

FDWA GROUND WATER MONITORING PROGRAM

APPENDIX C

OCTOBER 2009 SAMPLING EVENT

FIELD BOOKS

(On Disk)

FIELD BOOK #10

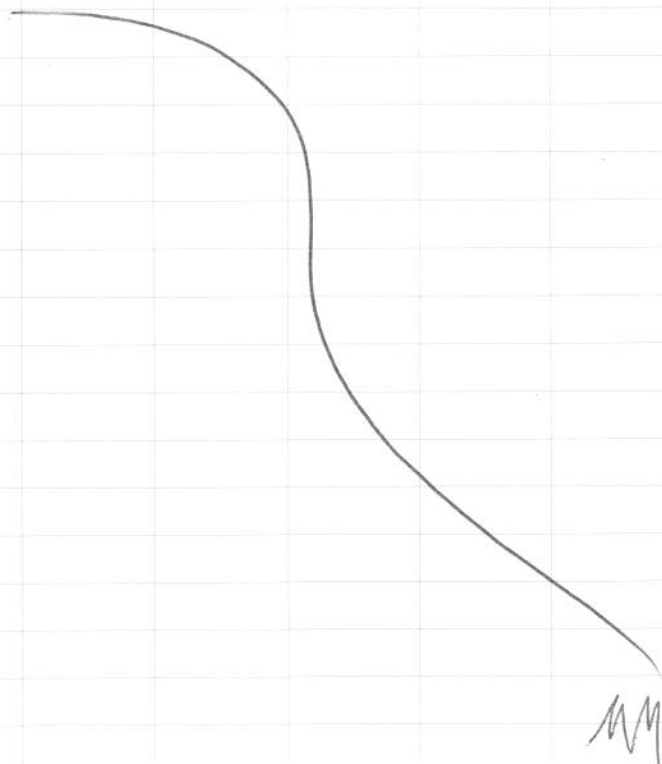
FWDA
GW monitoring
TMW 25

10/17/08
M. Masten
clear 50°

1030 setup
1040 begin purge

30 psi
10s purge
60s rchg

1054 8s purge
60s rchg



FWDA

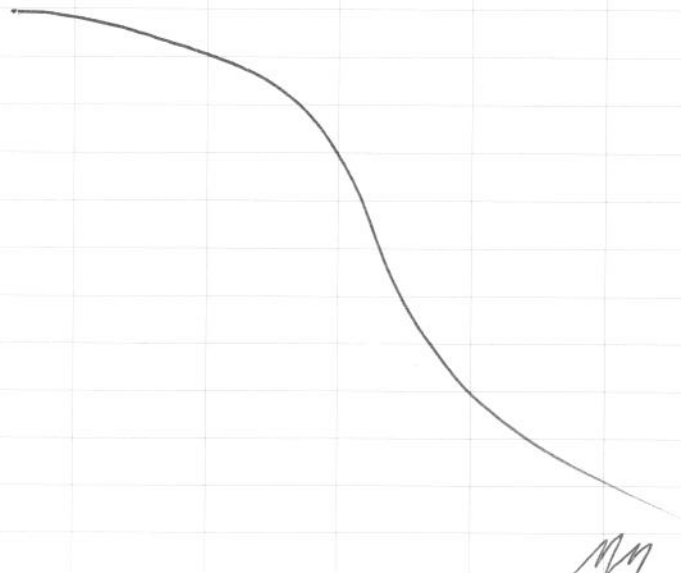
TMW 18

10/21/08
M. Masten
0900 clear cold

- pump stuck in
PVC casing @ ~ 75' below
TCC.

steel cable most likely
wrapped around pump, wedged
in between pump + casing.

will attempt to extract this
afternoon / tomorrow



FWDA

10/29/08
Mason, clear
60°

1030 Hand-dug well
West of FWDA property
0.7 ft standing H₂O in 5.5' diam well

1031 begin purge w/ electric pump

1035 purged 5 gal

1037 temp 13.47°
SpC 5.54 mS/cm
DO 12.46 mg/L
pH 7.46
2.87 NTU

1039 10 gal

1042 temp 13.44°
SpC 5.54 mS/cm
DO 8.89 mg/L
pH 8.06
2.44 NTU

1042 15 gal

1046 20 gal

1047

temp 13.43°
SpC 5.54 mS/cm
DO 10.64 mg/L
pH 7.72
2.56 NTU

1049 25 gal

1053 30 gal

1057 35 gal

1101 40 gal

1105 45 gal

1109 50 gal

1113 55 gal

1116 60 gal

1120 65 gal

1123 70 gal

6

1126 pH 7.34

Temp 13.53°
 SpC 5.54 mS/cm
 DO 8.29 mg/L
 1.28 NTU

1130 80 gal

1131 pumping air, small
 amount of water left in
 well. Not recharging,
 maybe overnight.

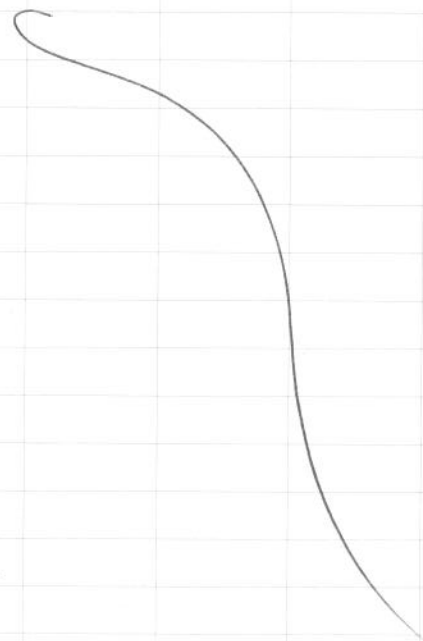
Total purged ~ 80.5 gal

7

10/31/08 FWDA
 Hand-dug Well

DTW 20.55'

Does not appear to have
 recovered after purging,
 small amount of water
 in bottom, same as on
 10/29.



