Albuquerque Bernalillo County
Water Utility Authority

ABCWUA Compliance Division Protocol Agreement

Date: **Program: WT** **Protocol: ASRT3** **Revision: 1**

Objective: To monitor the quality of water injected or extracted in Aquifer Storage Recovery DP-1626, Bear Canyon Recharge Demonstration Project.

Reference Document(s): Draft Discharge Permit Renewal, DP-1626, Bear Canyon recharge Demonstration Project, New Mexico Water Quality Act (WQA), NMSA 1978§§74-6-1 through 74-6-17, and New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

Sample Purpose: Monitoring and Permit requirments.

Sample Collection Type/Details: Grab

Sample Collection Frequency: As needed to satisfy DP-1626, Bear Canyon Recharge demonstration Project. Collect a sample from the out fall approximately one month prior to the end of recharge period. Collect sample set from three (3) monitoring wells if no recharge water is to be released that year.

Sample Point Nomenclature Convention: Prefixes include: MW-01R, MW-02, MW-03 and Reuse Outfall.

Sampling Personnel: Water Quality Specialist or other designated personnel.

Field Instruction: Flush tap as per permit. Record free and total chlorine residuals using colorimeter. Record 0.0 mg/L if sample is non-chlorinated. Record water quality field parameters using field meter. Record meter numbers and meter types in comments section of submittal form. Filter one liter of water for WQL dissolved portion. Preserve samples per Protocol Analytical Definition until delivered to laboratories.

Laboratory Instruction: Log in field parameters and meter numbers upon submittal. Preserve total metals sample with HNO3 upon submittal. Preserve dissolved metals sample with NHO3 upon submittal.

External Laboratory Instructions: External Laboratory Samples to be submitted to either SLD or HALL.

Special Handling Instructions:

Chain of Custody: Required ☐ Yes ☑ No

QA/QC Data Requirements: QA/QC data provided upon request.

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Client Contact(s):

Priority	Contact	Title	Phone	Cell Phone	Email
1	Katherine Yuhas	Program Manager WC/ WR		768-3633	kyuhas@abcwua.org
2	Lori Pettit	Program Manager/WQ	342-3017	681-8019	lpettit@abcwua.org
3	Mike Richardson	WQ Supervisor	342-3030	553-5731	mrichardson@abcwua.org

Reporting Criteria: LIMS view within four (4) weeks of sample submission

Billing Method: 21160. No charge for samples invalidated after login.

Protocol Agreement:

Protocol Agreement can only be approved or modified by 1) Compliance Division Manager, 2) Program Managers, or 3) Designated External Client Representative, and WQL Program Manager.

