SS-1h as specified in Section 713.

321.6 MIX PRODUCTION

ADD the following:

(1) Stockpiling

(a) Sufficient virgin mineral aggregate material shall be stockpiled at the site of the hot plant to produce the quantity of asphalt concrete required for a minimum of two successive 8 hour shifts; however, this requirement will be modified during the last 2 days production, or under special conditions with the Engineer's approval.

(b) Mineral aggregate shall be stockpiled so that segregation is minimized. An approved divider of sufficient size to prevent intermingling of stockpiles shall be provided.

(2) Proportioning

(a) No fine material which has been collected in the dust collection system shall be returned to the mixture unless the Engineer, on the basis of tests, determines that all or a portion of the collected fines can be utilized. If the Engineer so determines, he will authorize in writing the utilization of a specific proportion of the fines; however, authorization will not be granted unless the collected fines are accurately and uniformly metered into the mixture.

(b) Mineral aggregate and bituminous material shall be proportioned by volume, by weight, or by a combination of volume and weight.

(c) When mineral aggregate and bituminous material are proportioned by weight, all boxes, hopper buckets or similar receptacles used for weighing materials, together with scales of any kind used in batching materials, shall be insulated against the vibration or movement of the rest of the plant due to the operation of any equipment so that the error in weighting with the entire plant operating shall not exceed 2 percent for any setting nor 1½ percent for

any batch. Bituminous material shall be weighed in a heated, insulated bucket suspended from a springless dial scale system.

(d) When mineral aggregate and bituminous material are proportioned by volume, the correct portion of each mineral aggregate size introduced into the mixture shall be drawn from the storage bins by an approved type of continuous feeder which will supply bituminous material and so arranged that the proportion of each mineral aggregate size can be separately adjusted. The continuous feeder for the mineral aggregate shall be mechanically or electrically actuated.

(3) Drying and Heating

(a) A recording pyrometer or other approved recording thermometric instrument sensitive to a rate of temperature change of not less than 10 degrees F per minute shall be so placed at the discharge chute of the drier in order to record mineral aggregate and to facilitate reading the recorded temperature. A copy of the recording shall be given to the Engineer. The moisture content of the asphalt concrete immediately behind the paver shall not exceed 1 percent.

(4) Mixing

(a) The production of the plant shall be governed by the rate required to obtain a thorough and uniform mixture of the materials. Mixing shall continue until the uniformity of coating, when tested in accordance with the requirements of AASHTO T-195, is at least 95 percent.

(b) A positive signal system shall be provided to indicate the low level of mineral aggregate in the bins. The plant will not be permitted to operate unless this signal system is in good working condition. Each bin shall have an overflow chute or a divider to prevent material from spilling into adjacent bins.

(c) The temperature of asphalt concrete upon discharge from the mixer shall not exceed 325° F. If the asphalt concrete is discharged from the mixer into a hopper, the hopper shall be constructed so that segregation of asphalt concrete will be minimized.

321.8 PLACEMENT

ADD the following:

(A) The Contractor shall stringline finish ABC grade in the presence of the Engineer or his representative to verify compliance to specified tolerances prior to the placement of asphalt concrete. Placement of asphalt concrete shall not begin until adjacent Portland cement concrete items have obtained 75 percent of design strength.

(B) The handling of asphalt concrete shall at all times be such as to minimize segregation. Any asphalt concrete which displays segregation shall be removed and replaced.

(C) All wheels and tires of compactors and other equipment shall be wiped when necessary with an approved product in order to prevent the picking up of the asphalt concrete.

(D) Before asphalt concrete is placed, the surface to be paved shall be cleaned of objectionable material.

(E) The base or subgrade upon which the asphalt concrete is to be placed shall be prepared in accordance with the applicable requirements for the material involved and maintained in a smooth and firm condition until placement.

(F) At any time, the Engineer or his designee may require that the work cease or that the work day be reduced in the event of weather conditions either existing or expected which would have an adverse effect upon the asphalt concrete.

(G) The temperature of asphalt concrete just prior to compaction shall be at least 250 degrees F but shall not exceed 300 degrees F, unless permitted by the Engineer.

(H) The asphalt concrete shall be placed as a surfacing course. Surfacing courses are defined as courses placed to serve either as a traffic surface or as a surface upon which a finishing course or seal coat is to be placed. The thickness of surfacing courses will be shown on the project plans.

(I) In order to achieve, as far as practicable, a continuous operation, the speed of the paving machine shall be coordinated with the production of the plant.

(J) Tapered sections exceeding 8 feet in width or widened sections not exceeding 4 feet in width may be placed and finished by other means approved by the Engineer.

321.8.4 Compaction; Asphalt Base Course and Surface Course

ADD the following:

(A) Compacting and smoothing shall be accomplished by the use of self-propelled equipment. Compactors shall be pneumatic tired and tandem powered (steel wheel) and shall be approved by the Engineer.

(B) Compactors shall be operated in accordance with the manufacturer's recommendations. Compactors shall be designed and properly maintained so that they are capable of accomplishing the required compaction.

(C) Steel wheel compactors shall weigh not less than 8 tons and have the vibratory mode option.

(D) Pneumatic tired compactors shall be the oscillating type having a width of not less than 4 feet with pneumatic tires of equal size, diameter and having treads satisfactory to the Engineer. Wobble-wheel compactors will not be permitted. The tires shall be spaced so that the gaps between adjacent tires will be covered by the following tires. The tires shall be inflated to 90 pounds per square inch, or such lower pressure will not vary more than 5 pounds per square inch from the designated pressure.

(E) Pneumatic tired compactors shall be constructed so that the total weight of the compactor can be varied to produce an operating weight per tire of not less than 2,000 pounds.

(F) Steel wheel compactors shall not be used in the vibratory mode when the surface temperature of the asphalt concrete falls below 180° F.

(G) Asphalt concrete shall be compacted to not less than 95.0 percent of laboratory density.

(H) Compaction control shall be defined as the responsibility of the Contractor on the basis of his anticipated rate of production to determine the number and types of compactors and the sequence and manner in which they shall be used in order to achieve the specified percent density.

(I) The responsibility for developing and controlling the compaction lies with the Contractor.

(J) The City reserves the right to test the Contractor's percent of density at any time.

(K) Core samples shall be taken by the Contractor on a random location basis with locations determined by the Engineer and consist of one core per every 1,000 square yards of roadway, for each day's production. The asphalt cores shall be taken on the following workday or within 24 hours whichever applies and shall be submitted to the City's Quality Assurance firm for testing.

(L) For complete acceptance, all core densities must show a minimum relative density of 95.0 percent based on a 75 blow Marshall Density, AASHTO T-245. The Marshall Density shall consist of two sets of 3 specimens averaged for each day's production.

(M) If the core densities show inadequate compaction the unit price will be adjusted per the table below:

Percent Compaction	Reduction in Payment
94.0 - 94.9	5%
93.0 - 93.9	10%
92.0 - 92.9	25%

(N) When the percent compaction is less than 92.0 percent, the Contractor may be required to remove and replace any portions at the discretion of the Engineer at no extra cost to the City.

321.8.5 Smoothness

REMOVE the second sentence in its entirety and REPLACE with the following:

Surfacing course surfaces shall not vary more than 1/8 inch from the lower edge of 10 foot long straightedge when the straightedge is placed parallel to the center of the roadway.

321.9 QUALITY CONTROL

REMOVE in its entirety and REPLACE with the following:

Contractor Quality Control

(A) General Requirements

(1) It shall be the responsibility of the Contractor to administer a quality control plan (hereinafter, within this section, referred to as "Plan") sufficient to assure a product meeting the requirements of these specifications. The plan may be operated wholly or in part by a subcontractor or an independent organization; however, the plan's administration, including compliance with the plan and its modification, shall remain the responsibility of the Contractor.

(2) The Contractor is required to provide and maintain a quality control plan, along with all the personnel, equipment, supplies and facilities necessary to obtain samples, perform tests, and otherwise assure the quality of the project.

(3) The Contractor shall submit the quality control plan to the Engineer or his designee at the pre-construction conference.

(4) The Contractor shall perform process control sampling, testing and inspection during all phases of the work and shall perform the process control sampling, testing, and inspection at a rate sufficient to assure that the work conforms to the contract requirements. The Contractor shall provide the Engineer a certification stating that all of the testing equipment to be used is properly calibrated and will meet the specifications applicable for the specified test procedures.

(B) Elements of the Plan

(1) The plan shall address all elements which affect the quality of the asphalt concrete including, but not limited to the following: Mix Design, Aggregate Production, Quality of Components, Stockpile Management, Proportioning, Mixing (including addition of Mineral Admixture, if required), Placing and Finishing, Joints, Compaction.

(C) Plan Implementation

(1) The Contractor shall provide testing at the frequencies listed in Table 321.9.1 during production of the asphalt concrete. A laboratory accredited in each of the listed tests by the AASHTO Materials Laboratory (AMRL) shall perform the testing.

TABLE 321.9.1		
CONTRACTOR QUALITY CONTROL TESTING REQUIREMENTS		
Test	Sample Point	Frequency
Ignition Binder Calibration, ASTM D 6307	Stockpiles or storage tanks	1 per mix design per project
Ignition Binder Test, ASTM D 6307, C 117 and C116	Plant, truck, or on-grade	1 per 1000 tons, but not less than 1 per day
Gyratory or Marshall Density, ASTM D 4013 or AASHTO T 166	Plant, truck, or on-grade	1 per 1000 tons, but not less than 1 per day
Maximum Theoretical Density, ASTM D 2041	Plant, truck, or on-grade	1 per 1000 tons, but not less than 1 per day
Temperature	On-grade	Continuous Reading
Aggregate Gradation, ASTM C 117 and C 136	Cold Feed	1 per 1000 tons, but not less than 1 per day

(2) Results of each test shall be provided to the Engineer or his designee immediately upon completion and in no case later than the end of the day asphalt was produced. Test results shall be used to control the asphalt concrete production. Production of the asphalt concrete on consecutive paving days shall not commence until the prior day's test results have been submitted to the Engineer or his designee and appropriate actions have been taken in accordance with the criteria listed in Table 321.9.1 and Table 321.9.2.

TABLE 321.9.2		
CRITERIA FOR REQUIRED PLANT ADJUSTMENT		
Property	Criteria A (Adjustment)	Criteria S (Stoppage)
Binder Content	±0.4%of Mix Design	±0.5%of Mix Design
Air Voids	4±1.5%	4±2.0%
Gradation	Table 321-3	Table 321-3
Temperature	±10BC of Mix Design	±15BC of Mix Design

(3) The guidelines in Table 321.9.2 and Table 321.9.3 shall be used to determine if the plant will require adjustment or stoppage. If the Contractor's test results indicate the mixture does not comply with Criteria A in Table 321.9.2, an adjustment to the plant will be required to bring the production closer to the middle of the specification bands. The Contractor is responsible for determining the extent and the method of adjustment, and shall notify the Engineer or his designee in writing of what adjustments were made.

TABLE 321.9.3	
ALLOWABLE GRADATION VARIATION FROM MIX DESIGN TARGET	
Maximum Aggregate Size	100%
Nominal Maximum Aggregate Size (NMAS)	±5%
#8 (2.36 mm) Sieve to NMAS	±4%
#40 (0.425mm)Sieve	±3%
#200 (0.75 mm) Sieve	±1.5%

(4) If the Contractor's test results indicate the mixture is at or beyond the range established by Criteria S in Table 321.9.2, production shall cease immediately, and shall not resume (except as required to produce material for additional samples) until additional test results verify the adjustments will produce test results meeting Criteria A in Table 321.9.2. The Engineer or his designee may enforce the adjustment or stoppage criteria if the acceptance tests and the quality control tests are not in agreement.

(5) A representative of the City shall secure 2 representative samples of the mixture for each day's production.

(6) Samples will be tested for conformance with the mineral aggregate gradation in accordance with the requirements of AASHTO T27. The gradation of the mineral aggregate will be considered to be acceptable unless the average of any 3 consecutive tests or the results of a single test varies from the mix design gradation percentages as follows:

	Number of Tests	
Passing Sieve	Three Consecutive	One
Nominal Maximum Aggregate Size	± 6%	± 8%
No. 8	± 4%	± 6%
No. 40	± 4%	± 6%
No. 200	± 1.5%	± 2.0%

(7) Samples will be tested for conformance with the sand equivalent in accordance with AASHTO T176 and will be considered acceptable if the result is 45 or greater and does not vary from the design by more than -10 points. At any time that test results indicate that the gradation of the mineral aggregate or sand equivalent does not fall within all of the limits indicated, the production of

asphalt concrete shall cease immediately and shall not begin again until calibration tests indicate that the gradation and sand equivalent is within the limits indicated.

321.12 MEASUREMENT

ADD the following:

(A) Measurement under this item shall be to the nearest square yard.

(B) No separate measurement shall be given for the thickened edge, Standard Detail 201P and as detailed on project drawings. This work shall be considered incidental and included in the unit price bid in the contract documents. Payment shall be made at the unit price bid in the contract documents for the items complete in place, adjusted for compaction and thickness deficiencies as herein provided.

321.13 PAYMENT

ADD the following:

Pay Item: 321 Asphalt Concrete (AC) Pavements

Pay Item: 321.8.3 Asphalt Leveling Course

Pay Item: 321.8.6 Asphalt Concrete Overlay

Pay Item: 321.8.7 Pavement Fabric Interlayer

SECTION 329: TACK COAT

329.3 APPLICATION

REMOVE in its entirety and REPLACE with the following:

(A) The application rate shall be between 0.04 to 0.06 gallons per square yard of diluted material, 50 percent water and 50 percent emulsion, using SS-1h.

(B) The tack coat shall be applied only as far in advance of placing the asphalt concrete as ordered by the Engineer; however, in no event shall the tack coat be applied and not covered by the asphalt concrete in the same day.

329.6 MEASUREMENT

REMOVE in its entirety and REPLACE with the following:

Measurement shall be per ton diluted as placed, based on weight tickets.

329.7 PAYMENT

ADD the following:

Pay Item: 329 AC Bituminous Tack Coat, Type SS-1h

SECTION 336: PAVEMENT MATCHING AND SURFACING REPLACEMENT

336.1 DESCRIPTION

REMOVE the second paragraph in its entirety and REPLACE with the following:

Asphalt concrete roadway pavement replacement shall be constructed in accordance with Standard Detail 200Q-1 and as indicated on the plans.

REMOVE the fourth paragraph in its entirety and REPLACE with the following:

All other surface replacement in the right-of-way but not in paved roadways shall be constructed in accordance with Standard Detail 200Q-1 and as indicated on the plans.

336.2.1 Pavement Widening or Extensions

REMOVE the second paragraph in its entirety and REPLACE with the following:

The existing pavement shall be cut and trimmed after placement of required ABC and just prior to placement of asphalt concrete for pavement widening or extension, and the trimmed edges shall be painted with a light coating of emulsified asphalt immediately prior to constructing the new abutting asphalt concrete pavements. No extra payment shall be provided for these items and all costs incurred in performing this work shall be incidental to the widening or pavement extension.

336.2.3 Temporary Pavement Replacement

REMOVE the first and second paragraphs in their entirety and REPLACE with the following:

Temporary pavement replacement with UPM in accordance with Standard Detail 200Q-1 shall be required in right-of-way until permanent hot mix trench pavement replacement can be performed. The Contractor shall install temporary asphalt pavement or the first course of permanent pavement replacement in accordance with Section 336 immediately following backfilling and compaction of trenches that have been cut through existing pavement. Except as otherwise provided in Section 336, this preliminary pavement shall be maintained in a safe and reasonably smooth condition until required backfill compaction is obtained and final pavement replacement is completed. Temporary paving removed shall be hauled from the job site and disposed of by the Contractor at no additional cost to the Contracting Agency.

Permanent pavement replacement shall replace temporary repairs within 5 working days after completion of temporary work.

336.2.4.1 Permanent Asphalt Pavement Replacement

ADD the following:

(H) Asphalt concrete trench pavement replacement shall be a minimum 4 inch thickness compacted to 95 percent of laboratory density in accordance with Standard Details 200P-2, 200Q-1 and Section 601.6.

(I) Permanent hot mix asphalt concrete pavement replacement shall be required for all trench cuts. Installation of UPM or other high performance cold mix shall not be permitted for permanent installation. The Contractor shall be required to maintain pavement trench cuts to the satisfaction of the Engineer.

(J) The Contractor shall coordinate with Engineer a minimum of 2 working days in advance of trench paving.

REMOVE the last paragraph in its entirety.

336.3 TYPES AND LOCATIONS OF TRENCH SURFACE REPLACEMENT

REMOVE the first five paragraphs in their entirety and REPLACE with the following:

Normally, the type of pavement replacement and backfill required will be noted on the plans or specified in other portions of the contract documents and construction shall be in accordance with Standard Detail 200Q-1. If a type is not noted on the plans or specified in the special provisions, the following criteria will govern:

T-Top trench repair will be utilized on all streets per Standard Details 200Q-1.

Standard Detail 200Q-1 trench repair shall be utilized to repair surfaces other than asphalt concrete or Portland cement concrete pavement. It may also be used when the condition of the existing pavement does not justify construction of T-Top trench repair. Prior written approval of the Engineer is required for this condition.

336.4 MEASUREMENT

REMOVE paragraphs (A) and (B) in their entirety and REPLACE with the following:

(A) In computing pay quantities for replacement using Standard Detail 200Q-1, pay widths shall not exceed the maximum widths as depicted on Table 601-1, plus 24-inches for the T-Top.

(B) In computing pay quantities for replacement using Standard Detail 200Q-1, pay widths shall not exceed the maximum widths as depicted on Table 601-1.

336.5 PAYMENT

ADD the following:

Pavement matching and surfacing replacement shall include all saw cutting, removal and disposal of existing pavement, plus all labor and material for complete installation of permanent pavement replacement. No extra payment will be made for temporary pavement required for maintenance of utility trench cuts or for trench widths in excess of Section 336.4.

Pay Item: 336 Pavement Matching and Surfacing Replacement

SECTION 340: CONCRETE CURB, GUTTER, SIDEWALK, CURB RAMPS, DRIVEWAY AND ALLEY ENTRANCE

340.2 MATERIALS

REMOVE the first sentence in its entirety and REPLACE with the following:

Concrete shall be Class AA unless otherwise noted.

340.2.1 Detectable Warnings

ADD the following:

Detectable warnings shall be Masco Detectable Warning Panels, or approved equal, and in the color Salem Red.

340.3.1 Subgrade Preparation

REMOVE the second paragraph in its entirety and REPLACE with the following:

The subgrade shall be constructed and compacted true to grades and lines shown on the plans and as specified in Section 301. All soft or unsuitable material shall be removed to a depth of not less than 6 inches below subgrade elevation and replaced as directed by the Engineer. Unsuitable material shall be measured and paid in accordance with Section 205.2. The subgrade shall be compacted to not less than 95 percent of the maximum dry density.

All concrete items in this section shall be constructed on a minimum of 4-inches of aggregate base course unless noted otherwise, whether shown on the standard details or not. Aggregate base course shall be compacted to not less than 98 percent of maximum dry density.

ADD the following subsection to 340.3.3 Concrete Placement:

340.3.3.1 Concrete Curb, Gutter, and Curb Terminations

The pavement section (base and sub-base) shall extend to the back of curb.

ADD the following subsection to 340.3.3 Concrete Placement:

340.3.3.1a Single Curb

All single curb shall be constructed to MAG Standard Detail 222.

ADD the following subsection to 340.3.3 Concrete Placement:

340.3.3.2 Concrete Sidewalk, Sidewalk Landing, and Ramp

Concrete sidewalk, sidewalk landings, and ramps shall be in accordance with City Standard Details or as otherwise modified on the plans.

ADD the following subsection to 340.3.3 Concrete Placement:

340.3.3.3 Concrete Driveway Entrances and 6" Concrete Slabs

Portland cement concrete pavement shall contain 6 percent ±1 percent entrained air. Slump shall be a maximum of 3½ inches.

Construction Joints shall be a maximum of 15 feet apart. The Contractor shall submit a jointing pattern for review and approval prior to construction.

Driveways shall include the curb returns to the existing grades as shown on MAG Standard Detail 251 and modified by the driveway details in the plans. All concrete used in the driveways and adjacent sidewalk crossings shall be 6 inches thick.

Match up construction shall include 10 feet of replacement driveway surfacing from the new top of sidewalk to the existing driveway elevations behind the sidewalk unless otherwise shown on the plans.

ADD the following subsection to 340.3.3 Concrete Placement:

340.3.3.4 Concrete Valley Gutter

All concrete valley gutter shall be constructed on a minimum 8 inch thick aggregate base course, whether shown on the standard details or not.

340.3.10 Deficiencies

REMOVE in its entirety and REPLACE with the following:

Any section of the work deficient in depth or not conforming to the plans or specifications shall be removed and replaced by the Contractor at no additional cost to the City. Replacement or reconstruction shall be from joint to joint.

Concrete work that does not comply with tolerance requirements of Section 340.3.9, Tolerances, shall be removed and replaced. Remove and replace gutters that exceed the ponding tolerance. Grinding shall only be allowed if approved by the Engineer.

No placement of asphalt shall occur unless the Contractor receives acceptance from the Engineer for all concrete work, such as, but not limited to: curb and gutter, gutter, raised median, concrete sidewalks and ramps, and valley gutter.

It shall be the Contractor's responsibility to submit for approval in advance of any paving operations such that concrete work can be inspected, and deficient work can be removed and replaced by the Contractor. The Contractor shall make necessary removals, replacements and corrections at no additional cost to the City. The Contractor shall not receive any time extension for removal, replacements and corrections of deficient work unless approved by the Engineer. The Contractor shall not receive any time extension for failure to notify the City in a timely manner for inspection before paving operations.

Approval shall be a written document from the Engineer. Verbal approval shall not be accepted.

340.5 MEASUREMENT

ADD the following:

Concrete sidewalks, driveways, alley intersections, valley gutters and aprons, to include spandrels, will be measured to the nearest square foot complete in place. When concrete sidewalk, sidewalk ramps, driveways, alley intersections, valley gutters, and/or aprons are cut during trenching operations, the square foot measurement for payment will be in accordance with Section 336.

Aggregate base course shall be considered incidental to all items in the section.

No separate measurement or payment for the curb returns and transition curbs for driveways shall be made, the cost being considered incidental to Pay Item 340.3.3.3.

340.6 PAYMENT

ADD the following:

Aggregate base course shall be considered incidental to all items in the section.

No separate measurement or payment for the curb returns and transition curbs for driveways shall be made.

Pay Item: 340.3.3.1 Concrete Curb and Gutter

Pay Item: 340.3.3.1a Single Curb

Pay Item: 340.3.3.2 Concrete Sidewalk

Pay Item: 340.3.3.2a ADA Ramp

Pay Item: 340.3.3.3 Concrete Driveway Entrances and 6" Concrete Slabs

Pay Item: 340.3.3.4 Concrete Valley Gutter

SECTION 345: ADJUSTING FRAMES, COVERS AND VALVE BOXES

345.1 DESCRIPTION

REMOVE the second paragraph in its entirety and REPLACE with the following:

All frames, covers, valve boxes, manholes, etc., shall be adjusted to finished grade after placement of asphalt concrete surface course by the Contractor in accordance with the standard details.

The Contractor shall remove old frames and covers and install new frames and covers in accordance with standard detail drawings.

345.3 ADJUSTING FRAMES

REMOVE the second paragraph in its entirety and REPLACE with the following:

Frames shall be set to the elevations and slopes established by the Engineer and shall be firmly blocked in place in accordance with Standard Detail 422Q. Spaces between the frame and the old seat shall be sealed on the inside to prevent any concrete from entering the hand hole or manhole. Class AA concrete shall be placed around and under the frames to provide a seal and properly seat the frame at the required elevation and slope.

A single No. 4 rebar hoop will be placed in each concrete collar in accordance with the respective detail. The hoop diameter shall be such that its placement is centered between the edge of the manhole frame or valve box, and the outer edge of the concrete collar, the depth of the hoop shall be centered in the thickness of the collar. Each concrete ring shall be scored radially at quarter-circle points. Score lines shall be ¼ -inch wide by ½ - inch deep. The concrete collar surface shall be rough broom finished. (See Standard Details 270Q and 422Q)

Existing frames and covers shall be salvaged to the City. All salvaged items shall be delivered to the City Wastewater Collections facility, located at 1505 Sundog Ranch Road, and placed as directed by the Engineer.

REMOVE the fourth paragraph in its entirety and REPLACE with the following:

After removal of the temporary asphalt pavement in the area of adjustment, and prior to placement of the final concrete collar ring (as shown on Standard Details 270Q and 422Q) the asphalt pavement in proximity of the adjustment shall be rolled with a self-propelled steel wheel roller if requested by the Engineer.

Traffic shall not be allowed on the concrete collars until the concrete has reached a minimum compressive strength of 2,500 psi on residential and 3,000 psi on collector and major streets. On major streets the Contractor shall use "high-early" in the concrete mix, approved by the Engineer, to minimize delay in reopening the street(s) to traffic.

345.4 ADJUSTING VALVE BOXES

REMOVE in its entirety and REPLACE with the following:

Valve boxes shall be adjusted to the new elevations indicated on the plans, or as established by the Engineer.

New valve box top risers and caps shall be furnished by the Contractor at existing water valve locations and placed as directed by the Engineer. New valve box top risers and caps shall be considered incidental to the cost of adjustment.

Existing valve box risers and caps shall be salvaged to the City. All salvaged items shall be delivered to the City Water Operations facility, located at 1481 Sundog Ranch Road, and placed as directed by the Engineer.

A single No. 4 rebar hoop will be placed in each concrete collar in accordance with the respective detail. The hoop diameter shall be such that its placement is centered between the edge of the manhole frame or valve box, and the outer edge of the concrete collar, the depth of the hoop shall be centered in the thickness of the collar. Each concrete ring shall be scored radially at quarter-circle points. Score lines shall be ¼ -inch wide by ½ - inch deep. The concrete collar surface shall be rough broom finished. (See Standard Detail 391Q)

Traffic shall not be allowed on the concrete collars until the concrete had reached a minimum compressive strength of 2,500 psi on residential and 3,000 psi on collector and major streets. On major streets the Contractor shall use "high-early" in the concrete mix, approved by the Engineer, to minimize delay in reopening the street(s) to traffic.

Add the following subsection to 345.4 Adjusting Valve Boxes:

345.4.1 Adjusting Meter Boxes

Meter boxes shall be adjusted to the new elevations indicated on the plans, or as established by the Engineer.

Additional meter box sections, concrete, and miscellaneous items required to protect the utility in accordance with the respective standard detail shall be considered incidental to adjusting the meter box.

345.5 ADJUSTING MANHOLE AND VALVE COVERS WITH ADJUSTMENT RINGS

REMOVE in its entirety and REPLACE with the following:

Existing sanitary sewer manhole and covers shall be salvaged to the City. All salvaged items shall be delivered to the City Wastewater Collections facility, located at 1505 Sundog Ranch Road, and placed as directed by the Engineer.

Adjusting rings may be used to raise manhole covers in conformance to the dimensions noted on Standard Detail 420Q-1. The amount of adjustment, thickness of seal or overlay, and cross slope will be considered when using adjusting rings. Each location where an adjusting ring is used must have a sufficient depth of asphalt to assure the proper installation and operation of the ring. The rings shall be made of concrete and installed per the manufacturer's specifications. The rings shall be approved by the Engineer.

The concrete collar ring around the frame or valve box shall be circular, shall be a minimum of 8 inches thick, struck off and finished ¼ inch below with the adjacent new pavement surface. Concrete shall be a minimum of Class AA. All concrete shall be obtained from plants approved by the Engineer.

A single No. 4 rebar hoop will be placed in each concrete collar in accordance with the respective detail. The hoop diameter shall be such that its placement is centered between the edge of the manhole frame or valve box, and the outer edge of the concrete collar, the depth of the hoop shall be centered in the thickness of the collar. Each concrete ring shall be scored radially at quarter-circle points. Score lines shall be ¼ -inch wide by ½ - inch deep. The concrete collar surface shall be rough broom finished. (See Standard Detail 270Q)

Traffic shall not be allowed on the concrete collars until the concrete has reached a minimum compressive strength of 2,500 psi on residential and 3,000 psi on collector and major streets. On major streets the Contractor shall use "high-early" in the concrete mix, approved by the Engineer, to minimize delay in reopening the street(s) to traffic.

All machined surfaces on the frame and cover shall be such that the cover will lie flat in any position in the frame and have a uniform bearing through its entire circumference. Any frame and cover which creates any noise when passed over by automobiles shall be replaced by the Contractor at the Contractor's expense.

345.6 MEASUREMENT

ADD the following:

Measurement for adjusting existing frames, covers, valve boxes, and water meter boxes to finished grade shall be the actual number of each type adjusted and accepted.

Measurement for adjusting new frames, covers, valve boxes, and water meter boxes shall not be measured as adjustment to finished grade is considered incidental to installation of the respective item.

345.7 PAYMENT

ADD the following:

Pay Item: 345.3 Adjusting Frames

Pay Item: 345.4 Adjusting Valve Boxes

Pay Item: 345.4.1 Adjusting Meter Boxes

Pay Item: 345.5 Adjusting Manhole and Valve Covers with Adjustment Rings

SECTION 350: REMOVAL OF EXISTING IMPROVEMENTS

REMOVE the section in its entirety and REPLACE with the following:

350.1 DESCRIPTION

The work under this section shall consist of the removal, wholly or in part, and satisfactory disposal of all structures and obstructions within the right-of-way which have not been designated on the project plans or specified in the special provisions to remain, except for those structures and obstructions which are to be removed and disposed of under other items of work in the contract. The work shall also include salvaging of designated materials and backfilling the resulting cavities.

Existing structures, pavement, sidewalks, curbs, gutters and other existing improvements which are to become an integral part of the planned improvements shall remain even though not specifically noted.

Materials removed and not designated to be salvaged or incorporated into the work shall become the property of the Contractor.

All existing utilities not designated for removal shall remain in place and be protected against damage.

The removal of existing improvements shall be conducted in such a manner as not to damage active utilities or any portion of the improvement that is to remain in place.

350.2 CONSTRUCTION REQUIREMENTS

Bridges, culverts and other structures in use by traffic shall not be removed until l satisfactory arrangements have been made to accommodate the traffic. Blasting or other operations necessary for the removal of an existing structure or obstruction, which may damage new construction, shall be completed prior to commencing the new work.

Items designated to be salvaged shall be carefully stockpiled or stored by the Contractor at locations designated in the special provisions or as directed by the Engineer.

Items which are to be salvaged or reused in the new construction and are damaged or destroyed as a result of the Contractor's operations shall be repaired or replaced by the Contractor at no additional cost to the City.

Holes, cavities, trenches and depressions resulting from the removal of structures or obstructions, except in areas to be excavated, shall be backfilled with suitable material which shall be compacted to a density of not less than 95 percent of the maximum density as determined in accordance with the requirements of Section 601 or Section 211. Backfill of all excavated areas below structures shall be in accordance with Section 206.4.

350.3 REMOVAL OF PAVEMENT

(A) Portland Cement Concrete Pavement:

Unless otherwise specified in the special provisions, concrete pavement designated on the project plans to be removed shall be removed from the job site and disposed of at a site secured by the Contractor.

Where new construction is to join the existing concrete pavement, the pavement shall be saw cut to a true line perpendicular to the centerline of the pavement with straight vertical edges free from irregularities.

(B) Bituminous Pavement:

Unless milling is noted on the plans or is a bid item, all bituminous pavement designated on the project plans to be removed, shall be completely removed down to the underlying base course or subgrade. The pavement material shall be removed and disposed of at a site secured by the Contractor.

Where new construction is to join existing bituminous pavement, the existing pavement shall be cut to a true line perpendicular to the centerline of the pavement with straight vertical edges free from irregularities. The removal of asphaltic concrete at the approaches to structures shall be accomplished in a manner approved by the Engineer.

350.4 REMOVAL OF STORM PIPE AND CULVERTS

All removed pipe which is to be salvaged or re-laid shall be cleaned of all earth and other material inside and outside prior to being stockpiled or reused. Pipe to be reused shall be stored when necessary to avoid damage or loss before relaying.

Existing pipe to be partially removed shall be cut with straight and smooth edges on a plane perpendicular to the center line of the pipe.

Pipe that is not salvaged shall become property of the Contractor, removed from the project, and disposed of properly.

350.5 REMOVAL OF MISCELLANEOUS CONCRETE

Miscellaneous concrete shall be defined as all or portions of mortared rubble masonry, curbs, gutters, sidewalks, driveways, aprons, slope paving, island paving, retaining walls, spillways, drainage structures, concrete box culverts, foundations, footings and all other Portland cement concrete or masonry construction, except bridges and pavement. All existing miscellaneous concrete shall be removed to a depth of at least 5 feet below finished subgrade elevation unless otherwise noted on the project plans or special provisions. Other specification sections that discuss removal of concrete items shall supersede the provisions in this Section.

Where new concrete is to join existing concrete, the existing concrete shall be saw cut to a true line with straight vertical edges free from irregularities.

Concrete removal operations shall be performed without damage to any portion that is to remain in place. All damage to the existing concrete, which is to remain in place, shall be repaired to a condition equal to that existing prior to the beginning of removal operations. The repairing of existing concrete damaged by the Contractor's operations shall be at no additional cost to the City.

Existing reinforcement that is to be incorporated in new work shall be protected from damage and shall be thoroughly cleaned of all adhering material before being embedded in new concrete.

Concrete shall be disposed of as provided in 350.3(A).

The floors of concrete basements, pits and structures that are located within the right-of-way shall be completely removed.

350.6 REMOVAL OF UTILITIES

Removal of water mains, sewer mains, and related appurtenances shall be in accordance with Sections 650 and 651, respectively.

All existing utilities not designated for removal shall remain in place and be protected against damage.

A utility may be abandoned in place below a new major structure that is part of the work only if approved by the Agency and solidly filled with grout using methods approved by the Agency. All abandoned utilities to remain and the approved abandonment method shall be noted on the installation record drawings.

Utilities to be removed by the Contractor shall be disconnected and taken out in accordance with the requirements of the utility owner to the limits shown on the plans. Utility removal shall not be performed until a release has been obtained from the utility stating that their respective service connection and appurtenant equipment have been disconnected, removed or sealed and plugged in a safe manner.

The Engineer shall be notified when utilities are encountered that are not shown on the plans.

350.6.1 Removal and Disposal of Asbestos Cement Pipe

(A) Background

Asbestos Cement Pipe (ACP) is a mixture of Portland cement and asbestos fibers. It was introduced into North America in 1931 and by 1953 the American Water Works Association (AWWA) had established standards for ACP. Along with many other cities, ACP water mains were installed in the city of Prescott and as a consequence, we have a considerable quantity of this material in service. Some of these mains are old and need to be replaced; some are undersized and need to be upsized; and others are in conflict with new utility installations and need to be relocated. These actions require all or part of the existing ACP system to be removed and disposed. Subsequent to ACP's introduction into the United States, the Environmental Protection Agency (EPA) determined that asbestos, in an airborne condition, is a hazardous material and established laws/guidelines for the handling and disposal of the material. The Asbestos National Emission Standard for Hazardous Air Pollutants (NESHAP) establishes requirements for the removal and disposal of regulated asbestos containing materials. This policy statement establishes procedures and identifies responsibilities for the proper handling of asbestos-cement pipe in conformance with the Asbestos NESHAP requirements in effect as of November 1990.

NOTE: As used herein, within this section, the term "Engineer" shall refer to the Public Works Director or his/her designated representative. The term "Excavator" shall refer to that entity (individual or contractor) which actually excavates and exposes the pipe. The term "Generator" means any owner or operator of a source (covered by the regulation) whose act or process produces asbestos containing waste material. The term "extra cost" shall refer to the cost over and above the removal and disposal of the pipe in a non-friable state.

(B) Policy

(1) It is the intent of the City to comply with the requirements of the Asbestos NESHAPS found at 40 CFR Part 61, Subpart M. This Policy Statement will establish procedures to be used by all Excavators in the removal and disposal of ACP in compliance with NESHAPS. Nothing in this Policy Statement shall be construed to void any provision of a contract or other law, ordinance, regulation or policy whose requirements are more stringent.

(2) ACP is defined under NESHPS as a Category II, non-friable, non-regulated material in its intact state but which may become friable upon removal, demolition, and/or disposal. Consequently, if the removal/disposal process renders the ACP friable, it is regulated under the disposal requirements of 40 CFR 61.150. If more than 260 linear feet of ACP is removed which on removal will become friable, a NESHAPS notification must be filed with the Yavapai County Environmental Services Department. The notification must be filed at least 10 days prior to removal of the material. If it remains in its non-friable state, as defined by the NESHAPS, it can be disposed as a conventional construction waste. EPA defines friable as material, when dry, which may be crumbled, pulverized or reduced to powder by hand pressures.

(3) The Generator of the hazardous material is responsible for the identification and proper handling, transportation, and disposal of the material. Therefore, it is the policy of the City that if the

actions of the Excavator cause the material to become friable, and therefore subject to the regulations, that Excavator becomes the Generator.

(4) The requirements of Arizona Revised Statutes, Chapter 2, Article 6.3, Section 40-360.21 through 40-360.32 (Blue Stake Law) are important with respect to implementation of this policy statement. The Blue Stake Law mandates the owner of the facility (in this case the City) to maintain installation records and, upon request, to properly locate the underground facility. The law also places requirements on the Excavator to:

(a) Call Arizona 811 at least 2 working days prior to the start of excavation.

(b) Mark the boundaries of the location to be excavated.

(c) Excavate in a careful and prudent manner, including hand digging within 24 inches of the underground facility.

(d) Notify the City if the Excavator encounters an underground facility that has not been located and marked or has been marked in the wrong location.

If the Excavator does not comply in full with Arizona 811 requirements and therefore causes non-friable ACP to become friable, any and all extra costs incurred to handle, containerize, transport, and dispose of the asbestos containing waste shall not be paid or reimbursable by the City. If Arizona 811 requirements are met and ACP is accidentally or unknowingly disturbed thereby causing it to become friable, the Excavator may seek reimbursement from the City for additional costs to handle, containerize, transport and dispose of the material following the procedures described in Sections E and F below.

(5) The Contractor shall retain the services of an independent, qualified, licensed asbestos abatement Consultant. All removal and disposal of ACP shall be under the cognizance of the Consultant. The Excavator is responsible to contact the Consultant a minimum of 2 working days prior to the initiation of removal/disposal operations.

The Consultant will monitor the Excavator's work. If the ACP was not planned for removal and the Excavator accidentally disturbs the pipe, the Excavator will cease all work and notify the Engineer immediately for further instructions.

(6) It is the intent of the City that all ACP shall be removed in such careful and prudent manner that it remains intact and non-friable. The Excavator is responsible to deploy the means, methods, techniques, and sequences to ensure this result. When it is a practical impossibility, as determined by the Engineer, to remove the ACP without creating a friable material, the City will pay the Excavator for the removal of friable material in accordance with the measurement and payment section. The Excavator shall take steps to minimize the amount of the friable waste and abide with all asbestos regulatory requirements. The Consultant shall be available to provide recommendations or suggestions, which the Excavator may or may not choose to deploy. The Consultant shall measure or otherwise assess and recommend to the Engineer the amount or percentage of friable waste for which the City should pay for removal and disposal with the remainder being the responsibility of the Excavator. If the ACP is caused to become friable, the Consultant shall conduct perimeter air monitoring upon request by the City. If the Excavator fails to notify the Consultant, fails to excavate and remove the ACP in a careful and prudent manner creating friable material or fails to abide with all asbestos regulatory requirement, the Excavator shall be deemed to be the Generator responsible to handle, transport and dispose of the ACP in accordance with the NESHAPS requirements and will not be reimbursed for any cost incurred. This will include all penalties and associated legal fees of the Generator as well as any penalties assessed against the City, and any associated legal fees incurred by the City for violation of any of the asbestos regulatory requirements that are caused by the Excavator.

(7) ACP shall NOT be crushed and left in place.

(8) Compliance with all aspects of worker safety and health regulations including but not limited to the OSHA Asbestos Standard is the responsibility of the Excavator. The City assumes no responsibility for compliance programs which are the responsibility of the Excavator.

(9) Payment for removal of non-friable existing asbestos cement pipe shall be at the unit bid price shown in the bidding schedule for complete removal, proper disposal and trench backfill in accordance with the specifications.

(10) Payment for removal of friable existing asbestos cement pipe shall be a contingent item at the unit bid price shown in the bidding schedule for complete removal, proper disposal and trench backfill as determined by the Engineer in accordance with Paragraphs E and F and other provisions of the specifications.

350.7 REMOVAL OF SIGNS AND DELINEATORS

Street signs, traffic control signs, traffic signal material and control devices shall be removed as designated on project drawings, salvaged and delivered to the City at the site designated by the Engineer. The Contractor shall dismantle the sign panels and delineators and remove the sign posts from the ground in such a manner as to prevent damage to the posts. The Contractor shall not remove the existing signs prior to the completion of the new sign installation, but shall remove them within 5 working days after the installation of the new signs or as directed by the Engineer.

350.8 REMOVAL OF FENCE

All fence to be removed, shall become the property of the Contractor unless designated for salvage on the project plans. If fence is designated to be removed and salvaged, all fence, including gates shall be salvaged in accordance with the requirements of 202-3.01.

When designated for salvage, fence and gates shall be carefully dismantled and neatly rolled or coiled. Posts shall be cleaned of all concrete and dirt.

In areas where new fence or relocated fence is to be installed, the Contractor shall perform the removals in such a manner as to prevent the escape of any livestock and/or domestic pets, including the placement and removal of temporary fence when necessary.

350.9 REMOVAL OF GUARDRAIL

All guardrail to be removed shall become the property of the Contractor unless otherwise specified on the project plans.

If guardrail is designated to be removed and salvaged, the Contractor shall carefully dismantle the guardrail and remove the blocks and posts in such a manner as to prevent any damage to the removed items. The guardrail, including panels, end sections, posts and all hardware shall be salvaged in accordance with the requirements of 350.2.

350.10 MEASUREMENT AND PAYMENT

No separate measurement or payment shall be made for removal of existing improvements unless otherwise noted on the plans or there being removal bid items. This work shall be considered incidental and included in the unit price bid for construction of the appropriate contract pay items.

