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U. S. GEOLOGICAL SURVEY GROUND-WATER QUALITY NOTES

NWIS RECORD NO ___ ___ ___ ___ ___ ___ ___ ___

STATION NO. ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ SAMPLE DATE ___ ___-___ ___-___ ___ ___ ___ SAMPLE START TIME __ __ __ __

STATION NAME _____ LOCAL WELL NO. _____ END TIME __ __ __ __

SAMPLING TEAM _____ TEAM LEAD SIGNATURE _____ DATE ___/___/_____

PROJECT NO. _____ PURPOSE OF SITE VISIT (50280) _____ SAMPLE PURPOSE (71999) ___15_

COMMENTS: _____

QC SAMPLE COLLECTED? Equip Blank ____ Field Blank_____ Split _____ Sequential_____ Spike _____ Trip Blank ___ Other_____

NWIS RECORD NOS. _____ _____ _____ _____ _____ _____ _____

LABORATORY INFORMATION

SAMPLES COLLECTED: NUTRIENTS ___ MAJOR IONS ___ TRACE ELEMENTS: filtered ___ unfiltered ___ MERCURY ___ VOC ___

TPC ___ (VOL FILTERED_____mL) TPC ___ (VOL FILTERED_____mL) PIC ___ (VOL FILTERED_____mL) DOC ___ ORGANICS: filtered ___ unfiltered ___

RADIOCHEMICALS: filtered ___ unfiltered ___ ISOTOPES ___ RADON ___ MICROBIOLOGY ____ OTHER _____ OTHER _____

LABORATORY SCHEDULES: _____ _____ _____ _____ _____ _____

LAB CODES: _____ ADD/DELETE _____ ADD/DELETE _____ ADD/DELETE _____ ADD/DELETE _____ ADD/DELETE _____ ADD/DELETE

COMMENTS: _____

FIELD MEASUREMENTS

STATIC WATER LEVEL (72019) _____ ft

pH (00400) _____ units

BICARBONATE (00453) _____ mg/L

FLOW RATE (00059) _____ gpm

COND (00095) _____ µS/cm@25 °C

CARBONATE (00452) _____ mg/L

PUMP DEPTH (00003) _____ ft

TEMP, AIR (00020) _____ °C

HYDROXIDE (71834) _____ mg/L

DIS. OXYGEN (00300) _____mg/L

TEMP, WATER (00010) _____ °C

E. COLI ( ) _____ COL/100mL

BAROMETRIC PRES. (00025) _____ mm Hg

TURBIDITY (61028) _____ NTU

FECAL COLIFORM (31625) _____ COL/100mL

DO SAT. (00301) _____ %

ALKALINITY ( ) _____ mg/L

TOTAL COLIFORM (31501) _____ COL/100 mL

DISSOLVED SULFIDE, MEASURED(99118) _____MG/L
METHOD: HACH CHEMETRICS ELECTRODE

HYDROGEN SULFIDE ODOR DETECTED? (71875) YES NO
SAMPLE ACIDIFIED BEFOREHAND? YES NO

eH (00090) _____ MVOLTS

ANC ( ) _____ MG/L

OTHER: _____

SAMPLING INFORMATION

Sampler Type (84164) _____ Sampler ID _____ Sampling Method (82398) _____ Sampling Condition (72006) _____

Sampler Material: STAINLESS STEEL PVC TEFLON OTHER _____ Tubing Material: TEFLON PLASTIC TYGON COPPER OTHER _____

Aquifer name _____ Depth pump set at: _____ ft BLW LSD Time pumped before sampling (72004) _____ MIN.

Sampling point description _____

GW Color _____ GW Clarity _____ GW Odor _____ Sample in contact with: ATMOSPHERE OXYGEN NITROGEN OTHER _____

Weather : ***SKY-*** CLEAR PARTLY CLOUDY CLOUDY ***PRECIP-*** LIGHT MEDIUM HEAVY SNOW RAIN MIST ***WIND-*** CALM LIGHT BREEZE GUSTY WINDY EST. WIND SPEED___

TEMP- VERY COLD WARM HOT ***COMMENTS***_____

OBSERVATIONS _____

VOLUME FACTORS

DIAMETER (in.)	1.0	1.5	2.0	3.0	4.0	4.5	5.0	6.0	8.0	10.0	12.0	24.0	36.0
CASING VOL. FACTOR (F)	0.04	0.09	0.16	0.37	0.65	0.83	1.02	1.47	2.61	4.08	5.88	23.5	52.9

