



Westlands Water District Aquifer Storage and Recovery (ASR) Program

Westlands Water District (District) developed the Westside Subbasin Groundwater Sustainability Plan (GSP) to comply with the Sustainable Groundwater Management Act (SGMA). The GSP identifies projects that may be implemented by water users or the Westside Subbasin to generate “groundwater credits” for future use. One of the projects is Project and Management Action No. 3-Aquifer Storage and Recovery (ASR). The ASR Program (Program) is approved by the Central Valley Regional Water Quality Control Board (CVRWQB), and it is subject to Monitoring and Reporting Program (MRP) R5-2020-0809.

The Program was developed to promote conjunctive use in the Westside Subbasin and to inform the development of the GSP. “Groundwater credits” will be allocated to water users who develop a qualifying ASR project and provide the District data to support the project’s recharge benefit to the groundwater subbasin. The “groundwater credits” *may* be used in subsequent years for groundwater pumping as provided below. All “groundwater credits” shall be subject to the policies developed pursuant the GSP as they may be updated over time. Policies governing “groundwater credits” may include *but are not limited to* avoidance of undesirable results, quantification, transfer, expiration of credits, a leave-behind quantity (accounting for losses), and termination of the Program.

Water users in the Program (Participants) must follow the Terms listed below to receive monthly groundwater credit:

1. Application conditions are as follows:

- a. Wells shall be furnished with a (District approved) meter.
- b. Opening meter readings from all groundwater wells¹.
- c. Continued access by District personnel.
- d. If the District does **not** allocate groundwater in a given year, then *Groundwater wells shall not be pumped during the Contract Year after the recharge project has commenced. Exceptions may be granted if capacity limitations exist on the District’s distribution system or the recharge project is dependent on surging the groundwater well.*

¹ The Participant must provide access to all groundwater well(s), including but not limited to well(s) located inside of a locked structure. Failure to do so will delay the application review process.



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2. Source water monitoring (Table 3) will be sampled by the District for water provided from the San Luis Canal or Mendota Pool. Water quality for other water sources must be provided by the Participant.
3. Extraction well monitoring (See Table 4) will be sampled by the District in accordance with the MRP R5-2020-0809. Participant will be responsible for the cost incurred.
4. A Participant enrolled in the Program must report the following to sgma@wwd.ca.gov:
 - a. **Monthly Injection Well Monitoring**
 - i. Operational Status of the Well
 - ii. Number of Days of Injection
 - iii. Daily Average Injection Rate (AF/Day)
 - iv. Total Cumulative Injected Water (AF/current year)
5. Approved ASR projects are required to install a dedicated water meter to measure the amount of water delivered to the ASR facility. Groundwater credits will only be allocated to water users that meet the requirements of Term 1.
6. Participants are required to comply with the Checklist set forth below in the Application Checklist section (see page 6).
7. Appropriate and accurate information must be provided by the Participant to quantify the volume of water being recharged. Water account and project specific information provided by the water user shall remain confidential. The amount of groundwater credit received will be allocated based on the supporting documentation and subject to staff's review.
8. Participant shall indemnify, hold harmless and defend the District and each of its officers, officials, employees, agents and volunteers from any liability, claim of liability, damage, or claim of damage of any nature whatsoever, including any legal action brought by any third party, with respect to property damage, personal injury or death, or claims concerning the control, carriage, handling, use, disposal, or distribution of recharge water up to the point of delivery, incurred by the District, Participant or any other person, and from any and all claims, demands and actions in law or equity (including reasonable attorney's fees and litigation expenses), arising or alleged to have arisen directly or indirectly out of performance of this



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Application. Participant's obligations under the preceding sentence shall apply regardless of whether the District or any of its officers, officials, employees, agents or volunteers are passively negligent, but shall not apply to any loss, liability, fines, penalties, forfeitures, costs or damages caused by the active negligence or willful misconduct of the District or any of its officers, officials, employees, agents or volunteers.

If you have any questions regarding the ASR Program, please contact Antonio Solorio (asolorio@wwd.ca.gov) at (559)241-6244.