Measurement for non-friable and friable asbestos cement pipe shall be by the linear foot of pipe removed.

Payment for removal of non-friable existing asbestos cement pipe shall be at the unit bid price shown in the bidding schedule for complete removal, proper disposal and trench backfill in accordance with the specifications.

Payment for removal of friable existing asbestos cement pipe shall be a contingent item at the unit bid price shown in the bidding schedule for complete removal, proper disposal and trench backfill as determined by the Engineer in accordance with Paragraphs E and F and other provisions of the specifications.

Pay Item: 350.6.1 Removal, Disposal, and Backfill of Non-Friable ACP

Pay Item: 350.6.1a Removal, Disposal, and Backfill of Friable ACP

PART 400 – RIGHT-OF-WAY AND TRAFFIC CONTROL

SECTION 401: TRAFFIC CONTROL

401.1 DESCRIPTION

REMOVE in its entirety and REPLACE with the following:

Traffic control during construction shall be performed in accordance with Section 401 and the Manual on Uniform Traffic Control Devices for Streets and Highways, US Department of Transportation Federal Highway Administration, latest edition with the latest revisions, Arizona Department of Transportation Traffic Control Manual, the project plans, and as stated herein.

(A) Prior to beginning the project, the Contractor shall submit for approval a traffic control plan for the entire project. He must obtain approval from the Engineer for the traffic control plan and schedule prior to any construction. The Contractor shall submit the traffic control plan to the Engineer at or before the project pre-construction conference.

(B) Written notice shall be given to the Engineer or his representative on the job 48 hours prior to any changes in detours or routes of access. The notice shall give specific details with maps showing the access to all residences and businesses affected by the project.

(C) The City Police and Fire Departments shall be continually updated on access routes along and through the site during construction.

401.2 TRAFFIC CONTROL DEVICES

ADD the following:

(C) All traffic control devices required for the project shall be the responsibility of the Contractor.

(D) When required to cross, obstruct, or close a street, traffic way, or sidewalk for a short duration that is approved by the Director, the Contractor shall provide and maintain suitable bridges, detours or other approved temporary means for the accommodation of vehicular and pedestrian traffic.

(E) When traffic conditions at the construction site warrant the use of certified police personnel to direct traffic, arrangements shall be made with the City Police Department, Yavapai County Sheriff's Office, or Department of Public Safety for off-duty officers.

401.3 FLAGMEN OR PILOT CARS

REMOVE in its entirety and REPLACE with the following:

The Contractor shall provide sufficient certified flagmen, uniformed off-duty law enforcement officers and pilot cars to expedite the safe passage of traffic through the work zone as determined by the Engineer. Any individual who is stationed in a work zone to provide temporary traffic control (flagmen) or to drive a pilot car shall have completed training and be certified in flagging through a program that meets the training and certification standards of the national safety council highway flagger training program, the American Traffic Safety Services Association (ATSSA) flagger program or an equivalent program that meets the same objectives. An equivalent program must meet the United States Department of Transportation Federal Highway Administration Standards for the control of traffic through highway work zones as defined in the manual on uniform traffic control devices for streets and highways. This training and certification shall be renewed at least once every 4 years. It is the Contractor's responsibility to provide the certifications to the Engineer before flagmen engage in the traffic control and/or temporary traffic control. This section does not apply to law enforcement personnel who are employed by governmental entities. Should appropriately trained flaggers not be present, the City, at its discretion may cease operations until appropriately trained flaggers can be provided on-site.

401.6 MEASUREMENT

REMOVE in its entirety.

401.7 PAYMENT

REMOVE in its entirety.

ADD the following subsection to Section 401- Traffic Control:

401.8 MEASUREMENT AND PAYMENT

Payment for traffic control shall be at the applicable unit price bid in the contract documents.

(A) Preparation of traffic control plan shall be inclusive of all submittals, reviews and if needed, re-submittals.

(B) Flaggers shall be per hour for actual time directing traffic. It does not include travel time or time spent setting up or taking down devices.

(C) In the event off-duty police personnel are required to direct traffic, the bid schedule includes an allowance for certified police personnel for the purpose of encumbering funds to cover the cost of certified police personnel. The amount of the allowance is determined by the Engineer and is not subject to individual bid pricing. All bidders shall incorporate the amount in the bid proposal and shall reflect the same in the total bid for this project.

It shall be understood that this allowance is an estimate only. The allowance shall be not used without approval of the Engineer.

Reimbursement for certified police personnel shall be based on actual cost, plus an allowable markup to the prime Contractor of 15 percent, for use of certified police personnel approved by the Engineer.

Flagmen, uniformed off-duty law enforcement officers or pilot cars, with driver, will be measured by the hour for each individual, including vehicle and equipment, required to perform traffic control. When an officer is

used less than 3 hours, a minimum of 3 hours will be charged. Anything over 3 hours will be measured by the hour.

Payment will be made at the contract bid price in the proposal for uniformed, off-duty law enforcement officer. If the officer is utilized in excess of 8 hours in any calendar day or in excess of 40 hours in any calendar work week, payment shall be at the rate of 1 1/2 times the contract bid price for all hours worked in excess in either of the above time periods.

(D) Barricades and storage shall be at the lump sum bid and shall be inclusive of all temporary signs and devices in the traffic control plan and as required by the MUTCD and the Engineer.

(E) Message boards shall be measured by each per day as determined necessary by the approved traffic control plan and the Engineer.

(F) Pilot car and driver shall be per hour for actual time used as required by the approved traffic control plan and the Engineer. It does not include travel time or time spent setting up or taking down devices.

(G) Incidental traffic related items shall include all other pertinent tools, equipment, devices and or work required to provide safe and effective traffic control in accordance with the approved traffic control plan, the MUTCD and the Engineer.

Pay Item: 401Traffic Control Plan (LS)

Pay Item: 401.2a Barricades and Storage (LS)

Pay Item: 401.2b Message Boards (each per day)

Pay Item: 401.2c Incidental Traffic Related Items (LS)

Pay Item: 401.3a Flaggers (HR)

Pay Item: 401.3b Uniformed Off-Duty Law Enforcement Officers (HR)

Pay Item: 401.3c Pilot Car and Driver (HR)

ADD the following section to Part 400- Right-of-Way and Traffic Control:

SECTION 402: PAVEMENT MARKINGS AND STRIPING

402.2 THERMOPLASTIC PAVEMENT MARKINGS

Work under this item shall be performed per ADOT Specifications Section 704.

(A) Stop Bars and Crosswalks: Work under this item shall consist of the application of thermoplastic striping material at the locations noted on the project plans. All stop bars shall be 18 inches in width unless otherwise specified. Crosswalks shall be 12 inches in width.

(B) Measurement shall be in accordance with ADOT Section 704-5 (Width times Length divided by 4 inches equals LF as shown in bid schedule).

(C) Pavement Markings: Pavement markings shall be in accordance with ADOT Section 704-4, ADOT 4-M 1.12 through 4-M 1.17, and as modified herein. Work under this item shall consist of the application of thermoplastic striping material at the locations noted on the project plans.

402.3 TEMPORARY STRIPING

Work under this item, Temporary Striping (paint) where required, shall be performed per ADOT Specifications Section 701-3.05.

402.4 PERMANENT PAVEMENT MARKINGS

Work under this item shall be performed per ADOT Specifications Section 708.

402.4 MEASUREMENT AND PAYMENT

Measurement and payment for pavement markings shall be at the per each basis for each legend or marking installed in accordance with ADOT Section 704-5.

Measurement and payment for temporary striping shall be per ADOT Section 708-4 and 708-5.

Measurement for permanent pavement markings shall be in accordance with ADOT Section 708-4 (Width times Length divided by 4 inches equals LF as shown in bid schedule). Payment for permanent pavement markings shall be in accordance with ADOT Section 708-5.

Pay Item: 402.2 Thermoplastic Pavement Markings

Pay Item: 402.3 Temporary Striping

Pay Item: 402.4 Permanent Pavement Markings

ADD the following section to Part 400- Right-of-Way and Traffic Control:

SECTION 403: PERMANENT SIGNING, SIGN POSTS AND DELINEATORS

403.1 DESCRIPTION

Work under this item shall be done in accordance with the project drawings and requirements of the Manual on Uniform Traffic Control Devices (MUTCD), MAG Detail 131, and ADOT Signing and Marking Standards.

403.2 GENERAL SIGNING GUIDELINES

(A) All signing shall conform to the most recent editions of the publications shown above with regard to size, color, shape and placement.

(B) All signs shall be new (other than those shown to be relocated). All new and relocated signs shall be mounted on new posts with new hardware. Signs designed for installation on existing street light poles shall be mounted with new hardware.

(C) Traffic sign dimensions, colors and lettering shall conform to the latest MUTCD Specifications. Traffic sign size shall be standard unless otherwise specified here or on the plans.

(D) All non mountable curb section signs shall be located at least 2 feet from the curb face to the nearest edge of the sign. All other roadways signs shall be mounted from 6 feet to 12 feet from the edge of the pavement to the nearest edge of the sign, unless otherwise noted in the sign summary table or on the plans.

(E) Roadways with guardrail signs shall be located at least 6 feet from the face of the guard rail to the nearest edge of the sign, unless otherwise noted in the sign summary table or on the plans.

(F) Sign location shall be coordinated with landscaping plans to ensure sign visibility per AASHTO standards.

(G) Signs shall be mounted on street light poles whenever feasible.

(H) All signs installed in areas where parking or pedestrian movements occur shall typically be erected at a height of 7 feet above the normal edge of pavement or sidewalk to the bottom of the sign or to the lowest sign in a multiple sign installation assembly with the following exceptions:

(1) The height to the bottom of a secondary sign mounted below another sign may be up to 2 feet less than the height specified above.

(2) If the bottom of a secondary sign that is mounted below another sign is mounted lower than 7 feet above a pedestrian sidewalk or pathway, the secondary sign shall not project more than 4 inches into the pedestrian facility.

(3) Object markers shall be installed at least 4 feet above the normal edge of pavement.

(I) All R1-1 "STOP" signs and pedestrian warning signs shall be reflective with all reflective sheeting material to be diamond grade.

(J) All other signs are to be reflective with all reflective sheeting material to be high intensity prismatic meeting or exceeding ASTM 4956-04.

(K) Sign blanks shall be 5052-H38 alloy treated aluminum with Alodine 1200 conversion coating, 0.080 inch thick with rounded corners.

(L) Stop signs are to be shown at all local street intersections within a subdivision unless an engineering study shows that no control or yield control is warranted. Stop signs shall be designed and shown at all collector and non signalized arterial street intersections.

(M) Stop signs and Yield signs shall be a minimum of 30 inches in width. When specified by the City Traffic Engineer 36 inch and/or 48 inch signs may be required on major collectors and arterial streets.

403.3 SIGN POSTS

(A) Sign posts shall conform to the Standard Detail 131Q.

(B) For new construction the Telspar, Uni-strut or approved equal 12 gauge, galvanized steel, 4 sided perforated square tubing is required. Two inch tubing shall be used for smaller signs while 2½ inch tubing shall be used for the larger signs.

(C) The post shall be tall enough to provide the minimum clearances specified in section A (8).

(D) The base and sleeve system for the sign shall be anchored in a minimum of a 24 inch deep, 12 inch diameter foundation of concrete. The base shall have a breakaway slip base system. The exposed post from the base shall be 4 inches to 6 inches high.

(E) Signs over 48 inches wide shall be mounted on two, 2½ inch posts with a horizontal support frame.

(F) All station locations are approximate. The Contractor shall verify actual sign locations with the Engineer prior to the installation of all signs.

(G) The Contractor shall verify post lengths and elevations prior to installation.

403.4 MEASUREMENT AND PAYMENT

Measurement and payment shall be the unit price per each for posts and delineators and per square foot for sign panels, complete and in place.

Pay Item: 403 Permanent Signing and Delineators

Pay Item: 403.3 Sign Posts

ADD the following section to Part 400- Right-of-Way and Traffic Control:

SECTION 404: LOOP DETECTORS

404.1 QUADRUPOLE LOOP DETECTORS

(A) Loop detectors shall be installed in base course of asphalt concrete pavement and conform to ADOT Specifications Section 735 and 732-2.01, ADOT Traffic Signal and Lighting Standard Drawings (1985) 7-1. All loop detectors shall be installed per T.S. 7-1 Detail 2. Installation shall include the home runs and installation of loop wiring into the existing signal cabinet. The hardwiring in the cabinet will be accomplished by City forces.

(B) Prior to bidding the Contractor shall verify the location and layout of the existing detector loops and appurtenant home runs to ensure that home runs are re-established in their original configuration. Loop detectors shall be centered in lanes. The Contractor shall verify loop layout with project inspector prior to installation.

404.2 MEASUREMENT AND PAYMENT

Measurement shall be a complete quadrupole loop installation. Payment shall be made on a per each installed basis.

Pay Item: 404.1 Quadrupole Loop Detectors, Complete

SECTION 405: SURVEY MONUMENTS

405.1 DESCRIPTION

ADD the following:

All efforts shall be made to protect survey monuments from damage. Monuments shall be: 1) re-established by a Registered Land Surveyor at the Contractor's expense if damaged or covered, and 2) located by a Registered Land Surveyor where noted on plans.

Any monuments uncovered or found during the course of construction shall not be disturbed or removed until observed, measured and referenced by the Engineer.

405.2 MATERIALS

REMOVE the first paragraph in its entirety and REPLACE with the following:

The concrete portion of monuments shall be constructed in accordance with the provisions in Sections 725 and 505. Concrete shall be Class AA.

405.3 CONSTRUCTION

REMOVE the fourth paragraph in its entirety.

ADD the following:

Frames, covers and concrete shall be installed per Standard Detail 270Q.

405.5 PAYMENT

ADD the following:

No separate payment shall be made for resetting property monuments. This work shall be considered incidental and included in the unit price bid for construction or installation of the appropriate contract pay items.

Payment for survey monuments shall be based on a per each unit complete in place.

Pay Item: 405 Survey Monuments

SECTION 430: LANDSCAPING AND PLANTING

430.3.2 Seeding

REMOVE in its entirety and REPLACE with the following:

430.3.2 Seeding (Hydraulic)

(A) Seeding consists of furnishing and applying chemical fertilizer; furnishing and planting seed and furnishing, applying and affixing mulch. The areas to be seeded are disturbed or un-vegetated areas. Slopes are required to be seeded immediately upon completion; coordination with grading operations will be required.

Application rates of seed as specified are for Pure Live Seed (PLS). PLS is determined by multiplying the sum of the germination and hard or dormant seed by purity. Weed content of seed shall not exceed 0.5 percent. No substitution of species, strain or origin of seed will be allowed unless evidence is submitted in writing by the Contractor to the Engineer showing that the specified materials are not reasonably available during the contract period. The substitution of species, strains or origins shall be made only with the written approval of the Engineer, prior to making said substitution.

The seed shall be delivered to the project site in standard, sealed, undamaged containers. Each container shall be labeled in accordance with Arizona Revised Statues and the U.S. Department of Agriculture rules and regulations under the Federal Seed Act. Labels shall indicate the variety or strain of seed, the percentage of

germination, purity and weed content, and the date of analysis, which shall not be more than 9 months prior to the delivery date.

(B) Seed Mix

Botanical Name	Common Name	Seed/lb	Rate/Acre- PLS (Pure Live Seed)
Agropyron dasystachym	Thickspike Wheatgrass	154,000	3.0
Bouteloua gracilis	Blue Gramma	825,000	2.0
Koeleria crisata	Prairie Junegrass	825,000	1.0
Mulenbergia wrightii	Spike Muhly	1,000,000	1.5
Festuca arizonica	Arizona Fescue	500,000	2.0
Sitnian hystrix	Squirrel Tail	192,000	4.0
Sporobolus cryptandrus	Sand Dropseed	5,298,000	0.75

(C) Seed Supply Agreement

The required species may be in short supply during this project. Therefore, the Contractor shall enter a contractual agreement with a seed collector/supplier that verifies that sufficient supply of specified plant materials will be available on or immediately prior to the seeding dates. This requirement shall be fulfilled within 45 days following the preconstruction conference in order to allow sufficient time for seed collection. The Contractor shall provide written notification to the Engineer verifying that the required species are available and secured for the project. The collection contractor shall test the seed for purity and viability and hold the seed in a manner which maintains its' viability. The Contractor shall submit purity and viability test results to the Engineer for approval prior to the initiation of seeding operations. If it is required to be held for more than a year from initial testing the seed shall be tested again for viability. The Contractor shall compensate the seed supplier a percentage of the seed cost to hold seed material and for the seed tests as identified in Basis for Payment.

(D) General

The slurry for the hydroseed process shall be as follows:

Slurry Mix	Rate
Hydrofiber: Silva, Conwed or Spray mulch	800 lbs/acre
x-100 wood fiber or equivalent	
Tackifier	80 lbs active ingredient/acre
Starter fertilizer: Ammonium Phosphate	16-20-0 200 lbs/acre
Seed mix	As specified
Soil conditioner	1000 lbs/acre

The seed shall be applied within 30 minutes after being combined with the slurry mix.

Ingredients for Slurry Application	Percentages (Minimum)
Nitrogen	5
Phosphoric Acid	3
Water Soluble Potash	1
Humas	50
Humic Acids	15
Soluble Metallic Iron	1

(E) Wood Cellulose Fibers

Wood fiber mulch shall consist of a specially prepared wood fiber processed to contain no growth germination inhibiting factors. The mulch shall be virgin wood and be manufactured and processed so the fibers will remain in uniform suspension in water under agitation to form a homogenous slurry. The mulch shall have a pH range between 4.5 to 6.5.

When hydraulically sprayed on the ground, the material will form a blotter-like cover impregnated uniformly with seed. The cover will allow the absorption of moisture and allow rainfall to percolate to the underlying area.

(F) Tacking Agent

Binder shall be free flowing, non-corrosive powder produced from natural plant gum marketed under M-Binder, M145 Binder, AZ-TAC or approved equal. It shall have gelling properties to inhibit the tendency of water and fiber to move downhill as they are sprayed on steep slopes.

(G) Construction Requirements

(1) General

The Engineer will regularly observe the weighing of seed, mixing of slurry mix and application of seed.

(2) Seeding

Seeding shall be done immediately following the final grading or disking of each cut slope and each fill slope. The soil surface shall be loose. The Contractor will be required to mobilize frequently to accomplish this goal. No seeding shall be carried out under wind conditions exceeding 5 m.p.h. Scheduling of seeding mobilization will be coordinated with the Engineer at the weekly construction meetings. In no case shall a decision by the Engineer relieve the Contractor from the requirement of seeding prior to measurable rainfall. If measurable rain falls prior to seeding, or if the surface of the graded area has formed a crust or slightly hardened surface, the Contractor shall be responsible for ripping, blading or loosening the ground surface, or otherwise repairing and/or preparing the affected areas for seed, after they adequately dry out and prior to seeding, at no cost to the City. The use of specialized equipment or manual methods may be required to prepare the surface for seeding, if seeding is not accomplished immediately after grading or disking.

Seed is to be accomplished during the window of June 1 to July 15 and November 1 to January 30. These windows are to allow expected seasonal rains to start germination process.

All areas disturbed by construction are to be seeded. This may be more area than shown on the plans. All areas are to be approved by Engineer. The Contractor shall coordinate seeding operations with slope construction so that the tops of cuts and toes of fills can be reached with hydroseed equipment.

Hoses may be used where heavy equipment cannot access.

(3) Tillage

All slopes steeper than 3:1 shall either have a loose, friable soil depth of 2 inches or more or be tilled a minimum of 4 inches in depth as they are constructed.

Tillage shall be accomplished with a ripper bar, chisel plow or harrow tool or with other equipment which will provide thorough soil cultivation.

Tillage shall be performed along the contour. The slopes behind guardrail and in the ditch line in cut shall be left with roughened surface to aid in water absorption. Seeded areas which are not behind guardrail or between the ditch line and the roadway on a cut shall be left in a firm surface free of foreign material that would interfere in the seeding operation.

No work shall be done when the moisture content of the soil is unfavorable or the ground is otherwise in a condition not conducive to tillage.

(4) Planting

The Contractor shall submit a batch (tank) mix for the Engineer's approval prior to mixing any seed/mulch slurry. Batch mixing and coverage will be monitored throughout seeding operations. The Contractor is to coordinate monitoring with the Engineer in advance of mixing.

After the tillage is complete and accepted by the Engineer, seed shall be planted by slurry mix (cut slopes steeper than 3:1).

All areas to be seeded shall have a starter fertilizer of ammonium phosphate 16-20-0 applied at a rate of 200 pounds per acre and soil condition at the rate of 1,000 pounds per acre.

Any material sprayed on non-designated areas shall be immediately removed by the Contractor at his expense. Non-designated areas include pavement, guardrails, signs, plants and existing vegetation.

(5) Anchorage by Tacking

Mulch shall be anchored by tacking using a slurry consisting of a minimum of 150 pounds of binder, 400 pounds of wood fiber mulch and 700 gallons of water per acre.

(6) Preservation of Seeded Areas

Any material sprayed on non-designated areas shall be immediately removed by the Contractor at his expense. Non-designated areas include pavement, guard rails, signs, plants, and existing vegetation.

(7) Warranty

The Contractor shall guarantee that 75 percent of the applied tackifier remains in place for a period of 30 days after acceptance of the seeding application. Any areas that have less than 75 percent of the tackifier remaining shall be reseeded, re-mulched and re-tacked at the Contractor's expense.

Areas that require reseeding and re-mulching under the warranty shall be done at no additional cost to the City. The 30 day period(s) shall be within the allotted contract time.

Measurement and Payment: Seeding will be measured by the acre, to the nearest tenth acre, measured along the ground surface for the areas which have been planted and mulched, as determined by the Engineer. The Contractor may be reimbursed a partial payment based on the invoice amount for the cost to hold and test the seed in conformance with the Seed Supply Agreement.

The accepted quantities of seeding, measured as provided above, will be paid for at the contract price per acre for the full performance of the work herein described, which price shall be full compensation for the work completed including all equipment, labor and materials required.

Pay Item: 430.3.2 Seeding (Hydraulic)

ADD the following section to Part 400- Right-of-Way and Traffic Control:

SECTION 431: LANDSCAPE ROCK

431.1 REMOVE AND REPLACE LANDSCAPE ROCK

Landscaping shall be protected and restored in accordance with Section 107.9. Existing landscaping rock shall be removed, stockpiled, and replaced in its original position as closely as possible.

Measurement and Payment: Payment shall be per lump sum amount.

Pay Item: 431.1 Remove and Replace Landscape Rock

PART 500 – STRUCTURES

SECTION 505: CONCRETE STRUCTURES

505.1.1 Minor Structures

REMOVE in its entirety and REPLACE with the following:

Concrete structures such as manholes, catch basins, median barriers, headwalls, cattle guards, and other miscellaneous structures as defined by the Engineer are hereby defined as minor structures. Minor structures shall be precast units. MAG Type D Catch Basins shall be cast-in-place. Cattle guards, median barriers, and headwalls, at the option of the Contractor, may be either constructed of cast-in-place concrete, or furnished as precast units. Precast units shall be fabricated in accordance with shop drawings submitted by the Contractor and approved by the Engineer, in accordance with the requirements of Section 105.2. All structures not defined as minor structures shall be classified as major structures.

(A) Concrete Drainage Outlet/Structure

The work consists of constructing a concrete drainage outlet(s) and structure(s) as designated on the project drawings in accordance with Sections 505 and 725, and as modified herein. All cast-in-place concrete shall be Class AA, 4,000 psi. Subgrade and base materials under the structure shall be compacted to not less than 95 percent of the maximum dry density as determined by AASHTO T-99. No additional payment will be made for aggregate base materials required under concrete structures. The base material shall be considered incidental to the construction of this item and provided for in the unit price for the work. Measurement and payment under this item shall be to the nearest square foot complete in place in accordance with the respective detail for flat work, and per each unit installed for structures.

(B) Concrete Headwall

Work under this item shall be in accordance with Sections 505, 725, 726 and 727; MAG Standard Details 501-1 and 501-2; and the project drawings. Concrete shall be Class AA, 4,000 psi. Payment shall be made per each headwall installed complete in accordance with the respective detail.

(C) Concrete Catch Basin

Work under this item shall be in accordance with MAG Standard Details 530 through 540-2; Sections 505 and 725; and above mentioned specifications for Portland Cement Concrete. All grates shall be bicycle safe type. Measurement and payment under this item shall be per each catch basin complete in place in accordance with the respective detail, to include grates.

(D) Scupper

Work under this item shall be in accordance with MAG Standard Detail 203 and 206. Concrete shall be Class AA, 4,000 psi. Measurement and payment under this item shall be per each scupper installed complete in place in accordance with the respective detail.

(E) Concrete Retaining Wall

Work under this item shall be in accordance with the project drawings. Measurement and payment under this item shall be to the nearest square foot of the retaining wall measured from the top of the footing to the top of the wall complete in place in accordance with the respective detail.

505.6.2 Adverse Weather Concreting

REMOVE in its entirety and REPLACE with the following:

Adverse weather concreting shall be in accordance with Section 725.

505.12 PAYMENT

ADD the following:

Pay Item: 505.1.1a Concrete Drainage/Outlet Structure

Pay Item: 505.1.1b Concrete Headwall

Pay Item: 505.1.1c Concrete Catch Basin

Pay Item: 505.1.1d Scupper

Pay Item: 505.1.1e Concrete Retaining Wall

PART 600 – WATER, SEWER, STORM DRAIN AND IRRIGATION

SECTION 601: TRENCH EXCAVATION, BACKFILLING AND COMPACTION

601.1 DESCRIPTION

ADD the following:

(A) Unless specifically identified, no investigation of subsurface soil conditions for water or sewer main installation has been made for project limits.

(B) Excavation, backfilling and compaction shall be in accordance with this Section and Standard Details as noted.

(C) All water encountered during the work shall be disposed of by the Contractor in a manner such that it will not damage public or private property or create a public nuisance or health problem. The costs of furnishing pumps, pipes, special bedding, and over excavation as required to provide a stable foundation, and other equipment and materials shall be incidental to the work in accordance with Section 200.1 of these specifications.

601.2.3 Trench Grade

REMOVE in its entirety and REPLACE with the following:

All construction staking shall be in accordance with Section 105.8.

For all pipe, the Contractor shall excavate for and provide an initial granular bedding at least 6 inches thick. This bedding material shall be placed at a uniform density with minimum compaction and fine graded as specified below.

601.2.5 Over-excavation

REMOVE the second paragraph in its entirety and REPLACE with the following:

Unauthorized excavation below the specified grade line shall be refilled at the Contractor's expense with bedding material compacted to a uniform density of not less than 95 percent of the maximum density as determined by AASHTO T-99 and T-191 or ASTMD6938. When AASHTO T-99, method A or B, and T-191 are used for density determination, ARIZ 227c will be used for rock correction.

ADD the following subsection to 601.2 Excavation:

601.2.11 Rock Excavation for Utility and/or Drainage Construction

(A) Definition of Rock

When rock is encountered, it shall be stripped of earth and shale, and the Engineer notified in order that he may measure or cross-section the same. In lieu of stripping the earth overburden prior to excavation/blasting, the Engineer and the Contractor may mutually agree on a method to define the vertical limits of rock. Any rock excavated before such measurement or agreement is made, will not be estimated, allowed, or paid for. Rock excavation shall be defined to include: all hard, solid rock in ledges; bedded deposits and unstratified masses; all natural conglomerate deposits so firmly cemented as to present all the characteristics of solid rock; and masonry or concrete structures not shown on the plans. Shales, hard pan, masonry and concrete rubble boulders less than one cubic yard which are not a part of or attached to substrata of rock, shall not be considered rock excavation. Additionally, material to be considered "rock" shall be of such hardness that it cannot be excavated using hydraulic backhoe with combined breakout force, for bucket and stick cylinders, of at least 100,000 pounds.

(B) Blasting

(1) It is the Contractor's responsibility to determine the type of material he will encounter and whether blasting will be necessary.

(2) Blasting shall be done only by experienced, qualified blasters. Blasting shall be done in accordance with the recommendations for best practice in Section 9 of the AGC Manual of Accident Prevention in Construction and in accordance with the recommendations for best practices of the

Institute of Makers of Explosives. Also, all blasting must comply with the requirements of the Division of Industrial Safety and OSHA and all other federal, state and local ordinances.

(3) When work requires blasting or explosive conditions, precautions shall be taken to protect life and property, and give proper warning to persons who may be in vicinity of work before blast is set off.

(4) Blasting shall be performed in such a manner that no damage will result to any building, structure, pipeline, or facility on or off the site of work, above or below ground. Any damage suffered as a result of blasting shall be immediately settled, including repair or replacement.

(5) Blasting shall be done in such a manner that the earth is not loosened or disturbed below the footing or foundation of any proposed structure. Loosened material below footings or foundations shall be replaced with Class C concrete.

(6) The stemming of each hole or cover over explosive shall be sufficient to prevent surface blast wave, but in no case less than 3 feet, 6 inches. Multiple holes shall be shot using millisecond delays.

(7) The Contractor shall enlist the services of an experienced explosives engineer for advice on blasting methods and for the protection of existing structures or facilities.

(8) Blasting procedures shall comply with all rules and regulations as specified and determined by the City Fire Marshall or the Public Works Director.

601.4.2 Bedding

REMOVE in its entirety and REPLACE with the following:

Bedding shall be a minimum of 6 inches and shall be in accordance with Standard Detail 2-01P for paved areas and Standard Detail 2-02P for unpaved areas. Bedding/shade material shall be of granular consistency such as sand or crushed aggregates conforming to the following gradation and plasticity requirements:

Sieve Size	Percentage Passing By Weight
1 in	100
No. 200	< 25
PI	10 Max.

Volcanic cinders or glass materials are not acceptable.

Use of open graded rock (i.e. 3/8 inch pea gravel or ¾ inch rock) must be approved by the Engineer prior to placement and will be considered only in special circumstances.

Water consolidation by any means shall not be permitted.

Bedding and shading material shall not be considered "corrosive" or "aggressive" soil per the definitions in AWWA (including C105), DIPRA and other similar standards and industry accepted documents. The Contractor shall submit material certification documents from the bedding and shading material supplier indicating that the bedding and shading material to be provided is not considered "corrosive" or "aggressive" soil to ferrous metals, and shall include the pH, resistivity, oxidation/reduction, and sulfide values of the material within the certification package. Upon delivery of the material, the Contractor's geotechnical engineer shall provide quality control testing by testing samples of the bedding/shading material for

corrosivity. The Contractor's geotechnical engineer shall provide a letter sealed by a registered professional engineer, licensed in the state of Arizona, that the bedding/shading material is not corrosive to ferrous metals as defined by AWWA C105. If the material is found to be corrosive, the Contractor must install polyethylene encasement per Section 610.6 at no additional cost to the City. Testing shall occur a minimum of every 1,000 linear feet of pipe installed.

601.4.4 Initial Backfill

REMOVE in its entirety.

601.4.5 Final Backfill

REMOVE in its entirety and REPLACE with the following:

601.4.5 Backfill

Backfill material shall be in accordance with Standard Detail 200Q-1 for paved areas and Standard Detail 200Q-1 for unpaved areas. In paved areas, backfill from 1 foot above the pipe to the bottom of the base course shall be non-shrink slurry backfill compacted in 1 foot lifts. In unpaved areas, backfill from 12 inches above the pipe to 6 inches below existing grade shall be minus 3 inch native material similar in nature to material existing prior to excavation.

Trench backfill quality control testing frequency shall be one per soil type for Proctor Density testing and one per 1 foot vertical lift per 200 linear feet of trench.

601.4.6 Compaction Densities

REMOVE in its entirety and REPLACE with the following:

All backfill material with the exception of non-shrink slurry backfill shall be compacted to 95 percent maximum dry density per ASTM D-698.

601.4.7 Water Consolidation

REMOVE in its entirety and REPLACE with the following:

Water consolidation by any means shall not be permitted.

601.7 PAYMENT

REMOVE in its entirety.

ADD the following subsection to Section 601- Trench Excavation, Backfilling and Compaction:

601.8 MEASUREMENT AND PAYMENT

No separate measurement or payment shall be made for trench excavation, backfilling, compaction, or placement of temporary pavement. This work shall be included in the respective unit bid price for water, sewer, or storm main and lateral construction.

Rock excavation within the roadway excavation limits shall not be measured separately. It will be included in roadway excavation. No separate payment will be made for roadway rock excavation. It shall be combined as one item under roadway excavation.

Rock excavation within structural excavation limits shall not be measured separately. It will be considered incidental and shall be included in the appropriate bid item.

Rock excavation within trenches shall be measured in accordance with the following:

(1) Width of trench for rock excavation shall be based on pipe outside diameter plus 24 inches.

(2) Depth for rock excavation shall be actual depth from top of rock to bottom of rock, or to bottom of normal bedding section, whichever depth occurs first.

Payment for rock trenching shall be at the unit price bid per cubic yard which shall include the cost of blasting, excavation, removal, hauling and disposal.

Pay Item: 601.2.11 Rock Excavation for Utility and/or Drainage Construction

SECTION 610: WATER LINE CONSTRUCTION

610.1 DESCRIPTION

REMOVE in its entirety and REPLACE with the following:

Water main construction shall be in accordance with all applicable standard specifications and standard details.

610.3 MATERIALS

REMOVE paragraph (A) in its entirety and REPLACE with the following:

(A) Water Main piping shall be bell and spigot Class 350 ductile iron unless otherwise noted on the project plans, in accordance with Sections 610 and 750. Trace wire per Standard Detail 319Q-1 shall be required for all water main installations. Water main piping shall be furnished new in full lengths with manufacturer, class rating, and all other applicable information clearly marked on the barrel. Water main piping for 2 inch shall be copper in accordance with Section 754 and encased in polyethylene protective wrapping in accordance with Section 610.6.

REMOVE the fourth paragraph in its entirety and REPLACE with the following:

Ductile iron water pipe and fittings per: Section 750. Concrete pressure pipe-steel/cylinder type per: Section 758.

ADD the following:

(C) All ductile iron water main and fittings shall be encased in polyethylene protective wrapping in accordance with Section 610.6 where called for on the plans or after Contractor testing of bedding and shading material is found to be corrosive in accordance with AWWA C105.

All copper and brass water main and fittings shall be encased in polyethylene protective wrapping in accordance with Section 610.6.

(D) All water mains shall have NSF-PW seal clearly marked on each barrel and installed with trace wire in accordance with Standard Detail 319Q-1.

(E) Thrust restraint shall generally be accomplished through the use of restrained joints in lieu of thrust blocking. The preferred joint restraint system shall be "Field-Lok" gasket or approved equal except that vertical deflections, tees, valves and bends shall be restrained utilizing Mega-Lug, as manufactured by Ebba Iron, or equal.

(F) Joint restraint shall be required at piping configurations as show on Standard Detail 303Q-1. Required minimum lengths of joint restraint shall be per Standard Detail 303Q-2, or as noted on the plans. In "Tee" locations where perpendicular branch mains are shown as restrained, the main line run (LRN) shall be restrained for a minimum of 10 feet or one joint, whichever is greater, each side of the "Tee".

Concrete thrust blocking will be required at connections to existing lines at the locations noted on the plans. Thrust blocks placed at these connections shall be in conformance with Section 610.14, MAG Standard Detail 380 and shall be adequately braced to allow system operation during curing of the concrete thrust blocks. Fittings to be restrained with thrust blocks shall be wrapped and taped with heavy polyethylene sheeting per Section 610.6 to prevent covering with concrete on nuts and threading on fittings.

(G) All lateral water main connecting piping, valves and fittings shall be constructed using restrained joints from the main line "Tee" to the connection point at the existing water main at the locations shown on the plans.

(H) Prior to ordering of materials and scheduling connections to existing water mains and services, the Contractor shall complete investigations to verify the size, type and location of the existing water mains and services.

(I) The technical specification for "Air Release Valves" is expanded to include Combination Air Release-Vacuum Breaker valves at the locations shown on the plans constructed as shown in Detail 317Q-1.

(J) Payment for water main shall be at the unit price in the bidding schedule and shall include all connections, fittings, joints, flanges, thrust restraint and incidentals unless specifically itemized in the bidding schedule.

610.4.1 Trenching/Cover

REMOVE in its entirety and REPLACE with the following:

All water mains shall have a minimum cover of 48 inches over the top of the pipe.

Cover for water mains will be measured from existing or proposed finished grade of pavement or from natural ground, whichever is deeper.

No water main shall be deflected, either vertically or horizontally, in excess of 80 percent of the manufacturers' recommendation for the pipe or coupling, without the appropriate use of bends or offsets.

Except as otherwise required in this specification, the special provisions, or by the Engineer, trench excavation, backfilling and compaction shall be in accordance with the requirements of Section 601. Backfilling may be accomplished as soon as the pipe line has been installed to the satisfaction of the Engineer, subject to the requirements for testing per Section 611.

610.4.3 Blocking and Restraints

REMOVE the first four paragraphs in their entirety and REPLACE with the following:

All pipe lines, valves and fittings shall be restrained using mechanical joints, mechanical joint restraints, or gasket joint restraints in accordance with Standard Details 303Q-1 through 303Q-4.

If irregular soil or pressure conditions are encountered, a thrust block design revision or an alternate joint restraint system may be required. Thrust block installation or alternate joint restraint will require approval from the City.

610.4.5 Testing

REMOVE the last sentence of this section and REPLACE with the following:

All corporation stops used for testing and chlorination shall be removed and a stainless steel full circle repair clamp shall be installed.

610.5.1 General

ADD the following:

Concrete encased water mains that cross storm drains and/or other dry utilities which clear the crossed line by less than 12 inches shall incorporate a 6 inch sand pad to break the frictional contact.

610.9 FIRE HYDRANTS

ADD the following:

(A) Hydrant installation shall be in accordance with Standard Details 360Q, 362Q, 363Q and 364Q, and as specified on the project plans. Hydrants shall be Waterous, Mueller, East Jordan, or as approved by the Engineer.

(B) All ductile iron water pipe used in fire hydrant installation shall be Class 350.

(C) All new fire hydrants and connecting piping shall be constructed using restrained joints from the main line "Tee" to the hydrant.

(D) Payment for hydrant installation shall be at the unit price in the bidding schedule and shall include the hydrant, piping, valve, box and cover, and all appurtenant fittings, as noted for a complete assembly.

610.11 CONNECTION TO EXISTING MAINS

ADD the following:

The existing water main shall not be taken out of service prior to completion and ADEQ Approval to Operate the replacement water main and connection of all water services and fire hydrants to the replacement system.

The existing water system shall not be taken out of service at any time without the approval of the Engineer. With the approval of the Engineer, the existing water main may be taken out of service for limited periods to facilitate project construction. City Water Operations shall be contacted a minimum of 48 hours prior to a planned water service disruption.

The Contractor shall prepare and submit to the Engineer a plan for each connection to the existing system which demonstrates the ability to complete all work within the allowed period.

All temporary connections and/or elements which must be placed in service prior to full system disinfection, testing and approval shall be disinfected in accordance with Paragraph 4.7 of AWWA C651 after approval of the Engineer.

All existing water service connections shall be replaced in accordance with the provisions of the COP General Engineering Standards.

610.13 METER SERVICE CONNECTIONS

REMOVE paragraphs (A) and (B) in their entirety and REPLACE with the following:

(A) Type K soft copper pipe or tubing shall be used except as otherwise called for on the plans.

(B) When the existing main is not abandoned and the existing meter is to be connected to the new line, the corporation stop and saddle shall be removed and a stainless steel full circle repair clamp shall be installed.

ADD the following:

(E) Water Service Connection

(1) New Water Service shall be in accordance with Standard Detail 316P. All service piping and fittings from main tap to meter box shall be encased in polyethylene protective wrapping in accordance with Section 610.6. Existing water service shall be abandoned in place and existing meter box and cover shall be salvaged and delivered to the City's Maintenance Yard and placed as directed by the Engineer. The Contractor shall supply all necessary materials for new water service including service saddle, corporation stops, piping, meter yoke, boxes and covers, plus all appurtenant fittings to connect to customers existing service line. The Contractor shall maintain a minimum 4 feet of cover material over water service and set new box and yoke as indicated on plans.

(2) The Contractor shall take all necessary steps to maintain water service. Customers affected by water disruption due to water service installation/connection shall be notified by written flyer delivered by the Contractor a minimum of 24 hours in advance of scheduled water service disruption. The Contractor shall not disconnect or disrupt water service until new water main and services pass hydrostatic and disinfection tests and is accepted by the Engineer. Customers shall not be without water service for a total time period greater than 4 hours. The Contractor shall supply bottled potable water and temporary water service meeting all state health requirements for periods of water service disruption exceeding 4 hours. No separate payment will be made for water service maintenance or Contractor written notification of water service disruption.

(3) No separate measurement or payment will be made for adjustment of new water meter boxes to finished grade. This work is considered as incidental to the construction of the water service replacement.

(4) The Contractor shall install water service line from the main to the new water meter location and continue to a point after the existing water meter location. This point of connection shall be a maximum of 10 feet from the existing meter location. The Contractor shall remove existing valves, pressure regulators, nipples, connectors, etc. and replace per specifications. All private service lines shall be Type "K" copper in accordance with Section 754 and encased in polyethylene protective wrapping in accordance with Section 610.6. The Contractor shall maintain a minimum of 4 feet of cover material, including ditch inverts, over new private water service line and utilize existing in-situ material for backfill. The Contractor shall supply all necessary material for new private water service installation including a curb stop, plus an approved type pressure regulator, in an accessible box per

Standard Detail 316P at the new meter box location and all appurtenant fittings to connect to existing service line.

(5) The Contractor shall remove the existing water meter and reinstall in the new yoke at the new meter box location with all appurtenant fittings and adapters. The City shall supply the Contractor with new meters for use in new locations that were not previously served or there is no existing meter to remove.

(6) The Customer Box called out in Standard Detail 316P for the curb stop and pressure regulator on the customer side of the meter box shall be minimum #1 box, and the curb stop, regulator, box and lid shall be provided and installed by the Contractor.

(7) The Contractor shall be required to distribute written notices approved by the Engineer to all customers 24 hours in advance of proposed private service line reconnection work.

(8) Existing improvements disturbed by the Contractor shall be restored in "like kind" to the satisfaction of the Engineer. No extra payment will be made for restoring existing improvements in "like kind" to include concrete walkways, retaining walls, landscape improvements, etc.