MM
 10/31/08

27 Jan 2010 FWDA water levels

clear, cold, snow on ground

well IDDTW (feet)

TMW35	43.28'
TMW33	43.71'
TMW34	45.16'
MW22D	41.56'
MW22S	41.44'
MW20	44.83'
TMW10	36.99'
TMW08	36.44'
Wingate 91	14.41'
MW02	38.83'
MW01	41.86'
MW03	45.85'
TMW07	47.85'
TMW06	46.88'
TMW21	50.45'
Wingate 90	13.58'
Wingate 89	15.25'
TMW25	39.20'
TMW13	59.82'
MW18S	dry
MW18D	- ZIST docked, no level

cont'd →

27 Jan 2010 FWDA water levels

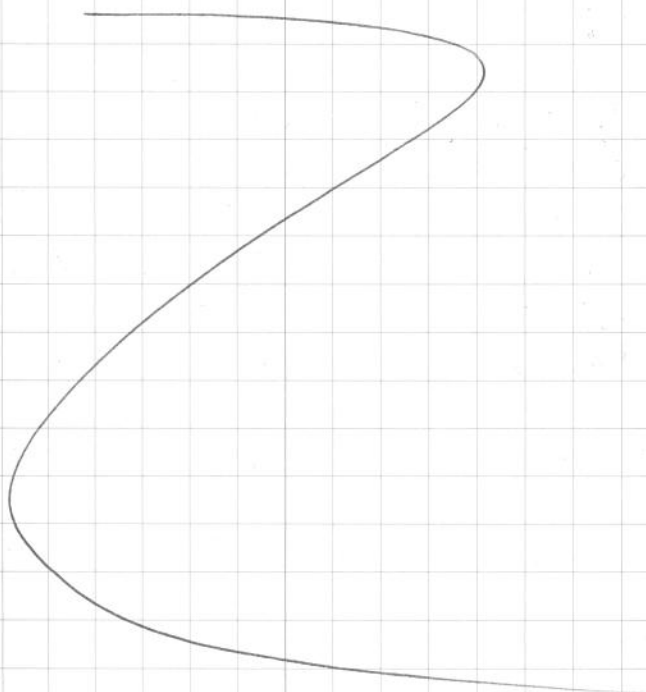
well IDDTW (feet)

TMW17	ZIST docked
TMW19	42.09'
TMW16	54.04'
TMW17	61.48 (ZIST docked)
TMW11	66.18'
TMW15	64.05'
TMW14	62.10'
TMW29	57.15'
TMW04	56.35'
FW12	dry
TMW37	24.95'
FW13	dry
TMW02	55.10'
TMW31D	35.11'
TMW31S	35.24'
TMW32	38.24'
TMW03	56.82'
TMW22	48.85'
TMW36	44.43'
TMW01	35.96'
TMW05	dry
TMW30	38.80'

FIELD BOOK #12

Location FluDA Date 10-12-89
Project / Client GW Sampling

Begin biannual
well sampling



Location FWDA Date 10-12-09
 Project / Client GW Sampling

Measure water levels
 13/5 Sunny, mod breeze
 65-70° Grant Kolb-

~~AAE~~
Well No Time Depth to Water Table

TMW-21	1320	50.42'
MW-22	1325	38.68'
MW-21	1330	41.72'
MW-23	1335	45.72'
MW-22S	1340	41.32'
MW-22D	1342	41.45'
MW-18S	1350	DRY
MW-18D	1347	42.63'
MW-24	1355	44.74'

Location FWDA Date 10-12-09
 Project / Client GW Sampling

Well No Time Depth to Water
 TMW-18 1410 54.28'
 From top of new Bennett pump case

TMW-11	1415	66.58'
TMW-17	1417	62.25'
TMW-15	1420	64.30'
FW-27	1430	DRY
FW-28	1435	DRY
TMW-19	1445	42.14'
TMW-16	1450	55.31'
FW-14	1455	49.20'
TMW-21	1500	35.74'

Location FWDA Date 10-12-07
 Project / Client GW Sampling

Well #	Time	Depth to Water
TMW-Q5	1505	DRY
TMW-22	1515	48.79'
TMW-Q6	1520	46.76'
TMW-Q7	1522	47.68'
TMW-13	1535	59.92'
TMW-23	1540	45.58'
TMW-24	1600	39.28'

Grant Kell



Location FWDA Date 10-13-07
 Project / Client GW Sampling

Sunny, very breezy, 55-60°
 Grant Kell

Measure remainder of water
 levels in ~~at~~ area and
 northern
 FW31 at Fort Wingate
 continuously.

Well No	Time	Depth to Water
FW31	0930	41.41'
TMW 14A	0950	62.61'
FW11	1000	DRY

FW10 1005 Bail well dry

Arrive at FW10 to bail
 it dry. removed \approx 1 gal of
 water. About 1" of water is
 bottom of well.

Location FWDA Date 10-13-09
 Project / Client GW Sampling

Leave FW10 at 1030

FW-23 1525 10-13-09

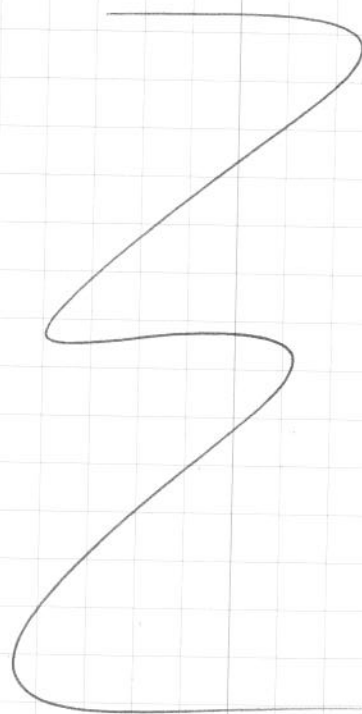
Arrive at 1525 to bail well dry & measure parameters
 Approx 34' of water in casing. Measured 3 sets of parameters while bailing dry.
 Very silty water. Bailed dry after removal of 4.5 gal.
 Left site at 1610.

FW-22 1615 10-13-09

Bail well dry & measure parameters. Measured 3 sets of parameters before well went dry after removal of 16 gal.
 Water was clear at first, but became cloudier as bailing progressed.
 - water level declined

Location FWDA Date 10-13-09
 Project / Client GW Sampling

Left site at 1705.
 Grant Kolb



Location FWDA Date 10-14-09
 Project / Client GW Sampling

Sunny, mod breeze, 55°,
 Grant Kolb
TMW-29 0920 10-14-09
 water level = 57.22
 TD = 61.65, $\approx 4.4'$ of water.
 Pump dry & measure parameters.