AFETY FIRST -- EVERY JOB -- EVERY TIM

WELL DATA

Well: SUPPLY MONITOR OBSERVATION OPEN HOLE SPRING OTHER_____

Comments:_____

Casing Material _____

Elevation, ft _____.____

Measuring Point (MP) _____.____ ft ABV BLW LSD

Well Depth, ft blw LSD_____.____ DATE MEASURED __ __/__ __/__ __ __ __

Static Water Level, ft blw LSD _____.____ _____.____ _____.____

Pumping Water Level, ft blw LSD_____.____

Allowable Drawdown, ft _____.____

Depth to Top of Sample Interval, ft blw LSD_____.____

Depth to Bottom of Sample Interval, ft blw LSD_____.____

Screened/Open Interval: TOP _____.____ ft blw LSD

BOTTOM _____.____ ft blw LSD

Diameter, inside, in. _____.____

Casing Volume, gal. _____.____ _____.____ _____.____

Actual Purge Volume, gal. _____.____

Water Level Status _____ (see REF_LIST)

Water Level Method _____ (see REF_LIST)

Held		
Cut-		
MP-		
Time		

QUALITY-CONTROL INFORMATION

LOT NUMBERS

PRESERVATIVES 7.5N HNO_3 (FOR METALS) _____ 6N HCl (FOR Hg) _____ 4.5N H_2SO_4 (FOR NUTRIENTS) _____

1:1 HCl (FOR VOC) _____ Conc. H_2SO_4 (FOR COD, PHENOL, O&G)_____ NaOH (FOR CYANIDE) _____

OTHER _____ _____ _____ **COMMENTS** _____

SPIKE VIALS _____ _____ _____ **SURROGATE VIALS** _____ _____ _____

BLANK WATER INORGANIC _____ _____ ORGANIC _____ _____ VOC _____ _____

FILTERS CAPSULE _____ PLATE _____ ORGANIC CARBON _____ OTHER_____ _____

MICROBIOLOGY

FECAL COLIFORM

Time collected: __ __ __ __

time in: __ __ __ __ date __/__/_____

VOLUME mL	COUNT COL/100mL	USED IN CALC?	REMARKS*
BLANK			
BLANK			

*REMARKS 1=LESS THAN 2=GREATER THAN E=EST COUNT K=NON-IDEAL CT

INCUBATE 24 hrs @44.5 °C FILTER SIZE=0.7 µM

IDEAL COUNT= 20-60 COL/100mL RMK

RESULT (31625) _____ COL/100 mL _____

TOTAL COLIFORM

Time collected: __ __ __ __

time in: __ __ __ __ date __/__/_____

VOLUME mL	COUNT COL/100mL	USED IN CALC?	REMARKS*
BLANK			
BLANK			

*REMARKS 1=LESS THAN 2=GREATER THAN E=EST COUNT K=NON-IDEAL CT

INCUBATE 24 hrs @35 °C FILTER SIZE=0.45 µM

IDEAL COUNT= 20-80 COL/100mL RMK

RESULT (31501) _____ COL/100 mL _____

E. COLI

Time collected: __ __ __ __

time in at 35ºC: __ __ __ __ date __/__/_____

time in at 44.5ºC: __ __ __ __ date __/__/_____

VOLUME mL	COUNT COL/100mL	USED IN CALC?	REMARKS*
BLANK			
BLANK			

*REMARKS 1=LESS THAN 2=GREATER THAN E=EST COUNT K=NON-IDEAL CT

INCUBATE [SEE NFM] FILTER SIZE=0.45 µM

IDEAL COUNT= [SEE NFM]

RESULT ( ) _____ COL/100 mL _____

COMMENTS: _____

_____

METER CALIBRATIONS/FIELD MEASUREMENTS

TEMPERATURE METER MAKE/MODEL _____ S/N _____ THERMISTER S/N _____ THERMOMETER ID _____

Lab Tested against NIST Thermometer/Thermister? Y N DATE: ___ ___/___ ___/ ___ ___ ___ ___ ±_____ °C

Measurement Location : FLOW-THRU CHAMBER SINGLE POINT AT _____ ft blw LSD VERTICAL AVG. OF _____ POINTS

READING # 1 _____ READING # 2 _____ READING # 3 _____ READING # 4 _____ READING # 5 _____ **MEDIAN:**_____ **ºC**

pH Meter MAKE/MODEL _____ S/N _____ Electrode No. _____ Type: GEL LIQUID OTHER _____