(9) It shall be the Contractor's responsibility to review existing water meter location and points of private service line reconnection locations and ascertain all work including existing improvement restoration costs to perform the private service line reconnection work as specified. Costs associated for private service line reconnection work shall be at the appropriate unit bid price in the bidding schedule and shall include private service line piping, curb stop and pressure regulator, plus all appurtenant fittings and existing improvement restoration work as specified.

(10) The pressure regulators shall be set at 65 psi. The Contractor shall bench-test or otherwise provide written verification from the supplier prior to installation that the pressure regulators have been set at the required psi.

(11) Payment for new water service and reconnection shall be at the appropriate unit bid price shown in the bidding schedule and shall include service saddle, corporation stops, curb stops, piping, meter yoke, adapters, boxes, pressure regulator, plus all appurtenant fittings for complete assembly for connection to existing service line. The Contractor shall supply and install all fittings necessary to install meter into new yoke.

(F) Commercial Water Service (Greater than 2 inches)

(1) The Contractor shall install water service line from the main to the new water meter location and continue to a point after the existing water meter location. This point of connection shall be a maximum of 10 feet from the existing meter location. The Contractor is to furnish and install gate valve and Pressure Regulating Valve (PRV) after meter vault. PRV shall be installed in accordance with the International Building Code as adopted by the City. All commercial service lines shall be a minimum of 4 inch Class 350 Ductile Iron Pipe in accordance with Section 610. The Contractor shall maintain a minimum of 4 feet of cover material over new water service line and may utilize existing in-situ material for backfill provided it meets the project specification. The Contractor shall supply all necessary material for commercial water service installation including a customer shutoff valve and PRV, in an accessible vault per Standard Detail 321Q at the new meter vault location and include all appurtenant fittings to connect to existing service line.

(2) The Contractor shall be required to distribute written notices approved by the Engineer to all customers 24 hours in advance of proposed private service line reconnection work.

(3) Existing improvements disturbed by the Contractor shall be restored in "like kind" to the satisfaction of the Engineer. No extra payment will be made for restoring existing improvements in "like kind" to include concrete walkways, retaining walls, landscape improvements, etc. It shall be the Contractor's responsibility to review existing water meter location and points of service line

connection locations and ascertain all work including existing improvement restoration costs to perform the service line connection work as specified.

(4) Measurement and Payment for commercial water service shall be at the applicable unit bid price in the bidding schedule and shall include piping, customer shutoff valve, PRV and vault, including all appurtenant fittings and existing improvement restoration work as required.

(G) Traffic Rated Concrete Meter Box

(1) Meter boxes located within traffic areas shall be Christy model B1324 by Christy Concrete Products or approved equal.

(2) Pre-cast concrete meter boxes shall have H-20 loading and be constructed of high density reinforced concrete with a minimum compressive strength of 4,000 psi. Covers to be furnished with the boxes shall be a steel checker plate, H-20 loading, and lid.

610.16 MEASUREMENT AND PAYMENT

REMOVE paragraph (E) in its entirety.

ADD the following:

Pay Item: 610 Water Line Construction

Pay Item: 610.9 Fire Hydrants

Pay Item: 610.13e Water Service Connections

Pay Item: 610.13f Commercial Water Service

Pay Item: 610.13g Traffic Rated Concrete Meter Box

SECTION 611: WATER, SEWER AND STORM DRAIN TESTING

611.1 HYDROSTATIC TESTING

REMOVE the first and second paragraphs and REPLACE with the following:

Water lines, including all fittings and connections to the water mains shall be tested for water tightness by subjecting each section to hydrostatic testing in accordance with applicable provisions of AWWA C-600, except as modified below, and the City Water Line Testing and Acceptance Procedures, and shall consist of pressure testing and allowance testing.

Testing shall be performed by the Contractor and shall be witnessed by the Engineer for approval.

Payment for testing of water mains shall be included in the unit bid price for water main construction.

The test section shall be slowly filled with potable water and all air shall be vented from the line. The rate of filling shall be as determined by the City, with at least 48 hour notice required before tests are scheduled.

611.2 DISINFECTING WATER MAINS

ADD the following:

Water main and services shall be disinfected in accordance with Section 611 and the City Water Line Testing and Acceptance Procedures. The City shall perform the sampling for bacteriological and residual chlorine testing. The Contractor shall notify the City 24 hours in advance to coordinate disinfection testing.

All valves in the lines being disinfected shall be opened and closed several times during the 24 hour period of disinfection.

Payment for disinfection of water mains shall be included in the unit bid price for water main construction.

611.3 SEWER LINE TESTING

ADD the following to (A) Low Pressure Air Test:

Sanitary sewers shall be low pressure air tested in accordance with ADEQ Engineering Bulletin 11, Chapter IV and in accordance with the Arizona Administrative Code Title 18 Chapter 9 Part E301(D)(2)(j)(i). One hundred percent of the total length of pipe shall be tested.

ADD the following to (C) Deflection Test for HDPE and PVC Pipe:

One hundred percent of new sewer main construction, regardless of pipe material shall be deflection tested in accordance with the following:

(1) The pipe section to be tested shall be cleaned free of dirt, sand, water, or other foreign materials.

(2) Backfill and compaction will have been completed prior to testing. Initial tests will be done immediately upon completion of the first reach of pipe for each diameter to ascertain if the Contractor's means, materials and methods are producing the desired quality within permissible tolerances.

(3) Test mandrels shall be solid sleeve or cage type with outside diameter and type of pipe permanently and clearly identified on the mandrel body. Worn, damaged or deformed mandrels will not be allowed. The mandrel shall have a cable attached at each end to enable removal if it becomes stuck.

(4) For acceptance, the mandrel must pass through the entire section between manholes or other structures in one pass when pulled by hand, without the use of excessive force. All testing shall be witnessed by the Engineer or his representative and the Engineer reserves the right to order additional tests in excess of 20 percent of new main installed.

(5) Any section of the installation which fails to pass the deflection test will be repaired and retested.

REMOVE paragraph (D) in its entirety and REPLACE with the following:

(D) Closed Circuit Television Inspection:

(1) Description

This section defines the requirements for internal television inspection of the sewer main and service laterals after they have been installed for all new construction and shall include the connection point

to the existing system. The Contractor shall inspect the sewer interior using a color Closed Circuit Television (CCTV) camera and document the inspection on video with audio location and date information, video title information and hard copy inspection logs.

Upon completion of sewer main rehabilitation, the Contractor shall perform CCTV inspection for 100 percent of the newly rehabilitated sewer main to provide a video record and associated written report to become the property of the Engineer. The Engineer shall be notified a minimum of 48 hours in advance of proposed scheduled sewer camera inspection, so Engineer may witness the video recording. Any inspection completed without Engineer witnessing will not be accepted.

(2) Submittals

(a) The Contractor shall submit samples of main and lateral (if separate) inspection logs and reports for approval in accordance with Section 105.2.

(i) The Contractor shall be responsible for modifications to his equipment and/or inspection procedures to achieve report material of acceptable quality. No work shall commence prior to approval of the material by the Engineer. Once accepted, the report material shall serve as a standard for the remaining work.

(ii) The Contractor shall maintain a copy of all inspection documentation (reports, DVD, etc) for the duration of the work and warranty period.

(iii) Mainline inspection reports shall be provided by the Contractor and shall show all observations, at a minimum: project title, name of owner, time of day, manhole-to-manhole pipe section, pipe segment length, pipe material, line size, compass direction of viewing, lateral identification and clock position, direction of camera's travel, pipe depth, name of operator and footage counter reading at the beginning and end of each manhole-to-manhole pipe segment. Report shall identify any deficiencies observed.

(iv) Video of sewer mainlines shall at a minimum include the following information: project title, time of day, pipe material, line size, compass direction of viewing, direction of camera's travel, and footage counter reading continuously through-out each manhole-to-manhole pipe section. The video shall pause at and identify all observations.

(v) Service lateral inspection reports shall be provided by the Contractor and shall show all observations, at a minimum: project title, time and date, property address of service, manhole-to-manhole pipe section, pipe segment length, pipe material, line size, direction of camera's travel, name of operator and footage counter reading at the beginning and end of each service. Report shall identify any deficiencies observed.

(vi) Video of sewer lateral shall show, at a minimum: project title, street address, time and date, pipe material, line size, direction of camera's travel, and counter reading at the beginning and end of each service. The video shall pause at and identify all observations including the connection point to the existing service line.

(b) The Contractor shall supply finished video recordings upon completion of sewer construction. Four sets of the videos (DVD) and reports shall be submitted to the City.

(3) Equipment

(a) Cameras: For inspection of sewer, the camera shall be equipped with a rotating head, capable of 90 degree rotation from the horizontal and 360 degree rotation about its centerline. Minimum camera resolution shall be 400 vertical lines and 460 horizontal lines. The camera lens shall not have less than 140 degree viewing angle and shall have automatic or remote

focus and iris controls. The focal distance shall be adjustable through a range of from 2 inches to infinity. Camera(s) shall be intrinsically safe and shall be operative in 100 percent humidity conditions. Lighting intensity shall be remote controlled and shall be adjusted to minimize reflective glare. Lighting and camera quality shall provide a clear, in-focus picture of the entire inside periphery of the sewer.

(b) Recording Media: Video recordings of all sewer line inspections shall be made on DVD. The audio portion of the composite video shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of the oral report. Each video shall be identified with labels showing the Owner's name, Contractor's name, Engineer's name and each manhole-to-manhole pipe segment of sewer line represented on the video. Each video shall be submitted at the completion of the project for records.

(c) Footage Counter: A footage counter device which measures the distance traveled by the camera in the sewer device shall be accurate to plus or minus 2 feet in 1,000 feet.

(d) Depth Gauge: The camera shall be fitted with a depth gauge to identify sags present in the main lines. The gauge shall have ¼ inch increment markings to measure the depth of the pipe sag. The depth of the sag and location shall be noted as an observation and recorded on the report.

(e) Video Titling: Video recording equipment shall include genlocking capabilities to the extent that computer generated data, (i.e. footage, date, size, etc) as determined by the City can be overlaid onto video, and both indicated on the television monitor and permanently recorded on the inspection video recording.

(4) Flow Control

(a) Flow control is required for TV inspection and for sewer line rehabilitation. Limited sewage flow, as defined below, is acceptable for TV inspection.

(b) Depth of flow shall not exceed 40 percent of pipe diameter as measured in the manhole when performing television inspection.

(c) Bypass pumping, if required, shall conform to the requirements of Section 200.2 and shall be incidental to Closed Circuit Television Inspection.

(5) Inspection Methods

(a) The Engineer and the City's wastewater collection representative shall have access to observe the video monitor and all other operations at all times. The system of cabling employed to transport the camera and transmit its signal shall not obstruct the camera's view.

(b) The Contractor shall physically measure and record on the inspection log, the length of each sewer reach from the centerline of its terminal manholes.

(c) The camera may travel through the sewer in either direction. Maximum rate of travel shall be 30 feet per minute when recording.

(d) The camera image shall be down the center axis of the pipe when the camera is in motion. The Contractor is required to provide a 360 degree sweep of the pipe interior, at points of interest, in order to more fully document the existing condition of the sewer. Points of interest may include, but are not limited to, defects, encrustations, mineral deposits, debris, sediment and any location determined not to be clean or part of a proper line installation and defects in the liner including, but not limited to, bumps, folds, tears, dimples, etc.

(e) The video and all inspection documentation should include the sewer line and manhole identifiers shown on the plans. After the rehabilitation of the sewer main is

complete, the Contractor shall use the upstream manhole as the identifier in conjunction with the distance meter.

(f) The City will review videos and logs to ensure compliance with the requirements listed in this specification and contract documents. If the sewer line, in the sole opinion of the City, is not adequately clean, it shall be cleaned and re-inspected by the Contractor at no additional cost to the City. If the construction work, in the sole opinion of the City, has not been properly installed, it shall be reinstalled and re-inspected by the Contractor at no additional cost to the City.

Final acceptance of the project will not be granted until sewer line video results, including any re-inspection of deficient sewer main, meet the satisfaction of the Engineer and are in accordance with this section.

ADD the following:

(E) Force mains shall be pressure tested at a minimum of 50 psi above the design working pressure for 2 hours in accordance with AAC R-18-9-E301.4.01.

(F) Testing is considered incidental to the price bid for sewer main installation and no additional payment shall be made for this item.

611.5 PAYMENT

REMOVE the second paragraph in its entirety and REPLACE with the following:

Measurement and payment shall be for the complete work of CCTV Inspection at the unit price in the bid schedule. All cleaning and bypass pumping required for a clear and complete CCTV inspection shall be incidental to the cost of video inspection.

Pay Item: 611.3d(1) Mainline Closed Circuit Television (LF)

Pay Item: 611.3d(2) Service Lateral Closed Circuit Television (EA)

ADD the following section to Part 600- Water, Sewer, Storm Drain and Irrigation:

SECTION 612: TEMPORARY WATER MAINS (FLY LINES)

612.1 DESCRIPTION

This section describes the requirements and procedures for the installation, testing and maintenance of temporary water main systems where required to maintain service to customers during the shutdown or removal of existing City water mains for new construction. *All* existing water services shall be moved to the temporary main so that customer service interruptions are avoided.

(A) Materials

All pipe valves, fittings, hose and connections furnished by the Contractor shall be of good quality, clean, meet NSF61 requirements for potable water. The City shall be the final arbiter if any questions arise regarding the suitability of any materials to meet these criteria. Previously used pipe that has been used in sanitary sewer, force main or effluent applications is specifically NOT allowed, regardless of any disinfection procedures or results submitted.

Temporary mains 6 inches or greater shall be constructed of HDPE solid wall pipe conforming to AWWA C906 with a minimum DR ration based on 150 psi. Higher rated pipe may be required based on analysis of the City water system for the construction area.

Temporary mains less than 4 inches may be constructed of either HDPE or PVC with the appropriate pressure rating for system and testing pressures.

(B) Installation and Protection

The temporary line may be installed above grade as necessary to facilitate the construction of new waterline. The temporary pipe shall be installed in such a manner that it will not present a hazard to vehicle traffic or pedestrians and will not interfere with access to homes, businesses and driveways along its route. Cover plates shall be installed as necessary. Where installed at driveway or street crossings the line shall be protected from traffic loads and displacement. During seasons with potential for freezing the lines shall be insulated to the degree necessary to prevent damage to the line or fittings and to maintain service.

Valves shall be installed at the beginning and end of the temporary line and at 300 foot intervals, or as directed by the City. The use of pressure reducing valves for individual service connections may be required as directed by the City.

All temporary piping, fittings and service connections shall be furnished, installed and maintained by the Contractor for the duration of the construction. The Contractor shall make connections to a water source designated by the City or as shown on the plans. Alternative connection points may be considered by the City.

(C) Testing

(1) Disinfection and Testing

The Contractor shall be responsible to disinfect all pipe, connections and fittings in accordance with Section 615.15. Disinfection of the line, if not connected to the City's existing system at either end, may be treated as a closed vessel for purposes of the disinfection period and combined with the pressure test. If the temporary line is connected to the City's existing system the line shall be disinfected, flushed and then pressure tested after a bacteriological sample is obtained and tested.

(2) Pressure Testing

All temporary water mains shall be pressure tested to ensure integrity of the system supplying water to the City's customers. Test pressure shall be a minimum of 50 psi over normal system operating pressure for the area served by the temporary line and shall be maintained for 2 hours. Pressure test results should be provided to the City's Public Works Inspector responsible for the project. A single length of HDPE line with no joints will not require a pressure test.

(3) Bacteriological Testing

Following disinfection, pressure testing and flushing of the temporary line, the Contractor shall obtain water samples from the line and submit to a certified laboratory for bacteriological testing. Results shall be provided to the City's Public Works Inspector responsible for the project. City's Utility Engineer will review test results prior to connection of existing customers to the temporary line.

(D) Maintenance and Repairs

(1) Maintenance

Following acceptance of the temporary system as a potable system by the City, the Contractor shall maintain continuous service through the temporary piping to all customers normally served both directly and indirectly by the pipe line. Once the temporary pipe has been accepted, the Contractor shall request the City to shut down the existing system piping and the Contractor shall remove the existing system piping in conflict with the new mains or as shown on the project plans.

Upon completion of the work, the Contractor shall remove the temporary piping and appurtenances and shall restore all ground surfaces and water service connections to the satisfaction of the City.

(2) Repairs

If repairs to temporary piping are necessary the Contractor shall make such repairs in a timely manner as directed by the City. If progress in making repairs is inadequate, as determined by the City, or in the event of an emergency, the City may take immediate corrective measures, which may include the performance of repair work by City forces or another contractor. All costs for corrective measures shall be borne by the Contractor.

(3) Fire Hydrants

Fire hydrants not on the temporary main that are taken out of service shall be covered with a bag to be easily recognized as being out of service until they are removed or until they are brought back into service. The Contractor shall notify the City Fire Marshal and the Water Operations Division of any fire hydrants that will be taken out of service.

(E) Measurement and Payment

Measurement for the installation, testing and maintenance of temporary water mains shall be for each separate main installation.

Payment shall be made at the unit price contained in the bid schedule. Such payment shall be full compensation for furnishing and installing the pipe, fittings valves, adaptors, service connections, and all miscellaneous fittings, complete in place, standard details, and/or Temporary Water Main Plan submittal and approval, and shall include all costs of excavation, removal of obstructions, shoring, bracing, bedding, backfilling, compaction, maintenance of traffic, testing, disinfection, connections to existing mains and services, disposal of existing pipes and materials. Disposal of asbestos cement pipe, lead joints and other potential hazardous materials shall be disposed of in accordance with applicable Federal, State and local regulations and shall be considered incidental to the payment for Temporary Mains unless specifically identified in other bid items.

Pay Item: 612 Temporary Water Mains (Flylines)

SECTION 615: SANITARY SEWER LINE CONSTRUCTION

615.2 MATERIALS

REMOVE in its entirety and REPLACE with the following:

Pipe used for sewer line construction, including specials, joints, and gaskets, shall be according to the following sections, or as modified by the special provisions.

High density polyethylene (HDPE) pipe shall conform to Section 738. Vitrified clay pipe shall conform to Section 743. Polyvinylchloride (PVC) pipe and fittings shall conform to Section 745. Ductile iron pipe shall conform to Section 750.

(A) Sanitary sewer main construction shall be in accordance with all applicable standard details and Section 750. All sanitary sewer piping and fittings shall be ASTM 3034 SDR-35 PVC or AWWA C-151 ductile iron Class 350 with an epoxy coating (Protecto Coat 401, Series 431 Perma-Shield, or approved equal). Sewer pipe shall be furnished new in full lengths with manufacturer, class, rating and other pertinent information clearly marked on the barrel. All ductile iron sewer main shall be encased in polyethylene

protective wrapping in accordance with Section 610.6 where called for on the plans or after Contractor testing of bedding and shading material is found to be corrosive in accordance with AWWA C105.

(B) Field cuts and taps of Ductile Iron Pipe shall be re-coated with Protecto Coat 401, Series 431 Perma-Shield, (or approved equal) field kit in accordance with the manufacturer's recommendations.

(C) Where noted on project plans, mechanical joint or restrained joint, Class 350, ductile iron sewer main shall be installed 10 feet (minimum) each direction from water/sewer interface where vertical separation is less than 2 feet or until 6 feet of horizontal separation is attained per MAG Standard Detail 404.

(D) The method of construction of manhole and sewer main replacements is of prime importance to the City. Maintenance of sewage flows is critical and shall be the responsibility of the Contractor. The Contractor's construction schedule shall be phased as to allow for minimal pumping of sewage flows for manholes and sewer main under construction.

(E) Payment for sanitary sewer main will be at the applicable unit bid prices for sewer main, as shown in the bidding schedule and shall include all excavation, backfill and compaction in accordance with trench details and all materials necessary for installation of the new sewer main.

615.8 SANITARY SEWER SERVICE TAPS

REMOVE the last sentence of the fourth paragraph in its entirety.

ADD the following:

All new or replacement sewer services, and any existing sewer services disturbed during construction, shall be replaced to the location indicated on project plans with a new minimum 4 inch ASTM 3034 SDR-35 PVC or AWWA C-151 Ductile Iron, Class 350, with an epoxy coating (Protecto Coat 401, Series 431 Perma-Shield, or approved equal) sewer pipe, backwater valve, manufactured wye, and appurtenances in accordance with Standard Details 405Q, 414P, 440P-1, 440P-2 and 440P-3, except as modified herein.

If individual sewer service disruption is anticipated, the Contractor shall notify the property owner 24 hours in advance. Sewer service must be restored within 4 hours or some alternate means of sewage disposal provided to allow for the resumption of individual sewer service.

Payment for sanitary sewer service shall be at the unit price indicated on the bidding schedule for the sewer service installation, and shall include connecting each existing sewer service including all labor, material, equipment, removal of existing pipe, new pipe, coupling concrete reinforcement, new concrete encasement, fittings, by-pass pumping and other work required to connect the existing yard line service to the new sewer main.

615.10 MANHOLES

ADD the following:

(A) The Contractor is to provide to the Engineer a detailed written description of the method of construction for manhole and sewer replacement for each individual area of work. This should include, but is not limited to the following:

(1) Maintenance of sewage flows during construction and curing of concrete.

(2) Type of concrete for manhole bases (i.e. pre-cast, "high-early", etc.)

(3) Method of curing concrete (i.e. protection against freezing, development strength before barrels and cones are set, etc.)

(4) What steps will be taken to ensure the grade around the manholes will not sink when complete (i.e. compaction testing, special base preparation, etc.)

Sanitary sewer manholes shall be constructed per Section 625.

615.16 MEASUREMENT AND PAYMENT

ADD the following:

Pay Item: 615 Sanitary Sewer Main

Pay Item: 615.8 Sanitary Sewer Service Taps

Pay Item: 615.9 Sanitary Sewer Cleanouts

SECTION 618: STORM DRAIN CONSTRUCTION

618.1 DESCRIPTION

ADD the following:

Work under this item shall be in accordance with Section 601 and as modified herein.

REMOVE the second paragraph in its entirety.

618.2 MATERIALS

REMOVE the first paragraph in its entirety and REPLACE with the following:

Pipe used for storm drain construction, including specials, joints, and gaskets, shall be according to the following sections, or as modified by special provisions.

The concrete pipe, high density polyethylene (HDPE) pipe, corrugated metal pipe (CMP), specials, joints, gaskets, and testing shall be according with Sections 621, 735, 736 and 738, except as specified below or as modified by special provisions.

ADD the following:

All CMP shall have $2^2/_3$ inch x ½ inch corrugations with a minimum gauge of 14. Steel lined or paved CMP will not be allowed.

(1) Rubber Gasket Joints

All joints for CMP shall conform to Section 621.3.1 and shall be watertight.

618.3 CONSTRUCTION METHODS

REMOVE the first paragraph in its entirety and REPLACE with the following:

Excavation, bedding, backfilling, and compaction of backfill and bedding of trenches shall be accomplished in accordance with Sections 601 and 603 for HDPE pipe, or as modified by special provisions.

618.6 PAYMENT

ADD the following:

Pay Item: 618 Storm Drain

SECTION 625: MANHOLE CONSTRUCTION AND DROP SEWER CONNECTIONS

625.1.1 Manholes

ADD the following:

Sanitary sewer manhole construction shall be in accordance with Standard Details 420Q-1, 420Q-2, 421Q, 422Q, 423P-1, 423P-2, 426Q-1, 426Q-2 and 427Q.

625.1.2 Sanitary Drop Sewer Connections

ADD the following:

Sanitary sewer drop connections shall be constructed per Standard Detail 426Q-1.

625.2 MATERIALS

REMOVE the second paragraph in its entirety and REPLACE with the following:

Brick shall not be used for maintenance and adjustment of the existing sanitary sewer manhole or ring and cover.

REMOVE the seventh paragraph in its entirety and REPLACE with the following:

Manhole steps, where approved by the City shall be in accordance with Standard Detail 412Q. Plastic manhole steps shall conform to OSHA and ASTM C-487 requirements. The manufacturer shall furnish a written certification indicating conformance.

625.3 CONSTRUCTION METHODS

REMOVE in its entirety and REPLACE with the following:

625.3.1 Manholes

Manholes shall be constructed of precast concrete sections, frames and covers, in accordance with the standard details. The invert channels shall be smooth and semi-circular in shape, conforming to the inside of the adjacent sewer sections. Changes in direction of flow shall be made with a smooth curve, having a radius

as large as the manhole will permit. Changes in size and grade of the channels shall be made gradually and evenly.

Invert channels may be formed of concrete having a smooth mortared surface, or may be constructed by laying a full section of sewer pipe through the manhole and cutting out the portion of pipe above the floor after the surrounding concrete has hardened. The floor of the manhole outside the channels shall be smoothed and shall slope towards the channels.

Existing manholes shall be totally removed, including the bases, and disposed of by the Contractor. Existing rings and covers shall be salvaged and delivered to the City Wastewater Collection Yard located at 1505 Sundog Ranch Road. No separate payment will be made for removing manholes or salvaging manhole rings and covers. The cost of this item of work shall be included in the cost of manhole construction.

The excavation shall be made cylindrical to a diameter sufficient in size to permit sheeting if necessary and leave room that the precast concrete sections may be properly assembled.

Concrete foundations shall be Class A concrete and in accordance with the standard details and Section 505 for both poured-in-place and pre-cast bases. Cast-in-place concrete bases and inverts shall cure for a minimum of 72 hours, depending on concrete development strength before barrels and cones can be placed and before sewage flows across the inverts.

Frame and Cover: All machined surfaces on the frame and cover shall be such that the cover will lie flat in any position in the frame and have a uniform bearing through its entire circumference. Any frame and cover which creates any noise when passed over by automobiles shall be replaced. Frames shall be set in accordance with Standard Detail 420Q.

Watertight Ring and Cover: Installation of watertight ring and cover shall be in accordance with Standard Detail 420Q as indicated on the plans. Watertight rings and covers shall be approved by the City prior to installation and cost shall be incidental to the manhole construction.

All water encountered during the work shall be disposed of by the Contractor in a manner such that it will not damage public or private property or create a public nuisance or health problem in accordance with Section 220.1. The costs of special bedding and over excavation as required to provide a stable foundation, and other equipment and materials shall be incidental to the work.

Backfilling shall be done in accordance with the requirements for trench backfilling as stated in Section 601. Quality control density testing shall be one test per 16 inches of fill, beginning at 2 feet above the crown of the pipe. A minimum of 2 density tests are required for each manhole. Each density test taken shall be in a different quadrant of the manhole as the previous test. If 4 tests are required, each quadrant shall have a density test.

625.3.2 Sanitary Sewer Drop Connections

Drop manholes that intercept existing mains (upper invert) shall not have a block-out for the pipe during the casting process. Said manholes shall be core drilled in place once the appropriate invert elevation has been verified in the field.

Core drilling shall not commence without approval from the Engineer.

The pipe shall be sealed at the penetration using a Link-Seal Modular Seal or approved equal.

(A) Internal Drop

(1) Internal drop systems shall be installed in drop manholes where indicated on the plan sheets and accordance with Standard Detail 426Q-1.

(2) Internal drop systems shall be constructed using Reliner Inside Drop System as manufactured by Reliner/Duran Inc., or approved equal.

(3) Manholes with internal drop systems require Internal Manhole Coating, and shall have the protective coating installed and tested prior to the installation of the drop system. Manhole coating shall be in accordance with Section 626.1.

625.3.3 Sanitary Sewer Manhole Testing

All manholes installed shall be tested by exfiltration or by vacuum testing as determined by the City. Testing shall be per ASTM C-1244-3 and in accordance with Arizona Administrative Code Title 18, Chapter 9, Part E301(D)(3)(e).

Testing of sanitary sewer manholes is considered incidental to the price bid for manhole installation and no additional payment shall be made.

625.4 MEASUREMENT

REMOVE in its entirety and REPLACE with the following:

Measurement of manholes shall be per manhole installed, complete in place regardless of depth.

Measurement of drop manholes shall be per manhole installed, complete in place regardless of depth.

Measurement for internal drops shall be per drop installed, complete in place regardless of depth.

625.5 PAYMENT

REMOVE in its entirety and REPLACE with the following:

Payment for each accepted manhole installation shall be at the contract unit bid price in the bidding schedule and shall include all excavation, backfill, installation, grade ring adjustment, all necessary materials and testing for a complete manhole installation.

Payment for each accepted drop manhole installation shall be at the contract unit bid price and shall include all excavation, backfill, installation, internal coating, internal drop assembly, core drilling, grade ring adjustment, all necessary materials, and testing for a complete manhole installation

Payment for internal drop systems installed in existing manholes shall be at the bid unit price and shall include complete installation of the internal drop assembly, and internal coating in accordance with Standard Detail 426Q-1 and all materials necessary for installation of the new drop sewer connections.

Pay Item: 625.1.1 Manholes

Pay Item: 625.1.2a Sanitary Drop Manhole

Pay Item: 625.1.2b Internal Drop System

ADD the following section to Part 600- Water, Sewer, Storm Drain and Irrigation:

SECTION 626: MANHOLE COATINGS

626.1 DESCRIPTION

This section specifies the coating system used for the lining of the manholes as indicated on the drawings. The Contractor shall furnish all labor, materials and equipment required to clean, modify and coat the manholes. The Contractor shall comply with the local authority and all OSHA requirements for confined space entry. The coating shall yield a hard, durable chemical resistant coating and shall be specifically designed to be applied on a dry surface. The finish coating shall provide a watertight seal and shall adhere to all components of pipeline liner systems.

(A) Specific coating terminology used in this section is in accordance with definitions contained in ASTM D16, ASTM D 3960 and the following definitions:

(1) Dry Film Thickness (DFT): The thickness of one fully cured continuous application of coating.

(2) Field Coat: The application or the completion of application of the coating system after installation of the surface at the site of the work.

(3) Shop Coat: One or more coats applied in a shop or plant prior to shipment to the site of erection or fabrication, where the field or finishing coat is applied.

(4) Tie Coat: An intermediate coat used to bond different types of paint coats. Coatings used to improve the adhesion of a succeeding coat.

(5) Photochemically Reactive Organic Material: Any organic material that will react with oxygen, excited oxygen, ozone or other free radicals generated by the action of sunlight on components in the atmosphere giving rise to secondary contaminants and reaction intermediates in the atmosphere which can have detrimental effects.

(6) Volatile Organic Compound (VOC) Content: The portion of the coating that is a compound of carbon is photochemically reactive and evaporates during drying or curing, expressed in grams per liter or pounds per gallon.

(7) Touch-Up Painting: The application of a paint on areas of painted surfaces to repair marks, scratches and areas where the coating has deteriorated to restore the coating film to an unbroken condition.

(B) Quality Assurance

(1) References: This section contains references to the following documents. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

ASTM D 16-93 Standard Terminology Relating to Paint, Varnish, Lacquer and Related Products

ASTM D 3359 A-92 Methods for Measuring Adhesion by Tape Test

ASTM D 3960-92 Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings

ASTM F 595 B-89 Federal Standard Colors

(2) Standardization: Materials and supplies provided shall be the standard products of manufacturers. Materials in each coating system shall be the products of a single manufacturer.

(C) Delivery and Storage

(1) Materials shall be delivered to the job site in their original, unopened containers. Each container shall bear the manufacturer's name, coating type, batch number, date of manufacture, storage life and special directions.

(2) Materials shall be stored in enclosed structures and shall be protected from weather and excessive heat or cold. Flammable materials shall be stored in accordance with state and local codes. Materials exceeding storage life recommended by the manufacturer shall be removed from the site.

626.2 MATERIALS

(A) The pre-approved coatings for the lining of manholes include: Sewer Shield Liner 150 as manufactured by Environmental Coatings, Mesa, Arizona; Sauereisen No. 210 as manufactured by Sauereisen, Inc., Pittsburgh, Pennsylvania; or Raven 405 as manufactured by Raven Lining Systems, Broken Arrow, Oklahoma. The coating color shall be approved by the owner.

(B) Primer shall be as recommended by the manufacturer for each application.

(C) Defect filler shall be as recommended by the manufacturer for each application. The coating shall contain no more than 20 percent filler, sand; no fiberglass fillers.

(D) Applicator Experience and Qualifications

The coating applicator must have a minimum of 2 years experience in applying either the specified coating or an equivalent coating and shall be certified as an applicator by the manufacturer. They shall submit a successful performance history for the application of either the specified coating or a similar coating in the wastewater industry:

(1) The coating applicator shall submit 3 references relating to the quality of workmanship performed on other projects using the same coating being proposed or an equivalent coating.

(2) The coating applicator shall be an Arizona Licensed contractor with an AE License or equivalent.

(3) The coating contractor shall submit a manufacturer's certification to apply the coating specified herein for each applicator involved in the coating process.

(E) Product Data

Before materials are delivered to the job site, the Contractor shall provide the following information in accordance with these specifications.

(1) For the filler, primer and finish coating, the Contractor shall furnish a Material Safety Data Sheet (MSDS).

(2) For the filler and finish coating, the Contractor shall provide the manufacturer's application instructions, which shall include the following:

(a) Surface preparation recommendations

(b) Primer type, where required

(c) Maximum dry and wet mil thickness per coat

(d) Minimum and maximum curing time between coats, including atmospheric conditions for each

(e) Curing time before submergence in liquid

(f) Thinner to be used with coating material

(g) Ventilation requirements

(h) Minimum atmospheric conditions during which the coating shall be applied

(i) Allowable application methods

(j) Maximum allowable moisture content

(k) Maximum storage life

(3) List of materials proposed to be used under this section and manufacturer's data for each material.

626.3 COATING

(A) Coating products shall not be used until the City has inspected the materials and the coating manufacturer's technical representative has instructed the Contractor and City in the surface preparation, mixing and application of the coating. The coating manufacturer's technical representative must be a factory representative, not a local representative or an affiliate of the Contractor.

(B) Field coats shall consist of one or more finish coats to build up the coating to the specified dry film thickness. Unless otherwise specified, finish coats shall not be applied until other work in the area is complete and until all previous coats have been inspected.

(C) All items of equipment, or parts and surfaces of equipment, which are immersed when in service, with the exception of pumps and valves shall have all surface preparation and coating work, performed in the field.

(D) Preparations

(1) Surfaces to be coated shall be clean and dry. Before applying coating or surface treatments, oil, grease, dirt, rust, loose mill scale, old weathered coatings and other foreign substances shall be removed except as specified. Oil and grease shall be removed before mechanical cleaning is started. Where mechanical cleaning is accomplished by blast cleaning, the abrasive used shall be washed, graded and free of contaminants, which might interfere with the adhesion of the coatings. The air used for blast cleaning shall be sufficiently free of oil and moisture to not cause detrimental contamination of the surfaces to be coated. The Contractor shall examine all surfaces to be coated and shall correct all surface defects as required by manufacture before application of any coating.

(2) The Contractor shall protect the sewer from debris, overspray or any detrimental activity due to restoration of the manholes.

(3) Holes shall be filled using a grout as recommended by the coating manufacturer, and approved by the Engineer. The grout filler shall be used to bring all areas of holes and pitting up to the nominal surface of the manhole so that there is an even interior surface in the manhole without waves, pits or holes. Any exposed rebar shall be cleaned, and all areas of corrosion removed, prior to application of the grout as recommended by the coating manufacturer and approved by the Engineer.

(4) After surface preparation is complete, all loose material shall be removed from the sewer and manholes.

(5) The Contractor shall repair all defects in the coating system where directed by the Engineer.

(6) Surface preparations for each type of surface shall be in accordance with the specific requirements of the coating system specification sheet (COATSPEC). COATSPEC shall be supplied by the manufacturer.

(E) Application

(1) The surface of the installed coating will be cleaned and prepared to permit visual inspection by the Engineer. Any areas of the coating showing poor adhesion, excessive air inclusion or edge or seam defects shall be properly repaired and re-inspected.

(2) Coated surfaces shall be free from runs, drops, ridges, waves, laps and brush marks. Coats shall be applied so as to produce an even film of uniform thickness completely coating corners and crevices. Painting shall be done in accordance with the requirements of SSPC Paint Application Specification No. 1. SSPC Paint Application Specification shall be supplied by the manufacturer.

(3) The Contractor's equipment shall be designed for application of the materials specified. The coating shall be obtained with the proper thickness and surface characteristics as recommended by the coating manufacturer.

(4) Each coat shall be applied evenly and sharply cut to line. Care shall be exercised to avoid over-coating or spattering on surfaces not to be coated.

(5) Film Thickness and Continuity: Coating system thickness is the total thickness of the finished coats. The surface area covered for various types of surfaces shall not exceed those recommended by the manufacturer. Coatings shall be applied to the thickness specified, and in accordance with these specifications. In testing for continuity of coating about welds, projections (such as bolts and nuts), and crevices, the City will determine the minimum conductivity for smooth areas of like coating where the dry mil thickness has been accepted. This conductivity shall then be taken as the minimum required for these rough or irregular areas. Pinholes and holidays shall be repainted to the required coverage.

(6) Safety and Ventilation: Requirements for safety and ventilation shall be in accordance with SSPC Paint Application Guide No. 3. SSPC Paint Application Guide shall be supplied by the manufacturer.

(7) Cleanup: Upon completion of coating, the Contractor shall remove surplus materials, protective coverings and accumulated rubbish and thoroughly clean all surfaces and repair any over spray or other paint-related damage.

(F) Testing

(1) Spark Testing: All coated surfaces shall be spark tested for holes. The spark tester used shall provide 14,000 volts. If pinholes are found, the Contractor shall repair the coating as recommended by the manufacturer and retest. All testing and repair work shall be at the Contractor's expense.

(2) Adhesion Testing: The Contractor shall perform an adhesion test after proper cure in accordance with ASTM D3359 to demonstrate that the specified field coatings adhere to the substrate. Test results showing an adhesion rating of 5A on immersed surfaces and 4A or better on all other surfaces shall be considered acceptable.

626.4 DEFECT REPAIR

The Contractor shall repair all defects in the coating system where directed by the Engineer.

Where unacceptable adhesion test results are obtained, the Contractor shall be responsible for removing and reapplying the specified coatings at no expense to the City.

626.5 WARRANTY

The coating applicator shall supply a minimum 5 year warranty, for the coating that has been approved through the submittal process. The coating applicator shall also supply a warranty from the coating

manufacturer addressed to the City. The warranty shall state, at a minimum, that the coating is applied in accordance with the manufacturer's instruction and that the coating will not fail for a period of 5 years. The definition of coating failure is that blistering, cracking, embrittlement or softening of the coating is starting to occur.

All structural rehabilitation work performed by the Contractor shall be guaranteed against faulty workmanship and/or materials for a period of 2 years after final acceptance of work.

626.6 MEASUREMENT AND PAYMENT

Payment for manhole coating shall be per square foot as measured from the invert to the ring and cover. The unit price shall include by-pass pumping and all materials necessary for internal coating of manholes specified on the plan sheets.

Pay Item: 626.1 Manhole Coatings

SECTION 630: TAPPING SLEEVES, VALVES AND VALVE BOXES ON WATER LINES

630.3.1 General

REMOVE the fifth paragraph in its entirety and REPLACE with the following:

All valves shall be designed for a minimum of 250 psi rated pressure unless otherwise noted.

REMOVE the thirteenth paragraph in its entirety and REPLACE with the following:

Valves 20 inches and smaller may be furnished with flanged ends or mechanical joint ends, unless otherwise noted.

ADD the following:

(A) Valves shall be resilient wedge gate valves, Waterous 2500 series, Clow, Mueller, or equal, suitable for use in line and in wet tapping water mains in conjunction with tapping sleeves. Gate valves shall be mechanical joint except where flange joints are specifically detailed in project plans or where required for tapping sleeves and hydrant installation.

(B) Valve blocking shall be provided on all valves in accordance with Standard Detail 3-05P. No separate payment will be made for valve blocking and the cost shall be included in the water main unit price.

(C) Valve boxes shall be in accordance with Standard Detail 391Q.

(D) Debris caps shall be installed on all valves within project limits according to MAG Standard Detail 392 and shall be color-coded according to Standard Detail 391Q. Debris caps shall be SW Services DC600 or approved equal.

(E) Retrofit Debris Caps on Valves: Debris caps shall be installed on all valves within project limits according to MAG Standard Detail 392 and shall be color-coded according to Standard Detail 391Q. Debris caps shall be SW Services DC600 or approved equal.

(F) The Contractor shall notify customers of scheduled water service disruption a minimum of 24 hours in advance of construction. Customers shall not be without water service nor shall the water main line be out of operation for a total time period greater than 4 hours, inclusive of contract time period from issuance of Notice to Proceed to the Final Acceptance by the Engineer.

630.3.2 Supplements Specifically Relating to Valve Sizes

REMOVE paragraph (C) in its entirety and REPLACE with the following:

(C) Valves. 14 inches through 16 inches:

Valves shall be iron body resilient-seated gate valves in accordance with the latest revision of AWWA C-509 or AWWA C-515.

Valves designed in accordance with AWWA C-509 shall be designed to work equally well with pressure on either side of the gate.

Valves shall be for operation in a horizontal position. The valve shall have bevel gears. The gears and stuffing box shall be enclosed in a watertight iron case, for operation in a buried location. The case shall be filled with grease at the factory.

By-pass valves shall be furnished and installed on each valve unless otherwise indicated on the approved plans. See Table 630-1 for by-pass valve sizes.

REMOVE paragraph (D) in its entirety and REPLACE with the following:

(D) Valves 18 inches and larger:

Valves shall be iron body resilient-seated gate valves in accordance with the latest revision of AWWA C-515.

Valves shall be for operation in a horizontal position. The valve shall have bevel gears. The gears and stuffing box shall be enclosed in a watertight iron case, for operation in a buried location. The case shall be filled with grease at the factory.

By-pass valves shall be furnished and installed on each valve unless otherwise indicated on the approved plans. See Table 630-1 for by-pass valve sizes.

630.4 TAPPING SLEEVES AND VALVES

ADD the following:

The City Utility Operations shall be notified 48 hours in advance to schedule water main tap. If the Contractor is not ready for the tap at the scheduled time, the tap will be rescheduled. City crews will not remain on standby until the Contractor is ready for the tap. The rescheduled tap shall include a new 48 hour notification.