Left well at 0940 for 10
 minutes to open Gate 51.

Bailed dry after removal of
 3 gal. Measured 3 sets
 of parameters. Cloudy
 water. Leave site at
 1015.

TMW-Q1 1030 10-14-09

Initial H₂O level = 35.94'

Set up on well. Equipment
 malfunction: Flow thru cell
 is broken & inverter box
 doesn't work. Don't begin
 pumping until 1140.

Location FWDA Date 10-14-09
 Project / Client GW Sampling

Parameters stable after
 measuring them for 47 min.
 Sample name = TMW-Q1 102009
 Sample collection time = 1300
 Collected

VOCs (2, 40-ml vials)
 perchlorate
 dissolved metals
 total metals
 NO₃/Np

dioxins/furans (2, 1-lanka)
 Sample # = TMW-Q1 102009
 For USGS, collected

major ions (1-l plastic)
 isotopes (125-ml glass)

Finish sampling at 1405.
 Final water level = 36.05'
 Clean up & leave site at
 1415.

Go to Bldg 31 to pack
 samples & chains of
 custody. Grant Kolb

Location FWDA Date 10-15-09
 Project / Client GW Sampling

Sunny, lt breeze, 60°, low humidity.
 Grant Kolb

KMW-09 1015 10-15-09

Set up on KMW-09 to low flow sample. Initial water level = 39.20'. No ZIST.

Began measuring parameters at 1045. Very clear water. Parameters stable after 44 min.

Purge = 3 sec, Rech = 30 sec,
 Press = 35 psi, Flow =
 94 ml/min. Stable water level throughout purging.

Sample collection time = 1200 hrs.

Collected
 VOCs (2, 40-ml vials)
 perchlorate
 NO₂, NO₃

Location FWDA Date 10-15-09
 Project / Client GW Sampling

total metals
 dissolved metals
 Aroclor / furan (2, 1-l amber)
 high explosives (2, 1-l amber)
 Sample # = KMW-09-102009

USGS samples
 major ions & isotopes

Final water level = 39.20'.
 Leave site at 1310.

CMW-22 1315 10-15-09

Bail well dry & measure parameters. Initial water level = 114.50'. Barely b of water in casing.

Bailed dry after removal of ~1 gal & measured 3 sets of parameters.
 Left site at 1405.

2

Location

FWDA

Date

10-15-09

Project / Client

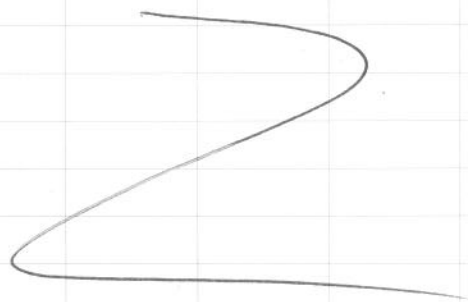
GW Sampling

~~KH0~~
 CMW-23 1410 10-15-09

Bail well dry & measure
 parameters. Initial
 water level = 97.14'.
 Bailed ≈ 1.75 gal before
 well went dry. Measured
 3 sets of parameters.

Clear water at initial
 withdrawal, but final
 withdrawals of bailer
 produced very silty water.
 Left site at 1500 hrs

Grant Kolb



Location

FWDA

Date

10-16-09

Project / Client

GW Sampling

Sunny, no clouds, calm breeze,
 55-60°. Grant Kolb

CMW-10 0845 10-16-09

Initial water level =
 166.93'. Bail well dry
 and measure parameters.
 Bailed approx 2 gal of
 water before well was
 dry. Measured 3 sets
 of parameters. Many
 problems w/ tangled bailer
 line, which consumed
 most of my time at this
 site. Left site at
 1035.

CMW 22 1040 10-16-09

Collected the following
 at sample time 1045:

VOCs C2, 40-ml vials,
 but one vial is defective
 & air bubble could not

be displaced)
 NO_3 , NO_2
 dissolved metal
 total metal
 Sample # CMW22102009
 Left site at 1115

CMW23 1120 10-16-09

Collected the following
 w sample time = 1130

VOCs (2 40-ml vials)
 dissolved metals
 total metals
 Sample # CMW23102009
 Left site at 1135

CMW25 1145 10-16-09
 Low flow sample CMW25
 Initial water level = 36.48'

Began purge = 5,
 Rech = 60 & PSI = 40

Water level plunged
 over 0.3' allowable at
 once w Se Mugs of R = 60 sec,
 Purge = 5 sec, PSI = 40.
 Decided to attempt to purge
 well dry & collect samples the
 next day. Eventually increased
 Purge = 10 sec, Rech = 20 sec &
 Flow = 220 ml/min. Decided
 to substantially reduce
 purge to 4 sec, increase
 rech to 75 sec & see if
 drawdown would stabilize
 within limits. Flow was
 30 ml/min. Drawdown did
 stabilize within limits &
 decided to collect samples.

Sample time = 1500

Collected
 VOCs (2, 40-ml vials)
 NO_3 , NO_2
 dissolved metal
 total metals

FWDA
GW Sampling

10-16-07

Pesticides (only one, 1-l amber)
Dioxin - Furan (one, 1-l amber)
Sample # = CMW25102009

Sample collection settings
were Press = 40 psi, Purge =
4 sec, reach = 75 sec, flow
= 30 ml/min. Parameters
stabilized w these settings

This well is an ideal well
for a Bennett pump. Long
water column & nearly
impossible to stabilize draw-
down & still have a
reasonable flow rate for
sampling. A Bennett pump
would ultimately save thousands
in labor costs on this well.

Pack up and leave site
at 1645

Final water level = 53.11'

Grant, Volk

FWDA
GW Sampling

Sunny, mod breeze, low
humidity, 55-60°
Grant, Volk

TMW-06 0910 10-17-07

Low flow purge & sample
Initial H₂O level = 47.12'
Began purging at 0930 &
began measuring parameters at
0950. Due to poor flow, it
took a long time to fill the
flow through cell with water

With Press = 30 psi, reach = 60 sec,
purge = 6 sec, the flow rate was
56 ml/min & drawdown
stabilized within the allowable
0.3'.