Mike Richardson — Prepared by
Water Quality Supervisor — Title
7/17/14 — Date

Lori Pettit — Program Manager
7/28/14 — Date

Designated External Client Representative — Title — Date

Compliance Division Manager — Date

Timothy H. Chapman — WQL Program Manager
7/21/14 — Date

ABCWUA Compliance Division Protocol Agreement

Protocol Analyses Definition

Program: WT Protocol: ASRT3 Revision: 1

Primary Laboratory	External Laboratory	Sample Kit	Analyte	Method*	Preservation	Units	Lab PQL	Hold Time	Turn Around Time	Analyte Cost	Reg Limit Low	Reg Limit High	Flag Limit Low	Flag Limit High
		1 Liter wide mouth polypropylene bottle.	CHLORIDE	SM4110B-2000		mg/L		28 days	14 days	$12.00			2	125
			BROMIDE			mg/L		28 days	14 days	$12.00				
			FLUORIDE	SM4500.F- 3C 1997		mg/L		1 month	14 days	$15.00		2	0.3	1.3
		1 Liter wide mouth polypropylene bottle.	CALCIUM AS CA-CACO3	SM3500D Ca-1997	< 4°C	mg/L		6 months	30 days	$13.00			5	175
			HARDNESS AS CA-CACO3	SM2340 C 1997		mg/L		6 months	7 days	$25.00			25	200
			NITRATE	SM4110B-2000		mg/L N		48 hrs.	7 days	$16.00		10	0.5	2
			NITRITE			mg/L N		48 hrs.	7 days	$16.00		1		0.9
			ORTHOPHOSPHATE	SM4110B - 2000		mg/L P		48 hrs.	7 days	$16.00				1
			PH	SM4500H.B - 2000		STD UNIT		-	7 days	$6.00			6.5	9.5
			PHS	SM2330B		STD UNIT		-	7 days	$15.00			7	9
			SATURATION INDEX (LANGLIER)	SM2330B (SI)				-	7 days	$0.00			1	-1
			SULFATE	SM4110B - 2000		mg/L		28 days	14 days	$12.00			10	120
			TDS	SM2540C - 1997		mg/L		7 days	14 days	$12.00			150	400
			SPECIFIC CONDUCTANCE	SM 2510B-1997		µmhos/cm		28 days	24 Hours	$8.00				
			TURBIDITY	SM2130B-2001		NTU		48 hrs.	7 days	$8.00		1		0.3
		1-500 plastic	Ammonia	SM 4500 NH3 D -2009	H2SO4 To pH <2, cool to <4°C	mg/L								
		1 L	BIOCHEMICAL OXYGEN DEMAND	SM 5210B-2001	<4°C None	mg/L								
Water Quality Lab	NA	1 Liter acid washed polypropylene bottle for Metals.	ALUMINUM	EPA 200.7 (1994)	Lab to Acidify w/ HNO_3 to pH < 2	µg/L		6 months	30 days	$10.00			10	115
			Antimony	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00		6		
			ARSENIC	EPA 200.8 (1994)		µg/L		6 months	6 weeks	$10.00		10		8
			BARIUM	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00		2000		
			Beryllium	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00		4	1	2
			BORON	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			25	400
			Cadmium	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00				
			CALCIUM	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			30	300
			CHROMIUM	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00		100		
			Cobalt	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			5	50
			COPPER	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00		1300	5	100
			IRON	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00		300	5	200
			LEAD	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00		15		10
			MAGNESIUM	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			0.5	100
			MANGANESE	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00		50		40
			Molybdenum	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			25	51
			NICKEL	EPA 200.7 (1994)		µg/L		6 months		$10.00			5	10
			POTASSIUM	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			1	10
			SELENIUM	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00		50	2	21
			SILICA AS SIO2	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			10	90
			SILVER	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00				
			SODIUM	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			15	150
			THALLIUM	EPA 200.8 (1994)		µg/L		6 months		$10.00				
			VANADIUM	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			5	105
			ZINC	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			8	250
		500 ml acid washed polypropylene bottle for total Mercury	MERCURY (TOTAL)	SM3112B-1999	Lab to Acidify w/ HNO3 to pH < 2. Chill to <4°C	µg/L		6 months	30 days	$10.00		2		
		Filtered 1 Liter acid washed polypropylene bottle for Metals.	ALUMINUM, DISSOLVED	EPA 200.7 (1994)	Sample Collectors to Filter in Field. Lab to Acidify w/ HNO_3 to pH < 2	µg/L		6 months	30 days	$10.00			10	115
			Antimony, DISSOLVED	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00		6		
			ARSENIC, DISSOLVED	EPA 200.8 (1994)		µg/L		6 months	6 weeks	$10.00		10		8
			BARIUM, DISSOLVED	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00		2000		
			Beryllium, DISSOLVED	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00		4	1	2
			BORON, DISSOLVED	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00				
			Cadmium, DISSOLVED	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00				
			CALCIUM, DISSOLVED	EPA 200.7 (1994)		mg/L		6 months	30 days	$10.00			30	300
			CHROMIUM, DISSOLVED	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00		100		
			Cobalt, DISSOLVED	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			5	50
			COPPER, DISSOLVED	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00		1300	5	100
			IRON, DISSOLVED	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00		300	5	200
			LEAD, DISSOLVED	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00		15		10
			MAGNESIUM, DISSOLVED	EPA 200.7 (1994)		mg/L		6 months	30 days	$10.00			0.5	10
			MANGANESE, DISSOLVED	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00		50		40
			Molybdenum, DISSOLVED	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			25	51