630.4.1 Tapping Valves

REMOVE the third paragraph in its entirety and REPLACE with the following:

Once the tap has been installed, the Contractor shall not operate the valve.

ADD the following:

Debris caps shall be installed on tapping sleeve valve according to MAG Standard Detail 392 and shall be color-coded according to Standard Detail 391Q. Debris caps shall be SW Services DC600 or approved equal.

630.5 BUTTERFLY VALVES

REPLACE item (A) with the following:

(A) 18 inches and larger:

REPLACE item (1) with the following:

(1) Valve body shall be of cast iron or ductile iron with connecting ends one of or a combination of Flanged (Short Body) or mechanical joint.

REMOVE item (B) in its entirety.

630.6 AIR RELEASE AND VACUUM VALVES

ADD the following:

(C) Air/vacuum release valves shall be in accordance with Standard Detail 317Q-1 or 317Q-2.

(D) Combination Air Valves

(1) Air valves shall be standard combination style. Cast iron air valves shall comply with AWWA C-512 except as modified herein. Valves shall be of the size shown and shall have threaded or flanged ends to match piping. Bodies shall be of high-strength cast iron, conforming to ASTM A126 Class B, or NSF 61 certified reinforced nylon. Floats of cast iron air valves shall be heavy stainless steel, suitable to withstand 1,000 psi external pressure. Seats of cast iron air valves shall be Buna-N. Other internal components of cast iron air valves shall be constructed of stainless steel, bronze, delrin, or cast iron as appropriate. Internal components for reinforced nylon valves shall be NSF 61 certified nylon, polypropylene, EPDM or NBR 70. Inlet and outlet ports for large orifice valves shall be baffled to prevent the action of high volume airflows from interfering with valve operations. Interior and exterior carbon steel surfaces shall be epoxy coated. Valves shall be designed for a minimum of 300 psi water working pressure, unless otherwise shown.

(2) Internal protective coatings shall be provided in accordance with AWWA C-550.

(a) Liquid epoxy lining and coating materials shall be listed in the NSF Listing for Drinking Water Additives, Standard 61, certified for use in contact with potable water.

(b) The minimum dry film thickness for epoxy linings shall be 0.203 mm (0.008-inch or 8 mils). Liquid epoxy lining shall be applied in 2 coats in accordance with AWWA C-210.

(3) Combination air valves shall be in accordance with Standard Detail 317Q-1 or 317Q-2-17P, unless shown otherwise. They shall have both large and small orifices in a single body. The large orifice shall serve to vent large quantities of air during filling operations and shall automatically open to relieve vacuum conditions. The small orifice shall vent small quantities of air under full line pressure that may become entrained in the system and collect at high points. Valves shall be APCO Series 140, Val-Matic Corp. Series 200, or equivalent

ADD the following subsection to 630.6 Air Release and Vacuum Valves:

630.6.1 Blow Off Installation

Blow off installation shall be in accordance with Standard Detail 318P. The Contractor shall be required to provide Mega-Lug restraint for all joints for a distance specified per MAG Standard Detail 303.

630.8 MEASUREMENT

REMOVE in its entirety and REPLACE with the following:

Measurement will be by the unit each of the various kinds and sizes of valves, manholes, vaults, or tapping sleeves and valves, including valve boxes and covers, retrofit debris covers, air release valve assemblies, combination valve assemblies, and blow off assemblies.

630.9 PAYMENT

ADD the following:

Payment for valves, box and cover shall be per each at the unit bid price shown in the bidding schedule. Valves on tapping sleeves and hydrant installations shall be included in the appropriate bid item in the bidding schedule.

Payment for retrofit debris cap shall be per each installed complete and in place.

Payment for tapping sleeves shall be at the unit price bid in the bidding schedule and include the tapping sleeve, valve, box and cover, and all appurtenant fittings for complete assembly.

Payment for air release valve installation shall be at the unit price bid in the bidding schedule and shall include all materials and appurtenant fittings as noted for a complete installation.

Payment for combination air valve assembly shall be at the unit price bid in the bidding schedule and shall include all materials and appurtenant fittings as noted for a complete installation.

Payment for blow off installation shall be at the unit price bid in the bidding schedule and shall include all materials and appurtenant fittings as noted for complete installation. No extra payment shall be made for Mega-Lug restraint.

Pay Item: 630.3a Gate Valves, Box and Cover

Pay Item: 630.3b Retrofit Debris Cap

Pay Item: 630.4 Tapping Sleeves and Valves, Box and Cover

Pay Item: 630.6a Air Release Valve Assembly

Pay Item: 630.6d Combination Valve Assembly

Pay Item: 630.6.1 Blow Off Installation

ADD the following section to Part 600- Water, Sewer, Storm Drain and Irrigation:

SECTION 650: ABANDONMENT AND REMOVAL OF WATER MAIN

650.1 WATER MAIN ABANDONMENT

(A) Abandonment of existing water main shall not commence until hydrostatic and disinfection test results for the new main have been accepted by the Engineer. The Contractor shall contact the Engineer a minimum of 48 hours in advance of abandonment activities to schedule City water crews to coordinate valve operation. Water customers affected by water service disruption due to water main abandonment shall be notified by written flyer delivered by the Contractor a minimum of 24 hours in advance of scheduled water service disruption. Scheduled water service disruptions are limited to a maximum of 4 hours.

(B) Abandonment of existing main shall include the removal of all valves, hydrants, and appurtenances within the reach to be abandoned. All valves and hydrants to be abandoned shall be salvaged to the City unless otherwise noted on the plans or special provisions. All salvaged items shall be delivered to the City Water Operations facility, located at 1481 Sundog Ranch Road, and placed as directed by the Engineer. Removed materials not identified to be salvaged shall become the property of the Contractor and properly disposed of. Removed or salvaged materials shall not be used in new main installation.

At all locations indicated on the plans, a minimum of 4 feet of water main shall be removed capped and the appropriate thrust restraint installed.

Existing valves to be abandoned shall include removing the valve, valve box, and cover in its entirety. Abandonment of appurtenances located in any structure (manhole, vault, etc.) shall include the complete removal and proper disposal of the appurtenance and the structure.

Abandonment of valves, hydrants, and appurtenances shall include the installation of the requisite number of mechanical joint caps as necessary to seal all pipe remaining in place.

(C) Restoration for water main abandonment shall include excavation, backfilling, compaction and re-surfacing in accordance with Section 601.

(D) Pavement matching and surface replacement shall be incidental to water main abandonment.

650.2 WATER MAIN REMOVAL

(A) Removal of water main shall not commence prior to authorization from the Engineer.

(B) Water main removal shall include the complete removal of all existing water main, valves, hydrants, structures, and appurtenances within the reach as indicated on the plans. All valves and hydrants to be removed shall be salvaged to the City unless otherwise noted on the plans or special provisions. All salvaged items shall be delivered to the City Water Operations facility, located at 1481 Sundog Ranch Road, and placed as directed by the Engineer. Materials not otherwise identified to be salvaged shall become the property of the Contractor and properly disposed of. Removed or salvaged materials shall not be used in new main installation.

(C) Removal of water main shall include excavation, backfilling, compaction, disposal and salvage in accordance with Section 601.

(D) Pavement matching and surface replacement shall be measured and paid accordance with Section 336. Any other restoration shall be considered incidental.

650.3 MEASUREMENT

Measurement for abandonment of water main and laterals shall be by the linear foot of pipe abandoned, measured horizontally through valves and fittings. Hydrants, valves, fittings, vaults, services, and other appurtenances shall be considered incidental to water main abandonment.

Measurement for removal of water mains and laterals shall be by the linear foot of pipe removed, measured horizontally through valves and fittings. Hydrants, valves, fittings, vaults, services, and other appurtenances shall be considered incidental to water main abandonment.

650.4 PAYMENT

Payment for water main abandonment shall be at the applicable unit bid price and shall include all work and appurtenant fittings necessary for complete abandonment. Pavement matching and surface replacement shall be incidental to water main abandonment.

Payment for water main removal shall be at the applicable unit bid price and shall include all work and appurtenant fittings necessary for complete removal. Pavement matching and surface replacement shall be measured and paid accordance with Section 336. Any other restoration shall be considered incidental.

Pay Item: 650.1 Water Main Abandonment

Pay Item: 650.2 Water Main Removal

ADD the following section to Part 600- Water, Sewer, Storm Drain and Irrigation:

SECTION 651: ABANDONMENT AND REMOVAL OF SANITARY SEWER

651.1 SANITARY SEWER ABANDONMENT

(A) Abandonment of sanitary sewer shall not occur until all existing sanitary sewer services have been transferred to another main or lateral, and abandonment is approved by the Engineer.

(B) Abandonment of sanitary sewer shall include gravity and/or force mains, manholes, vaults, wet wells, and other appurtenances within the reach noted on the plans to be abandoned.

(C) Manhole frames, covers, vault access hatches, and clean-out frame and covers shall be salvaged to the City unless otherwise noted on the plans or special provisions. All salvaged items shall be delivered to the City Wastewater Collections facility, located at 1505 Sundog Ranch Road, and placed as directed by the Engineer. Materials not otherwise identified to be salvaged shall become the property of the Contractor and properly disposed of. Removed or salvaged materials shall not be used in new sewer installation.

(D) Restoration for sanitary sewer abandonment shall include all excavation, backfilling, compaction, and resurfacing in accordance with Section 601.

651.1.1 Sanitary Sewer Mains

(A) Abandonment of sanitary sewer mains shall include all gravity mains, laterals, and force mains, and shall be accomplished by pipe bursting or grout filling as indicated on the plans.

(1) Pipe bursting shall be performed using industry standard methods and equipment.

A pipe bursting plan including equipment used, means and methods shall be submitted and approved in accordance with Section 105.2 prior to beginning bursting operations.

Valves shall be removed and disposed of prior to pipe bursting, and shall become property of the Contractor. All valves shall be properly disposed of in accordance with these specifications.

(2) Grouting shall be accomplished following industry standard methods, using a cement based grout to fill the void of the existing sanitary sewer main. The grouting material must have a minimum compressive strength of 100 psi and shall have flow characteristics appropriate for filling a sanitary sewer.

Injection of the grout material shall be done with sufficient pressure and injection locations to fill the existing sanitary sewer line. The method shall adequately provide for the removal and legal disposal of existing sewage in the lines and any pipe materials removed, and release of air from the system to facilitate proper abandonment.

A grouting plan including equipment used injection locations, grout mix design, and means and methods shall be submitted and approved in accordance with Section 105.2 prior to beginning grouting operations.

651.1.2 Manholes, Vaults and Wet Wells

(A) Abandonment of manholes, vaults, wet wells and other structural appurtenances shall include the complete removal of each structure within the reach to be abandoned as indicated on the plans.

(B) All items removed and not salvaged shall become property of the Contractor and properly disposed of in accordance with these specifications.

(C) Backfilling after removal shall be in accordance with Section 601.

(D) Pavement matching and surface replacement shall be incidental to sewer abandonment.

651.2 SANITARY SEWER REMOVAL

(A) Removal of sanitary sewer shall not commence prior to authorization from the Engineer.

(B) Removal of sanitary sewer shall include the complete removal of gravity and/or force mains, manholes, vaults, wet wells, and other appurtenances within the reach noted on the plans to be removed.

Existing sanitary sewer that is removed coincident with the installation of new sanitary sewer shall be considered incidental to the installation and shall not be measured or paid for under this section.

(C) Manhole frames, covers, vault access hatches, and clean-out frame and covers shall be salvaged to the City unless otherwise noted on the plans or special provisions. All salvaged items shall be delivered to the City Wastewater Collections facility, located at 1505 Sundog Ranch Road, and placed as directed by the Engineer. Materials not otherwise identified to be salvaged shall become the property of the Contractor and properly disposed of. Removed or salvaged materials shall not be used in new sewer installation.

(D) Removal of sewer main, laterals, or force main that tie into an existing manhole that is to remain in service shall include complete removal of the penetrating pipe and grouting the hole with lean, non-shrink grout. A water stop shall be used to ensure the integrity of the manhole.

The water stop proposed shall be submitted for review and approval prior to removal activities in accordance with Section 105.2

(E) Removal of sanitary sewer shall include excavation, backfilling and compaction in accordance with Section 601. Disposal, salvage, and bypass pumping shall be considered incidental to sewer removal.

(F) Pavement matching and surface replacement shall be measured and paid in accordance with Section 336. Any other restoration shall be considered incidental.

651.3 MEASUREMENT

Measurement for abandonment of sewer main, laterals, and force main shall be by the linear foot of pipe abandoned, measured horizontally through manholes, vaults, valves, and fittings. Valves, fittings, services, cleanouts, and other appurtenances shall be considered incidental to sewer abandonment.

Abandonment of manholes and wet wells shall be the number of each abandoned. Vaults shall be considered incidental to sewer abandonment unless otherwise noted in the special provisions.

Measurement for removal of sewer main, laterals, and force main shall be by the linear foot of pipe abandoned, measured horizontally through manholes, vaults, valves, and fittings. Valves, fittings, services, cleanouts, and other appurtenances shall be considered incidental to sewer removal.

Measurement for manholes and wet wells shall be the number of each removed. Vaults shall be considered incidental to sewer abandonment unless otherwise noted in the special provisions.

651.4 PAYMENT

Payment for abandoning sewer mains, laterals, and force main shall be made at the contract unit price. Said price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work. Pavement matching and surface replacement shall be incidental to sewer abandonment.

Payment for abandoning manholes and wet wells shall be made at the contract unit price. Said price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work. Pavement matching and surface replacement shall be incidental to sewer abandonment.

Payment for removing sanitary sewer shall be made at the contract unit price. Said price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work. Pavement matching and surface replacement shall be measured and paid in accordance with Section 336. Any other restoration shall be considered incidental.

Payment for removing manholes and wet wells shall be made at the contract unit price. Said price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work. Pavement matching and surface replacement shall be measured and paid in accordance with Section 336. Any other restoration shall be considered incidental.

Pay Item: 651.1 Sanitary Sewer Abandonment

Pay Item: 651.1.2 Sanitary Manhole Abandonment

Pay Item: 651.2 Sanitary Sewer Removal

Pay Item: 651.2a Sanitary Manhole Removal

PART 700 – MATERIALS

SECTION 701: AGGREGATE

701.4 RECLAIMED CONCRETE MATERIAL (RCM)

REMOVE in its entirety and REPLACE with the following:

Use of Reclaimed Concrete Material (RCM) is not allowed.

701.5 RECLAIMED ASPHALT PAVEMENT (RAP)

REMOVE in its entirety.

SECTION 710: ASPHALT CONCRETE

710.2.1 Asphalt Binder

REMOVE in its entirety and REPLACE with the following:

(A) The asphalt binder shall be a Performance Grade (PG) PG 64-22 Asphalt conforming to the requirements of AASHTO M 320-09 Performance-Graded Asphalt Binder. The binder grade shall be as specified in the contract documents or as directed by the Engineer.

(B) The Engineer may review a request by the Contractor to change from a PG 64-22 binder grade to a PG 64-16 grade. The City may require the Contractor to provide supporting justification and/or data for changing the grade of binder from PG 64-22 to PG 64-16.

710.3.2 Mix Design Criteria

ADD the following:

(A) The intent of this supplement is to use only 1/2 inch or 3/4 inch Marshall or Gyratory Mix Designs within the specification unless specifically called out in the project specifications.

(B) The asphalt mix design shall be for high traffic volume, unless otherwise specified.

710.3.2.1 Marshall Mix Design

REPLACE item (5) in Table 710-3 Marshall Mix Design Criteria with the following:

(5) Tensile Strength Ratio

Minimum percent requirement is changed to 75. A tensile strength ratio of 75 percent may require more than 1 percent mineral admixture.

SECTION 725: PORTLAND CEMENT CONCRETE

725.1 GENERAL

ADD the following:

All Portland cement concrete placed under this contract shall be Class AA with a maximum water/cement ratio of 0.45.

ADD the following subsection to 725.1 General:

725.1.1 Adverse Weather Concreting

(A) Hot Weather Concreting

Hot weather is defined as any combination of high ambient temperature, low relative humidity, and wind velocity which would tend to impair the quality of fresh concrete. These effects become more pronounced as wind velocity increases. Since last minute improvisations are rarely successful, preplanning and coordination of all phases of the work are required to minimize these adverse effects.

(1) Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

(a) Cool ingredients before mixing to maintain concrete temperature below 90 degrees F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is the Contractor's option.

(b) Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

(c) Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

(2) As an absolute minimum, the Contractor shall ensure that the following measures are taken:

(a) An ample supply of water, hoses, and fog nozzles are available at the site.

(b) Spare vibrators are on hand in the ratio of one spare vibrator for each 3 in use.

(c) Pre-planning has been accomplished to ensure prompt placement, consolidation, finishing, and curing of the concrete.

(d) Concrete temperature on arrival should be approximately 60 degrees F and in any event shall not exceed 90 degrees F. The use of cold water and ice is recommended.

(e) The subgrade is moist, but free of standing water.

(f) Fog spray is utilized to cool the forms and steel. Under extreme conditions of high ambient temperature, exposure to the direct rays of the sun, low relative humidity, and wind, even strict adherence to these measures may not produce the quality desired and it may be necessary to restrict concrete placement to early morning only. If this decision is made, then particular attention must be directed to the curing process since the concrete will be exposed to severe thermal stresses due to temperature variation; heat of hydration plus midday sun radiation versus nighttime cooling.

(B) Cold Weather Concreting

Comply with ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

(1) When air temperature has fallen to or is expected to fall below 40 degrees F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F and not more than 80 degrees F at point of placement.

(2) Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

(3) Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

(C) Wet Weather Concreting

Placing of concrete shall be discontinued when the quantity of rainfall is such as to cause a flow or wash to the surface. Any concrete already placed and partially cured shall be covered to prevent dimpling. A construction joint will be installed prior to shut down.

(D) Replacement of Damaged or Defective Concrete

Upon written notice from the Engineer, all concrete which has been damaged or is defective, shall be replaced by the Contractor at no cost to the Contracting Agency.

(E) References

(1) ACI-305 Hot Weather Concreting

(2) ACI-306 Cold Weather Concreting

(3) ACI-308 Recommended Practices for Curing Concrete

(F) No separate payment shall be made for adverse weather concreting. The work shall be considered incidental and included in the unit price bid for construction or installation of the appropriate contract pay item.

725.5 ADMIXTURES AND ADDITIVES

REMOVE the third paragraph in its entirety and REPLACE with the following:

Air entraining admixtures incorporated into the approved concrete mix design shall meet the requirements of ASTM C260. All Portland cement concrete shall contain 6 percent, plus or minus 1 percent, entrained air of evenly dispersed air bubbles at the time of placement. The air-entraining agent shall contain no chlorides. The air-entraining agent shall be added to the batch in a portion of the mixing water. The solution shall be batched by means of a mechanical batcher capable of accurate measurement. Air entrainment in the concrete shall be tested in accordance with AASHTO T-152. Air entrainment shall be tested at time of sampling in accordance with ASTM C143 and C231 respectively. The cost of this testing shall be the responsibility of the Contractor.

725.8.1 Field Sampling and Tests

REMOVE the fourth paragraph in its entirety and REPLACE with the following:

The slump of Portland cement concrete shall be tested in accordance with the requirements of AASHTO T119, ASTM C143 and ASTM C231 respectively. Concrete that does not meet the specification

requirements as to slump shall not be used, but shall be removed from the job at no cost to the City. Slump tests shall be taken in the field by a representative of the Contractor's quality control firm. The cost of this testing shall be the responsibility of the Contractor.

725.8.2 Concrete Cylinder Test:

ADD the following:

Concrete cylindrical specimens for compression tests shall be taken in the field by a representative of the Contractor's quality control firm in accordance with AASHTO T141 and T-23. These samples will be tested for compressive strength in accordance to AASHTO T22. Concrete samples will be taken in accordance with Sections 725.8.2 and 725.8.3, except as noted hereinafter. One set of not less than 4 cylinders per 50 cubic yards or ½ days pour shall be prepared and retained to verify compressive strength of the mixture. One cylinder shall be tested at 7 days and 2 at 28 days. The fourth cylinder shall be retained for up to 60 days. If the 28 day test does not meet the minimum strength requirement, cores shall be taken as provided herein and the cost of such will be the responsibility of the Contractor. Acceptance shall be based on minimum 28 day strength requirements. The cost of testing shall be the responsibility of the Contractor.

CITY OF PRESCOTT
ARIZONA
Everybody's Hometown

Phase 2 Drilling and Testing Program
Big Chino Sub-basin Data Collection and Monitoring Plan

Project Special Provisions

REGISTERED GEOLOGIST
CERTIFICATE NO.
46233
DYLAN J
EASTHOUSE
Date Signed 9-28-17
ARIZONA, U.S.A.
2017-6-30-19

SPONSOR:
CITY OF PRESCOTT, ARIZONA
DEPARTMENT OF PUBLIC WORKS

ENGINEER:
SOUTHWEST GROUNDWATER CONSULTANTS
143 E. GOODWIN ST., SUITE 200
PRESCOTT, ARIZONA 86303

THE SPECIAL PROVISIONS SHALL MODIFY AND SUPERSEDE THE VARIOUS SECTIONS OF THE CITY OF PRESCOTT (COP) SUPPLEMENT TO THE MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION, TECHNICAL SPECIFICATIONS.

1. ADDENDA;
2. THESE SPECIAL PROVISIONS;
3. THE COP GENERAL CONDITIONS;
4. CITY OF PRESCOTT (COP) SUPPLEMENT TO THE MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION, TECHNICAL SPECIFICATIONS;
5. MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION;
6. PROJECT PLANS.

TABLE OF CONTENTS

1.0 GENERAL AND OVERVIEW 4
1.1 LOCATION AND GEOLOGIC SETTING 4
1.2 DEFINITIONS 5
1.3 SCOPE OF WORK 6
1.4 PERFORMANCE OF WORK 7
1.4.1 Operations 7
1.4.2 Health and Safety 7
1.4.3 Confidentiality 8
2.0 PROTECTION OF SITE 8
2.1 GENERAL 8
2.1.1 Discharge and Cuttings – Shallow Monitor Wells 9
2.1.2 Mud Pits, Discharge, and Cuttings – Deep Monitor Wells 9
2.1.3 Site Restoration and Above-ground Completion 10
2.2 SOUND CONTROL AND MITIGATION 10
2.3 ADEQ REQUIREMENTS 11
3.0 UTILITIES 11
3.1 WATER 11
3.2 ELECTRICITY 11
3.3 UNDERGROUND UTILITIES 11
3.4 SANITARY FACILITIES 12
4.0 EQUIPMENT 12
4.1 GENERAL 12
4.2 EQUIPMENT DECONTAMINATION 12
5.0 LOGS, REPORTS, AND RECORDS 13
5.1 GENERAL 13
5.2 HEALTH AND SAFETY LOGS 13
5.3 PENETRATION RATE LOG 13
5.4 DAILY DRILLER'S REPORT 13
5.5 DRILLER'S LOG 13
5.6 DRILLING FLUID RECORD 13
6.0 DRILLING FLUID CONTROL PROGRAM 14
6.1 GENERAL REQUIREMENTS 14
6.2 DRILLING FLUID CONTROL PLAN 15
6.3 SPECIFIC CONDITIONS 15
6.4 LOST CIRCULATION 15
7.0 DRILLING AND WELL INSTALLATION 16
7.1 DRILLING METHOD AND AIRLIFT REQUIREMENTS 16
7.2 SURFACE CASING INSTALLATION 16
7.2.1 Drilling 16

7.2.2 Surface Casing Materials 17
7.2.2.1 Casing 17
7.2.2.2 Surface Seal 17
7.2.3 Surface Casing Installation 18
7.2.4 Surface Seal Installation 18
7.3 DRILLING 18
7.3.1 Borehole Drilling 18
7.3.1.1 Shallow Monitor Well Borehole Drilling 18
7.3.1.2 Deep Well Borehole Drilling 19
7.3.2 Lithologic Samples 19
7.3.3 Borehole Plumbness and Alignment 19
7.3.4 Geophysical Logging 20
7.3.5 Stand-by with Crew 21
7.3.6 Well Abandonment 21
7.4 MONITOR WELL MATERIALS AND CONSTRUCTION 21
7.4.1 Well Materials 21
7.4.1.1 Well Casing and Screen 21
7.4.1.2 Cement Seal 22
7.4.2 Well Construction 23
7.4.2.1 Joints in the Well Casing 23
7.4.3 Annular Material Installation 24
7.4.3.1 Cement Seal 24
7.5 WELL DEVELOPMENT 24
7.5.1 Bailing 24
7.5.2 Pumping 24
8.0 AQUIFER TESTING 25
8.1 GENERAL 25
8.2 TEST EQUIPMENT 25
8.3 TEST PUMP DISCHARGE 26
9.0 VISITATION AND INSPECTION 26
10.0 MEASUREMENT AND PAYMENT 27
10.1 PAYMENT ITEMIZATION 27

TABLE 1 - SCHEDULE OF CONTRACTOR DELIVERABLES 30
FIGURES 31
APPENDIX A SELECTED AREA WELL DRILLER LOGS 52

1.0 GENERAL AND OVERVIEW

The work to be accomplished under the following specification generally consists of drilling, construction, and aquifer testing of up to seven (7) monitor wells as part of the Big Chino Sub-basin Data Collection and Monitoring Plan (DCMP). The DCMP was developed with cooperation between the City of Prescott (CITY), Town of Prescott Valley (Town), and Salt River Project (SRP), to further evaluate hydrogeologic conditions in the areas of Yavapai County, Arizona shown on Figure 1. CITY will serve as the contracting entity. Due to specific construction and testing objectives for the monitor wells in the DCMP, items of utmost importance to CITY that require special attention and consideration by CONTRACTOR are outlined below:

- At least 5-years of experience with specified drilling methods and well designs – Section 1.4.1
- Health and Safety Plan – Section 1.4.2
- Mud Pits, Discharge, and Cuttings – Sections 2.1.1 and 7.3.3.3
- Sound Control and Mitigation – Section 2.3
- Borehole Drilling – Section 7.3
- Aquifer Testing – Section 8.0

Information regarding proposed well sites and subsurface conditions described in the following sections is an overview. CONTRACTOR shall be responsible to verify and confirm actual drill site conditions prior to submittal of a bid. CONTRACTOR shall design a drilling program for the project that conforms to these specifications. CONTRACTOR should not submit a bid unless the items listed above are clearly understood and accounted for in the project Bid Schedule. A list of deliverables and associated schedules that are required to be submitted by the CONTRACTOR during performance of the work specified herein is provided in Table 1.

1.1 LOCATION AND GEOLOGIC SETTING

Seven (7) new monitor wells for the DCMP are to be drilled in the Big Chino Sub-basin on undeveloped private, State, and Federal lands located near Paulden, Arizona. The site identification, legal location, and preliminary design of the new wells are given below.

- **Well MW-4b1** is located in the SE ¼ of the SW ¼ of the NW ¼ of Section 28, Township 18 North, Range 1 West [B(18-01) 28BCD] on USDA Forest Service land as shown on Figure 2 and Figure 4. The Preliminary Design of Well MW-4b1 has 4.5-inch outside diameter (OD) PVC casing installed to 460 feet below land surface (ft bls) as shown on Figure 11.
- **Well MW-4b2** is located in the SW ¼ of the SE ¼ of the NE ¼ of Section 19, Township 18 North, Range 1 West [B(18-01) 19ADC] on USDA Forest Service land as shown on Figure 2 and Figure 5. The Preliminary Design of Well MW-4b2 has 4.5-inch (OD) PVC casing installed to 520 ft bls as shown on Figure 12.
- **Well MW-4b3** is located in the SE ¼ of the SW ¼ of the SW ¼ of Section 31, Township 18 North, Range 1 West [B(18-01) 31CCD] on State Trust land as shown on Figure 2 and Figure 6. The Preliminary Design of Well MW-4b3 has 4.5-inch (OD) PVC casing installed to 480 ft bls as shown on Figure 13.
- **Well MW-4d** is located in the NE ¼ of the NW ¼ of the NE ¼ of Section 11, Township 17 North, Range 2 West [B(17-02) 11ABA] on State Trust land as shown on Figure 2 and Figure 7. The Preliminary Design of Well MW-4d has 4.5-inch (OD) PVC casing installed to 450 ft bls as shown on Figure 14.

- **Well MW-4e** is located in the SE ¼ of the NW ¼ of the SW ¼ of Section 12, Township 17 North, Range 2 West [B(17-02) 12CBD] on State Trust land as shown on Figure 2 and Figure 8. The Preliminary Design of Well MW-4e has 4.5-inch (OD) PVC casing installed to 340 ft bls as shown on Figure 15.
- **Well MW-4g** is located in the SE ¼ of the SE ¼ of the NW ¼ of Section 26, Township 18 North, Range 3 West [B(18-03) 26BDD] on private property as shown on Figure 3 and Figure 9. The Preliminary Design of Well MW-4g has nominal 12-inch and 8-inch steel casing installed to 1,400 ft bls as shown on Figure 16.
- **Well BMW-2** is located in the NE¼ of the SW ¼ of the NE ¼ of Section 1, Township 18 North, Range 4 West [B(18-04) 01ACA] on private property as shown on Figure 3 and Figure 10. The Preliminary Design of Well BMW-2 has nominal 12-inch and 8-inch steel casing installed to 2,000 ft bls as shown on Figure 17.

Depth to groundwater in the monitor wells is generally expected to range from 140 to 400 ft bls, with the exception of Well MW-4g where a perched aquifer is present at approximately 16 ft bls.

The upper portion of the shallow monitor well boreholes is expected to penetrate a thin sequence (<40 feet) of clay, silt, sand, and gravel deposits which have varying degrees of cementation. In the area east of US Highway 89 basalt is present at or near the surface, and may be up to 100 feet thick at some drill sites. The target aquifer for the monitor wells are the regional Paleozoic carbonate rocks comprised of limestone (Redwall Formation) and dolomitic limestone (Martin Formation). The Paleozoic carbonates are believed to be up to 550 feet thick in the subject area, and are thought to overly Tapeats Sandstone or Pre-cambrian granite (bedrock).

Basin fill sediments thicken west of US Highway 89 and are estimated to be up to 1,000 feet thick and 1,600 feet thick at Well MW-4g and Well BMW-2, respectively. Basalt is present in the subsurface throughout the Big Chino sub-basin, and may be up to 300 feet thick below 500 ft bls at Well MW-4g. A thin section of basalt is present at Well BWM-2 from approximately 850 to 880 ft bls. The target aquifer for Well MW-4g and Well BMW-2 is the underlying Paleozoic carbonates. This unit(s) is estimated to be approximately 400 feet thick above the Tapeats Sandstone or Pre-cambrian granite. All of the monitor wells for the DCMP are designed with well casing screen (or open hole) in the Paleozoic carbonate (limestone) rocks for the purpose of measuring water levels, aquifer parameters, and water quality.

Driller Logs from wells and boreholes in the subject areas are presented in Appendix A.

1.2 DEFINITIONS

Throughout this specification, the term CITY shall be understood to represent City of Prescott (CITY) with whom the CONTRACTOR will enter into contract for the specified scope of work. Additionally, the Town of Prescott Valley, Salt River Project, and their representatives, have vested interest in the DCMP, and will participate equally in discussions regarding the drilling project. The term ENGINEER shall be understood to represent Southwest Groundwater Consultants (SGC). The term CONTRACTOR shall be the person, firm, or corporation with whom CITY will execute an agreement setting forth the terms and conditions for the work to be performed, as specified herein. The term SUBCONTRACTOR will apply to any person, firm, or corporation with whom CONTRACTOR executes a secondary agreement for a portion of the scope of work.

1.3 SCOPE OF WORK

Following contracting and the submittal of all appropriate insurance certificates, CONTRACTOR shall mobilize to the site within 30 days from the CITY'S Notice to Proceed. The scope of work, demobilization, and cleanup must be completed within 150 days (7-wells). CONTRACTOR shall be responsible for completing the following scope of work:

1) Preparing the site for drilling operations.
2) Installing sound barrier and/or temporary fencing to secure the perimeter of the site
3) Borehole drilling into the Paleozoic carbonates per the preliminary well design
4) Installation of steel well casing and pressure grouting of the annular space above the Paleozoic carbonates (2-deep wells)
5) Installation of PVC well casing and screen as specified
6) Obtaining permits and installing pump and discharge equipment to conduct up to three (3) separate 7-day aquifer tests

The primary objectives of drilling the shallow monitor wells (i.e. Wells MW-4b1, MW-4b2, MW-4b3, MW-4d, and MW-4e) are to collect representative cutting samples, perform geophysical logging, and to construct a PVC well to a minimum of 100 feet below the static water level. Additionally, the objective at Well MW-4d is to conduct aquifer testing in the open borehole prior to installation of the PVC well casing. The primary objectives of the deep hydrologic test wells (i.e. Well MW-4g and Well BMW-2) are to identify the depth and full thickness of the Paleozoic carbonates, collect geophysical logs, and conduct aquifer testing.

To achieve these objectives, CONTRACTOR shall install seven (7) monitor wells as specified herein using the dual-wall drilling system (direct or reverse). CONTRACTOR will be capable to drill the boreholes up to 2,000 ft bls in order to characterize the full thickness of the basin fill sediments, basalt, and Paleozoic carbonate rocks beneath the site(s). The purpose of the borehole shall be to collect representative samples of the drilled cuttings and to conduct geophysical logging surveys. Based on the information obtained from the borehole, a Final Well Design will be developed by ENGINEER. CONTRACTOR shall then furnish and install well casing and annular materials pursuant to the final design as specified herein.

Due to increased likelihood of lost circulation in the Paleozoic carbonates, CONTRACTOR shall use only the dual-tube reverse circulation drilling system to complete the monitor wells.

A Preliminary Well Design for each monitor well is presented on Figures 11 thru 17. **CITY reserves the right to drill beyond the depths specified, or to stop at lesser depths, depending on subsurface conditions.** ENGINEER or CITY may modify the dimensions of the well based on information obtained during the drilling of the borehole. The drilling, geophysical logging, casing and annular materials installation, well development, well completion, aquifer testing, and final well surveys by CONTRACTOR shall be conducted under the oversight of ENGINEER.

1.4 PERFORMANCE OF WORK

1.4.1 Operations

CONTRACTOR shall have no less than five (5) years of experience using dual-tube drilling methods under similar aquifer conditions (Basin and Range physiographic province in Arizona), and shall have recent experience installing monitor wells with similar dimensions. CONTRACTOR shall assign a foreman to oversee all work required by this specification. CONTRACTOR shall provide with its bid submittal a resume of the foreman, including years of experience using dual-tube drilling method in the installation of monitor wells and/or production wells with abstracts and references for three (3) successfully completed wells utilizing the dual-tube methods within the past five years.

CONTRACTOR shall provide a copy with their bid of a valid Arizona Department of Water Resources (ADWR) Well Driller's License in the reverse circulation or mud rotary category, a Register of Contractor License type A, A-4, A-16, or L-53, and all other licenses and permits required by federal, state, city or municipal rules and regulations. CONTRACTOR should confirm that license is in good standing.

CONTRACTOR shall employ only competent employees for the execution of work. All operations shall be performed under the direct and personal supervision of an Arizona licensed well driller with a Registrar of Contractor License type A, A-4, A-16 and L-53. CONTRACTOR shall construct the monitor wells in accordance with the Rules and Regulations of the ADWR, Article 8, Well Construction and Licensing of Well Drillers, as adopted January, 2002. Well construction shall also comply with the guidelines of the Arizona Department of Health Services Engineering Bulletin No. 10 (1978), and all other applicable State, County, and local regulations.

Should the well be lost due to any fault on the part of CONTRACTOR, the well shall be abandoned at no cost to CITY, in accordance with ADWR Article 8, Rule R12-1-816, and a replacement well shall be constructed in the immediate area. The replacement well location will be selected by the CITY and ENGINEER. CITY shall pay CONTRACTOR for the replacement well based on the depth and status at which the original well was terminated. CONTRACTOR shall complete the replacement well in accordance with all the terms and conditions stated herein. However, if the inability to complete the well was not due to any fault of CONTRACTOR, CITY and ENGINEER may designate a replacement well location and CITY shall provide additional compensation in accordance with the prices set forth in the Bid Schedule.

1.4.2 Health and Safety

CONTRACTOR shall appoint in writing a Health and Safety Officer who is not a member of the CONTRACTOR's drilling crew on this project as the person responsible for implementation of the CONTRACTOR's corporate health and safety program.

CONTRACTOR's Health and Safety Officer is responsible for assuring that CONTRACTOR and SUBCONTRACTORS personnel conform to all state and federal health and safety rules and regulations. CONTRACTOR shall prepare a written site specific Health and Safety Plan (HASP) that meets all current OHSA and ADOSH requirements and shall provide it to ENGINEER one (1) week prior to mobilization of equipment to the site. CONTRACTOR shall maintain a copy of the HASP on site and make it easily accessible at all times. In addition, CONTRACTOR shall require all personnel to be trained in the use of any personal protective equipment required by their HASP. CONTRACTOR is responsible to assure that all CONTRACTOR personnel and

SUBCONTRACTORS at the well site are thoroughly familiar with the CONTRACTOR implemented HASP for the proposed work.

CONTRACTOR's Health and Safety Officer shall inspect the site to verify compliance with all requirements in the HASP and shall have the authority to make changes as necessary to ensure compliance. CONTRACTOR's Health and Safety Officer shall provide the CITY and CONTRACTOR's corporate office a signed report with the observations for each site inspection and descriptions of the necessary corrective actions taken to meet compliance with the HASP. At least **three** inspections will be conducted, including but not limited to: 1) upon mobilization and prior to drilling, 2) during drilling activities, and 3) after mobilization of pump equipment, prior to pump development. CONTRACTOR shall implement and meet the requirements of their HASP; any costs associated with this requirement shall be included in the CONTRACTOR's price for mobilization/demobilization.

1.4.3 Confidentiality

CONTRACTOR shall not disclose any information relating to this project or the well site to anyone other than CITY or ENGINEER without written permission from CITY, except as may be required by law. At all times during the conduct of CONTRACTOR'S services, CONTRACTOR and its employees and agents shall treat the work conducted by CONTRACTOR and its SUBCONTRACTORS and the results thereof as confidential and proprietary to CITY.

Any questions regarding the purpose or scope of work which are directed to CONTRACTOR from individuals or entities other than representatives of CITY or ENGINEER, while work is being conducted for this project, should be directed by CONTRACTOR to ENGINEER or CITY.

2.0 PROTECTION OF SITE

2.1 GENERAL

CONTRACTOR shall secure the monitor well site(s) by installing a minimum six (6) foot tall temporary chain-link fence around the perimeter of the site as required by the CITY. For cost estimation purposes the fenced area around the monitor well sites will be approximately 120'x120'. The chain-link fence shall be secured with chains and locks including the entrance gate. All CONTRACTOR activities (including ingress and egress, parking of vehicles and work equipment, and staging of equipment and materials) shall not extend beyond the fenced perimeter of the site. **CONTRACTOR shall not utilize the neighboring driveways or private property for any activity without prior approval of ENGINEER.** An agreement letter for use of private property must be obtained from the parcel owner according to the Contract documents under Legal Regulations and Responsibilities/Protection of Personal Property. A copy of this agreement must be delivered to CITY and ENGINEER. During periods when CONTRACTOR's equipment is onsite without crew members present, CONTRACTOR shall maintain site security to protect the site from unauthorized access at CONTRACTORS expense.

CONTRACTOR, at its own expense, shall be responsible for any improvements necessary to existing access roads, and for maintaining the existing access roads in good condition during the drilling and testing program. If reasonable and necessary, CONTRACTOR will provide 'track-out' rock or other suitable fill material approved by ENGINEER at the location(s) where CONTRACTOR vehicles routinely access the drill sites on State Trust land (i.e. Wells MW-4b3, MW-4d, and MW-4e). The anticipated track out area consists of approximately 700 LF of jeep trail near Well MW-4e, but may also include other sections of the well access road based on

CONTRACTOR judgment. CONTRACTOR is responsible to estimate the quantity of track out material necessary for the project, and shall include its cost (with installation) in Pay Item 1 – Mobilization and Demobilization. CONTRACTOR shall establish and maintain a traffic control plan for site activities in accordance with all City, County, and State regulations and standards.

CONTRACTOR shall prepare the monitor well sites including clearing and grubbing, and establishing access as required to perform the work. All debris from this activity will be transported and disposed at a landfill in accordance with all City, County, and State regulations. CONTRACTOR shall take all necessary precautions to preserve the well site, as nearly as practical, in its present condition. CONTRACTOR shall be responsible for replacing any damaged items at no additional cost. CONTRACTOR shall clean up all litter and debris daily and place it in containers for off-site disposal in a legal manner. CONTRACTOR shall place a plastic tarp beneath the drilling rig during mobilization to protect the site against oil or hydraulic fluid spills or leaks; the tarp will remain beneath the rig until demobilization.

2.1.1 Discharge and Cuttings – Shallow Monitor Wells

During drilling of the small diameter monitor well boreholes (e.g. MW4b1, MW4b2, MW4b3, and MW4e), CONTRACTOR shall lift out the cuttings and formation water using compressed air, or compressed air in combination with a biodegradable foaming agent (surfactant). Additional additives, lost circulation materials, or drilling fluids **may not** be used during drilling of the boreholes without prior written approval from ENGINEER. CONTRACTOR shall employ a cyclone to separate the cutting samples from the air. Cuttings and fluids generated during drilling operations shall be conveyed to above grade steel storage tank(s) where it can be contained without damage to the property, contamination of other wells or waterways, or creation of a nuisance. The total capacity of the steel storage tanks shall contain the cuttings and cuttings mixed with water, as required. CONTRACTOR shall pump clear water from the storage tanks to adjacent ephemeral drainage(s) in compliance with the BMPP described in Section 2.4. CONTRACTOR shall notify ENGINEER prior to the discharge of clear water. ENGINEER will review CONTRACTOR documentation of the water condition prior to the discharge. Additional site protection measures that are required prior to off-site discharges are found in Section 8.3.

During drilling of the boreholes CONTRACTOR shall temporarily stockpile drill cuttings on the ground within the fenced perimeter of the drill site. Following completion of the monitor well drilling, and after such time as the cuttings have dried, CONTRACTOR shall transport cuttings off-site for disposal at a location approved by ENGINEER and CITY. As an option, CONTRACTOR may haul the cuttings to the Big Chino Water Ranch. If drilling fluids other than air are approved and utilized during drilling, CONTRACTOR shall remove any drilling fluids from the site. Any drilling fluids used during the monitor well drilling shall be transported and disposed by CONTRACTOR at a landfill in accordance with all City, County, and State regulations.