Sample collection time = 1100 h
Collected:

VOCs (2, 40 ml vials)

NO₃/NO₂

total metals

dissolved metals

SVOCs (2, 1-l amber)

90

Location FWDA Date 10-17-09
 Project / Client GW Sampling

High Explosives (2, 1-lambda)

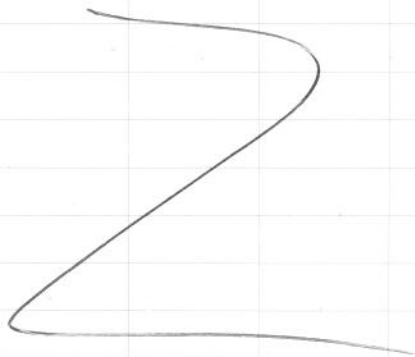
Sample # = TMWR6102009

For USGS, collected
 isotopes & major ions

Final water level = 47.39'

Pack up and leave site
 at 1310.

Grant Kolb



91

Location FWDA Date 10-19-09
 Project / Client GW Sampling

0815 TMWR22 10-19-09
 Morning began overcast
 w/ spitting rain at 0700.
 By the time I got to the
 well, the sky was sunny.
 Mod to high breeze, 20+
 mph winds. Dry ground.
 Grant Kolb

Pump was removed from
 well. Well had been
 bailed dry last week.
 Bailer still hanging in
 well. Water level at
 bailer in well = 48.94'

Collect samples until
 well bails dry. Water is
 very cloudy.

Sample collection time = 0900
 Collected

VOCs (2, 40-ml vials)

NO₃, NO₂

Perchlorate

FWDA

Date 10-19-09

GW Sampling

total metals
 dissolved metals
 high explosives (2, 1-l amber)
 SVOCs (2, 1-l amber)

For USGS, collected iso topos
 & major ions.

Leave site at 0905

TMW24 10-19-09 0920

Low-flow sample TMW24.
 Initial water level = 39.51'

Initial rock of 50 sec & purge
 of 5 sec w pressure of 30 psi.
 Dropped water level rapidly
 up excess of 0.3' allowed
 increased rock to 75 sec &
 decreased purge to 3 sec.
 Draw down was then stable
 during parameter measure-
 ments w flow rate = 25
 ml/min.

FWDA

Date 10-19-09

GW Sampling

Topt well over 10 min to 511
 flow thru cell w water.
 Very clear water w sulfur odor.
 Sample collection time = 1200.

Collected

VOCs (2, 40-ml vials)
 NO₃, NO₂
 perchlorate
 dissolved metals
 total metals
 pesticides (2, 1-l amber)
 total explosives (2, 1-l amber)

For USGS, collected isotopes
 & major ions.

The pump in this well
 needs to be pulled & the
 well converted to a bailer
 well like TMW-224 TMW-23.
 I spent nearly 6 hrs on
 this well, which is
 excessive, & the flow is only

Location FWDA Date 10-19-09
 Project / Client GW Sampling

25 ml/min.
 Pack up. Final level $\approx 40.55'$
 leave site at 1505.

TMW23 1520 10-19-09

Collect sample w bailer.
 Well was previously bailed dry
 & parameters measured.

Water level = 45.72', with
 bailer in well.

Very muddy water.
 Sample collection time = 1600

Collected
 VOCs (2, 40-ml vials)

Perchlorate

NO_3 , NO_2

dissolved metals

total metals

HE

Pesticides

Arvin - Fluor

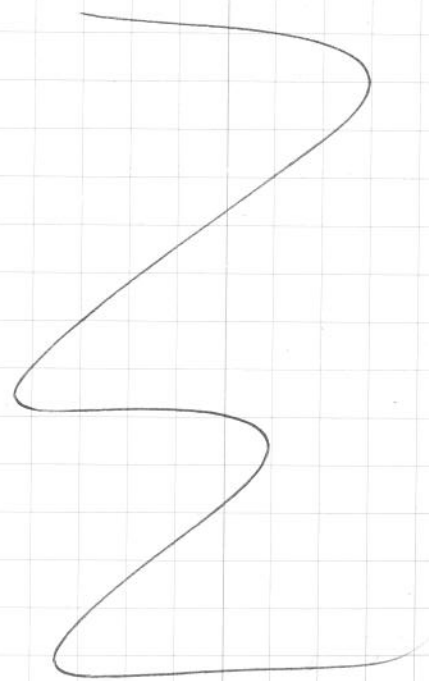
} two
 1-L
 amber

Location FWDA Date 10-19-09
 Project / Client GW Sampling

For USGS, collected
 1504065 & major ion

Pack up, leave site at 1605

Grant Kolb



Location FWDA Date 10-20-09
Project / Client GW Sampling

Sunny, but rain predicted,
very breezy w 20+ mph
winds, dry ground.
Grant KALB

MW225 0810 10-20-09

Collect samples w bailer
until well runs dry.
Well was purged dry &
parameters measured
previously.

Sample time = 0830
Collected

VOCs } 2, 40 ml vials
GRO }

NO₃, NO₂
dissolved metals
total metals
perchlorate.

bailed well dry
left site at 0835

Location FWDA Date 10-20-09
Project / Client GW Sampling

TMW29 0850 10-20-09

Collect samples with
bailer. Well was previously
purged dry & parameters
measured on 10-14-09.

Sample time = 0900
Collected

VOCs (2, 40 ml vials)

NO₃ NO₂

perchlorate

total metals

dissolved metals

For USGS, collected
isotopes & major ions.

Leave site at 0910.

TMW11 0915 10-20-09

Low-flow sample

Initial water level = 66.61'

FWDA

Date 10-20-09

GW Sampling

Using chart settings of
4 sec rech & 10 sec surge
resulted in rapid drop
of water level. Appears
Z1ST was removed from this
well. Adjusted settings to
55 sec rech & 7 sec surge - P_{app}
Obtained flow = 40 ml/min &
no further drawdown.
Drawdown was only ≈ 0.1
foot from initial water level.
Sample collection time = 1120.
Collected

VOCs (2, 40-ml vials)

NO_3 , NO_2

perchlorate

dissolved metals

total metals

HE

dioxins-furans } 2, one-l
amber

Collected for USGS,
isotopes & major ions.