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Primary Laboratory	External Laboratory	Sample Kit	Analyte	Method*	Preservation	Units	Lab PQL	Hold Time	Turn Around Time	Analyte Cost	Reg Limit Low	Reg Limit High	Flag Limit Low	Flag Limit High
Water Quality Lab	NA	Filtered Continued from previous page 1 Liter acid washed polypropylene bottle for Metals.	NICKEL, DISSOLVED	EPA 200.7 (1994)	Sample Collectors to Filter in Field. Lab to Acidify w/ HNO3 to pH < 2	µg/L		6 months	30 days	$10.00			5	10
			POTASSIUM, DISSOLVED	EPA 200.7 (1994)		mg/L		6 months	30 days	$10.00			1	10
			SELENIUM, DISSOLVED	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00		50	2	21
			SILICA AS SIO2, DISSOLVED	EPA 200.7 (1994)		mg/L		28 days	30 days	$10.00			10	90
			SILVER, DISSOLVED	EPA 200.8 (1994)		µg/L		6 months	30 days	$10.00				
			SODIUM, DISSOLVED	EPA 200.7 (1994)		mg/L		6 months	30 days	$10.00			15	150
			THALLIUM, DISSOLVED	EPA 200.8 (1994)		µg/L		6 months		$10.00				
			VANADIUM, DISSOLVED	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			5	105
			ZINC, DISSOLVED	EPA 200.7 (1994)		µg/L		6 months	30 days	$10.00			8	250
		One (1) 125 mL sterile microbiolgical collection bottle with $Na_2S_2O_3$ as supplied by WQL	Total Coliform	SM9222B-1997	< 4°C	Presence=1Absence=0		30 hours	48 hours	$37.00	0	1	0	1
			Escherichia Coli	SM9222G-1997	< 4°C	Presence=1Absence=0		30 hours	48 hours		0	1	0	1
HALL		FILTERED 1-250 ml Amber	SULFITE, DISSOLVED	SM 4500-S032-B	<4°C EDA	mg/L				$40.00				
		250 ml Amber	BROMATE	EPA 317.0	<4°C EDA	µg/L				$25.00				
		250 ml Amber	CHLORITE	EPA 300.0	<4°C EDA	µg/L				$30.00				
		250 plastic + 1 500 Amber	HYDROGEN SULFIDE	SM 4500-H	<4°C NaOH/Zn Acetate	mg/L				$85.00				
		1-500 ml plastic	CYANIDE (TOTAL)	EPA 335.4	<4°C NaOH	mg/L				$40.00				
		1-L Amber	PHENOLS		<4°C H2SO4					$70.00				
		2-1L	DIOXIN		<4°C None					$500.00				
		1 Liter	Asbestos	EPA 100.1	< 4°C in dark, Lab to filter within 48 hrs	mg/L				$200.00				
		2-40 ml amber bottles	DISSOLVED ORGANIC CARBON	SM5310B	< 4°C/Lab to Acidify w/HCL	mg/L		28days	7 days	$35.00				
		2-40 ml amber bottles	TOTAL ORGANIC CARBON	SM5310B	< 4°C/Lab to Acidify w/HCL	mg/L		28days	7 days	$35.00				
		1- 250 mL plastic	Inorganic Mercury		< 4°C									
		1-500 ml plastic	TOTAL KJELDAHL NITROGEN	EPA 351.2	H2SO4 To pH <2, cool to <4°C	mg/L		28 days	5 weeks	$30.00		10		
SLD	NA	1 Liter Cubitainer	ALKALINITY	SM2320B.4	< 4°C	mg/L		48 hrs.	7 days	$14.00			90	150
			BICARBONATE	SM2320B.5.3		mg/L		-	7 days	$0.00			95	185