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Table 3 - Source Water Monitoring

Constituent/Parameter	Units	Sample Type	Frequency
pH	S.U.	Grab	Monthly
Electrical Conductivity	µmhos/cm	Grab	Monthly
Total Dissolved Solids	mg/L	Grab	Monthly
General Minerals	mg/L	Grab	Monthly
Arsenic	µg/L	Grab	Monthly
Total Coliform	MPN/100 mL	Grab	Monthly
Giardia and Cryptosporidium	Count / 100 gal	Grab	Monthly
Primary Bio-indicators <small>(see 1 below)</small>	Count / 100 gal	Grab	Monthly
Total Trihalomethanes	µg/L	Grab	Monthly
Total Chromium	µg/L	Grab	Quarterly
Uranium	pCi/L	Grab	Quarterly
Vanadium	µg/L	Grab	Quarterly

Table 4 - Extraction Well Monitoring

Constituent/Parameter	Units	Sample Type	Frequency
Well Activity <small>(see 1 below)</small>	N/A	Recorded	Quarterly
Average Pumping Rate	gpd	Meter	Continuous
Extracted Water/Year <small>(see 2 below)</small>	ac-ft/yr	Meter	Continuous
pH	S.U.	Grab	Quarterly
Electrical Conductivity	µmhos/cm	Grab	Quarterly
Total Dissolved Solids	mg/L	Grab	Quarterly
Total Coliform	MPN/100 mL	Grab	Quarterly
General Minerals	mg/L	Grab	Quarterly
Arsenic	µg/L	Grab	Quarterly ^{<small>(see 3 below)</small>}
Total Chromium	µg/L	Grab	Quarterly ^{<small>(see 3 below)</small>}
Uranium	pCi/L	Grab	Quarterly ^{<small>(see 3 below)</small>}
Vanadium	µg/L	Grab	Quarterly ^{<small>(see 3 below)</small>}
Giardia and Cryptosporidium	Count / 100 gal	Grab	Quarterly ^{<small>(see 3 below)</small>}
Primary Bio-indicators	Count / 100 gal	Grab	Quarterly ^{<small>(see 3 below)</small>}
Total Trihalomethanes	µg/L	Grab	Quarterly ^{<small>(see 3 below)</small>}

1. Well activity shall be reported for all wells associated with the Ag-ASR Project. Injection/extraction activity shall be recorded on a daily basis. The monitoring report shall



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specify the latitude/longitude of the well and the length and depth of the well screen. The report shall also indicate if the well is screened above or below the Corcoran Clay (or both).

2. Extracted Water/Year represents the total amount of water extracted from a well for the Contract Water Year.
3. For each new extraction well added to the Ag-ASR Project, initial monitoring for arsenic, total chromium, uranium, vanadium giardia and cryptosporidium, primary bio-indicators, and total trihalomethanes shall be quarterly for the first two quarters of groundwater recovery after the first major (>3 months) period of injection. If a Maximum Contaminant Level (MCL) is exceeded or primary bio-indicators indicate the presence of giardia or cryptosporidium, then quarterly analysis shall continue into the next recovery cycle. Otherwise, if the initial quarterly monitoring does not show exceedances of an MCL or indicate the presence of giardia or cryptosporidium, future sampling for these constituents (at that specific extraction well) shall be performed once three months after commencement of recovery pumping, but not more frequently than once every year.



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CHECKLIST (Include with Application)

Participant Contact Information

- Name, Company, Email, Phone

Participant Project Information/Support

- Extraction Meter & Turnout Information (Location, Number, etc)
- Existing Layout (Pictures, Location, etc)
- Location of Proposed ASR Well (show on map and provide latitude/longitude)
- Source of Supply
- Capacity of Well (AF daily and annually)
- Total Recharge time-period



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WWD STAFF ONLY

Application Date	
Date of Approval	
Total Groundwater Credit	
Recharge Project Number	

Aquifer Storage and Recovery (ASR) Application

1. Participant Information and Recharge Request:			
Company		Field ID(s)	
Water User Account		Meter Number(s)	
Contact Name		Proposed Recharge Start Date	
Contact Number		Proposed Amount of Recharge (AF)	
Email		Aquifer to be recharged	

2. Source(s) of Water Supply (Check all Box(es) that apply and provide supporting information):		
Water Source	Quantity (AF)	
<input type="checkbox"/> Central Valley Project Water		
<input type="checkbox"/> Section 215 (Identify source and attach water quality characteristics)		
<input type="checkbox"/> Supplemental Water (Identify source and attach water quality characteristics)		
<input type="checkbox"/> Other (Identify source and attach water quality characteristics)		

I hereby acknowledge the terms and conditions of the ASR Program and agree that all groundwater credits are subject to the policies developed pursuant the District's Groundwater Sustainability Plan.