2.1.2 Mud Pits, Discharge, and Cuttings – Deep Monitor Wells

During drilling of Well MW-4g and Well BMW-2, CONTRACTOR shall use earthen mud pits for the drilling fluid program. The location of the mud pits shall be approved by ENGINEER. All excavation, including ingress and egress of excavation equipment shall be confined within the fenced perimeter of the drill site. CONTRACTOR shall fence or barricade all earth mud pits to prevent accidental injury of employees and/or on-site visitors.

CONTRACTOR shall use steel storage tanks (or hoppers) to store any drilling fluids and drilling fluids mixed with water removed from the earthen mud pits prior to offsite disposal. The total

capacity of the storage tanks shall contain the drilling fluids and drilling fluids mixed with water, as required. CONTRACTOR shall dispose of fluids in the tanks in a timely manner and as necessary to maintain available capacity. Costs associated with delays of work related to the available volume in the steel storage tanks shall be at the cost of the CONTRACTOR.

CONTRACTOR shall dispose of drill cuttings, fluids, and excess soil from the mud pit excavation by evenly spreading the materials on the site(s) in the area approved by ENGINEER. After completion of drilling, CONTRACTOR shall remove all fluids from the earth mud pits, which shall be allowed to dry to the maximum extent possible before backfilling. Soil used to fill the earth mud pit excavations shall be compacted by CONTRACTOR using compaction equipment to a minimum 95% of proctor using methods appropriate for the soil type as approved by ENGINEER.

2.1.3 Site Restoration and Above-ground Completion

After completion of the work, CONTRACTOR shall remove all debris, waste, trash, and unused materials or supplies; and, shall eliminate all signs of temporary construction facilities such as temporary work areas, temporary structures, sound barriers, and stockpiles of excess or waste materials per CITY Specification Section 104.1.5. CONTRACTOR shall restore the site, as nearly as possible, to its original condition including re-seeding with native plants per applicable parts of CITY Specifications Section 430; cost for re-seeding shall be included in Pay Item 1 – Mobilization and Demobilization. Any environmental impacts caused by CONTRACTOR will be corrected at CONTRACTOR expense.

CONTRACTOR shall secure the surface casing, being approximately 2' above existing grade, with either a non-welded, hinged and locking lid, or a welded steel plate with 1-inch steel plug per ENGINEER. CONTRACTOR shall construct a concrete pad being a minimum of 4-inches thick around the surface casing. The concrete shall be sloped to drain surface run-off away from the well. CONTRACTOR shall cover the outside of all well casing materials exposed above ground with high visibility yellow paint. Upon final acceptance, CITY or ENGINEER shall secure the well with lock and key (if necessary).

2.2 SOUND CONTROL AND MITIGATION

CONTRACTOR shall take appropriate measures to control the transmission of airborne sound. Equipment which makes sound which has the potential to disturb the peace shall be controlled by CONTRACTOR using mufflers (if appropriate) and other sound control equipment. CONTRACTOR shall use air compressors and generators designed to operate quietly. Sound made by trash pumps shall be controlled by installing a temporary sound barrier around the trash pump (for example) using pallets and sound blankets.

If necessary (as contingency), sound panels will be installed along the eastern, western, and northern boundaries of the Well MW-4g site. For cost estimation purposes a total of 360 linear feet of sound panels shall be used. CONTRACTOR shall install additional sound barriers as requested by CITY. Sound barriers shall include insulated sound blankets and/or acoustic foam (or equivalent material) and be specifically designed to reduce the transmission of sound. The sound barriers shall be a minimum of 16 feet high and designed to function safely in windy conditions. CONTRACTOR shall be required to maintain the sound barriers during all drilling and testing activities at the site, and shall be responsible for costs associated with sound barrier maintenance.

2.3 ADEQ REQUIREMENTS

CONTRACTOR will prepare a Notice of Intent (NOI) for Single Source De Minimus Discharges to Waters of the United States under the Arizona Pollution Discharge Elimination System (AZPDES) De Minimis General Permit (AZG2010-001) administered by the Arizona Department of Environmental Quality (ADEQ). CONTRACTOR is responsible for submittal of a NOI to ADEQ, and shall have a Best Management Practices Plan (BMPP) for the project. The discharge for the three (3) aquifer tests for this project will be directed to an ephemeral drainage located between 200 to 5,600 feet from the well site. The anticipated path of discharge for each of the pumping tests are shown on Figures 18, 19 and 20, respectively.

CONTRACTOR shall be responsible for the installation, implementation, and maintenance, of all BMP's throughout the life of the project, and for all discharge monitoring requirements listed in NOI Table A. A combination of BMP's to address erosion and sediment control, and the control of wastes and other construction site pollutants may be required to fully meet the requirements of the NOI. CONTRACTOR shall meet the requirements of the NOI at its own expense.

3.0 UTILITIES

3.1 WATER

Make-up water necessary for the drilling program at the monitor well sites shall be obtained and paid by CONTRACTOR. CONTRACTOR shall be responsible for any necessary permits and meters to obtain water and properly monitor usage from its source. As a suggestion, CONTRACTOR may obtain potable make-up water for the project from the Abra Water Company in Paulden, Arizona, or from the CITY water production facility in Chino Valley, Arizona.

Alternatively, a water source for the drilling and well installation activities for Well MW-4g and Well BMW-2 monitor wells will be available from existing wells located at the respective sites. Well 55-803378 (Patton Well) is located less than 100-feet from Well MW-4g. It is constructed with 16-inch steel casing to approximately 94 ft bls, and has a static water level of approximately 16 ft bls.

Well 55-905773 (BMW-3) is located approximately 200-feet from of Well BMW-2 and is constructed of 4.5-inch diameter steel casing to approximately 1,000 ft bls. The static water level of in BMW-3 is 180 ft bls. Well BMW-3 is currently installed with a continuous water level recording device and telemetry equipment that is owned and operated by ADWR. Prior to mobilization CONTRACTOR shall notify CITY or ENGINEER of intent to use BMW-3 for make-up water in order to coordinate removal of this monitoring equipment by ADWR.

CONTRACTOR shall be responsible for installing the necessary pumping equipment and generator power to obtain water from the existing wells. CONTRACTOR shall be responsible for connections or ancillary equipment required for the use of water at the site.

3.2 ELECTRICITY

CONTRACTOR shall provide (or obtain), at CONTRACTOR'S expense, all power required to perform work.

3.3 UNDERGROUND UTILITIES

Location of all utilities at the site shall be the responsibility of CONTRACTOR. Utility damage, caused by CONTRACTOR, shall be repaired at CONTRACTOR'S expense in accordance with all City, County, and State regulations and standards. It is the responsibility of CONTRACTOR

to contact Arizona 811 (Blue Stake) and CITY, and to maintain utility clearances prior to mobilization. Known utilities in the area (identified by Blue Stake) which have not indicated the site has been cleared or utilities which have provided unclear markings, shall be contacted by CONTRACTOR for utility clearance prior to mobilization to the site.

3.4 SANITARY FACILITIES

CONTRACTOR shall provide and maintain an onsite portable toilet consistent with Occupational Safety and Health Administration (OSHA) regulations (Code of Federal Regulations Title 29, Part 1926.51(c)(1)). The toilet shall be maintained consistent with the service schedule in American National Standards Institute (ANSI) Standard Z4.3-1995, Section 3. The ANSI standard calls for a toilet used by up to 10 people to be serviced a minimum of once per week.

4.0 EQUIPMENT

4.1 GENERAL

CONTRACTOR shall furnish and maintain in safe and efficient working condition all equipment necessary to perform the specified work, including a drilling rig or rigs capable of performing the specified operations to the specified depths; pumping, testing, sampling, and auxiliary equipment as specified or required to complete the described tasks and which shall meet the following requirements.

- The drilling rig, pumping equipment, and auxiliary equipment used for this project shall be well maintained and shall meet the standards of the OSHA.
- All high-pressure hoses shall be equipped with a safety chain or cable to protect against the event of hose or coupling failure.
- The drilling rig for the shallow monitor wells (MW-4b1, MW-4b2, MW-4b3, MW-4d,and MW-4e) shall have a manufacturer's specified derrick rating and hook load capacity capable of lifting no less than 1.5 times the weight of the proposed casing string as shown in the preliminary well design (Figures 11 thru 15) or 50,000 pounds, whichever is greater.
- The drilling rig for Well MW-4g and Well BMW-2 shall have a manufacturer's specified derrick rating and hook load capacity capable of lifting no less than 1.5 times the weight of the proposed casing string as shown in the preliminary well design (Figure 17) or 100,000 pounds, whichever is greater.

Compressed air introduced into the well must be treated by passage through a high volume carbon or coalescing filter installed on the compressor equipment to remove organic contaminants (e.g., compressor lubrication oil).

4.2 EQUIPMENT DECONTAMINATION

Prior to the arrival of the drilling equipment to the site, CONTRACTOR shall decontaminate the drill rig and downhole tools by steam cleaning. ENGINEER must approve the method and extent of steam cleaning. CONTRACTOR will be required to provide a letter of certification to ENGINEER of the decontamination of CONTRACTOR'S equipment, prior to utilization. CONTRACTOR may certify, in writing, the decontamination of critical (downhole) pieces of drilling equipment in lieu of actual steam cleaning, provided the downhole pieces of drilling equipment have not been in contact with any hazardous or toxic materials since the last decontamination. All necessary steam cleaning shall be conducted at CONTRACTOR'S expense.

5.0 LOGS, REPORTS, AND RECORDS

5.1 GENERAL

CONTRACTOR shall keep accurate and legible all required logs as described below and make these logs available onsite at all times.

5.2 HEALTH AND SAFETY LOGS

CONTRACTOR shall maintain all records and logs required by the site specific HASP.

5.3 PENETRATION RATE LOG

During the drilling of the borehole, CONTRACTOR shall keep a time log showing the actual penetration time required to drill each foot of the borehole. CONTRACTOR shall note the types of bits used in each interval of the borehole in this log and whether designed for soft, medium, or hard formations, including approximate weight on the bit during the drilling of the various types of formation in the various sections of the borehole. CONTRACTOR shall make this log available for review by ENGINEER throughout the drilling program and shall deliver the log to ENGINEER upon completion of drilling.

5.4 DAILY DRILLER'S REPORT

During the drilling and construction of the well, CONTRACTOR shall maintain a detailed driller's report and provide it daily to ENGINEER at the well site. The daily driller's report forms must be International Association of Drilling Contractors (IADC) or equal approved by ENGINEER. The report shall give a complete description of all formations encountered including number of feet drilled, number of hours on the job, shutdown due to breakdown, type of bit used, weight of the collars included in the drill string, weight on the bit, amount and type of drilling fluids used, plumbness test results at each 100-foot interval, and length and type of casing set; and, such other pertinent data as may be requested by ENGINEER. CONTRACTOR shall submit this report to ENGINEER for approval daily.

If Daily Driller's Reports are not completed as required or are not available for review by ENGINEER upon request, CONTRACTOR shall stop work at the CONTRACTOR'S expense to provide the required Daily Driller's Reports.

5.5 DRILLER'S LOG

During the drilling of the borehole(s), CONTRACTOR shall prepare a detailed driller's log in compliance with the requirements of the Arizona Department of Water Resources (ADWR). The log shall include all depth measurements below land surface, a generalized description of each formation encountered, the depth at which each formation is encountered, and the thickness of each formation. The lithologic log prepared by ENGINEER will be made available to CONTRACTOR to assist in the preparation of the driller's log. CONTRACTOR shall furnish a copy of the completed driller's log to ENGINEER.

5.6 DRILLING FLUID RECORD

During the drilling of the borehole(s), CONTRACTOR shall maintain a log of drilling fluid properties. CONTRACTOR shall record the drilling fluid properties on an American Petroleum Institute (API) -approved form, and will document all items listed in Section 6.1. CONTRACTOR shall make the drilling fluid log available for review by ENGINEER throughout the course of drilling, and shall deliver it to ENGINEER upon completion of each day's work activities.

6.0 DRILLING FLUID CONTROL PROGRAM

6.1 GENERAL REQUIREMENTS

During drilling of the Paleozoic carbonates (limestone) CONTRACTOR shall drill the borehole using compressed air, or compressed air combined with a biodegradable foaming agent approved by ENGINEER prior to use. Compressed air introduced into the well must be treated by passage through a high volume carbon or coalescing filter installed on the compressor equipment to remove organic contaminants (e.g. compressor lubrication oil). Additional additives, lost-circulation materials, or drilling fluids may not be used during drilling of the borehole in the Paleozoic carbonates without prior written approval by ENGINEER. Authorized drilling products shall be NSF International Standard 60 Approved for use in production wells.

During drilling of the upper basin fill sediments (i.e. Well MW-4g and Well BMW-2) CONTRACTOR shall be responsible for maintaining the quality of a low-solids, non-dispersed bentonitic/polymeric fluid

CONTRACTOR shall be responsible for maintaining the quality of any drilling fluids to assure:

1. Protection of water bearing and potential water bearing formations exposed to the borehole.
2. Representative samples of the formation material.
3. Maximum development capability and optimum potential yield of the completed well.
4. Inhibition of the formation and prevention of formation-caused drilling problems (e.g., heaving sands, swelling clays, lost circulation).
5. Protection of the integrity of the boring during the drilling operations.

At all times prior to the installation of the blank well casing in Well MW-4g and Well BMW-2, CONTRACTOR shall maintain a drilling fluid control program in accordance with American Water Works Association (AWWA) Standard A100-06, Section 4.7.3. When feasible based on subsurface conditions, CONTRACTOR shall have a drilling fluid control program to maintain fluid properties as specified below:

- Weight (fluid density): less than 9.0 pounds per gallon.
- Viscosity: 34 to 38 seconds per quart with a Marsh funnel.
- pH: 8.5 to 9.5 standard pH units.
- API Filtrate: less than 14 cubic centimeters water loss in 30 minutes with filter press.
- Sand content: less than 2 percent by volume.
- Solids content: less than 10 percent by volume.
- Filter cake thickness: less than 1/16-inch.

Prior to the installation of annular materials, CONTRACTOR shall maintain a drilling fluid control program in accordance with AWWA Standard A100-06, Section 4.7.6.2 as specified.

- Weight (fluid density): less than 9.0 pounds per gallon.
- Viscosity: less than 30 seconds per quart with a Marsh funnel.
- Sand content: less than 1 percent by volume.

CONTRACTOR shall maintain current records at the site at all times to show: 1) the time, depth, and results of all drilling fluid tests; 2) all materials added to the system, i.e., kind, amount, time,

and depth; and, 3) variances or modifications from the agreed upon fluid program such as time, depth, reason, and authorization. CONTRACTOR is responsible for maintaining an adequate supply of drilling fluid additives (including lost circulation material) at the drilling site, and for the removal of all drilling fluids and additives from the borehole during development of the well. CONTRACTOR shall make available a Marsh-type viscosity funnel and a mud scale at the well site during all well construction operations, and upon request, shall make them available to ENGINEER.

CONTRACTOR shall be responsible for designing and controlling a drilling program that conforms to this specification.

6.2 DRILLING FLUID CONTROL PLAN

CONTRACTOR shall provide ENGINEER a drilling fluid control plan 48 hours prior to drilling. ENGINEER must approve the Drilling Fluid Control Plan prior to implementation. The Drilling Fluid Control Plan shall include:

- Explanation of potential problems and issues associated with the lithology.
- How anticipated changes in the drilling conditions will affect the drilling fluid control plan.
- Lost Circulation Plan.
- List of products, purpose of each product, and application rates.
- Test parameters, test equipment, and fluid property limits.
- Frequency of fluid tests.
- Material Safety Data Sheets (MSDS) for drilling products.

Drilling fluid tests will be required during periods when any drilling fluid additives (not only clear water) are being circulated in the borehole. CONTRACTOR shall measure physical and chemical properties of the drilling fluid in accordance with the procedures of the American Petroleum Institute (API) Standard RP 13B "Standard Procedures for Testing Drilling Fluids". CONTRACTOR shall test those samples which are collected at the rig pump discharge line, with care taken to assure a true and representative sample. CONTRACTOR shall conduct drilling fluid tests a minimum of: 1) every 24 circulating-hours, 2) when significant changes to the drilling fluid are made, 3) whenever conditions appear to have changed or when problems arise, or 4) at the request of ENGINEER.

6.3 SPECIFIC CONDITIONS

During the drilling of the borehole, and the installation of well, CONTRACTOR shall take care to minimize chemical and biological disturbance of the vadose zone and saturated alluvial matrix. The use of organic drilling fluid materials (such as starch, guar, or cottonseed hulls) will not be accepted for drilling. The use of "nonreversible" lost circulation materials such as newspaper and cellophane may be allowed in the upper non-test zone only with prior written approval by CITY and ENGINEER. Once the expected test zone is penetrated as estimated by ENGINEER, no lost circulation material will be allowed. MSDS from the manufacturer for all drilling fluid additives must be provided to ENGINEER for review and approval prior to use.

6.4 LOST CIRCULATION

During the drilling of the borehole(s), if there is no return of circulated drilling fluid (lost circulation) for a period of at least two (2) continuous hours and CONTRACTOR is unable to advance the hole at a rate of 4 feet per hour or greater, CONTRACTOR may invoke the Lost Circulation Clause. In order to invoke the Lost Circulation Clause, CONTRACTOR shall notify the

ENGINEER immediately upon experiencing lost circulation. CONTRACTOR shall provide written notification to ENGINEER and CITY within one (1) hour of observed lost circulation, and ENGINEER shall provide a written field order to CONTRACTOR to continue under the Lost Circulation Clause, or no compensation for regaining lost circulation will be made.

The conditions of the Lost Circulation Clause shall apply from the beginning of the time period of total lost circulation, with no returns at the land surface, and shall continue only until such time as drilling fluid circulation is regained, with full or partial returns of drilling fluid at the land surface. After an initial lost circulation event has occurred, should circulation be lost again, CONTRACTOR shall again provide written notification to ENGINEER and CITY within one (1) hour of observed lost circulation, and ENGINEER shall provide a written field order to CONTRACTOR to continue under the Lost Circulation Clause, or no compensation for regaining lost circulation will be made. The Lost Circulation Clause will continue until such time as drilling fluid circulation is regained with full or partial returns of drilling fluid at the land surface for one (1) hour.

CONTRACTOR shall be compensated on a time and materials basis under lost circulation conditions if CONTRACTOR invokes the Lost Circulation Clause and maintains the Lost Circulation Plan. During the period of the Lost Circulation Clause, CONTRACTOR shall be compensated for time and compensated for materials used during the period of the Lost Circulation Clause at cost plus 10 percent markup.

7.0 DRILLING AND WELL INSTALLATION

7.1 DRILLING METHOD AND AIRLIFT REQUIREMENTS

CONTRACTOR shall drill the monitor well borehole(s) using dual-tube reverse circulation (DTRC) drilling methods. **Conventional direct air and mud-rotary, bucket auger, or rotary auger drilling methods are permitted only during installation of surface casing.**

Shallow monitor wells (e.g. Wells MW4b1, MW4b2, MW4b3, MW4d, and MW4e) shall be completed using DTRC with air and a conventional DTH hammer or DTH RC hammer. Deep monitor wells (e.g. Wells MW4g and BMW2) are permitted to be completed in the upper basin fill sediments using flooded DTRC methods to the top of the Paleozoic carbonate unit (limestone). CONTRACTOR shall complete the borehole using DTRC with air (DTH hammer or tri-cone button bit) unless otherwise approved by ENGINEER.

CONTRACTOR shall be required to have for air lifting purposes, compressors capable of supplying a minimum total of 750 cubic feet per minute at 350 pounds per square inch, and any needed boosters to lift drilling fluids to the surface.

CONTRACTOR shall be responsible for designing and controlling a drilling program that conforms to this specification.

7.2 SURFACE CASING INSTALLATION

7.2.1 Drilling

For monitor wells MW-4b1, MW-4b2, MW-4b3, and MW-4e CONTRACTOR shall drill the surface casing boreholes to a diameter of 12 inches, and to a depth of no less than 20 feet. For Well MW-4d CONTRACTOR shall drill the surface casing borehole to a diameter of 18 inches, and to a

depth of no less than 20 feet. For Well MW-4g and Well BMW-2 CONTRACTOR shall drill the surface casing borehole to a diameter of 24 inches, and to a depth of no less than 100 feet.

ENGINEER and CITY reserve the right to direct the drilling of the surface casing borehole to a greater depth depending on geologic formations and other subsurface conditions. The surface casing borings shall be drilled using conventional direct air and mud rotary drilling methods, or using a bucket or flight auger. CONTRACTOR shall be responsible to minimize chemical and biological disturbance of the vadose zone and saturated alluvial matrix.

7.2.2 Surface Casing Materials

7.2.2.1 Casing

The surface casing for this test well shall be new, and manufactured in accordance with American Society for Testing and Materials (ASTM) Specification A53 Grade B low-carbon steel. Per the Preliminary Well Design shown on Figures 11 thru 17, this surface casing materials shall include 6.5-inch, 12.75 inch and 18.0 inch outside diameter. The 6.5-inch casing shall and have a minimum 0.188-inch wall thickness; the 12.75-inch diameter and 18.0-inch diameter casings shall have a minimum 0.250 inch wall thickness. The total length of the 6.5-inch and 12.75-inch surface casing shall be a minimum of 22 feet to be installed with a maximum 2-foot stickup above land surface. The total length of the 18-inch surface casing shall be a minimum of 100 feet, and shall be installed with a maximum 2-foot stickup above land surface. The surface casing(s) shall be factory assembled in not less than 20-foot lengths.

7.2.2.2 Surface Seal

The surface seal for the surface casing shall consist of a slurry of neat cement or sand cement. ENGINEER must approve the specific constituents and mix design of the surface seal. CONTRACTOR shall provide a vendor-supplied slurry mix design (with mix ratios and ASTM designations for the constituents) to ENGINEER at least three (3) days prior to placement of the surface seal.

The slurry mix design for the surface seal shall include:

- If neat cement is used, the mixing ratio shall not exceed six (6) gallons of water per 94-pound sack of Portland cement.
    - The Portland cement shall conform to ASTM Standard C150, Type II.
    - Accelerator additives, such as calcium chloride, shall not exceed two percent by weight of the cement.
    - The slurry shall not exceed 15.1 pounds per gallon (lb/gal) (113 lb/cf).
- If sand cement is used, the mix ratio for the volume of sand shall not exceed the volume of Portland cement.
    - The Portland cement shall conform to ASTM Standard C150, Type II.
    - The mixing ratio shall not exceed 6 gallons of water per 94-pound sack of Portland cement.
    - For cost estimation purposes only, CEMEX mix code 1332916 for a 15 Sack Sand Slurry is acceptable.

- Accelerator additives, such as calcium chloride, shall not exceed two percent by weight of the cement.
- The slurry shall not exceed 17.0 lb/gal (127 lb/cf).

CONTRACTOR shall provide a mud scale to ENGINEER to measure the weight of the slurry, as an indicator of the mix ratio, prior to installation. CONTRACTOR shall mix the slurry thoroughly and the slurry shall be free of lumps to the satisfaction of ENGINEER. Surface seal material that does not meet the slurry mix requirement shall be rejected at the cost of the CONTRACTOR.

7.2.3 Surface Casing Installation

Details for the surface casing construction for the monitor wells are shown on Figures 11 thru 17. For wells have 6.5-inch and 12.75-inch surface casings, CONTRACTOR shall furnish surface casing, conforming to Section 7.2.2, and install it approximately 2-feet above the ground surface to a minimum of 20 feet below the ground. For wells having 18-inch surface casing, CONTRACTOR shall furnish surface casing, conforming to Section 7.2.2, and install it approximately 2-feet above the ground surface to a minimum of 98 feet below the ground. If necessary, field welding of joints shall conform to section 7.4.2.1.

7.2.4 Surface Seal Installation

CONTRACTOR shall place a cement slurry surface seal conforming to the specification in Section 7.2.2.2 from the base of the surface casing to ground surface. At Well MW-4g and Well BMW-2 the cement slurry shall be installed from the base of the surface casing to approximately five (5) ft bls to accommodate the flow pipe from the mud pit. CONTRACTOR shall completely fill the annular space with cement slurry and form a continuous seal between the surface casing and the wall of the borehole. CONTRACTOR shall take care to maintain an equalization of pressures to the extent necessary to prevent collapse of the surface casing. CONTRACTOR shall maintain the surface casing centered in the hole for a minimum curing time of 12 hours or until the seal obtains a compressive strength of 5,000 pounds per square inch (psi).

7.3 DRILLING

CONTRACTOR shall drill the boreholes, as specified, to preliminary depths shown on Figures 11 thru 17. Data collected during drilling of the borehole will be used to prepare a Final Well Design. CONTRACTOR shall drill the boreholes using the methods described in Section 7.1, and in compliance with the drilling fluid testing and reporting requirements of Section 6.0. During drilling activities, CONTRACTOR shall conduct all operations on a minimum 12-hour per day, 7-day per week basis.

7.3.1 Borehole Drilling

CONTRACTOR shall drill the monitor wells borehole(s) between 6 to 16 inches in diameter as shown on Figures 11 thru 17. The boreholes are anticipated be drilled a total depth ranging from 340 to 2,000 ft bls. CITY reserves the right to direct the drilling of the well borehole to a greater or lesser depth based on recommendations of ENGINEER.

7.3.1.1 Shallow Monitor Well Borehole Drilling

CONTRACTOR shall drill a borehole at monitor wells MW-4b1, MW-4b2, MW-4b3, and MW-4e to a minimum diameter of 6-inches. CONTRACTOR shall drill Well MW-4d to a minimum diameter of 12-inches. **CONTRACTOR shall drill the shallow monitor wells boreholes using dual-tube reverse circulation (DTRC) with air and a down-the-hole (DTH) hammer.**

7.3.1.2 Deep Well Borehole Drilling

CONTRACTOR shall drill the borehole at Well MW-4g and Well BMW-2 in two (2) parts. The Upper Unit borehole (basin fill) will be drilled in a single-pass, and be a minimum 16-inches in diameter to approximately 1,000 feet at Well MW-4g, and to approximately 1,600 ft bls at Well BMW-2. CITY reserves the right to direct the drilling of the well borehole to a greater or lesser depth at the recommendation of ENGINEER. CONTRACTOR shall use either flooded dual-tube reverse circulation or dual-tube reverse circulation with air to drill the upper borehole.

Following well construction per Section 7.4.2, CONTRACTOR shall drill a Lower Unit (Paleozoic carbonate) borehole in a single pass to 12-inches in diameter. Based on hydrogeologic conditions at the time of well construction ENGINEER will determine if the lower unit can be completed using flooded reverse circulation. For purposes of bidding, **CONTRACTOR shall use the dual-tube reverse circulation (DTRC) with air and a DTH hammer drilling to complete the Lower Unit borehole.** The Lower Unit borehole will be drilled to a depth of approximately 1,400 feet at Well MW-4g, and to approximately 2,000 ft bls at Well BMW-2. CITY reserves the right to direct the drilling of the well borehole to a greater or lesser depth, depending on geologic formations and other subsurface conditions.

7.3.2 Lithologic Samples

During the drilling of the borehole(s), CONTRACTOR shall collect and preserve for ENGINEER, two duplicate samples of the drill cuttings. CONTRACTOR shall collect the samples at 10-foot intervals from ground surface to the bottom of the borehole. CONTRACTOR shall provide an acceptable means of sampling the drilled cuttings at the discharge point. Catching the drilled cutting samples in sieves, or from the mud system shaker, will not be allowed. CONTRACTOR shall provide a sump-type or baffle-type sample catching device. CONTRACTOR shall carefully collect each cutting sample from the sampling point, and CONTRACTOR shall clean the sample catching device of all cuttings after each sample is taken.

CONTRACTOR shall furnish and place the samples in 4.5 inch by 6 inch cloth sacks (HUBCO or equal). In addition, as an on-site visual record of the borehole stratigraphy, CONTRACTOR shall lay each sample out in a sample storage area on a water-proof tarp or ground cloth for each sampled interval in descending order. CONTRACTOR shall protect the samples from rain fall, wind, or other disturbance. The storage area and ground cloth must allow samples to be maintained in sequence and unmixed with surface material or other samples until they have been examined and logged by ENGINEER. CONTRACTOR shall submit details of the proposed formation sampling method including the sampling equipment to be used to ENGINEER prior to the start of drilling. ENGINEER must approve the sampling program prior to the start of drilling.

7.3.3 Borehole Plumbness and Alignment

During the drilling of the monitor well borehole(s), CONTRACTOR shall perform plumbness tests by use of an inclinometer (Eastman mechanical drift indicator available from the Eastman Oil Well Survey Company or equivalent) at 100-foot intervals. CONTRACTOR shall use a 3-degree unit with the inclinometer. The maximum acceptable drift shall be no more than 0.5 degree. If a survey measurement exceeds the maximum acceptable drift, CONTRACTOR, at its own expense, shall correct the plumbness of the borehole to the satisfaction of CITY and ENGINEER.

At the completion of borehole drilling, ENGINEER shall test plumbness and alignment using a magnetic deviation tool. The deviation tool shall measure plumbness and alignment at 20-foot intervals. The borehole will be considered to be within tolerance if plumbness meets the

requirement of AWWA Standard A100-06, Section 4.7.9.2 for the entire length of the borehole (i.e. 2/3 inside diameter of the well casing per 100 feet of well depth).

Should the plumbness and alignment of the well boreholes not meet AWWA Standard A100-06, Section 4.7.9, CONTRACTOR, at its own expense, shall correct the plumbness and/or alignment of the well to the satisfaction of the CITY. Borehole plumbness and alignment must be approved by the CITY and ENGINEER prior to construction of the monitor well.

CITY may waive the requirements of plumbness and alignment if: (1) CONTRACTOR has exercised all possible care in constructing the well, and fully executed the corrective action plan, submitted as part of this section, to the satisfaction of ENGINEER, and (2) the utility of the completed well will not be materially affected, and (3) CONTRACTOR has submitted a written report explaining the cause of the borehole deviation and corrective actions taken to bring the well within acceptable limits of deviation. CONTRACTOR shall furnish that report to CITY and ENGINEER prior to acceptance of the well.

7.3.4 Geophysical Logging

ENGINEER will provide geophysical logging services for the borehole(s). Shallow monitor wells (i.e. Wells MW-4b1, MW-4b2, MW-4b3, MW-4d, and MW-4e) shall have borehole geophysics conducted one time at total depth. ENGINEER will provide geophysical logging services for the deep monitor wells (i.e. Wells MW-4g and BMW-2) on two occasions per well:

1. Following completion of the Upper Unit borehole, and
2. Following completion of the Lower Unit borehole to total depth.

The selected SUBCONTRACTOR shall conduct, at a minimum, the following geophysical logs of the monitor well boreholes:

- Spontaneous potential
- 64-inch and 16-inch normal resistivity
- Natural gamma ray
- Sonic
- Sonic porosity
- Borehole televiewer (acoustic)
- Caliper

CONTRACTOR shall notify ENGINEER a minimum of 12-hours prior to completion of the borehole(s) in order to provide adequate time to schedule the geophysical logging SUBCONTRACTOR. CONTRACTOR shall be compensated per the Bid Schedule for actual hours of stand-by (with crew) that occurs during normal drilling operations. CONTRACTOR shall not be compensated for stand-by that is not directly related to performing geophysical logging.

ENGINEER will be present for all geophysical logging activities and shall approve the quality of all geophysical logs in the field. ENGINEER shall provide CONTRACTOR with two (2) field copies upon completion, and electronic copies of all geophysical logging surveys as requested by CONTRACTOR within two (2) weeks of completion.

7.3.5 Stand-by with Crew

During the project CONTRACTOR may be required by ENGINEER or CITY to stop drilling. CONTRACTOR shall be compensated for the cost of maintaining equipment and personnel if a work stoppage occurs that is not due to any fault of CONTRACTOR or its SUBCONTRACTORs. CONTRACTOR shall notify ENGINEER and CITY immediately upon work stoppage. CONTRACTOR shall not be compensated for standy-by time without prior written approval by ENGINEER and CITY.

7.3.6 Well Abandonment

If required, CONTRACTOR shall abandon the borehole or well per ADWR Article 8, Rule R12-1-816. ENGINEER shall approve specific methods and materials used in the well abandonment. CONTRACTOR shall not proceed with well abandonment without prior written approval from ENGINEER and CITY.

7.4 MONITOR WELL MATERIALS AND CONSTRUCTION

ENGINEER shall provide CONTRACTOR with the Final Well Design within 24-hours following completion of geophysical surveys.

7.4.1 Well Materials

The materials that are anticipated to be installed in the monitor wells are described below. The actual quantities of materials to be used are subject to change, based on information obtained during the drilling and testing of the boreholes. ENGINEER shall provide a Final Well Design prior to installation of the casing and annular materials by CONTRACTOR.

CONTRACTOR shall be responsible for the accuracy of the well material order necessary to comply with the Final Well Design. CONTRACTOR shall be responsible for coordinating the timely delivery of well materials for inspection and approval by ENGINEER. Well materials not within the requirements described below, or not within factory specifications for roundness, may be rejected. Well materials damaged during loading, transportation, or unloading may be rejected by CITY or ENGINEER. CONTRACTOR shall be responsible for all costs or additional work associated with damaged well materials.

7.4.1.1 Well Casing and Screen

CONTRACTOR shall provide blank casing and screen for the monitor wells as specified below:

1. PVC flush joint threaded blank casing.
2. PVC flush joint threaded screen casing.
3. Low carbon steel (LCS) blank casing.
4. LCS slotted casing.

The blank PVC well casing (Figures 11 thru 15) shall be new 4.5-inch outside diameter schedule 40 PVC flush joint threaded casing. This casing shall have a minimum inside diameter (ID) of 3.99-inches. The length of this blank well casing in the shallow monitor wells is anticipated to range from 240 to 420 feet. The final dimension (length) of blank casing is subject to change based on actual conditions encountered during drilling. The well casing shall be new and factory-assembled in lengths not less than 10-feet, unless smaller sections are required by the Final Well Design.

The slotted PVC well screen shall be new, factory-assembled 4.5-inch diameter flush-threaded Schedule 40 PVC. The well screen shall 0.050-inch wide machine cut slots being horizontal to the axis of the casing, and with 0.250-inch spacing. The screen casing shall have a minimum ID of 3.99-inches. The length of the well screen in monitor well is anticipated to range from 100 to 120 feet. ENGINEER shall confirm the final position of the screen interval based on the results of drilling and the geophysical surveys. The bottom of the lowermost screen casing will be closed with a flush threaded Schedule 40 PVC bottom cap.

The LCS blank well casing shall be new and manufactured in accordance with ASTM Specification A139 Grade B steel. Manufactured welds shall be by the automatic submerged-arc process using at least one pass on the inside and one pass on the outside. The LCS blank well casing shall have a 12.250 inch inside diameter, 12.75 inch outside diameter, and a 0.250-inch wall thickness. The blank casing shall be factory assembled in not less than 40-foot long pieces, unless shorter lengths are required based on the final well design.

The LCS slotted well casing shall be new and manufactured in accordance with ASTM Specification A139 Grade B steel. Manufactured welds shall be by the automatic submerged-arc process using at least one pass on the inside and one pass on the outside. The LCS screen well casing shall have a 8.625 inch outside diameter, 8.125 inch outside diameter, and a 0.250-inch wall thickness. The mill cut slotted opens shall be 0.125-inches wide, with 32-slots per foot. The slotted LCS casing shall be factory assembled in not less than 40-foot long pieces, unless shorter lengths are required based on the final well design.

7.4.1.2 Cement Seal

The cement seal material shall consist of a slurry of neat cement or Pozzolanic cement. Accelerator additives (such as calcium chloride or sodium chloride) or inert additives such as sand or aggregate material shall not be accepted. ENGINEER must approve the specific constituents and mix design for the cement seal. CONTRACTOR shall provide a vendor-supplied slurry mix design (with mix ratios and ASTM designations for the constituents) to ENGINEER for approval at least three (3) days prior to placement of the cement seal.

The slurry mix design for the cement seal shall include:

- If neat cement is used for the seal, the mixing ratio shall not exceed six (6) gallons of water per 94-pound sack of Portland cement.
    - The Portland cement shall conform to ASTM Standard C150, Type II.
    - The slurry shall not exceed 15.1 lb/gal (113 lb/cf).
- If Pozzolanic cement is used for the seal, the mixing ratio shall not exceed 74 pounds of Pozzolanic material per 94-pound sack of Portland cement with no more than 10 gallons of water per 94-pound sack of cement.
    - The Portland cement shall conform to ASTM Standard C150, Type II.
    - The Pozzolanic (fly ash) material shall conform to ASTM Standard C618.
    - For cost estimation purposes only, CEMEX mix code 1333054 for a 19.8 Sack Cement/Ash/Water mix is acceptable.
    - The slurry shall not exceed 14.1 lb/gal (106 lb/cf).

CONTRACTOR shall provide a mud scale to ENGINEER to measure the weight (density) of the slurry, as an indicator of the mix ratio, prior to installation. Slurry that does not meet the approved mix design shall be rejected at the cost of CONTRACTOR. CONTRACTOR shall mix the slurry thoroughly and the slurry shall to be free of lumps to the satisfaction of ENGINEER. Slurry which is not adequately mixed will be rejected by ENGINEER due to possibilities of the slurry bridging during placement.

7.4.2 Well Construction

During the construction of the well (including installation of blank casing and screen) CONTRACTOR shall keep the boring free from any obstructions detrimental to complete well installation. CONTRACTOR shall center the well casing in the hole so as not to interfere in any way with the annular materials installation. The Preliminary Design for the monitor wells are shown on Figures 11 thru 17. CONTRACTOR shall be required to work continuously, on a 24-hour per day, 7-day per week basis until the well construction is complete.

CONTRACTOR shall install the casing in the open borehole with the blank casing and well screen set at depth intervals specified by ENGINEER. CONTRACTOR shall secure casing centralizers to the well casing at intervals of not greater than 80 feet, and at the positions approved by ENGINEER. In the case of Well MW-4g and Well BMW-2 CONTRACTOR shall hang the well casing in suspension until the cement seal has been installed.

7.4.2.1 Joints in the Well Casing

CONTRACTOR shall connect individual pieces of flush joint threaded Schedule 40 PVC well casing per manufacturer recommendations to ensure proper alignment and strength. CONTRACTOR shall inspect individual pieces prior to installation for quality and fit, and shall not install casing that does not meet standards for new construction.

CONTRACTOR shall field weld joints in the blank LCS well casing in accordance with applicable provisions of the AWWA Standard C206 for welded joints. CONTRACTOR shall provide a welder or welders experienced for the method and type of welding specified to perform all welding activities.

Prior to welding, CONTRACTOR shall ensure the ends of each casing section are free of grease, paint, cement, dirt, oil, scale, slag, heavy rust, or any other foreign material. CONTRACTOR shall ground, or sufficiently scarf, the ends of the casing lengths to remove sharp edges or burrs. CONTRACTOR shall install section ends either with joint collars or beveled to a 30 degree angle, perpendicular to the axis of the casing, to facilitate proper alignment of joined casing sections. The section ends shall not vary more than 0.010 inches at any point from a true plane at right angles to the axis of the casing. CONTRACTOR shall sufficiently orient the ends of the casing sections to assure 100% penetration of the weld, and adequate welding passes shall be made to provide for complete filling of the joined casing ends.

CONTRACTOR shall follow a welding sequence which will avoid excessive distortion. Each welding pass shall be smooth and free of blisters, scale, bubbles, cracks, and imperfections that would contribute to a lack of strength of the overall welded joint. CONTRACTOR shall make all well casing joints or overlaps watertight.

7.4.3 Annular Material Installation

CONTRACTOR shall hang the well casing in the borehole to maintain tension on the pipe throughout the installation of annular materials. CONTRACTOR shall maintain the drilling fluid level in the borehole during installation of annular materials.

7.4.3.1 Cement Seal

The cement seal shall consist of slurry conforming to the mix design in Section 7.4.1.5. CONTRACTOR shall place the cement slurry to completely fill the annular space between the well casing and the wall of the borehole by the submerged tremie method and/or pressure grouting with mechanical or hydraulic packers. The cement seal will extend from the bottom the borehole to ground surface. ENGINEER must approve the specific method of installation.

Prior to pumping the cement seal, CONTRACTOR shall pass the cement slurry through a 2-inch slotted bar strainer in order to remove any unmixed lumps. CONTRACTOR shall be required provide a piston-style concrete pump capable of installing cement slurry by the submerged tremie method. When installing the cement slurry, CONTRACTOR shall continuously submerge the discharge end of the tremie in the slurry until the zone to be sealed is completely filled. CONTRACTOR shall install the cement seal material in as few lifts as possible without compromising the integrity of the LCS well casing. A minimum curing time for the cement seal is 12 hours, during which the material must obtain a compressive strength of 500 pounds per square inch (psi).

7.5 WELL DEVELOPMENT

CONTRACTOR shall accomplish well development at the shallow monitor wells (i.e. Wells MW-4b1, MW-4b2, MW-4b3, and MW-4e) by bailing and pumping to remove any remaining fine sediment in the borehole after well construction. Water bailed or pumped during well development will be discharged into steel storage tanks (frac tank or roll off bin) to collect any settled solids. Clear water conforming to requirements of the ADEQ discharge permit (Section 2.3) may be pumped from the storage tank into the natural drainage adjacent to the well site(s). ENGINEER must approve the specific methods and equipment for well development.

Well development of the deep monitor wells (i.e. Well MW-4g and Well BMW-2) will be accomplished by pump and surge activities described in Section 8.0.

7.5.1 Bailing

CONTRACTOR shall bail the constructed PVC monitor wells (i.e. Well MW-4b1, MW-4b2, MW-4b3, and MW-4e) to remove any remaining drilling fluids or heavy solids from the well, proceeding from the bottom of the screen, to the top of the screen, then back to the bottom of the screen as required by ENGINEER. While bailing tools are being used during development, it is imperative that CONTRACTOR use extreme caution in order to prevent pressure differences that may cause screen collapse or borehole collapse. For cost estimating purposes, bailing of the wells is anticipated to take approximately 4-hours per well.