Sample: FILTERED UNFILTERED FLOW-THRU CHAMBER SINGLE POINT AT _____ ft blw LSD VERTICAL AVG. OF _____ POINTS

pH BUFFER	BUFFER TEMP	THEO-RETICAL pH FROM TABLE	pH BEFORE ADJ.	pH AFTER ADJ.	SLOPE	MILLI-VOLTS	BUFFER LOT NO.	BUFFER EXPIRA-TION DATE	COMMENTS
pH 7									
pH 7									
pH 7									
pH ___									
pH ___									
pH ___									
CHECK pH ___									

TEMPERATURE CORRECTION FACTORS FOR BUFFERS APPLIED? Y N

CALIBRATION COMMENTS:

_____
_____
_____
_____
_____
_____
_____

READING # 1 _____ READING # 2 _____ READING # 3 _____ READING # 4_____ READING # 5 _____ **USE:** _____ **units**

SPECIFIC CONDUCTANCE Meter MAKE/MODEL _____ S/N _____ Sensor Type: DIP CUP FLOW-THRU OTHER _____

Sample: FLOW-THRU CHAMBER SINGLE POINT AT _____ ft blw LSD VERTICAL AVG. OF _____ POINTS

Temperature compensation:

AUTO

MANUAL CORR. FACTOR= _____

STD VALUE µS/cm	STD TEMP	SC BEFORE ADJ.	SC AFTER ADJ.	STD LOT NO	STD EXPIRATION DATE	COMMENTS

READING # 1 _____ READING # 2 _____ READING # 3 _____ READING # 4_____ READING # 5 _____ **MEDIAN:** _____ **µS/cm**

DISSOLVED OXYGEN Meter MAKE/MODEL _____ S/N _____ Probe No. _____

Sample: FLOW-THRU CHAMBER SINGLE POINT AT _____ ft blw LSD VERTICAL AVG. OF _____ POINTS BOD BOTTLE Stirrer Used? Y N

Air Calibration Chamber in Water _____ Air-Saturated Water_____ Air Calibration Chamber in Air _____ Winkler Titration _____ Other _____

Battery Check: REDLINE _____ RANGE _____ Thermister Check? Y N _____ Barometer Calibrated? Y N

WATER TEMP ºC	BAROMETRIC PRESSURE mm Hg	DO TABLE READING mg/L	SALINITY CORR. FACTOR	DO BEFORE ADJ.	DO AFTER ADJ.

Zero DO Check? Y N Solution Date _____

Zero DO Reading _____ mg/L Adj. to _____ mg/L

Membrane Changed? N Y Date: ____/____/_____ Time: _____

READING # 1 _____ READING # 2 _____ READING # 3 _____ READING # 4_____ READING # 5 _____ **MEDIAN:** _____ **mg/L**

ALKALINITY/ANC CALCULATIONS

pH	ΔpH	Vol acid DC or mL	ΔVol acid DC or mL	ΔpH ΔVol acid	pH	ΔpH	Vol acid DC or mL	ΔVol acid DC or mL	ΔpH ΔVol acid