By: _____

Date: _____

Print Name: _____



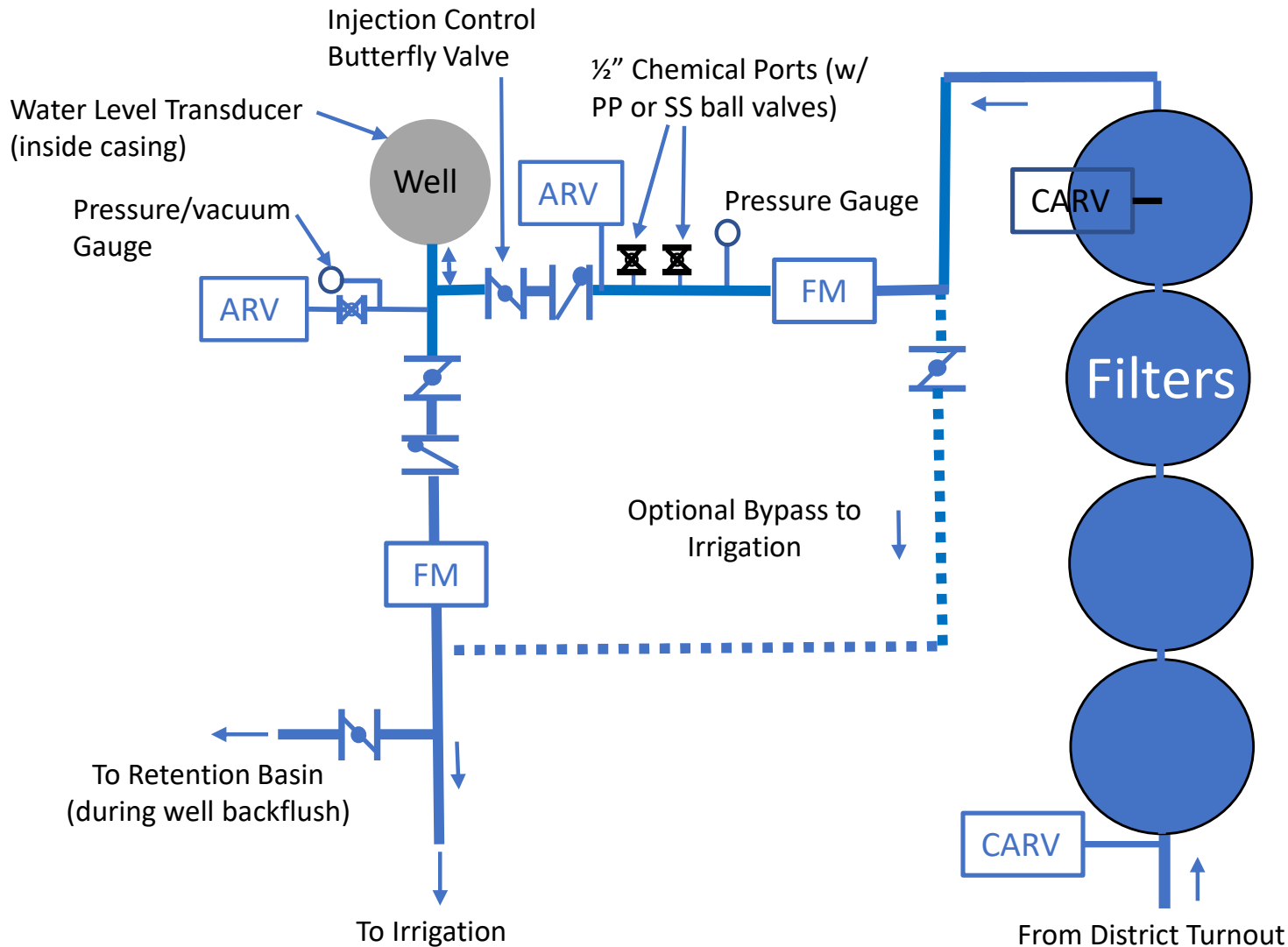
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Aquifer Storage and Recovery Application Form