7.5.2 Pumping

Following well bailing of the shallow PVC monitor wells CONTRACTOR shall install a nominal 4-inch diameter submersible test pump for purposes of pump development and water quality sampling (by others). The test pump shall consist of a stainless steel submersible pump capable of discharging a up to 35 gallons per minute (gpm) and shall be set at an depths ranging from 320 to 520 ft bls. Initially, the discharge from the well must be directed to storage tanks to collect any

settled solids. Clear water may be pumped to waste per the ADEQ discharge permit (Section 2.3).

Pump discharge rate shall be measured with a recently (1-year) calibrated flow-meter that is approved by ENGINEER prior to its installation by CONTRACTOR. For cost estimating purposes, the pump development program is anticipated to total approximately 8-hours per shallow monitor well (4). ENGINEER will select the total duration of pump development based on well development performance.

8.0 AQUIFER TESTING

8.1 GENERAL

Per the DCMP, aquifer testing is planned to be conducted at the following three (3) new monitor wells: Well MW-4d, Well MW-4g, and Well BMW-2. Aquifer testing is anticipated to consist of 12 hours of pump and surge development, a 20-hour step-rate pumping test, and a 168-hour (7-day) constant-rate pumping test, followed by a 168-hour (7-day) water-level recovery period, respectively. ENGINEER shall determine the depth of the test pump setting based on the Final Well Design. However, for cost estimation purposes only, the depth of the test pump will be 400 ft bls in Well MW-4d, and at 850 ft bls in both Well MW-4g and Well BMW-2.

ENGINEER will oversee the pump and surge development program and monitor the well development performance. CONTRACTOR shall install the necessary pump and motor to perform pump development at the minimum pumping rate of 600 gpm. ENGINEER will select the total duration of pump and surge development based on well development performance. Due to use of DTRC during well drilling, the pump development period is not anticipated to be more than 12 hours per well. CONTRACTOR shall be compensated per Bid Schedule for the actual hours of pump and surge well development.

The pumping rates for the step-rate pumping test will vary incrementally from approximately 350 to 600 gpm as required by ENGINEER. The pumping rate for the 168-hour constant-rate pumping test will be determined based on the step-rate pumping test results. The constant-rate pumping test will start a minimum of 12 hours following the completion of the step-rate pumping test. Based on recommendations of ENGINEER, CITY reserves the right to extend or shorten development and test durations.

8.2 TEST EQUIPMENT

CONTRACTOR shall furnish pumping equipment with satisfactory throttling devices and valves, so that the discharge can be adjusted to various rates. The pump equipment shall not include a check valve or an anti-reverse rotation device. The pumping unit shall be complete with an ample power source and shall be capable of being operated without interruption for a minimum period of 168-hours (7-days). CONTRACTOR shall submit descriptions of the pump equipment and other required information to ENGINEER for approval prior to mobilization of pump equipment to the site.

CONTRACTOR shall install two sounding tubes to monitor water levels in the well. The sounding tubes shall be a minimum 1.5-inches nominal diameter, perforated in the lower 40 feet, and include a bottom cap. The sounding tubes shall be strapped to the column pipe and extend from the pump intake to land surface.

CONTRACTOR shall measure the pump discharge by the orifice weir method and with a magnetic flow meter. The section of discharge pipe with the orifice weir shall be horizontal and the edges of the orifice shall be sharp and clean. Several orifice weir plates with different size orifice diameters will be utilized as required by ENGINEER to maintain the head in the piezometer tube at a level at least three times greater than the orifice diameter. It is anticipated that orifice weir plates with six (6) inch and seven (7) inch diameter orifices will be required for ten (10) inch nominal diameter discharge pipe. The magnetic flow meter shall include a 4-20 mA current loop and manufacturer's instructions for connection of a logger owned by ENGINEER to monitor flow rates. CONTRACTOR shall provide documentation regarding the accuracy of the magnetic meter to ENGINEER prior to aquifer testing. ENGINEER must approve the discharge measurement devices and set-up.

CONTRACTOR shall also furnish equipment for measurement of the sand test during pumping. The sand measurement device shall be a centrifugal sand sampler such as a Rossum sand sampler or equal. CONTRACTOR shall install a spigot or valve for water sample collection from the discharge pipe.

CONTRACTOR shall not remove the pump equipment from the well until after the completion of the water level recovery test. Upon removal of pump equipment, CONTRACTOR shall immediately secure the well casing with a hinged and lockable steel cover.

8.3 TEST PUMP DISCHARGE

CONTRACTOR shall operate the test pump as directed by ENGINEER. CONTRACTOR shall control discharge from the pump by a gate valve, engine throttle, or diesel generator. CONTRACTOR shall control the discharge and maintain it at the rate required by ENGINEER for the entire test duration with an accuracy of plus or minus five (5) percent. CONTRACTOR shall orient the discharge pipe in such a manner as to ensure that the pipe remains full of water at the location of the flow meter at all times during pumping.

During aquifer testing at Well MW-4d, CONTRACTOR shall discharge water to a steel storage tank located within the fenced perimeter of the drill site. CONTRACTOR shall use a trash pump (DV150 or equivalent) to transfer water from the tank through 5,600 feet of 8-inch temporary discharge pipe (aluminum) to an ephemeral natural drainage. CONTRACTOR shall be responsible for installation and management of discharge BMPs described in Section 2.3. A map of the discharge piping alignment for the aquifer test at MW-4d is provided on Figure 18.

Aquifer testing at Well MW-4g and Well BMW-2 will not require use of the trash pump. Discharge during testing at Well MW-4g may be directed to a natural drainage (Big Chino Wash) located approximately 200 feet south from the well as shown on Figure 19. Discharge during aquifer testing at Well BMW-2 may be directed to a natural drainage (Walnut Creek) located approximately 700 feet north of the well as shown on Figure 20. CONTRACTOR shall be responsible for installation and management of BMPs described in Section 2.3.

9.0 VISITATION AND INSPECTION

At any reasonable time during the term of work, ENGINEER, CITY, Town, SRP, or any of their duly authorized representatives, shall have access to CONTRACTOR'S facilities and have the right to examine books, documents, and records of CONTRACTOR involving transactions related to this project.

10.0 MEASUREMENT AND PAYMENT

Compensation for all work specified to be performed under this specification shall be made under the payment items presented in this section. The prices for the said payment items shall be full compensation for all labor, material, equipment, tax, bond, and insurance costs in connection therewith. Principal features of the work to be included under the various payment items will be on a linear foot (LF), hourly (HR), daily (DL), per ton (TN), per cubic yard (CY), or lump sum (LS) basis, as designated. Quantities are not guaranteed. Final payment will be based on actual quantities installed; CONTRACTOR shall not be compensated for materials not installed. If the required quantities of the items listed above are increased or decreased by Change Order, the unit prices set forth above shall apply to such increased or decreased quantities.

10.1 PAYMENT ITEMIZATION

A payment schedule for well drilling and construction of seven (7) monitor wells, well development of four (4) monitor wells, aquifer testing at three (3) wells, as specified herein. Payment shall be made per unit costs presented in the Bid Schedule. A brief description of each item of the payment schedule is presented below, with reference to either Technical Specifications (TS), or these Special Provisions (SP).

Item 1 – Mobilization and Demobilization (*TS 109.10*)
Consists of all labor, equipment, and material costs associated with but not limited to Sections 1.4, 2.0, 3.0, 4.0, 5.0, and 6.0 including installation and removal of temporary fence, storage tanks; transportation and disposal of all debris, drilling fluids, and drilled cuttings; required State, County, and City permits and plans; all utilities; assembling all drilling, testing, and support equipment at the job site; installing and maintaining BMPs in accordance with the AZPDES permit for the life of the project; securing the well after completion; removing or transferring the equipment from the job site when the work is completed; job site cleanup. Payment shall be made on a lump sum basis per well.

Item 2 – Contract Allowance (*TS 109.10*)
Consists of an allowance to reimburse CONTRACTOR for reasonable costs to complete the scope of work which are outside the control of CONTRACTOR, or for items not included in the Special Provisions, and with **prior written authorization** from the CITY. The Bid Schedule includes Additional Contingency Costs for several of these items; however if CONTRACTOR costs of any of these items exceeds the bid total, the difference will be compensated per *Specification 109.11* with **prior written approval** by CITY.

Items 3, 4, and 5 – Surface Casing Construction (*SP Section 7.2*)
Consists of all labor, equipment, and material costs associated with drilling, providing casing materials, and installing a surface seal. Payment shall be made on a linear foot basis of the required casing length.

Items 6, 7, and 8 – Borehole Drilling (*SP Section 7.3.1*)
Consists of all labor, equipment, testing requirements, and material costs associated with drilling specified boreholes to total depth in accordance with Section 7.3.1. Payment shall be made on a linear foot basis of the required borehole diameter (nominal).

Item 9 – PVC Blank and Screen Casing (*SP Section 7.4.1*)
Consists of all labor, equipment, and material costs required to furnish and install the PVC well casing and screen. Payment for this item shall be on a linear foot basis.

Item 10 – LCS Blank Casing (*SP Section 7.4.1*)
Consists of all labor, equipment, and material costs required to furnish and install the LCS blank casing. Payment for this item shall be on a linear foot basis.

Item 11 – LCS Slotted Casing (*SP Section 7.4.1*)
Consists of all labor, equipment, and material costs required to furnish and install the LCS slotted casing. Payment for this item shall be on a linear foot basis.

Item 12 – Cement Seal (*SP Section 7.4.3*)
Consists of all labor, equipment, and material costs to furnish and install the cement seal as specified. Payment shall be made on a cubic yard basis.

Item 13 – Well Development (*SP Section 7.5*)
Consists of all labor, equipment, materials, and other costs associated with well bailing and pump development. Payment shall be made on a lump sum basis per well.

Items 14 and 15 – Aquifer Testing Mobe/Demobe (*TS 109.10*; *SP Section 8.0*)
Consists of the cost for labor, equipment, and materials necessary to perform pump and surge development and borehole testing requirements including installation and removal of temporary storage tanks; assembling all testing and support equipment at the job site; installing and maintaining BMPs in accordance with the AZPDES permit (Section 2.3); securing the well after completion; removing or transferring the equipment from the job site when the work is completed; job site cleanup. Payment for mobilization and demobilization of all aquifer testing equipment shall be made on a lump sum basis per well (3). Payment for discharge piping and auxiliary trash pump at Well MW-4d shall be made on linear foot basis.

Item 16 – Pumping Period (*SP Section 8.0*)
Consists of the cost of all labor and continuous operation of equipment associated with pump and surge development and borehole testing. Payment for time spent during well pumping be made on an hourly basis.

Item 17 – Optional Sound Panels *(SP Section 2.2)*
Consists of the cost of all labor, equipment and materials to install, maintain, and remove sound control and mitigation equipment at Well MW-4g for the duration of the project. Payment for this item shall be made on a linear foot basis of sound barrier installed by CONTRACTOR as requested by the CITY with prior written authorization to proceed.

Item 18 – Lost Circulation *(SP Section 6.4)*
Consists of all labor, equipment, and material costs associated with drilling under lost circulation conditions. CONTRACTOR must be able to demonstrate a penetration rate of less than 4 feet per hour over a period of at least two (2) continuous hours and that there are no issues with the drill bit or drilling fluids. Payment shall be made on an hourly basis.

Item 19 – Rig Standby with Crew *(SP Section 7.3.5)*
Consists of the cost of maintaining equipment, personnel, and borehole integrity if a work stoppage occurs as required by the ENGINEER or CITY, which is not due to any fault of CONTRACTOR (e.g. during geophysical logging). Payment shall be made on an hourly basis for the duration of the required delay.

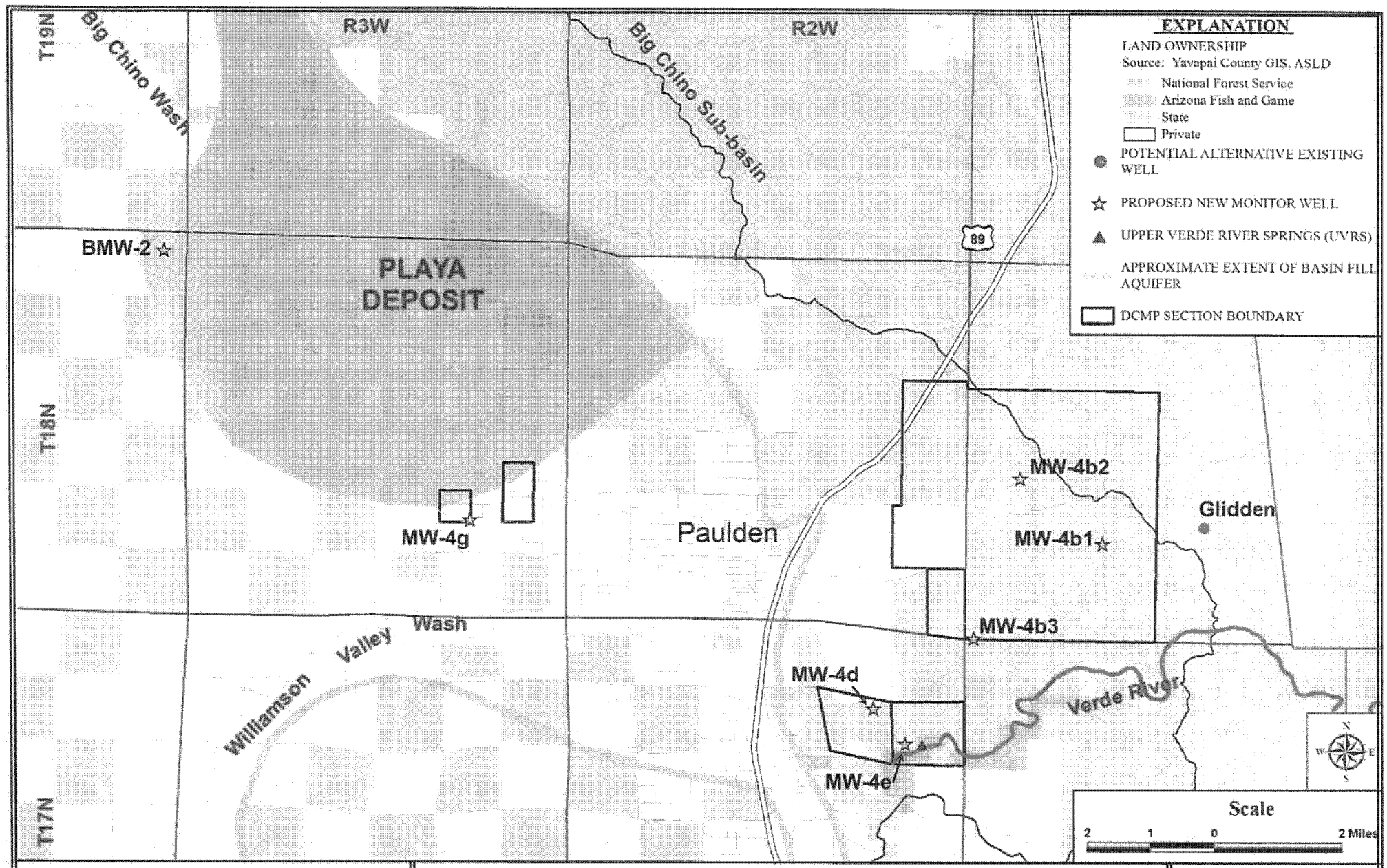
Item 20 – Well Abandonment (SP Section 7.3.6)
If necessary, consists of the cost of abandoning the well per ADWR Article 8, Rule R12-1-816. ENGINEER shall approve specific methods and materials used in the well abandonment. CONTRACTOR shall not proceed with well abandonment without prior written approval from ENGINEER and CITY. Payment for this item will be on a cubic foot basis.

TABLE 1 - SCHEDULE OF CONTRACTOR DELIVERABLES

Task	Section	Delivery Schedule	Date
Health and Safety Plan	1.4.2	1 week prior to mobilization	
Health and Safety Inspection #1 Signed Report	1.4.2	During mobilization/prior to drilling	
ADEQ Notice of Intent	2.4.2	At least 7 days prior to mobilization	
Notice of Termination	2.4.2	Within 30 days of final well testing	
Arizona 811 Notification	3.3	2 days prior to mobilization	
Letter Notification of Drill Rig Steam Cleaning	4.2	2 days prior to mobilization	
Penetration Rate Log	5.3	Daily during drilling and upon request	
Daily Driller Report	5.4	Daily during drilling and upon request	
Health and Safety Inspection #2 Signed Report	1.4.2	During drilling activities	
ADWR Driller Log	5.5	Provide to ADWR within 30 days of well completion	
Drilling Fluid Log	5.6	Daily during drilling and upon request	
Drilling Fluid Control Plan	6.2	48 hours prior to drilling	
Surface Seal Cement Mix Design	7.2.2.2	3 days prior to placement	
Drill Cuttings Sampling Plan	7.3.1.1	Prior to the start of drilling	
On-site Delivery of Well Materials	7.4.1	3 days prior to start of drilling	
Well Cement Design Mix	7.4.1.6	3 days prior to placement	
Proposed Method of Cement Seal Installation	7.4.3.1	3 days prior to placement	
Plumbness Corrective Action Plan	7.6.1	Only if well fails to meet AWWA A100-06	
Letter Notification of Pump Equipment Steam Cleaning	4.2	Prior to mobilization of pump equipment to the site	
Health and Safety Inspection #3 Signed Report	1.4.2	After mobilization of pump equipment/prior to pumping	
Description of Proposed Pump Test Equipment	8.2	Prior to mobilization	
Confirmation of Accuracy of Magnetic Meter	8.2	Prior to use	
Demobilization and Site Clean-up	1.3	Within two weeks of completion of well testing	

FIGURES

FIGURE 1 – Project Location Map 32
FIGURE 2 – Vicinity Map, Shallow Monitor Wells 33
FIGURE 3 – Vicinity Map, Deep Monitor Wells 34
FIGURE 4 – Site Map, Well MW-4b1 35
FIGURE 5 – Site Map, Well MW-4b2 36
FIGURE 6 – Site Map, Well MW-4b3 37
FIGURE 7 – Site Map, Well MW-4d 38
FIGURE 8 – Site Map, Well MW-4e 39
FIGURE 9 – Site Map, Well MW-4g 40
FIGURE 10 – Site Map, Well BMW-2 41
FIGURE 11 – Preliminary Well Design, Well MW-4b1 42
FIGURE 12 – Preliminary Well Design, Well MW-4b2 43
FIGURE 13 – Preliminary Well Design, Well MW-4b3 44
FIGURE 14 – Preliminary Well Design, Well MW-4d 45
FIGURE 15 – Preliminary Well Design, Well MW-4e 46
FIGURE 16 – Preliminary Well Design, Well MW-4g 47
FIGURE 17 – Preliminary Well Design, Well BMW-2 48
FIGURE 18 – Discharge Route Map, Well MW-4d 49
FIGURE 19 – Discharge Route Map, Well MW-4g 50
FIGURE 20 – Discharge Route Map, Well BMW-2 51



Southwest Groundwater

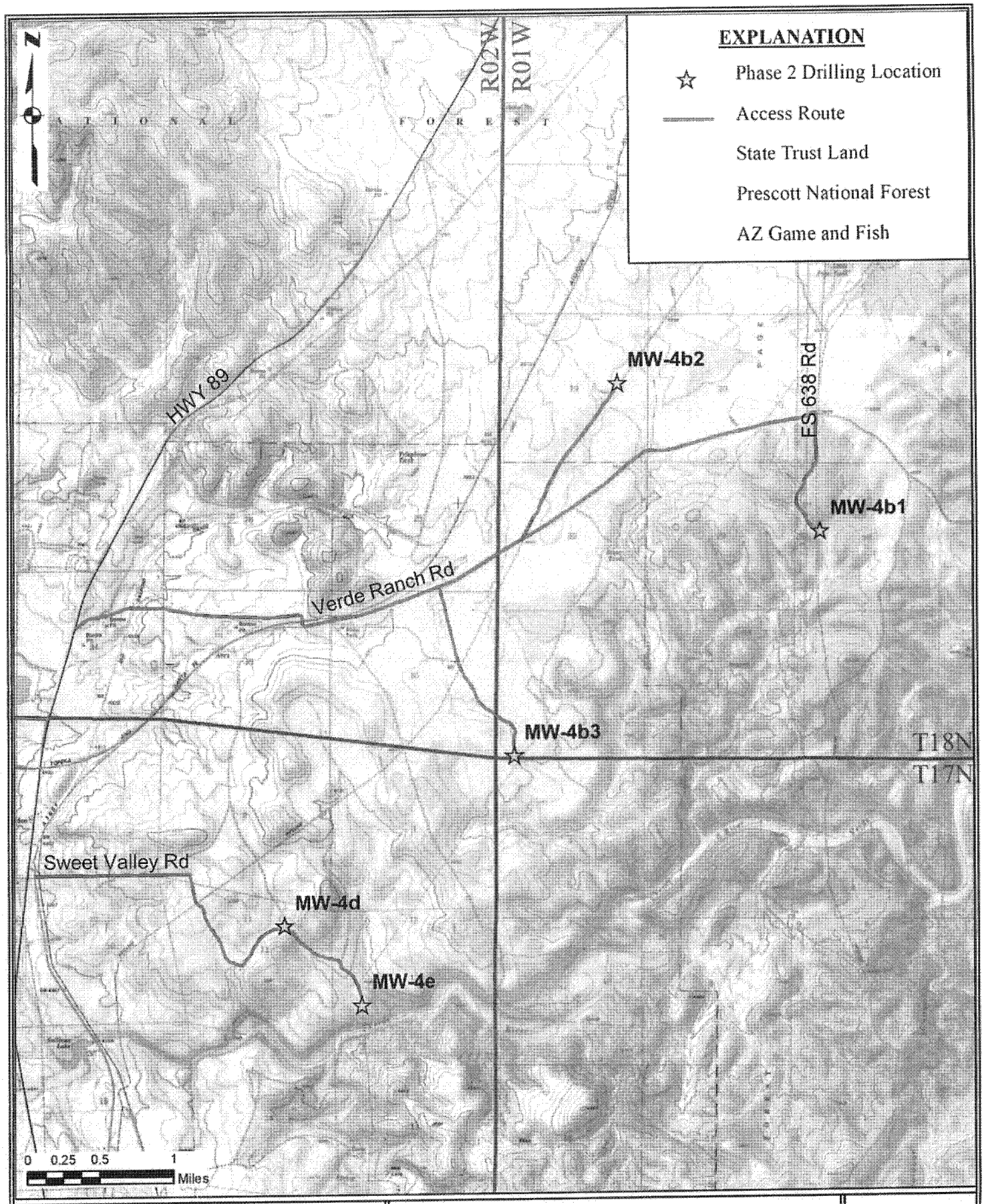
September, 2017 B.2407

PHASE 2 DRILLING SCOPE OF WORK

DCMP MONITOR WELLS

Big Chino Sub-basin, Yavapai County, Arizona

Figure 1



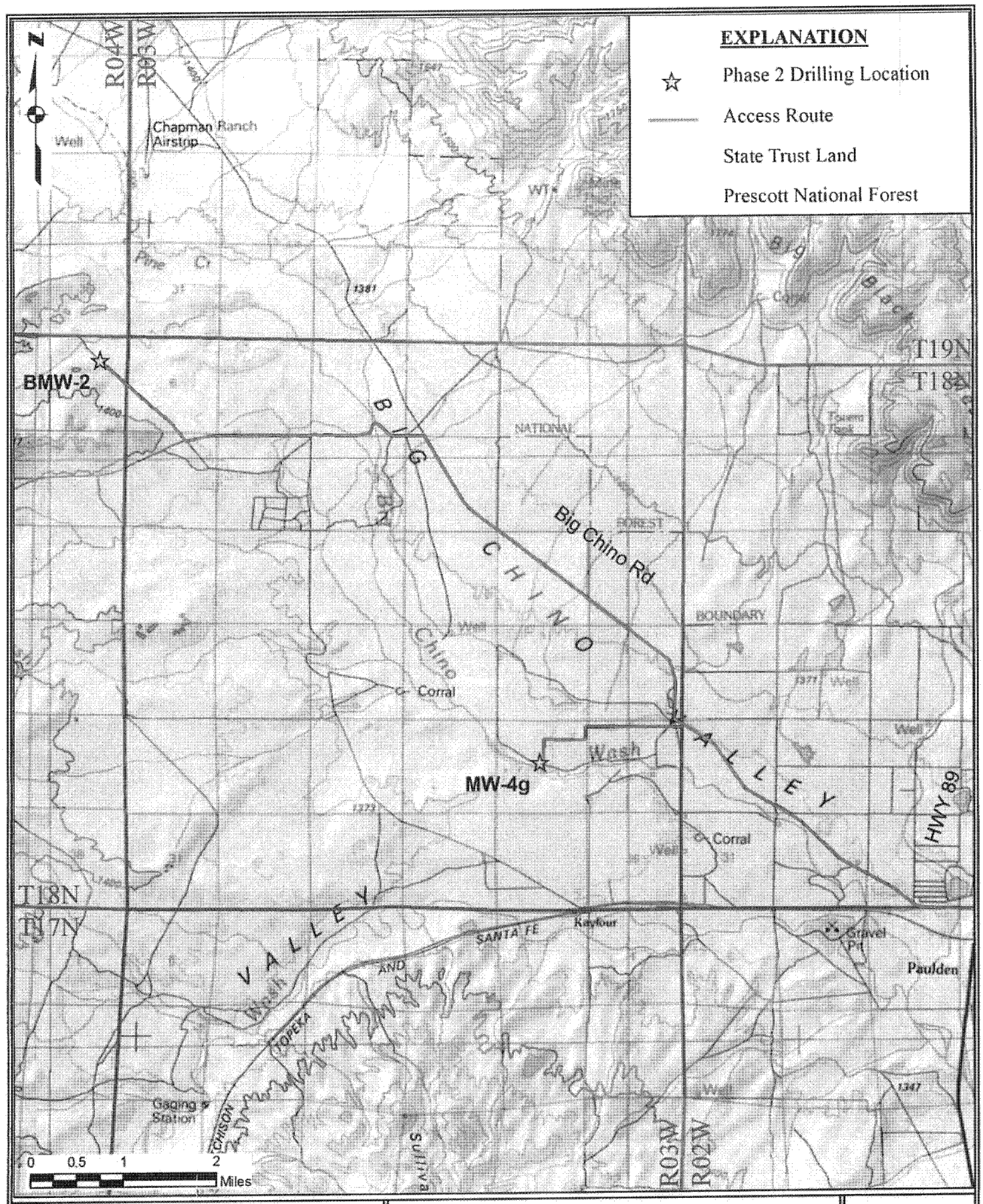
Southwest Groundwater

September, 2017 Project B.2407

VICINITY MAP
SHALLOW MONITOR WELLS

Big Chino Sub-basin DCMP, Yavapai County

Figure 2



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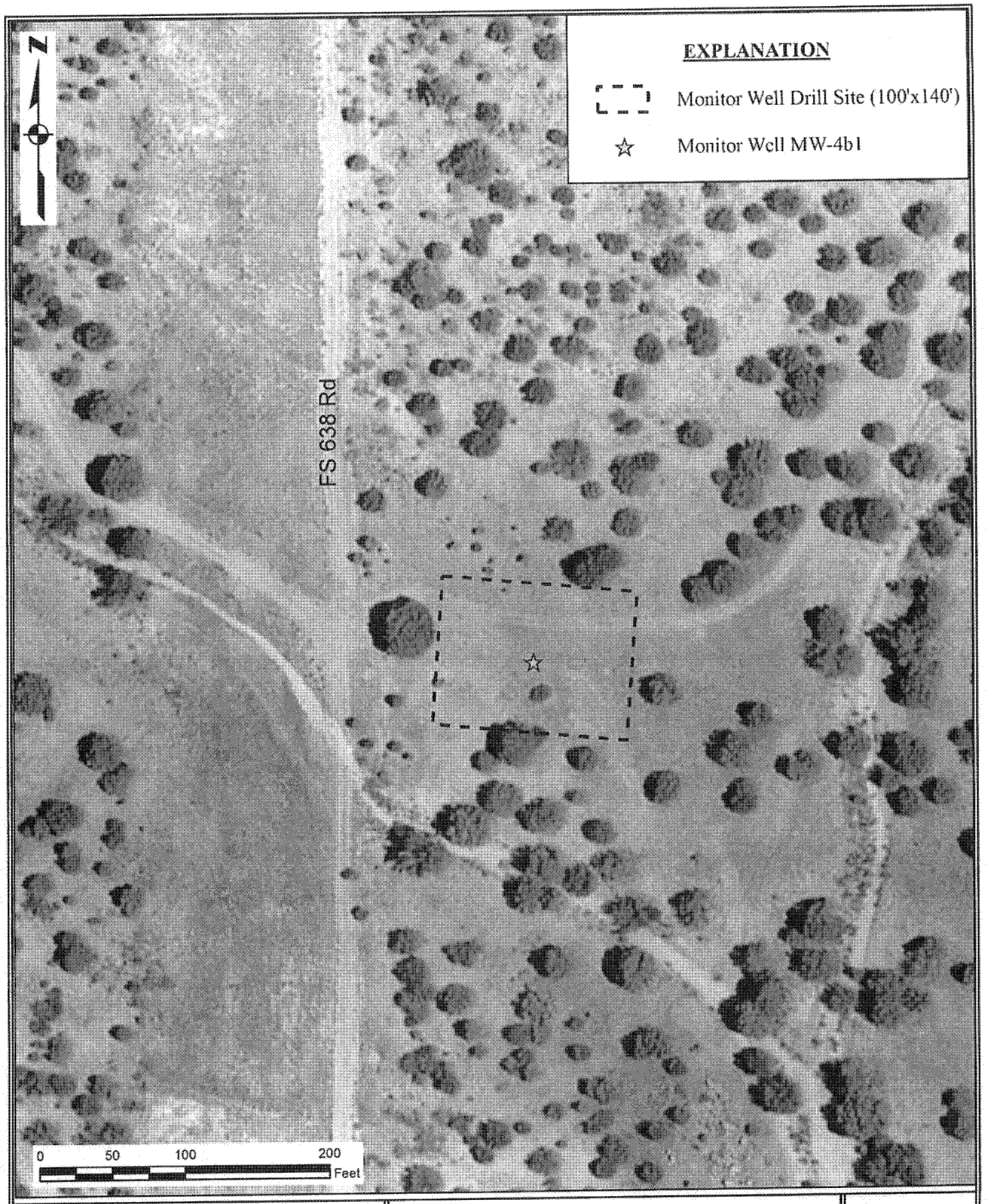
September, 2017 Project B.2407

VICINITY MAP
DEEP MONITOR WELLS

Big Chino Sub-basin DCMP, Yavapai County

Figure 3



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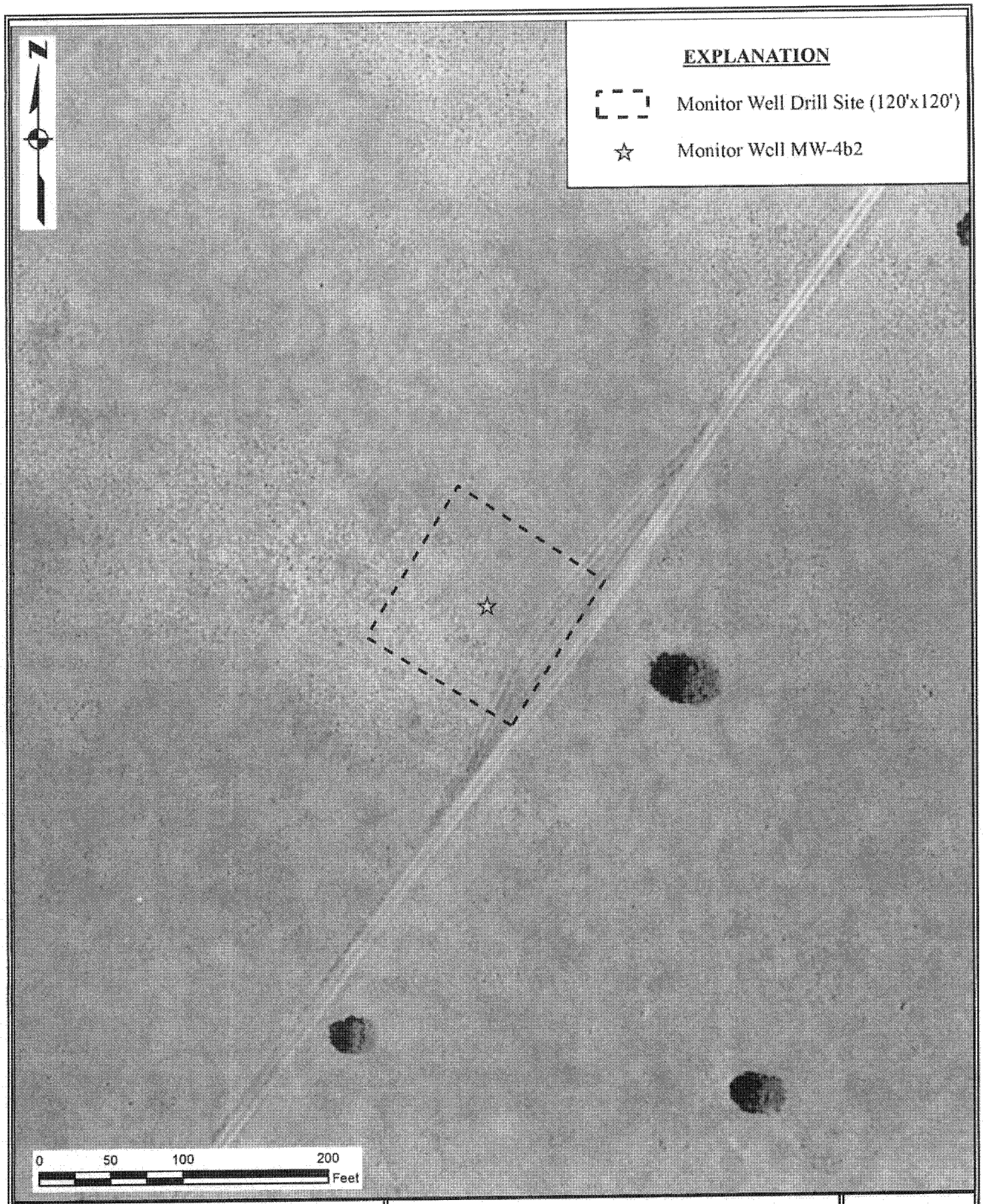
SITE MAP
WELL MW-4b1
[B(18-01) 28BCD]