			CARBONATE	SM2320B.5.1		mg/L			7 days	$0.00				20
		1 Liter Cubitainer	TOTAL PHOSPHORUS	EPA 365.4	H2SO4 To pH <2, cool to <4°C	mg/L		28 days	14 days	$25.00				
		2 - 1 Gal Cubitainer	Beta Particle and/OR Gross alpha	SM 7100B	Lab to Acidify				8 weeks	$100.00				
			GAMMA SCAN		Lab to Acidify				8 weeks	$100.00				
			Radium 226 and 228 (combined)	EPA 903.1/904.0	Lab to Acidify				8 weeks	$200.00				
			URANIUM	EPA 200.8	Lab to Acidify	µg/L		6 months	30 days	$20.00				
		FILTERED 1 Liter Cubitainer	URANIUM dissolved	EPA 200.8	Lab to Acidify	µg/L		6 months	30 days	$20.00				
		2-60 ml vials with head space with 6 mg NH4Cl	HALOACETIC ACIDS	EPA 552.2	< 4°C	µg/L		14 days	45 days	$150.00				
		2-40 ml vials with no head space with 3 mg Na2SO3	TOTAL TRIHALOMETHANES	EPA 524.2	< 4°C	µg/L		14 days	45 days	$65.00				
		various	SOC FULL SUITE		Lab to Acidify, <4°C	µg/L				$1,060.00				
		2-40ml vials with no head space	VOC	EPA 524.2	<4C	µg/L		14 days	30 days	$80.00				
FIELD ANALYSIS	FIELD	NA	FLDCL2 (FREE CHLORINE RESIDUAL)	SM4500CL G	-	mg/L		-		-	0.2	4.0	0.4	1.5
			FLDTCL2 (TOTAL CHLORINE RESIDUAL)	SM4500CL G	-	mg/L		-		-			0.4	1.5
			METER TYPE	Colorimeter										
			METER NUMBER	Serial Number										
			CHLORINE DIOXIDE	Colorimeter		mg/L								
			METER NUMBER	Serial Number										
			METER TYPE	Colorimeter										
			CHLORAMINES	Colorimeter		mg/L								
			METER NUMBER	Serial Number										
			METER TYPE	Colorimeter										
			PHOSPHORUS, REACTIVE (ORTHOPHOSPHATE)	SM4048P E	-	mg/L		-		-				
			METER NUMBER	Serial Number										
			METER TYPE	Colorimeter										
			FLDCOND (SPECIFIC CONDUCTANCE)	SM2510	-	µmhos/cm		-		-			200	650
			FLDDO (DISSOLVED OXYGEN)	SM4500O G	-	mg/L		-		-				
			FLDEH (OXIDATION REDUCTION POTENTIAL)	SM2580A	-	mV		-		-			300	750
			FLDPH (pH)	SM4500H	-	STD UNIT		-		-			7	9.5
			FLDTEMPC (TEMPERATURE)	SM2550	-	Deg C		-		-			4	35
			METER NUMBER	Serial Number	-			-		-				
			METER TYPE	YSI-SONDE										
									Total cost for all analysis	$3,657.00				

* Except as noted at the end of this footnote, approved methods may be from Standard Methods for the Examination of Water and Wastewater (SM) 18th, 19th, 20th or 21st editions. SM3113B may be from the 18th, 19th or 21st editions. From SM Online edition only methods: 2320B-97, 3113B-99, 3120B-99, 4110B-00 or 4500F-C97 may be used. Analysis for Arsenic, Chromium, and Selenium to be analyzed using EPA method 200.8.

* Any approved method in 40 CFR 136, 141 or 143 as applicable may be substituted