<input type="checkbox"/> Aquifer Storage and Recovery	
Well Location	
Well ID	
Meter ID (Injection)*	
Meter ID (Recovery)*	
Sand Filter Information	
Map	<input type="checkbox"/> Attachment Required
Site Layout	<input type="checkbox"/> Attachment Required
Well Properties	
Capacity (CFS)	
Screening Location	<input type="checkbox"/> Upper Aquifer <input type="checkbox"/> Lower Aquifer or <input type="checkbox"/> Composite Well
Well Completion Report	<input type="checkbox"/> Attachment Required
<i>Water Quality (Pre-Project)</i>	
Native Groundwater	
Source Water	
<i>Depth to Water Table (bgs)</i>	

*The Participant must have a functioning meter that measures the volume of water injected and recovered.

Figure B-1. Typical Ag-ASR Wellhead Configuration for Injection Down the Pump Column



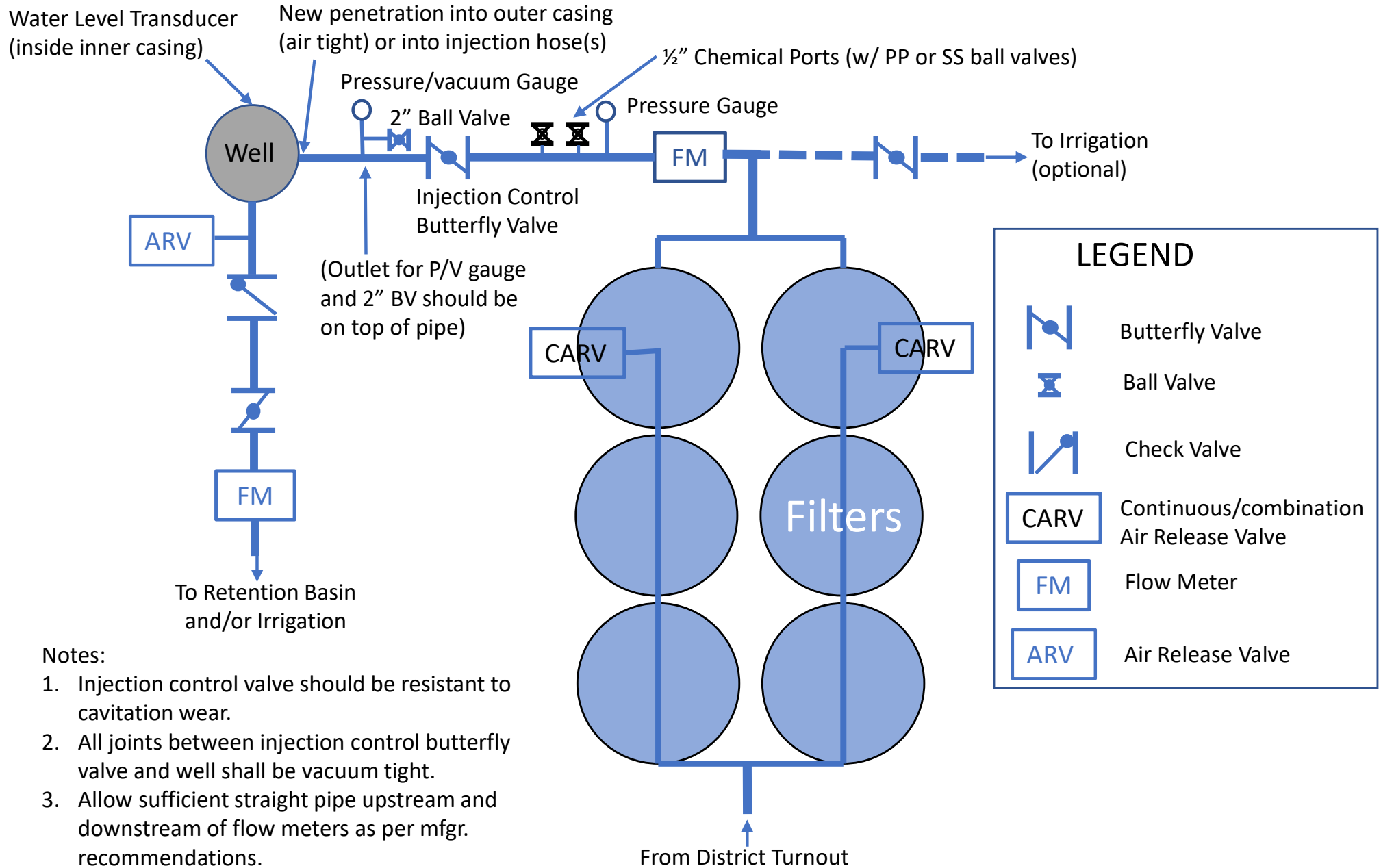
Legend

	Check Valve
	Air Release Valve
	Continuous/comb. Air Release Valve
	Butterfly Valve
	Ball Valve
	Flow Meter

Notes:

1. Injection control valve should be resistant to cavitation wear.
2. All joints between butterfly valve and well shall be vacuum tight.
3. Allow sufficient straight pipe upstream and downstream of flow meters as per mfr. recommendations.
4. An anti-reversing ratchet may be required on the pump motor.

Figure B-2. Typical Ag-ASR Wellhead Configuration for Injection Into Casing Path Well or Injection Hoses



LEGEND	
	Butterfly Valve
	Ball Valve
	Check Valve
	Continuous/combination Air Release Valve
	Flow Meter