Big Chino Sub-basin DCMP, Yavapai County

Figure 4

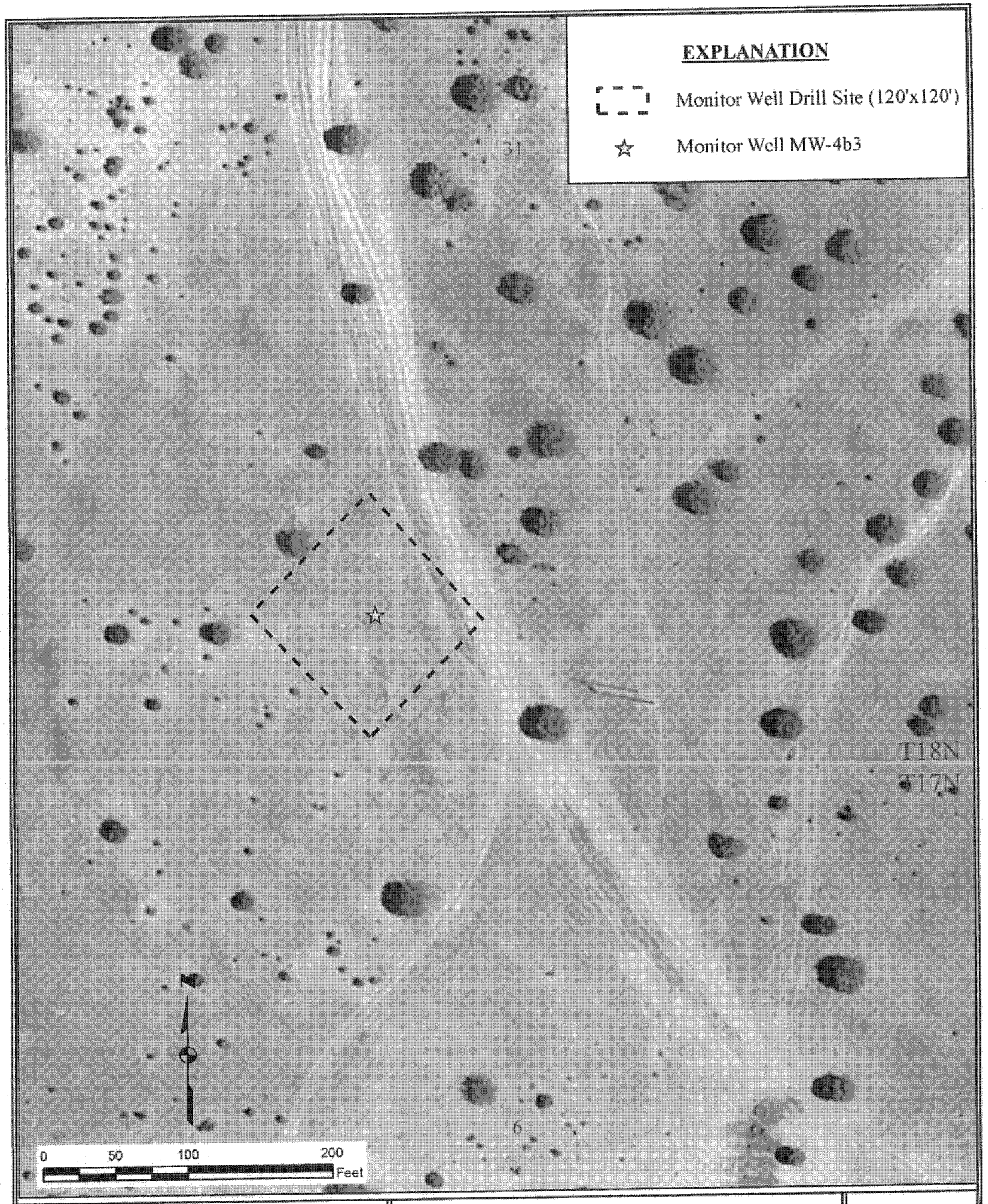


Southwest Groundwater

September, 2017 Project B.2407

SITE MAP
WELL MW-4b2
[B(18-01) 19ADC]
Big Chino Sub-basin DCMP, Yavapai County

Figure 5

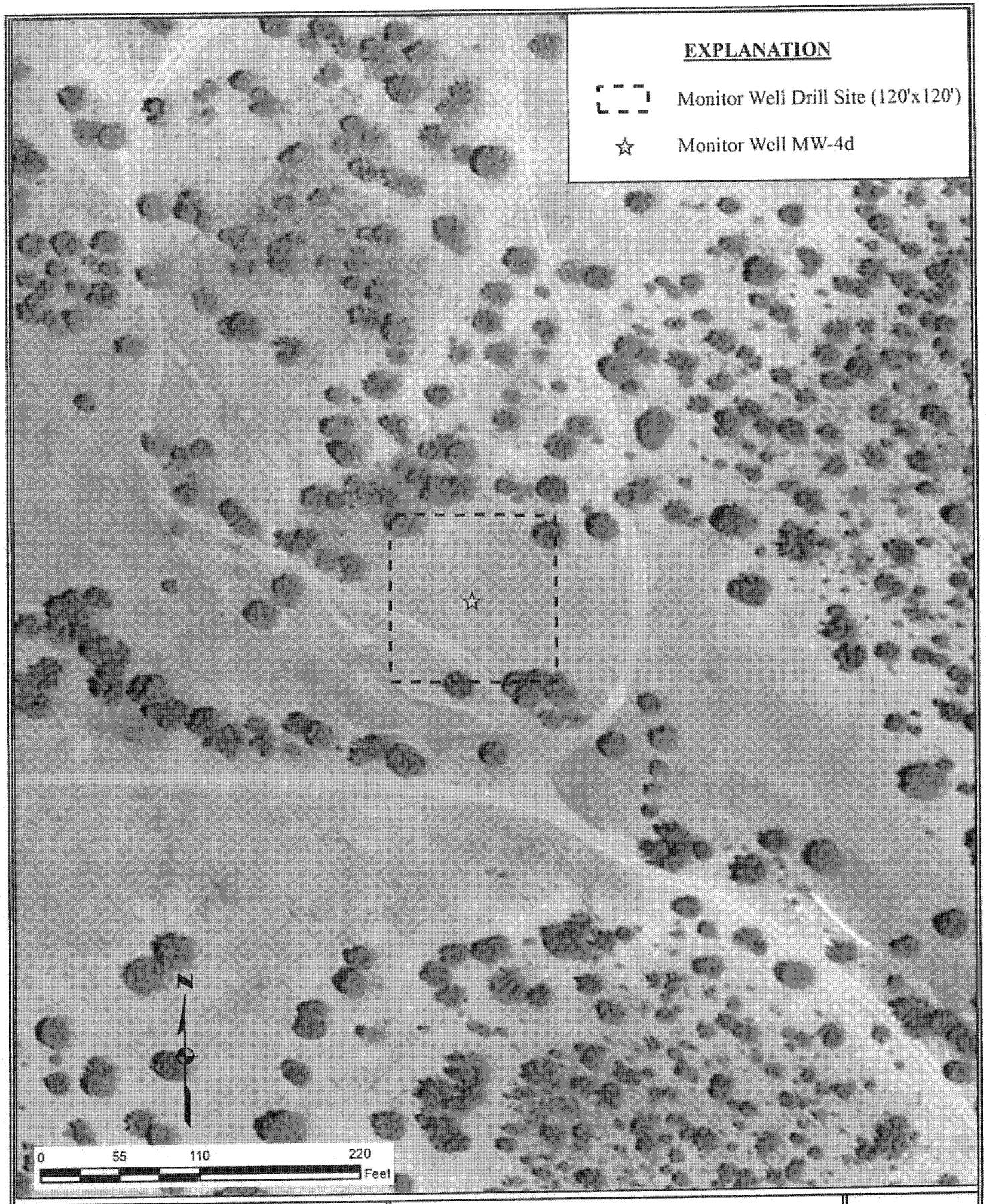


Southwest Groundwater

September, 2017 Project B.2407

SITE MAP
WELL MW-4b3
[B(18-01) 31CCD]
Big Chino Sub-basin DCMP, Yavapai County

Figure 6

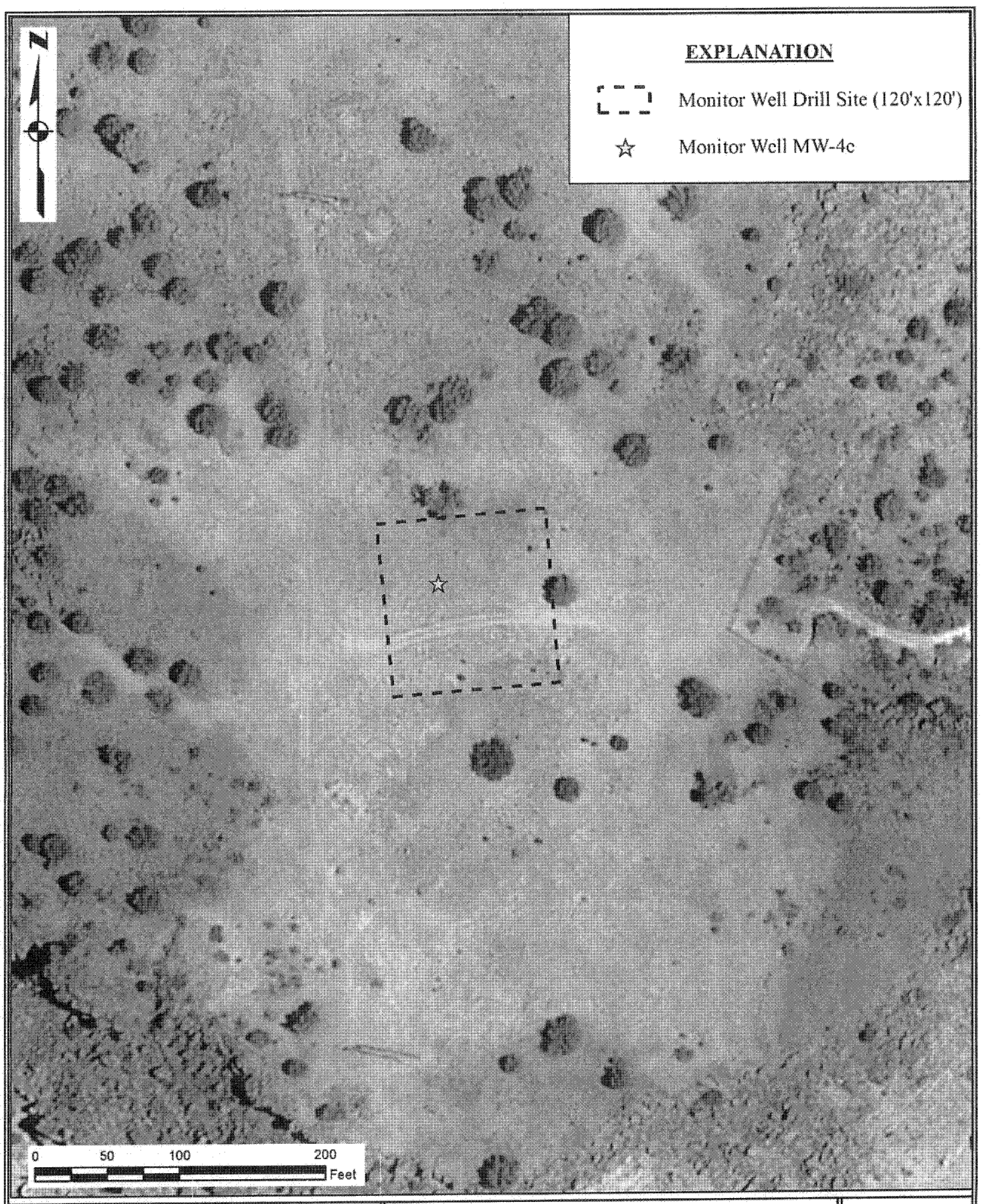


Southwest Groundwater

September, 2017 Project B.2407

SITE MAP
WELL MW-4d
[B(17-02) 11ABD]
Big Chino Sub-basin DCMP, Yavapai County

Figure 7

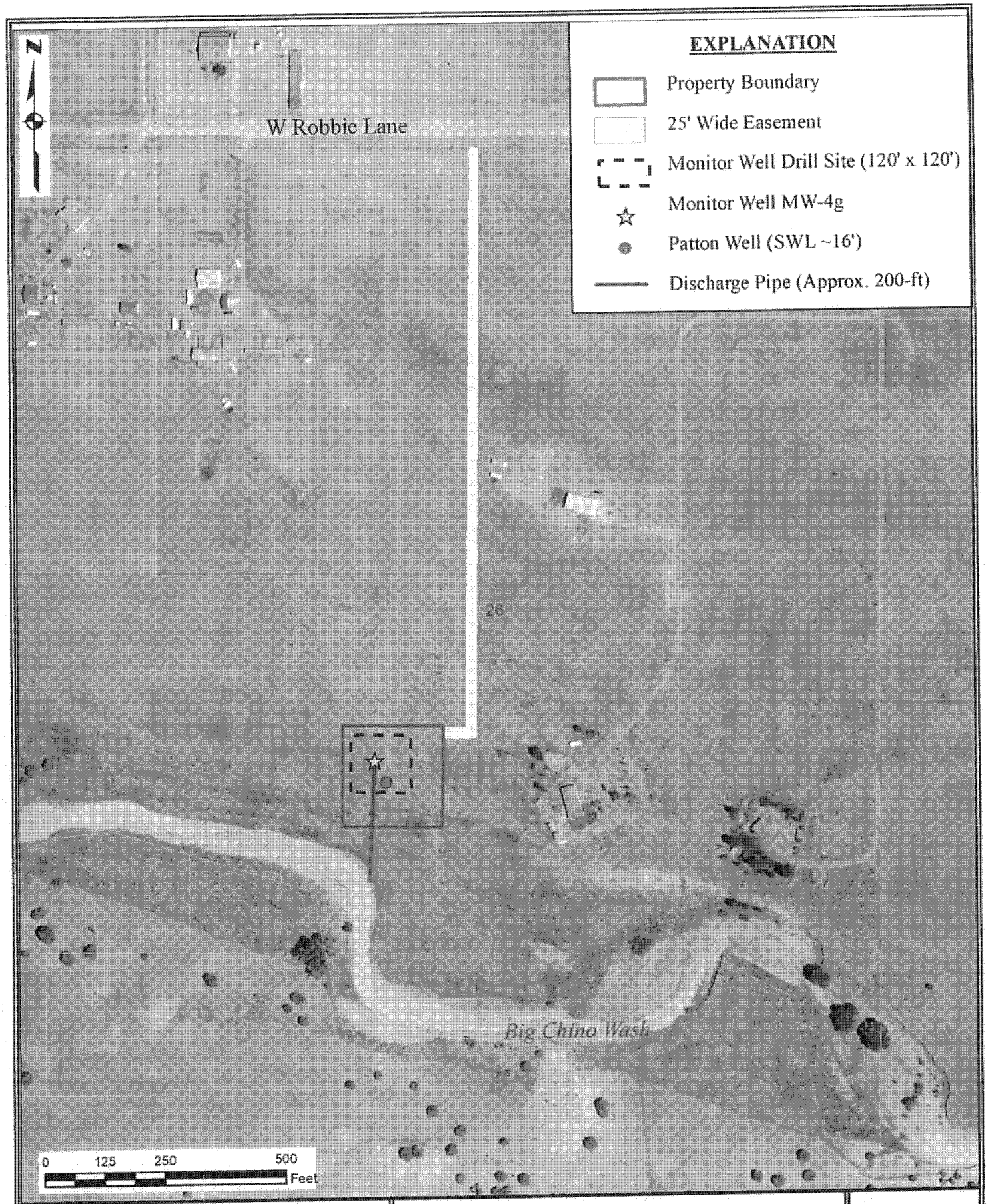


Southwest Groundwater

September, 2017 Project B.2407

SITE MAP
WELL MW-4e
[B(17-02) 12CBD]
Big Chino Sub-basin DCMP, Yavapai County

Figure 8

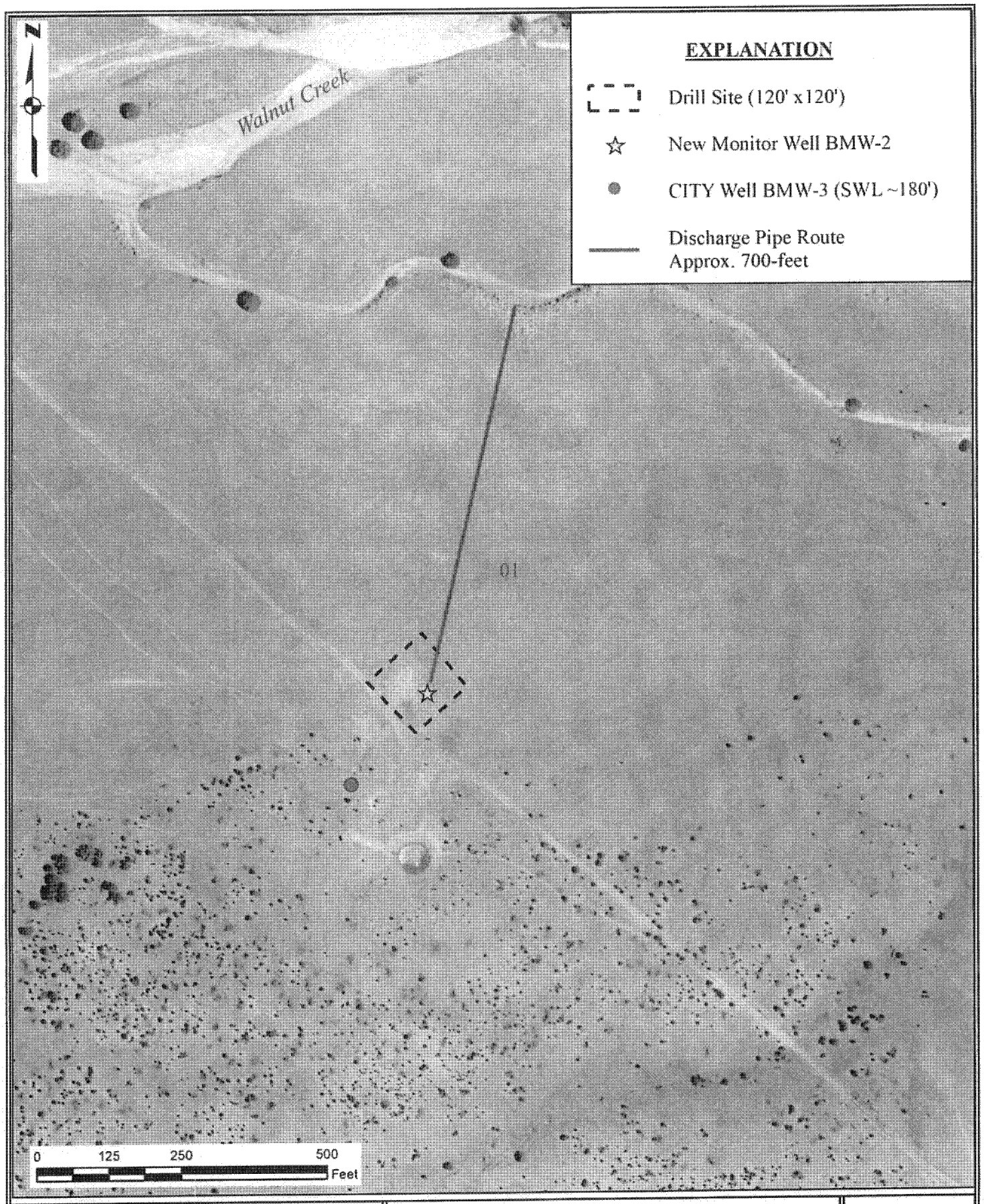


Southwest Groundwater

September, 2017 Project B.2407

SITE MAP
WELL MW-4g
[B(18-03) 26BDD]
Big Chino Sub-basin DCMP, Yavapai County

Figure 9

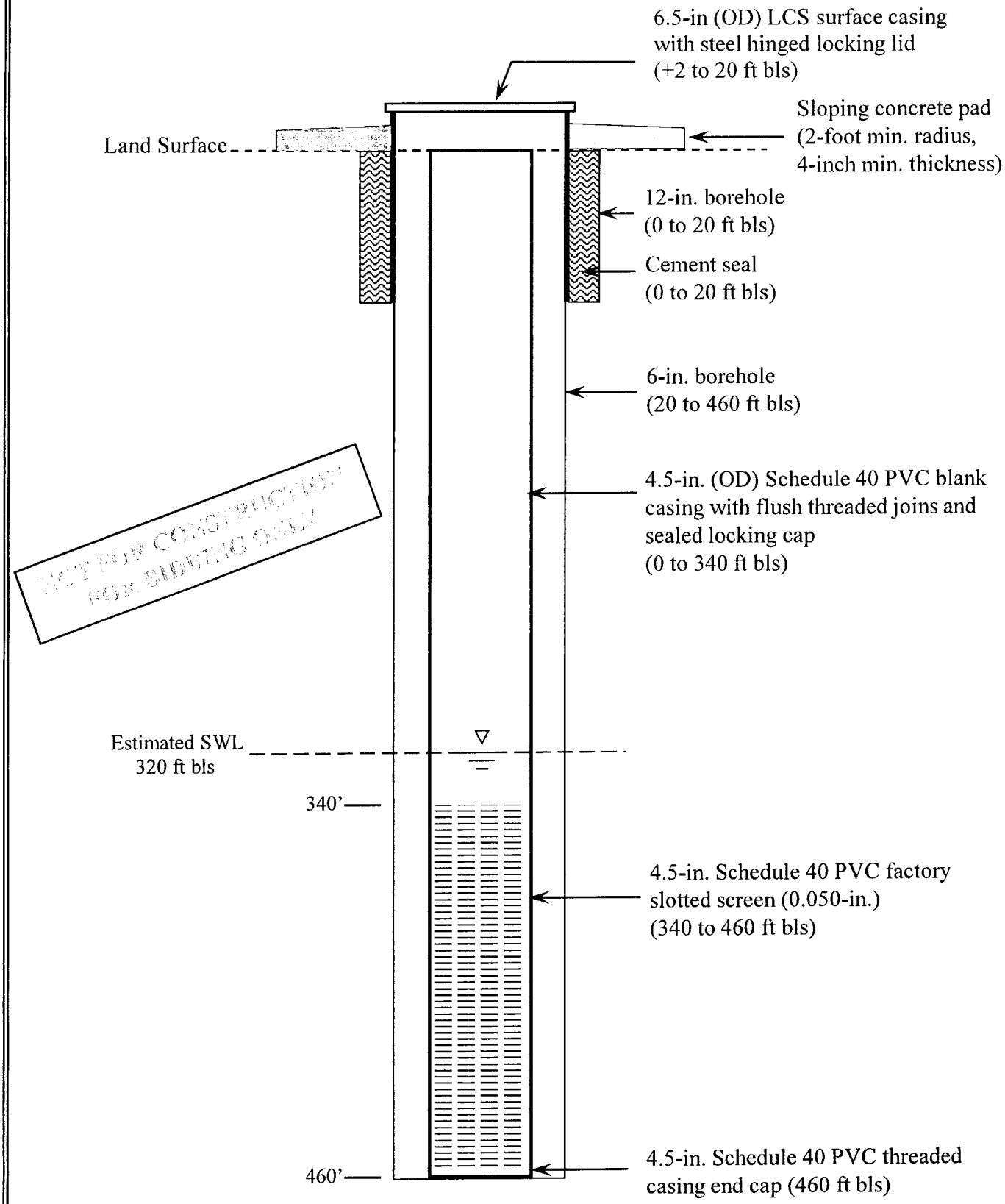


Southwest Groundwater

September, 2017 Project B.2407

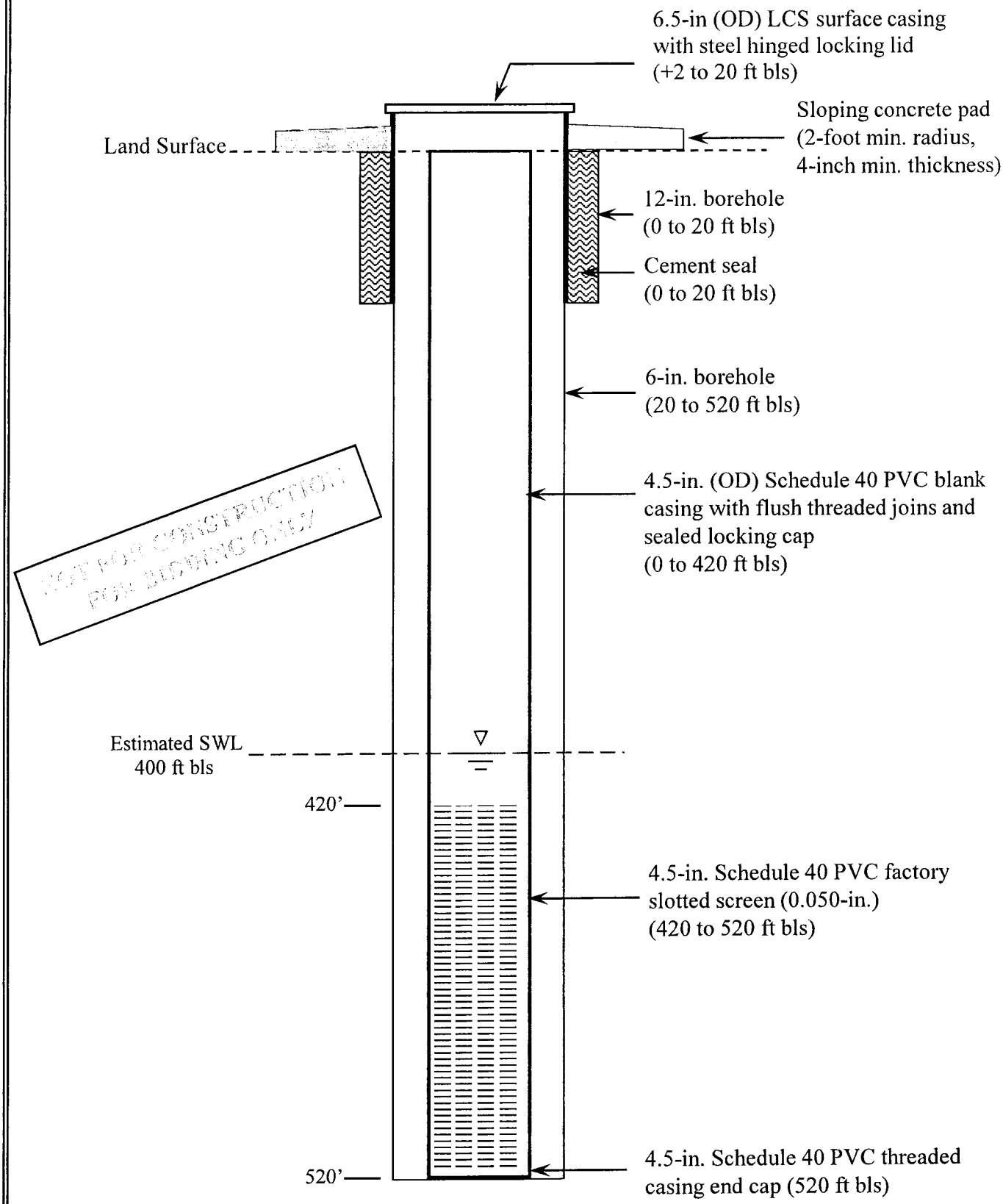
SITE MAP
WELL BMW-2
[B(18-04) 01ACA]
Big Chino Sub-basin DCMP, Yavapai County

Figure 10



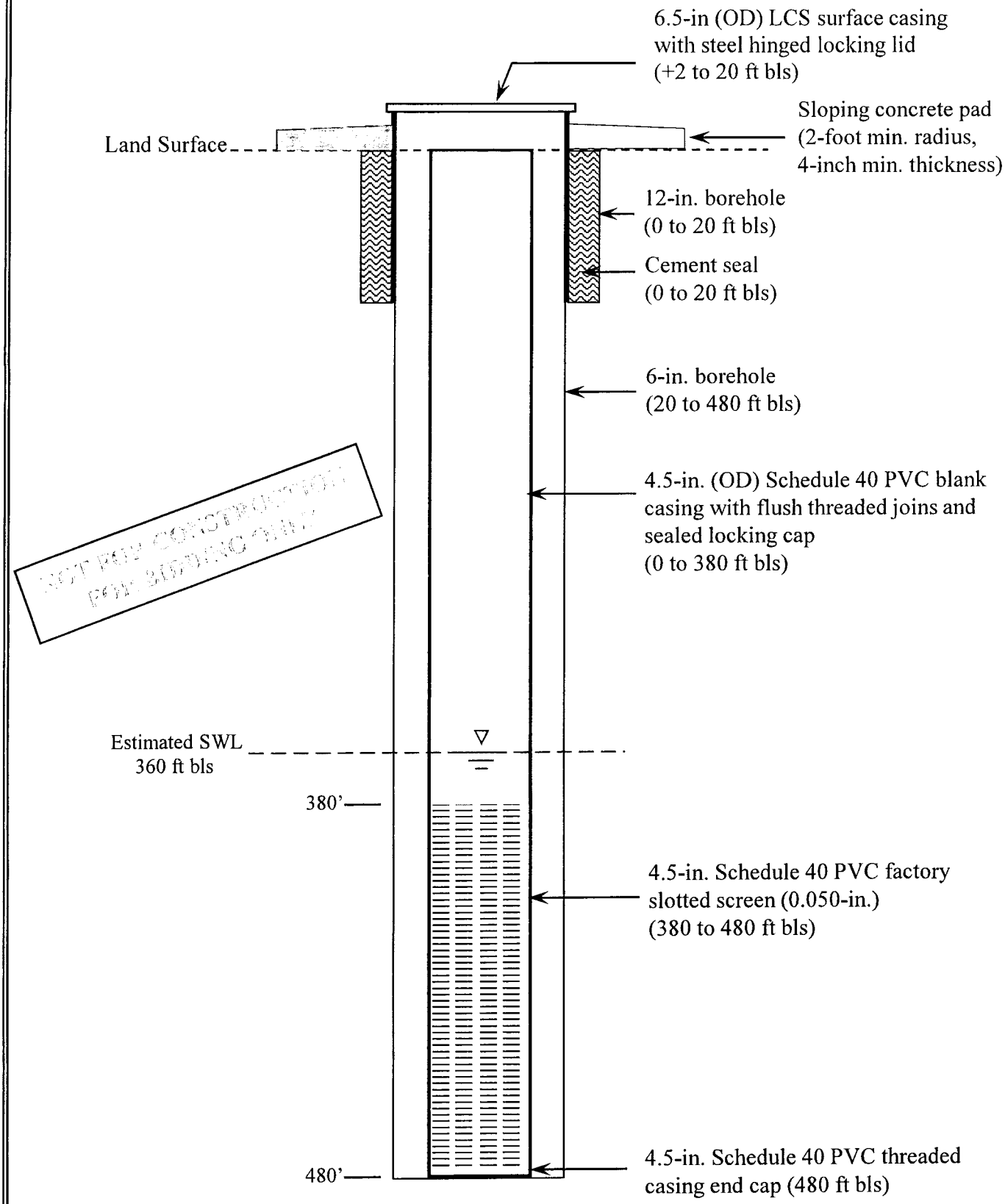
NOT TO SCALE

Groundwater September, 2017 Project B.2407	**PRELIMINARY DESIGN** **WELL MW-4b1** **Big Chino Sub-basin DCMP, Yavapai County**	**Figure 11**



NOT TO SCALE

Groundwater September, 2017 Project B.2407	**PRELIMINARY DESIGN** **WELL MW-4b2** **Big Chino Sub-basin DCMP, Yavapai County**	**Figure 12**



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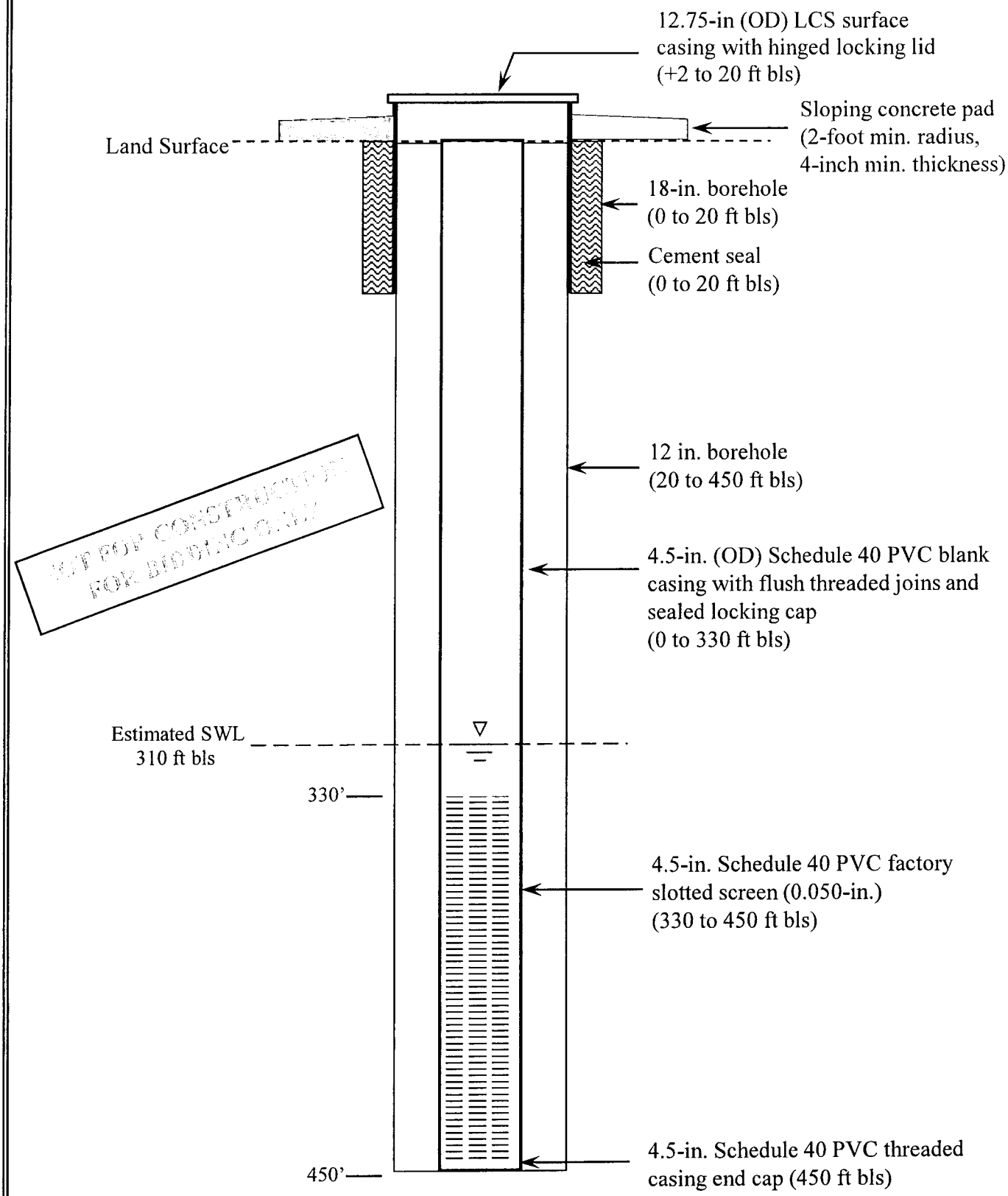
Groundwater September, 2017 Project B.2407	**PRELIMINARY DESIGN** **WELL MW-4b3** **Big Chino Sub-basin DCMP, Yavapai County**	**Figure 13**



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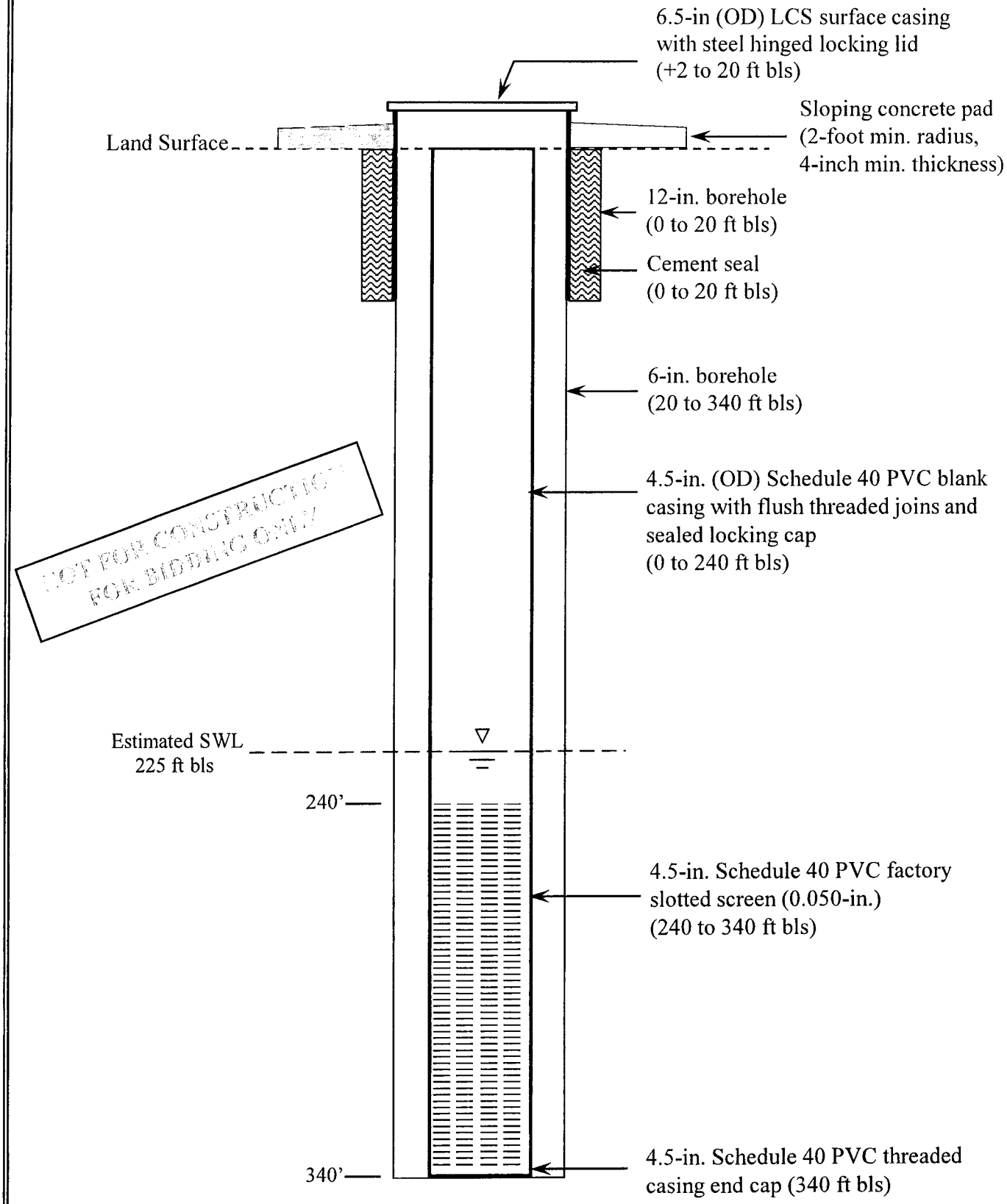
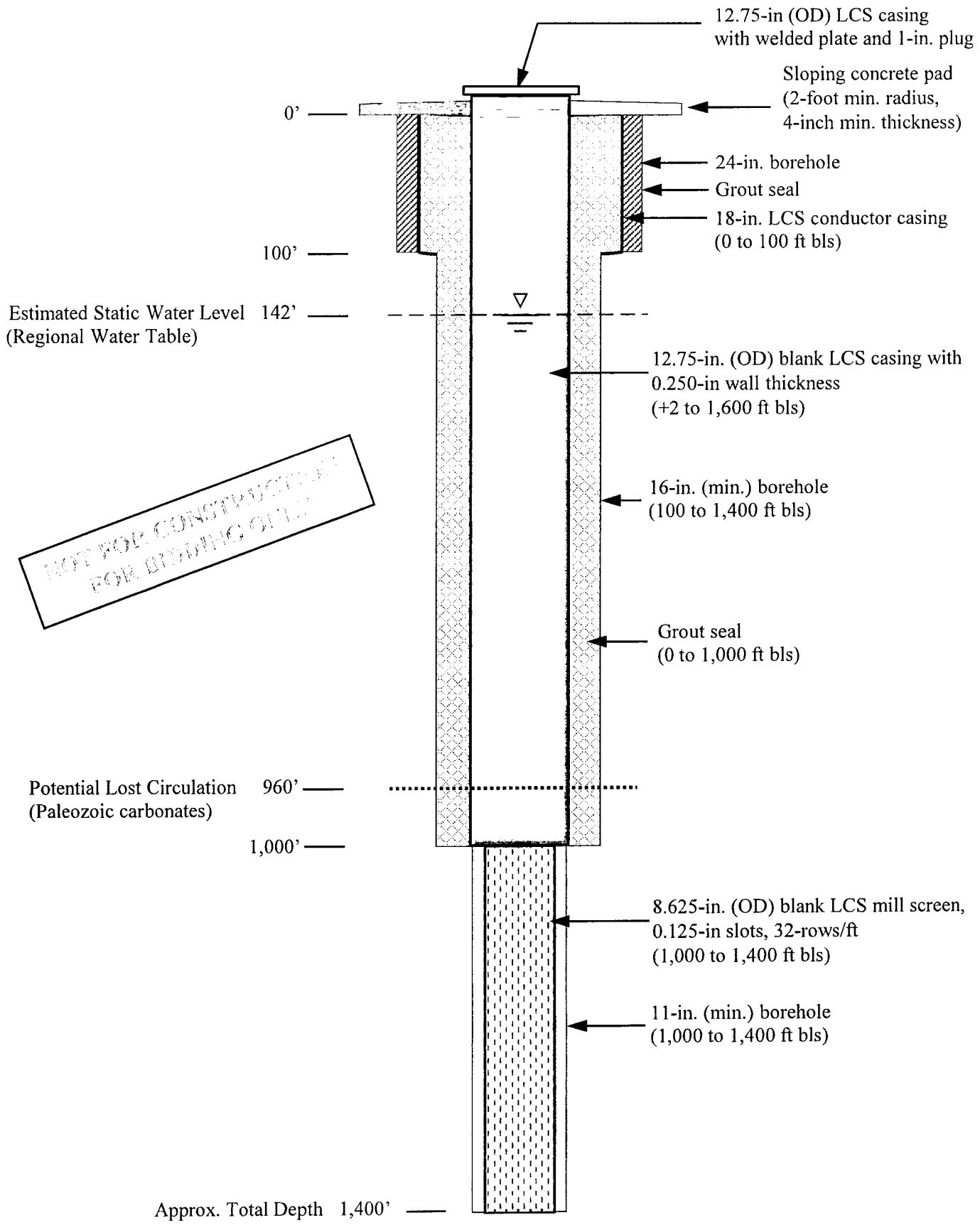
Groundwater September, 2017 Project B.2407	**PRELIMINARY DESIGN** **WELL MW-4d** **Big Chino Sub-basin DCMP, Yavapai County**	**Figure 14**



NOT TO SCALE

Groundwater September, 2017 Project B.2407	**PRELIMINARY DESIGN** **WELL MW-4e** **Big Chino Sub-basin DCMP, Yavapai County**	**Figure 15**



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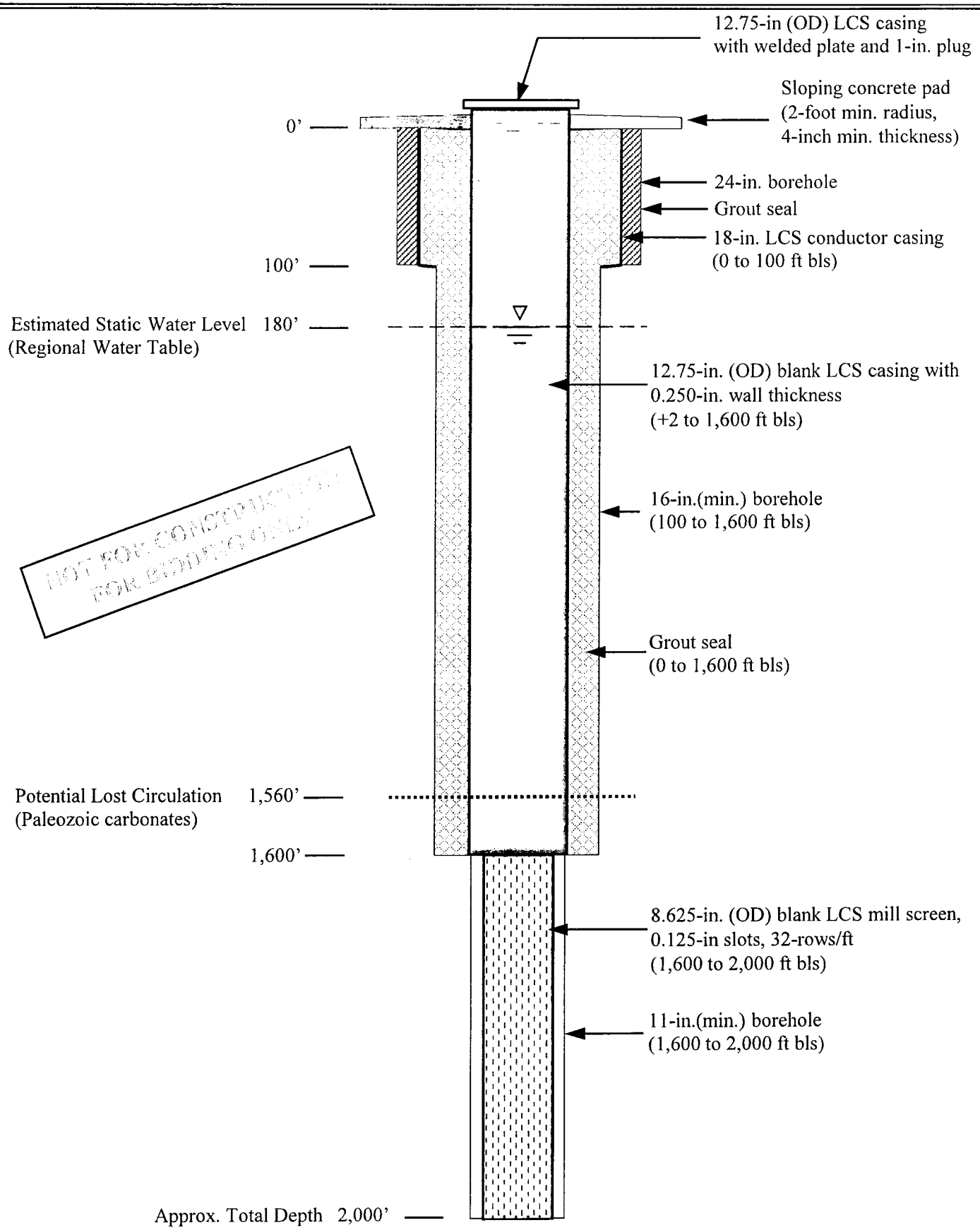
Groundwater September, 2017 Project B.2407	**PRELIMINARY DESIGN** **WELL MW-4g** **Big Chino Sub-basin DCMP, Yavapai County**	**Figure 16**



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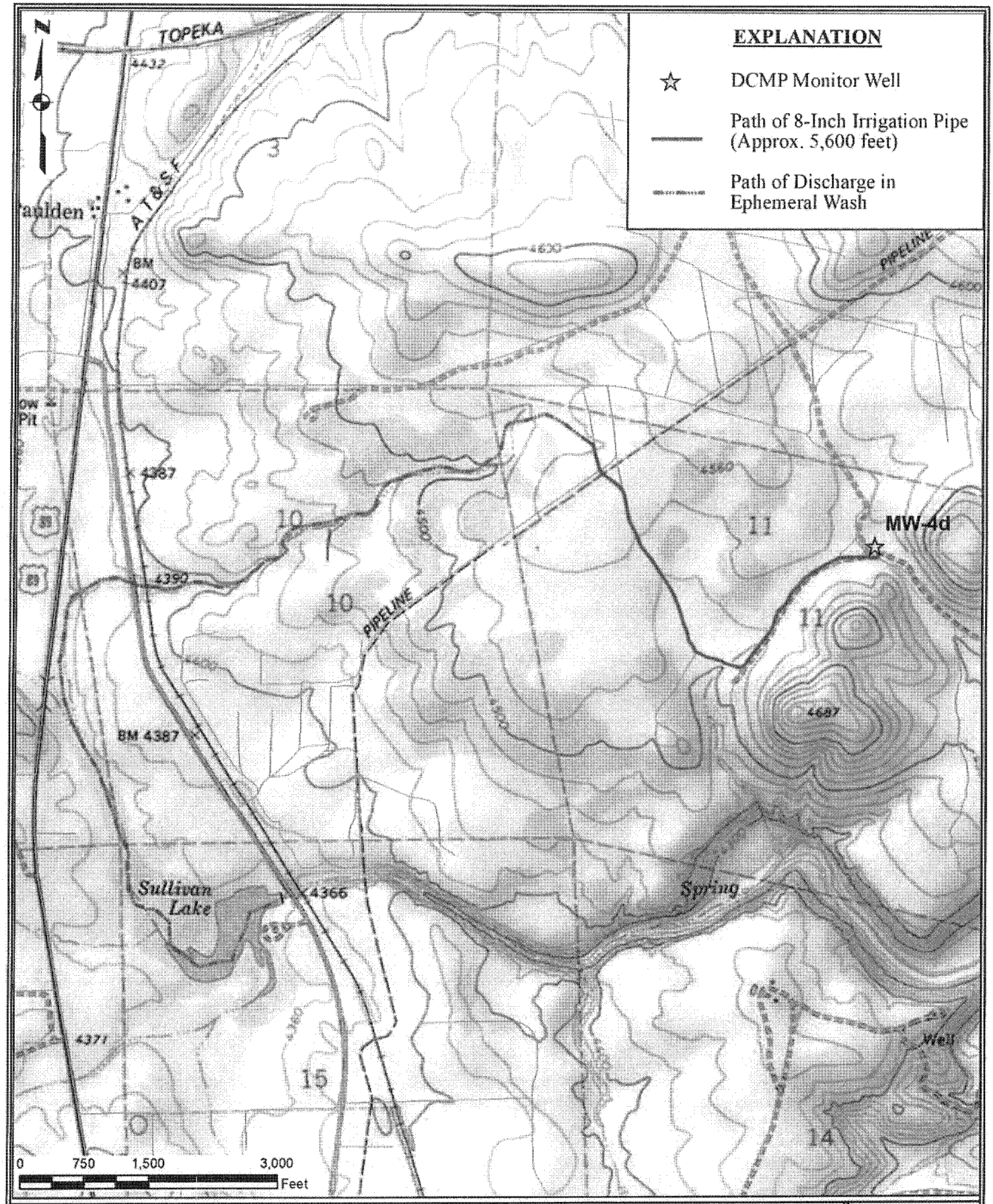
Groundwater September, 2017 Project B.2407	**PRELIMINARY DESIGN** **WELL BMW-2** **Big Chino Sub-basin DCMP, Yavapai County**	**Figure** **17**