FWDA

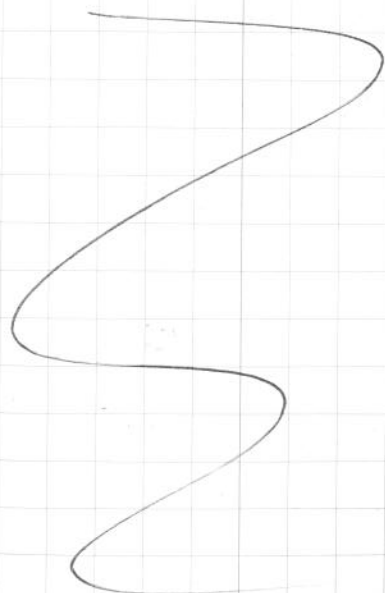
GW Sampling

Half hour shutdown from
1230-1300 for lightning
storm.

Final water level at 1315
= 66.72.

Leave site at 1320.

Grant Kolb



Location FWDA Date 10-21-09
 Project / Client GW Sampling

MW22S 0800 10-21-09

Overcast, wet ground, 45 - 50°, calm winds

Continue sampling MW22S until it bails dry.

Sample collection time = 0815

Collected

SVOC } only one, 1-l amber
 DRO } due to poor well volume

Well bailed dry. Left site at 0815.

MW22D 0940 10-21-09

Low-flow sampling. Set up on well at 0845.
 Begin pumping at 0855.

Location FWDA Date 10-21-09
 Project / Client GW Sampling

Parameters stabilized after measuring them for 104 min.
 Sample collection time for MW22D = 1100
 Collected QC and primary set.

VOC } 2, 40-ml vials
 GRO }

perchlorate

NO₃, NO₂

total metals

dissolved metals

* 1,4-dioxane (1, 1-l amber)

DRO

SVOC

dioxin-furan

pesticides

explosives

* QC samples only

Dissolved metals were field filtered. Conditioned filter by pumping 10-ml of GW through filter before.

Location FWDA Date 10-21-09
Project / Client GW Sampling

Filter specs - mfg by Geotech,
0.45 μ , Lot # 73050004

During sampling, pump
was increased to 6 sec,
increasing flow to 125 ml/min.
However, the increase in
drawdown was minimal, &
drawdown stabilized
rapidly.

1400 = Sample collection
time for blind cup
FWQ2102009.

Final water level = 41.52' at
1550 hrs.

Pack up & leave site at 1555.

Grant Kolb

7

Location FWDA Date 10-22-09
Project / Client GW Sampling

Frost on ground.

Sunny, cold, 30°, no wind,
dry to slightly damp ground.
Grant Kolb

MW225 0755 10-22-09

Bail sample from well until
it bails dry.

Sample collection time = 0800
Collected

pesticide } Only one
dioxin - furan } 1-liter
high explosives } amber
each also &
low well volume

Left site at 0820.

MWQ2 0825 10-22-09

Bail well & collect sample.
Well was previously bailed
dry and barometers were

Location FWDA Date 10-22-09
 Project / Client GW Sampling

measured.

Sample collection time = 0830

Collected

VOCs (2, 40-ml vials)

NO₃, NO₂

perchlorate

total metals

dissolved metals

HE

pesticides } two, 1-l
 amber bottles each

For USGS, collected isotopes
 & major ions.

Left site at 0900.

MW01 0905 10-22-09

Collect samples by bailing.
 Well was previously purged
 dry and parameters were
 measured.

Sample collection time = 0930.

Location FWDA Date 10-22-09
 Project / Client GW Sampling

Collected

VOCs (2, 40-ml vials)

NO₂, NO₃

perchlorate

total metals

dissolved metals

HE

pesticides } two, 1-l amber
 bottles each

For USGS, collected isotopes
 & major ions.

Left site at 0935.

TMW13 1000 10-22-09

Set up on TMW13 to low-flow
 sample. Initial water level
 = 59.99'.

Parameters stabilized after
 measuring them for 44 min.
 Reach = 30 sec, purge = 7 sec,
 pressure = 38-40 psi, flow rate

Location FWDA Date 10-22-09
 Project / Client GW Sampling

= 70 ml/min. Drawdown very stable.

Sample collection time = 1130
 Collected

VOCs (2, 40-ml vials)

NO₃, NO₂

perchlorate

dissolved metals

total metals

chloroform } Two, 1-liter
 PCBs } amber bottles
 each

For USGS, collected isotopes
 & major ions.

Final water level = 60.11' at 1240
 Pack up & leave site at 1245.

QC
 Deliver samples to FedEx
 & pack samples remainder
 of day. Ok - A Volk

Location FWDA Date 10-23-09
 Project / Client GW Sampling

Sunny, cold, 20°F, no breeze,
 dry ground.
 Great Kolb

MW22S 0815 10-23-09

Collect USGS samples
 (isotopes & major ions)
 w/ bailer. Sample time = 0815.
 Leave site at 0825.

MW20 0830 10-23-09

Low-flow purge. Begin
 purging at 0845. Bad
 kink in well "gas" hose.
 Initial water level = 44.88'.

Parameters stable after 59
 min of purging & measure-
 ment. Purge = 6 sec, Rec = 60 sec,
 Press = 38-40 psi, Flow = 70-75 ml/min
 Sample collection time = 1000

FWDA

Date 10-23-09

GW Sampling

Collected
 VOCs } two, 40-ml vials each
 GRO }
 NO₃, NO₂
 perchlorate
 total metals
 dissolved metals
 HE
 SVOC
 DRO
 pesticides } two, one-liter
 } amber bottles
 } for each

For USGS, collected isotopes
 & major ions.

Final water level = 45.12' at
 1225 hrs.

Pack up & leave site at 1230.

MWD3 1235 10-23-09

low-flow sample.

Initial water level = 45.90
 began pumping at 1247.

FWDA

Date 10-23-09

GW Sampling

Parameters stable after
 measuring for 45 minutes.
 Pressure = 80 psi, Lech = 55 sec,
 purge = 5 sec, flow = 60 ml/min

Sample collection time = 1400

Collected
 VOCs (2, 40-ml vials)
 NO₃, NO₂
 perchlorate
 dissolved metals
 total metals

HE - 2, one-liter amber bottles

For USGS, collected isotopes
 & major ions.

At 1505, final water level
 = 46.13'

Pack up and leave site at
 1515.

Grant Kolb

FWDA

10-24-09

GW Sampling

Sunny, no breeze, 40-45°, dry ground.
Grant Kolb

TMW21085010-24-09

Initial water level = 50.49'
Low Flow Sample.