	Air Release Valve

- Notes:
1. Injection control valve should be resistant to cavitation wear.
 2. All joints between injection control butterfly valve and well shall be vacuum tight.
 3. Allow sufficient straight pipe upstream and downstream of flow meters as per mfr. recommendations.
 4. Injection hoses should also have individual ball valve control.



WESTLANDS WATER DISTRICT

AMI STANDARD SADDLE MOUNTED METER TUBE REQUIRED CONFIGURATION



Know what's below.
Call before you dig.

METERING TUBE DIMENSIONS				
NOMINAL SIZE	ALL METERING TUBES		SADDLE METER MINIMUM CLEAR DISTANCES	
	PIPE O.D.	MINIMUM WALL	UPSTREAM	DOWNSTREAM
6"	6.625"	.250"	18"	12"
8"	8.625"	.250"	24"	16"
10"	10.750"	.250"	30"	20"
12"	12.750"	.250"	36"	24"

GENERAL METER TUBE NOTES

- SADDLE METER CUTOUTS SHALL BE A MINIMUM OF 3 INCHES IN DIAMETER, MADE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS. SPECIFICATION SHEETS WILL BE PROVIDED TO EACH WATER USER DEPENDING ON THE SIZE OF EACH CONVERTED WELL.
- ALL SURFACE IRREGULARITIES, WELDS AND WELD SPATTER SHALL BE GROUND SMOOTH.
- ALL SURFACES SHALL BE GRITBLASTED PRIOR TO COATING AND PAINTING. GRITBLASTING SHALL CONFORM TO STEEL STRUCTURES PAINTING COUNCIL SPECIFICATIONS SP-10.
- INTERIOR OF TUBE AND FLANGES SHALL BE COATED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION.
- THE EXTERIOR SURFACES SHALL BE EPOXY COATED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
- ALL WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY CODE.