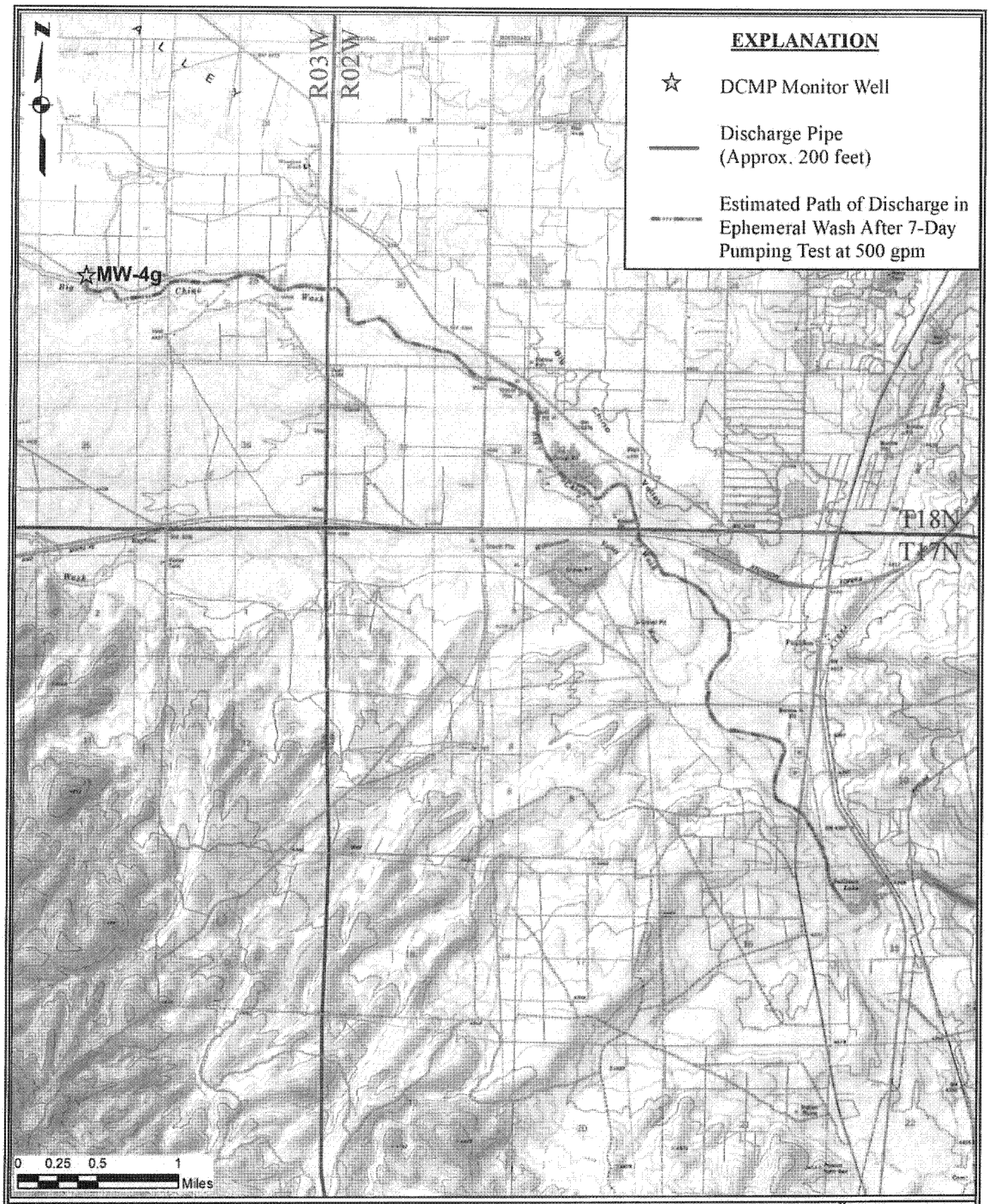


Southwest Groundwater

September, 2017 Project B.2407

DISCHARGE ROUTE MAP
WELL MW-4d
[B(17-02) 11ABD]
Big Chino Sub-basin DCMP, Yavapai County

Figure 18

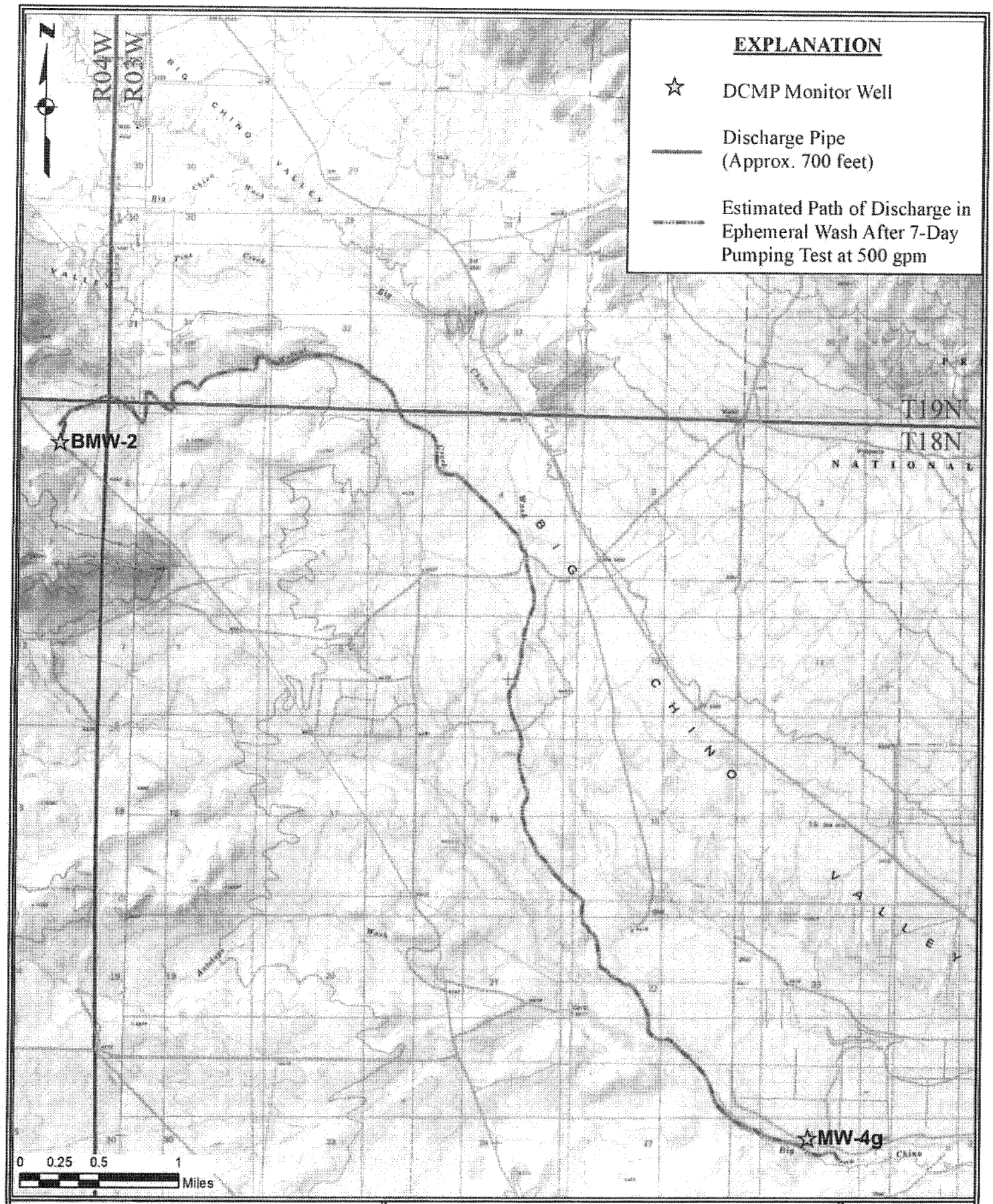


Southwest Groundwater

September, 2017 Project B.2407

DISCHARGE ROUTE MAP
WELL MW-4g
[B(18-03) 26BDD]
Big Chino Sub-basin DCMP, Yavapai County

Figure 19



Southwest Groundwater

September, 2017 Project B.2407

DISCHARGE ROUTE MAP
WELL BMW-2
[B(18-04) 01ACA]
Big Chino Sub-basin DCMP, Yavapai County

Figure 20

APPENDIX A

SELECTED AREA WELL DRILLER LOGS

STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES
99 EAST VIRGINIA AVENUE
PHOENIX, ARIZONA 85004

STATE OF ARIZONA

DEPARTMENT OF
WATER RESOURCES

WELL DRILLER REPORT

This report should be prepared by the driller in all detail and filed with the Department within 30 days following completion of the well.

1. Owner D. R. GIPE
Name
1150 AVENUE C YUMA AZ 85364
Address

2. Lessee or Operator _____
Name
_____
Address

3. Driller CAMPBELL'S DRILLING INC.
Name
PO BOX 933 WICKENBURG AZ 85358
Address

4. Location of well: 18N 1W 17 NE NE NE

5. Permit No. _____
(if issued)

DESCRIPTION OF WELL

6. Total depth of hole 620 ft.
7. Type of Casing STEEL PVC
8. Diameter and length of casing 8 in. from 0 to 20, 6 in from 0 to 620.
9. Method of sealing at reduction points CEMENTED
10. Perforated from 540 to 620, from ____ to ____, from ____ to ____
11. Size of cuts 1/8 x 3 Number of cuts per foot 8
12. If screen was installed: Length ____ ft. Diam ____ in. Type ____
13. Method of construction DRILLED
drilled, dug, driven, bored, jetted, etc.
14. Date started 6 (Month) 28 (day) 85 (year)
15. Date completed 6 (Month) 30 (day) 85 (year)
16. Depth to water 520 ft. (If flowing well, so state.)
17. Describe point from which depth measurements were made, and give sea-level elevation if available.
_____
18. If flowing well, state method of flow regulation _____
19. REMARKS: _____

DO NOT WRITE IN THIS SPACE
OFFICE RECORD
Registration No. 55-511557
Received _____ By _____
Entered 7.8.85 By S
File No. B(18-1)17aaa

(Well log to appear on Reverse side)

RECEIVED JUL 5 1985 DEPT OF WATER RESOURCES

7-8-85 BC

DWR-55-6-5/83

LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0	96	CLAY w/ ROCK
96	138	MALAPAI
138	252	LIMESTONE CONGLOMERATE CEMENTED
252	620	LIMESTONE
		WATER AT 520'

I hereby certify that this well was drilled by me (or under my supervison), and that each and all of the statements herein contained are true to the best of my knowledge and belief.

JUL 1985
DEPARTMENT OF WATER RESOURCES

Driller CAMPBELL'S DRILLING INC.
Name

PO BOX 933
Address

WICKENBURG AZ 85358
City State Zip

Date 7-1-85

ARIZONA DEPARTMENT OF WATER RESOURCES
Records Management Section
500 N. 3rd Street * Phoenix, Arizona 85004
(602) 417-2405 * (800) 352-8488
www.water.az.gov

Well Driller Report and Well Log

8 9/30/03

RECEIVED SEP 25 2003 34-1580 Information Management

FILE NUMBER: B(18-1)31
WELL REGISTRATION NUMBER: 55-599693
PERMIT NUMBER (IF ISSUED):

- Review instructions prior to completing form
- This report should be prepared by the driller in detail and filed with the Department within 30 days following completion of the well.

** PLEASE PRINT CLEARLY **

SECTION 1. REGISTRY INFORMATION

Well Owner

FULL NAME OF COMPANY, ORGANIZATION OR INDIVIDUAL: CALIFORNIA PORTLAND CEMENT CO
MAILING ADDRESS: 2025 E FINANCIAL WAY
CITY / STATE / ZIP: GLENDORA, CA 91741
CONTACT PERSON NAME AND TITLE:
TELEPHONE NUMBER: 520-682-2221
FAX:

Location of Well

WELL LOCATION ADDRESS (IF KNOWN):

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
			1/4	1/4	1/4

LATITUDE ° ' "N — LONGITUDE ° ' "W

LAND SURFACE ELEVATION AT WELL: Feet Above Sea Level

METHOD OF LATITUDE / LONGITUDE (CHECK ONE): ☐ Hand-Held ☐ USGS Quad Map ☐ Conventional Survey ☐ GPS: ☐ Survey-Grade

COUNTY ASSESSOR'S PARCEL ID NUMBER: BOOK 0 MAP 0 PARCEL

COUNTY WHERE WELL IS LOCATED:

SECTION 2. DRILLING AUTHORIZATION

Drilling Firm

NAME: LAYNE CHRISTENSEN COMPANY
DWR LICENSE NUMBER: 7
TELEPHONE NUMBER: 480-895-9404
FAX:

SECTION 3. WELL CONSTRUCTION DETAILS

DATE WELL CONSTRUCTION STARTED: 8-12-03
DATE WELL CONSTRUCTION COMPLETED: 8-16-03
IF FLOWING WELL, METHOD OF FLOW REGULATION: ☐ Valve ☐ Other

Drill Method

CHECK ONE
- ☒ Air Rotary
- ☐ Bored or Augered
- ☐ Cable Tool
- ☐ Dual Rotary
- ☐ Mud Rotary
- ☒ Reverse Circulation
- ☐ Driven
- ☐ Jetted
- ☐ Air Percussion / Odex Tubing
- ☐ Other (please specify)

Method of Well Development

CHECK ONE
- ☐ Airlift N/A
- ☐ Bail
- ☐ Surge Back
- ☐ Surge Pump
- ☐ Other (please specify)

Method of Sealing at Reduction Points

CHECK ONE
- ☐ None N/A
- ☐ Packed
- ☐ Swedged
- ☐ Welded
- ☐ Other (please specify)

Water Level Information

STATIC WATER LEVEL: Never hit Feet Below Land Surface
DATE MEASURED: 8-12-03

ANSWERED SEP 26 2003

DWR-55-55-10/01 (Rev.)

Well Driller Report and Well Log

A B140

WELL REGISTRATION NUMBER
55- 599693

SECTION 4: WELL CONSTRUCTION DESIGN (AS BUILT) (attach additional pages if needed)

Borehole			Installed Casing														
DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)	DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE (X)				PERFORATION TYPE (X)						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	IF OTHER TYPE, DESCRIBE	
0	293	5.5							N/A							

Installed Annular Material											
DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE (X)								FILTER PACK		
						BENTONITE						
FROM (feet)	TO (feet)	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	GROUT	CHIPS	PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	SAND	GRAVEL	SIZE
0	20		X									
20	293								Cuttings			

DEPTH OF BORING		DEPTH OF COMPLETED WELL	
293'	Feet Below Land Surface	No Well	Feet Below Land Surface

DWR-55-55B-10/01 (Rev.)

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55- 599693

SECTION 5: GEOLOGIC LOG OF WELL

DEPTH FROM SURFACE FROM (feet)	TO (feet)	DESCRIPTION Describe material, grain size, color, etc.	Check (X) every interval where water was encountered
0	10	Weathered besalt	Never
10	200	Grayish limestone, powdery to fine	
200	250	1/4" chunks of redish to pink "redwall limestone"	
250	293	somewhat larger + weathered "red wall limestone"	

STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES
15 South 15th Avenue
Phoenix, Arizona 85007

HR-2

WELL DRILLER REPORT

This report should be prepared by the driller in all detail and filed with the Department within 30 days following completion of the well.

1. Owner Headwaters Associates Inc
   Name
   2203 Clubhouse Dr. Prescott, AZ 86302
   Mailing Address

2. Driller EDWARDSON DRILLING
   P. O. Box 401 Name
   Chino Valley, AZ 86323
   Mailing Address

3. Location of well: T17N R2W Section 2 SW NE SE

4. Permit No. _____
   (If issued)

DESCRIPTION OF WELL

5. Total depth of hole 500' ft.
6. Type of casing steel
7. Diameter and length of casing 10-5/8". from 0 to 20', _____ in from _____ to _____
8. Method of sealing at reduction points cemented
9. Perforated from _____ to _____, from _____ to _____, from _____ to _____.
10. Size of cuts _____ Number of cuts per foot _____
11. If screen was installed: Length _____ ft. Diam _____ in. Type _____
12. Method of construction drilled
    drilled, dug, driven, bored, jetted, etc
13. Date started June 5, 1990
    Month Day Year
14. Date completed July 13, 1990
    Month Day Year
15. Depth to water 322' ft. (If flowing well, so state)
16. Describe point from which depth measurements were made, and give sea-level elevation if available ground level
17. If flowing well, state method of flow regulation: _____
18. Remarks: _____

DO NOT WRITE IN THIS SPACE
OFFICE RECORD

REG. No. 55-527679

File No. B(17-2)2dae

Entered _____ By _____

ENTERED AUG 13 1990

RECEIVED
AUG - 9 1990

DWR-55-55-2/89

LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0	2	clay/small rock
2	8	caleachie
8	20	caly/small rock
20	25	black malapai
25	30	clay
30	35	black malapai
a35	60	brown/black malapai with clay
60	70	brown malapai
70	77	black malapai
77	85	brown malpai
85	110	black malapai
110	120	brown/black cinders
120	140	brown malapai
140	170	lost circulation
170	280	diorite
280	310	lost circulation
310	485	brown malapai
485	500	limestone/sandstone
		FIRST WATER 310'
		SECOND WATER 390'
		THIRD WATER 485'

I hereby certify that this well was drilled by me (or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller EDWARDSON DRILLING
Name

P. O. BOX 401

CHINO VALLEY, AZ 86323

City State Zip

Date AUG. 8 1990

FORM W-3—2M—3-50—S.P.CO.

LAND DEPARTMENT
WATER DIVISION
STATE OF ARIZONA

RECEIVED JUL 17 1952 STATE LAND DEPT.

REPORT OF WELL DRILLER

EXCERPT OF 1945 GROUNDWATER LAW

Report of Well Driller must be prepared by the driller in all detail and filed with the State Land Commissioner as required by Section 7, Chapter 12, Senate Bill No. 3, First Special Session, 1945. This report should be in the mail within 30 days following completion of the well. Section 8 of the law provides: "Any person (includes any individual, firm, public or private corporation, or governmental agency) who shall fail or refuse to make any of the reports, give the notices required, or **fail to cooperate** with the State Land Commissioner or his representative, under the provisions of this Act, shall be guilty of a **misdemeanor** and shall be fined a sum not exceeding One Hundred Dollars."

1. OWNER: Phil Tovrea Jr. (Name)
   5001 E. Washington, Phoenix, Arizona. (Address)
2. Lessee or Operator: ..... (Name)
   ..... (Address)
3. DRILLER: C. W. Frealove (Name)
   4150 E. Washington, Phoenix, Arizona. (Address)
4. Location of well: Twp. 18 N Rge. 3 W Section 25 SW ¼ SW ¼ NE ¼ (10-acre subdivision)
5. Intention to Drill File No. (B-18-3) 25 acc

DESCRIPTION OF WELL

6. Total depth of hole 625 ft.
7. Type of casing Seamless pipe
8. Diameter and length of casing 16 in. from 0 to 196., ... in. from ..... to ....., ... in. from ..... to .....
9. Method of sealing at reduction points .....
10. Perforated from ..... to ....., from ..... to ....., from ..... to ....., from ..... to .....
11. Size of cuts None Number cuts per foot .....
12. If screen was installed: Length ..... ft. Diam. ..... in. Type .....
13. Method of construction Drilled (drilled, dug, driven, bored, jetted, etc.)
14. Date completed June 25, 1952 (Month, Year)
15. Depth to water 120 ft. (If flowing well, so state.)
16. Describe point from which depth measurements were made, and give sea-level elevation if available .....
17. If flowing well, state method of flow regulation .....
18. REMARKS: .....

DO NOT WRITE IN THIS SPACE

OFFICE RECORD

Received 7-17-52 by lec
Filed 7-17-52 by lec
File No. (B-18-3) 25 acc

(Well Log to Appear on Reverse Side)

LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

FROM (FEET)	TO (FEET)	DESCRIPTION OF FORMATION MATERIAL
0	16	surface clay
16	28	sand and gravel (water)
28	45	conglomerate
45	85	clay
85	120	hard sand
120	465	clay streaks, hard sand.
465	515	calechi with hard streaks
515	522	clay
522	610	malapi.
610	620	concrete conglomerate.
620	625	clay conglomerate

I hereby certify that this well was drilled by me (or under my supervision), and that each and all of the statements herein contained are true to the best of my knowledge and belief.

Driller C. M. Fulcher
Name

Address

Date July 16, 1952

ARIZONA DEPARTMENT OF WATER RESOURCES
500 North Third Street
Phoenix, Arizona 85004

WELL DRILLER REPORT

This report should be prepared by the driller in all detail and filed with the Department within 30 days following completion of the well.

RECEIVED
MAR 1 1 1999
RECORDS MGT

1. DEL RIO DRILLING & PUMP, INC.
6645 NORTH HIGHWAY 89
CHINO VALLEY, AZ 86323

2. Owner Name: Wayne Muckleroy
Address: P.O. Box 190 Chino Valley Az 86323
City State Zip

3. Location: 18N N/S 3W E/W 26 ¼ SW ¼ SW ¼ SE
Township Range Section 10-acre 40-acre 160-acre

4. Well Registration No. 55- 572168 (Required)
5. Permit No. _____ (If issued)

DESCRIPTION OF WELL

6. Total depth of hole 310' ft.
7. Type of casing F480 PVC
8. Diameter and length of casing 7 in. from 0 to 20, 4.5 in from 0 to 300
9. Method of sealing at reduction points _____
10. Perforated from 200' to 300', from _____ to _____ from _____ to _____
11. Size of cuts Factory Number of cuts per foot _____
12. If screen was installed: Length _____ ft. Diam _____ in. Type _____
13. Method of construction drilled
(drilled, dug, driven, bored, jetted, etc)
14. Date started 1-16-99
Month Day Year
15. Date completed 3-5-99
Month Day Year
16. Depth to water 20' ft. (If flowing well, so state)
17. Describe point from which depth measurements were made, and give sea-level elevation if available
_____
18. If flowing well, state method of flow regulation: _____
19. Remarks: _____

DO NOT WRITE IN THIS SPACE
OFFICE RECORD

Registration No. 55-572168
File No. B(18-3) 26 ACC
Received _____ By _____
Entered _____ By _____

DWR-55-55-7/95 (Rev.)

ANSWERED MAR 1 2 1999

Muckleroy

LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0	20	clay
20	75	Sand + Gravel
75	~~201~~ 220	Clay
220	310	Clay + Gravel Layers
		GPM: 50+

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller Name: DEL RIO DRILLING & PUMP, INC.

6645 NORTH HIGHWAY 89
Street

CHINO VALLEY, AZ 86323
City State Zip Phone No.

Signature of Driller Date

LAND DEPARTMENT
WATER DIVISION
STATE OF ARIZONA

REPORT OF WELL DRILLER

This report should be prepared by the driller in all detail and filed with the State Land Commissioner following completion of the well.

1. OWNER: K4 Ranch (Name)
Box 513, Prescott, Arizona (Address)

2. Lessee or Operator: Gene Pearce Pump & Well Drilling (Name)
Casa Grande, Arizona (Address)

3. DRILLER: Gene Pearce Pump & Well Drilling (Name)
Casa Grande, Arizona (Address)

4. Location of well: Twp. 18 N. Rge. 3 W. Section 35 NE ¼ NE ¼ SW ¼ (10-acre subdivision)

5. Intention to Drill File No. (B-18-3)35 caa Permit No.

DESCRIPTION OF WELL

6. Total depth of hole 832 ft.

7. Type of casing Steel

8. Diameter and length of casing 16 in. from top to 270', in. from to, in. from to

9. Method of sealing at reduction points

10. Perforated from 130' to 260', from to, from to, from to

11. Size of cuts ½" x 4' Number of cuts per foot

12. If screen was installed: Length ft. Diam. in. Type

13. Method of construction Drilled (drilled, dug, driven, bored, jetted, etc.)

14. Date started December (Month) 9 (Day) 1960 (Year)

15. Date completed February (Month) 1 (Day) 1961 (Year)

16. Depth of water 144' ft. (If flowing well, so state.)

17. Describe point from which depth measurements were made, and give sea-level elevation if available

18. If flowing well, state method of flow regulation

19. REMARKS:

DO NOT WRITE IN THIS SPACE
OFFICE RECORD

Received 4-4-61 by R.W.F.
Filed 4-26-61 by [illegible]
File No. (B-18-3) 35 caa

(Well Log to Appear on Reverse Side)

WD FORM G-301
REV. 4-27-53

LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

FROM (FEET)	TO (FEET)	DESCRIPTION OF FORMATION MATERIAL
	4	Soil-top
4	30	Sand and Gravel
30	70	Clay
70	160	Clay
160	170	Sand, clay, water
170	250	Clay
250	320	Clay, rock
320	350	White clay
350	370	Sand, hard rock, white clay
370	490	White clay
490	515	Clay, gravel
515	832	Malapai

RECEIVED APR 4 1961 STATE LAND DEPT.

4646

I hereby certify that this well was drilled by me (or under my supervision), and that each and all of the statements herein contained are true to the best of my knowledge and belief.

Gene Pearch Pump & Well Drilling

Driller Gene Pearch
Name

Casa Grande, Arizona
Address

Date 4-3-61

56-532827
B(18-3)14

CV-DH-1
Geologic Log

Unit	Depth (Feet)	Description
- - - - -	0-20	Clay and silt with interbedded sands and gravels. Pink (5YR 7/4) to reddish-yellow (5YR 6/6); strong reaction with HCl.
Qt ?- - -?	20-30	Sand. Weak red (2.5YR 5/2) to reddish-yellowish (5YR 7/6); weak reaction with HCl (carbonate coating on grains); sand-medium to coarse, subrounded to rounded; fine gravel-subangular to rounded; clasts are composed of quartz, feldspar, and basalt.
Ts_{fg} - - - - -	30-108	Gravelly, silty, sandy clay. Light brown (7.5YR 6/4) to light red (10R 6/6); weak to strong reaction with HCl. Very little gravel below 80 feet; becomes more clayey toward bottom.
	108-143	Clay with sand. Reddish-yellow (5YR 7/6) to light red (2.5YR 6/6); strong reaction with HCl.
	143-161	Clay - with interbedded limestone. Reddish-yellow (5YR 6/6); strong reaction with HCl. Cutting sample contains some carbonate fragments around 150 feet and some limestone fragments in the 150-160 foot interval.
	161-305	Clay. Predominately light reddish-brown (5YR 6/4); strong reaction with HCl. Some fine gravel between 180 and 200 feet.
Ts_f	305-410	Clay - interbedded with silt, and trace of gravel. Pink (5YR 7/3) to reddish-yellow (5YR 6/6); strong to moderate reaction with HCl. (Interbedding interpretation from geophysical log).
	410-500	Clay. Reddish-yellow (5YR 7/6) to (5YR 6/6); strong reaction with HCl. Clay is highly plastic (fat). Carbonate fragments increasing with depth.
	500-540	Clay. Reddish-yellow (5YR 7/6) to (5YR 6/6); strong reaction with HCl. Clay is highly plastic (fat). Less carbonate fragments than above; material looks the same as above.

	540-580	Clay with carbonate. Reddish-yellow (5YR 7/6) to red (2.5YR 5/8); strong reaction with HCl. Large increase in carbonate fragments (white, sand-size particles) from 570-590 feet.
Ts_f	580-795	Clay. Pink (7.5YR 7/3) to red (2.5YR 5/8); strong reaction with HCl. Small interval of carbonate present (780-800 feet); andesite fragments (690-700 feet). (Cuttings from interval 580-590 feet looks like material above).
	795-920	Clay with carbonate beds. Light reddish-brown (5YR 6/6) to reddish-yellow (7.5YR 6/6); comprised of clay and carbonate material except for the interval 800-820 feet which is predominately a mottled carbonate material with some clay; strong reaction with HCl. Carbonate particles are white to off white (mottled areas).
- - - - -		
Ts_{fg}	920-1020	Sandy, gravelly clay. Red (2.5YR 4/8) to pink (5YR 7/4); strong reaction with HCl. Clasts are composed of andesite, quartz, basalt, and a trace of olivine that are angular to rounded. Material at top of the interval is fine and becomes coarser at depth; most of the gravels are coated with carbonate. (Cuttings from the 920-940 foot interval looks like material above (time lag).
	1020-1090	Clayey, silty sand and gravel with carbonate. Red (2.5YR 5/6) to pink (5YR 7/4); strong reaction with HCl. Clasts are composed of quartz, feldspars, andesite, basalt, and olivine; angular to rounded. Carbonate material decreases with depth.
- - - - -		
Ts_{fg}	1090-1245	Gravelly clay. Reddish-yellow (5YR 7/6) to light brown (7.5YR 6/4); strong reaction with HCl. Gravel clasts are composed of basalt, quartz, chert, feldspars, and some limestone; angular to rounded; sample also contains some sand and carbonate material.
- - - - -		
Ts_o (Ts_g)	1245-1350	Clayey sand with strong carbonate cement. Pinkish-white (5YR 8/2) to pink (5YR 7/4); strong reaction with HCl. Clasts are fine sand to gravel, angular to rounded. Larger pieces (fine gravel) are composed of limestone and basalt; Smaller material is quartz, chert, limestone, basalt, and some olivine; very hard drilling (slow penetration, probably well cemented).

Ts_o (Ts_g)	1350-1450	Sandy clays - clayey sands with carbonate cement. Light reddish brown (5YR 6/4) to pink (7.5YR 8/3); strong reaction with HCl. Sand - fine to coarse; subrounded to rounded.
- - - - -		
Ts_o (Ts_{fg})	1450-1520	Sandy clay with gravel. Pink (7.5YR 7/3) to light reddish-brown (5YR 6/4), strong reaction with HCl. Clasts are composed of quartz, limestone, chert, basalt, and some olivine; sand - fine to coarse; subrounded to rounded; gravel - fine, angular to subrounded. Carbonate coatings on some of the grains. (Cuttings from interval 1450-1460 looks like material above.)
- - - - -		
Dm	1520-1730	Limestone/Dolomite. Light gray (5YR 7/1 to 7.5YR N7/) to reddish-gray (10R 6/1). Reaction with acid becomes weaker with depth; weak to none at bottom. Cuttings from 1540-1560 feet contain a lot of clay, quartz, basalt, and some limestone chips (some of this material is rounded). First positive identification of limestone in cutting samples is 1560 feet. The first chips of limestone are coarse-grained sand size; later chips (below 1620 feet) become larger (¼ inch plus).
- - - - -	1730	Bottom of Hole

55-532332

B(18-3)28

CV-DH-2
Geologic Log

Unit	Depth (feet)	Description
Qg_o	0-20	Silt and clay with sand and some gravel. Brown (7.5YR 5/4); strong reaction with HCl.
Ts_f	20-310	Clayey silts and silty clay (interbedded). 20-30 feet: Pink (5YR 7/4). Becomes lighter colored with depth. 150-160 feet: Pink (5YR 7/3). 300-310 feet: Pinkish-white (5YR 8/2). Weak to strong reaction with HCl (mostly strong). (Interbedding interpretation from geophysical log).
	310-480	Silty clays with carbonate. Predominately pinkish-white (5YR 8.2) with some white (N9); strong reaction with HCl.
	480-540	Carbonate, clays, and clayey silts (interbedded). White (N9) and pink (7.5YR 7/3); strong reaction with HCl. (Interbedding interpretation from geophysical log).
Ts_g	540-634	Sands and gravel (poorly cemented). Pinkish-white(5YR 8/2) to pink (5YR 7/4); strong reaction with HCl (carbonate coating on some of the grains). Sand - mostly quartz, fine to coarse (mostly coarse), subangular to rounded. The interval 570-590 feet is a well sorted quartz sand. Intervals above and below this contain some clayey silt and carbonate.
Ts_{gf}	634-815	Sandy gravel and clayey, sandy gravels (interbedded). Light gray (5YR 7/1) to reddish-pink (5YR 7/6); variable cementation, none to strong reaction with HCl. Clasts are composed of limestone, basalt, andesite, quartz, feldspars; angular to rounded; Recovered a lot of loose gravel in interval 700-750 feet (possible washout zone). (Interbedding interpretation from geophysical log).
Dm	815-830	Limestone/Dolomite. Light gray (N8) to light gray (10YR 7/1); strong reaction with HCl; limestone/dolomite chips have none to very weak reaction. Most of the chips are angular. Lost circulation at 830 feet; could not get it back; terminated hole.
	830	Bottom of Hole

ARIZONA DEPARTMENT OF WATER RESOURCES
Records Management Section
500 N. 3rd Street * Phoenix, Arizona 85004
(602) 417-2405 * (800) 352-8488
www.water.az.gov

RECEIVED NOV - 7 2003 Information Management

Well Driller Report and Well Log

FILE NUMBER: B(18-4) 1 ACA
WELL REGISTRATION NUMBER: 55- 200028
PERMIT NUMBER (IF ISSUED)

- Review instructions prior to completing form
- This report should be prepared by the driller in detail and filed with the Department within 30 days following completion of the well.

** PLEASE PRINT CLEARLY **

SECTION 1. REGISTRY INFORMATION

Well Owner

FULL NAME OF COMPANY, ORGANIZATION OR INDIVIDUAL: JOHN KIECKHEFER
MAILING ADDRESS: PO BOX 1151
CITY / STATE / ZIP: PRESCOTT, AZ 86302
CONTACT PERSON NAME AND TITLE:
TELEPHONE NUMBER: 928-771-0610
FAX:

Location of Well

WELL LOCATION ADDRESS (IF KNOWN):

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
18 N	4 W	1	NE 1/4	SW 1/4	NE 1/4

LATITUDE				LONGITUDE			
34 °	58. '	76 "	N	112 °	38. '	18 "	W

LAND SURFACE ELEVATION AT WELL: 4582 Feet Above Sea Level

METHOD OF LATITUDE / LONGITUDE (CHECK ONE): [X] Hand-Held
[ ] USGS Quad Map [ ] Conventional Survey [X] GPS : [ ] Survey-Grade

COUNTY ASSESSOR'S PARCEL ID NUMBER
BOOK: 300 MAP: 44 PARCEL: 001

COUNTY WHERE WELL IS LOCATED: Yavapai

SECTION 2. DRILLING AUTHORIZATION

Drilling Firm

NAME: STEWART BROTHERS DRILLING COMPANY
DWR LICENSE NUMBER: 314
TELEPHONE NUMBER: 505-287-2986
FAX:

SECTION 3. WELL CONSTRUCTION DETAILS

DATE WELL CONSTRUCTION STARTED: 10-5-03
DATE WELL CONSTRUCTION COMPLETED: 10-8-03
IF FLOWING WELL, METHOD OF FLOW REGULATION: [ ] Valve [ ] Other

Drill Method

CHECK ONE
- [ ] Air Rotary
- [ ] Bored or Augered
- [ ] Cable Tool
- [ ] Dual Rotary
- [x] Mud Rotary
- [ ] Reverse Circulation
- [ ] Driven
- [ ] Jetted
- [ ] Air Percussion / Odex Tubing
- [ ] Other (please specify)

Method of Well Development

CHECK ONE
- [ ] Airlift
- [ ] Bail
- [ ] Surge Back
- [ ] Surge Pump
- [ ] Other (please specify)

No development

Water Level Information

STATIC WATER LEVEL: 460 Feet Below Land Surface
DATE MEASURED: 10-8-03

Method of Sealing at Reduction Points

CHECK ONE
- [x] None
- [ ] Packed
- [ ] Swedged
- [ ] Welded
- [ ] Other (please specify)

ANSWERED NOV 7 , 2003

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55- 200028

SECTION 4. WELL CONSTRUCTION DESIGN (AS BUILT) (attach additional page if needed)

Borehole			Installed Casing													
DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)	DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE (X)				PERFORATION TYPE (X)						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	IF OTHER TYPE, DESCRIBE	
0	20	12"	0	20	8"	X				X						
20	1900	6"	N/A													

Installed Annular Material											
DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE (X)								FILTER PACK		
						BENTONITE						
FROM (feet)	TO (feet)	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	GROUT	CHIPS	PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	SAND	GRAVEL	SIZE
									N/A			

DEPTH OF BORING		DEPTH OF COMPLETED WELL	
1900'	Feet Below Land Surface	N/A Well Abandoned	Feet Below Land Surface

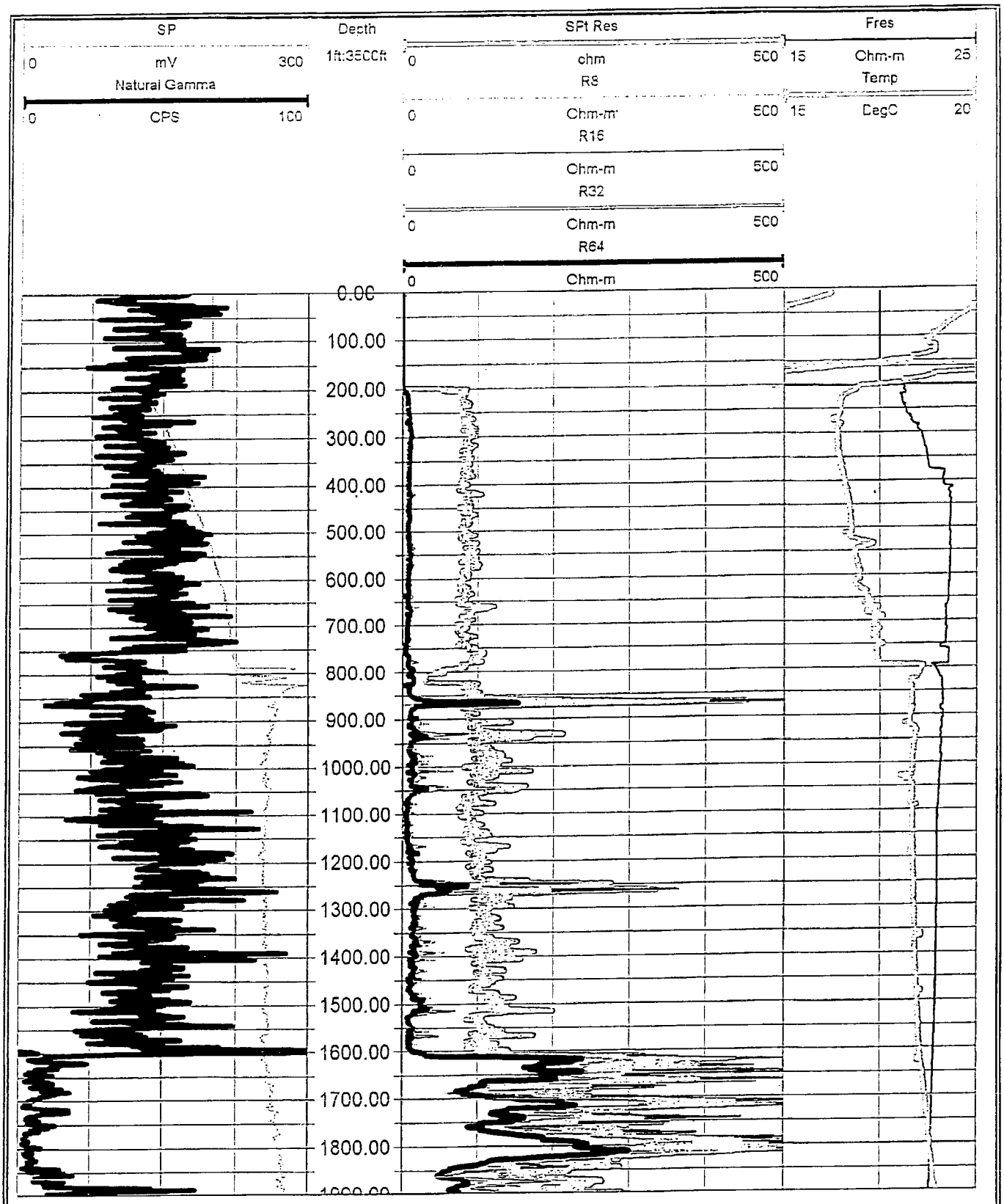
DWR-55-55B-10/01 (Rev.)

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55- 200028

SECTION 5. GEOLOGIC LOG OF WELL

DEPTH FROM SURFACE FROM (feet)	TO (feet)	DESCRIPTION Describe material, grain size, color, etc.	Check (X) every interval where water was encountered
0	20	Sand and gravel	
20	40	Tandclay, some gravel	
40	850	Reddish brown clay	
850	880	Black basalt	
880	1010	Reddish brown clay	
1010	1250	White and reddish brown clay	
1250	1340	Brown and pink clay	
1340	1620	Mostly greenish gray clay	
1620	1680	Dolomite, gray with some gray shale	
1680	1690	Reddish brown clay	
1690	1900	Dolomite	



Southwest Ground-water Consultants, Inc.

March 26, 2004 Project B.706

Project Name: CV Ranch
Project Location: Yavapai County, Arizona
Boring: BH-2
Logger Date: 9/30/03
Logger Depth: 1870 ft below TOC