Began purging at 0910. W
press of 30 psi, could not get
well to flow. Increased P
to 40 psi & then 50 psi before
well flowed. Then reduced
P to 30 psi & left rock at
30 sec & 7 sec. Drawing
down water level until
it stabilizes. Obtained
flow \approx 0920.

Drawdown & Ds finally
stable after measuring
parameters for 87 min.
Drawdown stable at 52.01'
Sample collection time = 1100

FWDA

10/24/09

GW Sampling

Collected

VPCs (2, 40-ml vials)

No₃, No₂

perchlorate

dissolved metals

total metals

HE - two, 1-liter amber bottle

For USGS, collected isotopes
& major ions.

Final water level = 52.01' at
1155. Pack up & leave site
at 1205.

FW10121010-24-09

Bait and collect samples
until well runs dry. After
several bailer with drawals,
filled one perchlorate bottle
Sample collection time = 1210
Collected only perchlorate.
Well bailed dry
Leave site at 1215.

FWDA
GW Sampling

10-24-09

TMWQS 1220 10-24-09
 Check water level in well.
 TMWQS remains dry.
 Leave site at 1225.
 Grant Kolb

FWDA
GW Sampling

10-26-09

Sunny, cold = 25°F, no breeze,
 dry ground.
 Grant Kolb

TMWIS 0840 10-26-09

Low flow sample. Collect
 QC set & blind dup.

Initial water level = 64.33'
 Began purging at 0905.
 Initial settings of P = 55 psi,
 rock = 30 sec, a purge = 12 sec
 produced flow of > 120 ml/min,
 rapid drawdown & gushing
 water at end of purge.
 Immediately reduced purge to 8 sec
 & P to 40 psi. Increased
 rock to 40 sec. Flow decreased
 to 60 ml/min, but drawdown
 was reduced (water level
 rose) & became stable
 thru remainder of purging.
 Parameters stabilized

FWDA

Date 10-26-09

GW Sampling

after measuring them for 40 min.

Sample collection time for
TMDL primary & QC sets =
1000 hrs.

For QC Set, collected,
VOCs (2, 40-ml vials)

perchlorate

NO_3 , NO_2

total metals

dissolved metals (filtered in field)

1,4-dioxane (1, 1-l amber bottle)

SVOC

dioxin/furan } two, 1-l amber
explosives } bottles each

Disposable filter mfg by
Geotech, Lot # 7305004,
0.45 micron

For primary set and
blind dup, collected

FWDA

10-26-09

GW Sampling

VOCs (2, 40-ml vials)

NO_3 , NO_2

perchlorate

dissolved metals

total metals

HE

SVOC

dioxin-furan } two, 1-liter
amber bottles
each

Blind dup = FWQ5102009
w sample collection time =
1400 hrs.

For USGS, collected
isotopes & major ions.

Final water level at 1445
= 64.41'. Leave site at 1500.

Grant Kelle

Location FWDA Date 10-27-09
 Project / Client GW Sampling

Overcast, cold, $< 30^\circ$, very
 windy, dry ground.
 Grant K01B

TMW-14A 0820 10-27-09

Low flow sample.

Collect primary & QC set
 & blind duplicate.

Initial water level = 62.41'
 w Z151 undocked.

Nose in well kinked. No flow.
 Pulled cap from well & lifted
 hoses one foot. Flow visible
 in discharge hose to flow
 thru cell. Reset cap &
 began purging. Did not dock
 Z151 until 0900, by which
 time water level had dropped
 1.31 feet. Docked Z151 at
 0900 and water level then
 stabilized.

Parameters stable after
 70 min.

Sample collection time

Location FWDA Date 10-27-09
 Project / Client GW Sampling

For primary & QC sets =
 10/5.

For QC set, collected
 VOCs (2, 40-ml vials)

NO_3 , NO_2

total metals

dissolved metals - filtered in field
 1, 4- dioxan (one, 1-l amber)

SVOCs

Explosives

Chlorine - furans } two, 1-l
 amber
 bottles

Dissolved metal filter mfg by
 GooTech. 0.45 micron. Lot # =
 073050004. Pumped 100L of H₂O
 thru filter before collecting sample.

For TMW14A primary set
 and blind dup FWQ1,
 collected

VOCs (2, 40-ml vials)

NO_3 , NO_2

total metals

dissolved metals

SVOCs - two, 1-l amber bottles

FIELD BOOK #13

Location FWDA Date 15-Oct-09¹⁵

Project / Client Groundwater monitoring

Grant Kolb

0930 - mostly sunny, ~70°F, wind ~5-10 mph.

S. Carpenter, E. Kolb, J. Reale
measured gw levels in 08/00

CMW 25

36.47

CMW 23

97.15

CMW 22

114.53

CMW 21

Not measured, buried from recent storm events

KMW 13

Dry

KMW 09

39.21

KMW 12

48.54

CMW 24

45.56

KMW 11

32.24

KMW 10

166.84

CMW 19

24.25

CMW 14

29.82

CMW 10

65.02

FW 38

Dry

CMW 07

38.95

CMW 20

Dry, cover broken
Needs repair

CMW 02

13.60 - water b/e casing & cover

CMW 04

45.13

1220 - ended gw depth measurements

FIELD BOOK #14

Location FWDA Date 12 OCT 09
Project / Client Steve Wagner
63°F, mostly clear, light wind

FW 26	WTH DTW	dry
TMW 25	DTW	39.29
SMW 01	DTW	28.90
FW 29	DTW	30.01
TMW 27	DTW	28.41
FW 28	DTW	DRY
FW 27	DTW	DRY
TMW 29	DTW	57.09
TMW 02	DTW	55.00
FW 13	DTW	DRY
TMW 03	DTW	56.81
FW 12	DTW	DRY
TMW 04	DTW	56.29
FW 35	DTW	20.66
EMW 01	DTW	84.62
EMW 04	DTW	99.21
EMW 03	DTW	28.89
EMW 02	DTW	31.51
TMW 10	DTW	34.83
TMW 08	DTW	36.20
TMW 28	DTW	18.70
TMW 26	DTW	26.62

Location TMW03 Date 14 OCT 09³⁷
Project / Client PWDA Subgner J Reale

Sampling - 55°F, PC
mostly Sunny, 20% RH

DTW 56.92

start 1240 calibration

46 psi 8 on 2 off 275 ml/min

started stabilization @ 1240.