GROUNDWATER PUMP METER NOTES

- OWNER SHALL BE RESPONSIBLE FOR CONSTRUCTING OR REHABILITATING PUMP DISCHARGE TO MEET MINIMUM DIMENSIONS AND STANDARDS SHOWN IN DRAWINGS.
- WESTLANDS WATER DISTRICT SHALL SUPPLY SADDLE METER. OWNER IS RESPONSIBLE FOR FURNISHING AND INSTALLING ALL OTHER MATERIALS.
- FLANGES FOR CONNECTION TO DISTRICT SUPPLIED MATERIAL SHALL BE AWWA CLASS D.
- MINIMUM CLEAR DISTANCE FOR SADDLE METERS SHALL BE 3 PIPE DIAMETERS UPSTREAM AND 2 PIPE DIAMETERS DOWNSTREAM. NO ALTERATIONS ARE REQUIRED IF EXISTING DIMENSIONS MEET MINIMUM CLEAR DISTANCES. CLEAR DISTANCE IS DEFINED AS A STRAIGHT, LEVEL SEGMENT OF UNIFORM DIAMETER PIPELINE, WITHOUT ANY CONNECTIONS, TEES, VALVES, AIR RELEASES, OR OTHER FEATURES THAT MAY ALTER PIPE FLOW.
- DISCHARGES OR CONNECTIONS SHALL NOT BE PRESENT UPSTREAM OF FLOW METER.
- FLEXIBLE COUPLING SHALL BE PROVIDED UPSTREAM OF FLOW METER TO FACILITATE MAINTENANCE.

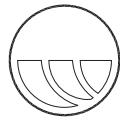
SEE REVERSE FOR METER TUBE DETAIL

		WESTLANDS WATER DISTRICT FRESNO, CALIFORNIA	
AUTOMATED METER INFRASTRUCTURE METER TUBE DETAILS			
DRAWN K VANDERGON		APPROVED Cody M. Vandergon	
CHECKED BP, JJ, CS		DATE 07/11/2019	
O&M DIVISION		RESOURCES	
C.O.D.		DWG NO. 2019-W-0104 SHEET 1 OF 2	

NUMBER	DATE	DRAWN	CHECKED	APPROVED
1	10/10/2019	A. YOUNG	KWV	Cody M. Vandergon
SCALING CHANGED FROM 11X17 TO 8.5X11				
2	4/19/2021	A. YOUNG	KWV	Cody M. Vandergon
UPDATED METER TUBE NOTES & DIMENSIONS				
NUMBER	DATE	DRAWN	CHECKED	APPROVED
REVISION				