FIRST TITRATION RESULTS

DATE ___ ___/___ ___/___ ___ ___ ___

TIME ___ ___ ___ ___

ALKALINITY/ANC _____ meq/L

ALKALINITY/ANC _____ mg/L AS $CaCO_3$

BICARBONATE _____mg/L AS HCO^{-1}_3

CARBONATE _____mg/L AS CO^{-1}_3

ACID: 1.6N 0.16N 0.01639N

OTHER:_____

ACID LOT NO. _____

ACID EXPIRATION DATE __ __/__ __/__ __ __ __

SAMPLE VOLUME: _____mL

___ FILTERED ___ UNFILTERED

___ INFLECTION POINT TITRATION
___ GRAN METHOD

STIRRING METHOD: ___ MAGNETIC ___ MANUAL

SECOND TITRATION RESULTS

DATE ___ ___/___ ___/___ ___ ___ ___

TIME ___ ___ ___ ___

ALKALINITY/ANC _____ meq/L

ALKALINITY/ANC _____ mg/L AS $CaCO_3$

BICARBONATE _____mg/L AS HCO^{-1}_3

CARBONATE _____mg/L AS CO^{-1}_3

ACID: 1.6N 0.16N 0.01639N

OTHER:_____

ACID LOT NO. _____

ACID EXPIRATION DATE __ __/__ __/__ __ __ __

SAMPLE VOLUME: _____mL

___ FILTERED ___ UNFILTERED

___ INFLECTION POINT TITRATION
___ GRAN METHOD

STIRRING METHOD: ___ MAGNETIC ___ MANUAL

DIGITAL TITRATOR CALCULATIONS

ALKALINITY OR ANC (meq/L) = B (D3) (C_a) / mL_{SAMPLE}

CARBONATE (mg/L AS CO_3^{2-}) = A (D1) / mL_{SAMPLE}

BICARBONATE (mg/L AS HCO_3^-)=(B-2A)(D2) / mL_{SAMPLE}

HYDROXIDE (mg/L AS OH^-) = (A-C) (D4)/ mL_{SAMPLE}

ALKALINITY (mg/L AS $CaCO_3$) = B (D3)/ mL_{SAMPLE}

A = DIGITAL COUNT FROM INITIAL pH TO INFLECTION POINT NEAR 8.3

B = DIGITAL COUNT FROM INITIAL pH TO INFLECTION POINT NEAR 4.5

C = DIGITAL COUNT FROM THE INFLECTION POINT NEAR 8.3 TO THE INFLECTION POINT NEAR 4.5

D = DIGITAL TITRATION FACTOR

C_a = CONCENTRATION OF ACID

DIGITAL TITRATION FACTORS
[N, ACID NORMALITY]

FAC-TORS	0.016N TITRANT	0.16N TITRANT	1.6N TITRANT
D1	1.20	12.0	120
D2	1.22	12.2	122
D3	1.00	10.0	100
D4	.34	3.4	34

BURET CALCULATIONS

ALKALINITY OR ANC (meq/L) =

$$\frac{mL_A \times N\ (meq/mL_A) \times 1000\ (mL/L)}{mL_{SAMPLE}}$$

CARBONATE (mg/L AS CO_3^{2-}) =
$1000/mL_{SAMPLE}$ X [(mL_{ACID} FROM IP NEAR pH 8.3) X 0.9835] - (mg/L OH^- X 3.527) X CF

BICARBONATE (mg/L AS HCO_3^-) = $1000/mL_{SAMPLE}$ X [(mL_{ACID} FROM IP NEAR pH 8.3 TO IP NEAR pH 4.5) - (mL_{ACID} FROM IP NEAR pH 8.3)] X CF

HYDROXIDE (mg/L AS OH^-) = $1000/mL_{SAMPLE}$ X [(mL_{ACID} FROM IP NEAR pH 8.3) - (mL_{ACID} FROM IP NEAR pH 8.3 TO IP NEAR pH 4.5)] X 0.2788 X CF

ALKALINITY = $1000/ mL_{SAMPLE}$ X (0.8202 X mL_{ACID}) X CF

N = NORMALITY OF ACID SOLUTION USED
IP = INFLECTION POINT
CF = CORRECTION FACTOR; CF IS DETERMINED BY DIVIDING THE ACTUAL NORMALITY OF THE H_2SO_4 BY 0.01639.

TURBIDITY CALIBRATION

Meter: MAKE/MODEL _____ S/N _____ Type: TURBIDIMETER SUBMERSIBLE SPECTROPHOTOMETER

Sample: PUMP DISCHARGE LINE FLOW-THRU CHAMBER SINGLE POINT AT _____ ft BLW LSD SAMPLE STORED? Y N HOW LONG? _____

SAMPLE DILUTED? Y N VOL. OF DILUTION WATER _____ mL SAMPLE VOLUME _____ mL NTU = A x (B+C) / C

A= NTU IN DILUTED SAMPLE
B= VOLUME OF DILUTION WATER, mL
C= SAMPLE VOLUME, mL

	Date Prepared	Concentration NTU	Temperature ºC	Initial instrument reading	Reading after adjustment
Stock Turbidity Standard					
Zero NTU Standard					
Standard 1					
Standard 2					
Standard 3					

READING #1 _____ READING #2 _____ READING #3 _____ READING #4 _____ READING #5 _____ **MEDIAN** _____NTU

COMMENTS: _____

_____

WELL PURGE LOG

TIME	WATER LEVEL BLW MP LSD	DRAW-DOWN ft	WELL YIELD gpm	PUMP-ING RATE gpm	WATER TEMP ºC	CONDUC-TIVITY µS/cm	pH units	DIS-SOLVED OXYGEN mg/L	TURBID-ITY NTU or	COMMENTS [CLARITY, ETC.]

Purge method:

STANDARD LOW-FLOW

OTHER _____

COMMENTS/CALCULATIONS

DIGITAL PHOTO OF SITE CAN BE INSERTED HERE

NOTES, CALCULATIONS

COMPILED BY: _____ CHECKED BY: _____ DATE: _____