Finished collecting parameters and
started collecting gw samples @ 1315.

DTW 57.11 ft @ 1315

57.08 ft @ 1327

start sampling 1315
Finish Sampling 1345
Final DTW 57.05

36

Location TMW02 Date 14 OCT 09
 Project / Client FWDH S. Wagner J. Reale

Sampling - 45°F, PC mostly
 Sunny, windy 20% RH

DTW 55.15

Start 0945

8on 10 off 55 psi = 125 ml/min

started stabilization at
 0945. Water is going back
 down the well between
 each off period.

Finish stabilization 1030

Started ed Sampling 1035

DTW 56.1 @ 1050
 DTW Final = 55.87
1120 complete

37

Location TMW03 Date 14 OCT 09
 Project / Client FWDH S. Wagner J. Reale

Sampling - 55°F, PC
 mostly Sunny 20% RH

DTW 56.92

Start 1240 Calibration

46 psi 8on 20 off 275 ml/min

started stabilization @ 1240.
 Finished collecting parameters and
 started collecting gw samples @ 1315.
 DTW 57.11 ft @ 1315

57.08 ft @ 1327

Start Sampling 1315
 Finish Sampling 1345
 Final DTW 57.05

Location TMW 04 Date 14 OCT 09
 Project / Client PWDA Surgeon

DTW 56.36 1420 start
 calibration

15 off 8 on 50 psi 260 ml/min

finished calibration 1505

start sampling 1510

DTW 1510 → 52.44
 final

Finished sampling 1530

Location EMW 01 Date 15 OCT 09
 Project / Client PWDA Surgeon
5052392460

DTW 84.22 0950

started well at 10 off 8 on
 233 ml/min 60 psi

ran for 20 min stabilized
 at 88.56 DTW at 20 off
 8 on 60 psi at 145 ml/min
 it is recharging and
 holding water level

Start sampling 1040

DTW 92.7 start

6 on 30 off 60 psi
 ~ 100 ml/min

93.6

1050

at 108.50 ft seemed to
 stabilize at ~ 150 ml/min
 at 113.5 ~ 70 ml/min
 continue surge → 116 ft stopped

Location EMW02 Date 15 OCT 09
 Project / Client PWDA Surgeon

Started purge at 1445
^{60 psi}
 6 on 20 off DTW 31.59

~ 200 ml/min reduced

to 40 psi 6 on 20 off ~ 150
 ml/min Dropped to 32.85
 after 7 minutes, purge
 well started @ 1455

12 on 10 off 50 psi 350 ml/min
 ↑ 60 psi 440 ml/min

2 min a foot 100-38 ~ 2 hrs
 slowed to 5 min a foot

Stop @ 1800 106.00 final

16 OCT 2009 0940 77.32 ft
 recharging at 5 min ~ 0.18 ft

Location EMW03 Date 16 OCT 09
 Project / Client PWDA Surgeon

Started purge at 0900
 DTW 28.90 ft

^{100 off} Time	DTW	12 on 60 psi 400 ml/min Time	DTW
0910	36.05	1010	73.50
0920	43.72	1020	78.20
0930	49.90	1030	81.70
0940	56.20	1040	82.90
0950	62.71	1050	84.91
1000	68.57	1100	86.30
1110	87.10	1140	
1120		1150	
1130		1200	

Started stabilization at
 1130 flow rate of 90 ml/min
 gave steady water level
 at 87.20

Start sampling 1230

Final DTW 87.80 20 off 6 on ^{50 psi} ~ 79 ml/min
 Finished

42

Location EMW02 Date 16 OCT 09Project / Client FWDA S. Wagner

70.33 DTW 1505

Calibrated start sampling
@ 1540 300ml/min

12 on 10 off 60 psi

Finished 1610, 88.03 DTW

Location TMW08 Date 17 OCT 09 43Project / Client FWDA S. Wagner J. RealeDTW 36.65 starting
water level.

1010 Started Stabilization

5 on 20 off 30 psi
~ 50 ml/min gives
stable level.1045 started sampling
36.70 final DTW

Finish 1145

Location MW225 Date 17 OCT 09
 Project / Client PWDA S. Wagner

1245 started hauling
 and took 3 stabilization
 readings 2.3 l of water
 remove till dry

Location TMW26 Date 17 OCT 09
 Project / Client PWDA S. Wagner

Started sampling @ 1310
 DTW 26.66

70N 10 off 30 psi

Finished Sampling 1320

46

Location TMMW 10 Date 19 OCT 09

Project / Client FWD A S Wagner

75°F 10-20 mph RH 20%

Started stabilization @

1340 @ 100 ml/min

starting DTW 36.99

finish DTW 37.20

Start sampling at

1345, 25 off, 50 on 30 psi
~ 100 ml/min

Finish 1445 37.20 DTW

47

Location TMMW 28 Date 19 OCT 09

Project / Client FWD A S Wagner

75°F 10-20 mph RH 20%

started stabilization at

1540 at 60 ml/min

45 off 3 on 30 psi 60 ml/min

completed @ 1600 and

started sampling

start DTW ~~19.10~~ 18.83

finish DTW 19.10

48

Location CMW02 Date 20 OCT 09

Project / Client FEUDA SLAGNER

PC 60°F 10-20mph 20% RH

Started stabilization at
0945 at 140 ml/min
30psi 20 off 5 on
Completed stabilization
in 30 min. Started sampling
at 1030 20 off 6 on 30psi
~ 160 ml/min

DTW 14.62 during stab
+ sampling. completed
~ 1100

49

Location CMW04 Date 20 OCT 09

Project / Client FEUDA SLAGNER

cloudy, light rain 60°F 10-20mph
40% + RH

Started stabilization at
@ 1125 sampling @ 1150

20 off 6 on 40psi 110 ml/min

Completed sampling at

1220, DTW 45.12 through
stabilization and sampling

50

Location CMMW07 Date 20 OCT 2009Project / Client FWDA Subgner50°F windy cloudy raininitial 39.2 maintained
throughout sampling and
stabilization.