WATCH FOR OVERHEAD POWER LINES

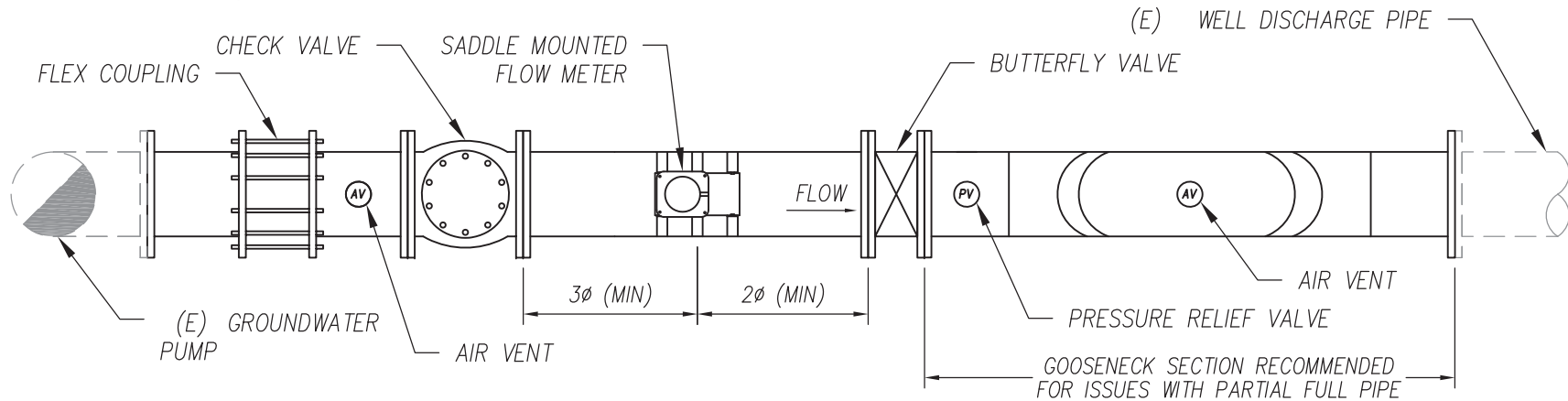


WESTLANDS WATER DISTRICT

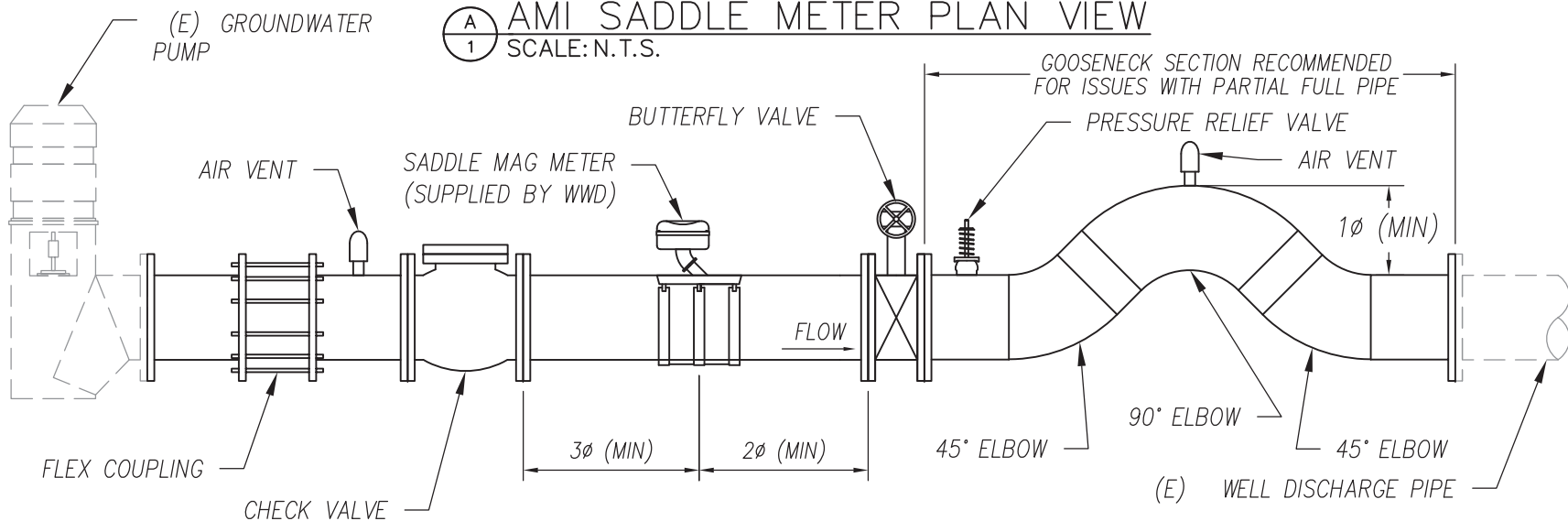
AMI STANDARD SADDLE MOUNTED METER TUBE
REQUIRED CONFIGURATION



Know what's below.
Call before you dig.



A AMI SADDLE METER PLAN VIEW
SCALE: N.T.S.



B AMI SADDLE METER PROFILE VIEW
SCALE: N.T.S.

WESTLANDS WATER DISTRICT
FRESNO, CALIFORNIA

**AUTOMATED METER INFRASTRUCTURE
METER TUBE DETAILS**

1	10/10/2019	A. YOUNG	KWV		
SCALING CHANGED FROM 11X17 TO 8.5X11					
NUMBER	DATE	DRAWN	CHECKED	APPROVED	
2	4/29/2022	A. YOUNG	KWV		
ADDED GOOSENECK SECTION					
NUMBER	DATE	DRAWN	CHECKED	APPROVED	
REVISION					

DRAWN	K VANDERGRON	APPROVED	
CHECKED	BP, JL, CS	O&M DIVISION	RESOURCES
DATE	07/11/2019	C.O.O.	
DWG NO. 2019-W-0104		SHEET 2 OF 2	