Started stabilization @ 1310

Started sampling @ 1330

20 off 6 on 40 psi ~ 90 ml/min

Completed @ 1445 —

Location CMMW18 Date 21 OCT 09Project / Client FWDA Subgner J Hug50°F overcast calm 50% RHStarted Stabilization @
0930 completed @ 0948
parameters every 3 minutes

Started sampling @ 1000

Starting DTW 41.05
@ 1000 DTW 41.18

12 off 6 on 34 psi 210 ml/min

Final DTW 46.36

CMMW17 —

Bad Pump, only air
after a 1 liter flush

52

Location CMW 14 Date 21 OCT 09
 Project / Client FWDA

started stabilization at
 1220, every 3 minutes

10 off 12 on ~ 250 ml/min

started sampling @ 1245

DTW 16.23 start
 16.23 finish

53

Location KMW 10 Date 21 OCT 09
 Project / Client FWDA Slagener Aug 21
Overcast, 45°F, light rain

Hand Vailed samples

1400 sample time

1st full

22 OCT 09

collected VOC's and

Perchlorate @ 0845.

Full Butler

Location KMW 11 Date 22 OCT 09Project / Client FWDA Subgen J RealeClear 35°F, 20% RHStarted stabilization @
0900 DTW 32.40 at
160 ml/min after 20 minwell stabilized and
DTW = 33.23. SinceThis well was purged
a week ago will start
sampling @ 0930 and
to trips and will recordDTW = at finished
maintain 160 ml/min

FWO & sampling time 1045

at 33.45 ft it was relaxing
at ~ 160 ml/minLocation CMW 24 Date 22 OCT 09Project / Client FWDA Subgen J RealeClear 55°F, 20% RH 5-10Started stabilization @
1200 and sampling @
1230 DTW 46.95 and
wasn't moved much.Started at 10 off 13 on
and 80 psi. Sampling
became less and less
as flow was going back
down toward pump.
Put 2 on way valves
with no change even
after turning around.

Reconfigured meter to

10 off & 30 on to get enough
water to continue sampling

Time 48.08 DTW 1430

Location TMW25 Date 22 OCT 09Project / Client PWDA Suzanne J Reale
Clear 50°F light wind 20% RHStarted Stabilization 1530
cond sampling 1545Starting DTW 37.90 120ml/min
at end of Stab'd 41.30
at 1555 41.55 → 160ml/minThis well was purged the
previous week.Final DTW 41.73 - 1600Need to resample
as water level
dropped more
than 0.3 during
stabilizationLocation TMW25 AGAIN Date 23 OCT 09Project / Client PWDA Suzanne J Reale
Clear, calm RH 20%Started Stabilization @ 1006
Maintained constant
DTW 42.72 during Stabilization
30 off 6 on 30 psi
Started sampling @ 1030
at 8 on 30 off 30 psi
only 4 samplescomplete at 1040 DTW 42.72

Location MW-18 D Date 23 OCT 2009

Project / Client FUDA S. Wagner

Clear, 10-15 mph, 20% RH 55°F

Started stabilization @

1110 completed 1128

DTW 42.65 no change

during stab. 30 off 30 on

40 psi ~ 100 ml/min

sampling time 1140

DTW 42.65 20 off 56 on 40 psi

settled to 40 off 6 on 30 psi
1243 → 12 → 16 ml/min but
ran out of water.40 off 4 on 30 psi 1300 → 12
completed 1415

Location TMW 17 Date 23 OCT 09

Project / Client FUDA S. Wagner

Clear, light wind, 65°F 20% RH

Started stabilization @ 1445

completed 1610 DTW 62.10

has not moved.

20 off 3 on 62 psi ~ 70 ml/min

1510 started sampling

sample

1510

20 off 6 on 62 psi ~ 100 ml
completed 6 bottles 1530

Location SIMWOL Date 24 OCT 09Project / Client PWDA Subagui
clear, calm 50°F 20% RHDTW 29 started at
10 off 6 on 40 psi, pump
down to 32 ft30 off 5 on maintain
level ~ 70 ml/min
completed stabilization.

@ 1005 Start sampling

@ 1010 maintain 32 ft

DTW level, water level
came up to 30.8 ft during
stabilization.20 off 6 on 35 psi @ 120
ml/min to 31 ft. then
maintained 31 ft at 25 off
6 on 35 psi to finish of
sampling @ 1040Location TMWZT Date 24 OCT 09Project / Client PWDA Subagui
clear 5-10 mph 55°F 20% RH

PTW 28.50 pump to 31.50

10 off 6 on 35 psi ~ 300 ml/min
pump down to 29.90 and
maintained through
stabilization at ~ 140 ml/minsample time 1130 at
~ 200 ml/min completed
sampling @ 1200 29.90 PTW

Location CMW 17

Date 26 OCT 09

Project / Client

PwDA S. Wagner J. Hug

Clear 45°F 5-10 mph 20% RH

Set up and was able to get ~ 500 ml before running out of water. 30 off 4 on 30 psi.

— This well recharges very slowly. Justin pinged this well by 7 gallons of water during the previous week. ~ recharge rates very very slow.

DTW 16.56

27 OCT 09

Sample 1100

~ 250 ml of perchlorate

ss well was undrilled and no cable added. However the well would not re-sock and seems that something blocking after 2 hours 16.52

Location

CMW 10

Date 26 OCT 09

Project / Client

PwDA S. Wagner J. Hug

Clear 45°F 10-20 mph 20% RH

Sample time 1015, hand bailed samples except for 1/2 l, will come back later to complete. Could not get water level as bailer was in well.

Jim indicated that when the well was bailed dry they took out 7 gal 4 days ago. Recharge was ~ 1 1/2 gallons in 4 days suggest collecting parameters and sampling in one event.

27 OCT 09

Trid to get sample for uses only could opt.

the small isotope

sample. 1030

no more water

Location

CNUW 19

Project / Client

FLUDD Subgravelly

Date

26 OCT 09

START TIME 1150
 55°F, 5-10 mph, clear 2028.
 — set up and get a set
 of samples @ 2098 & on 30ps
 @ 150 ml/min. took out
 ~ 1.5 gallons ~ then
 quit, got another 1/2 L
 but at 3007 2 on but
 eventually could not pump
 more. Very fine low in the
 Two well also purged
 during the previous week.

27 OCT 2009

set up on CNUW 19, took
 1 L sample for USGS.
 Then pulled pump cord

Sample 1215 1L USGS

Did take water level before
 pulling pump but did not
 write it down.

27.54