Final Technical Report

Award Number: G13AP00100

Preservation and digital conversion of DGS Paper Well and Outcrop Records

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September 14, 2013 – September 14, 2014

August 29, 2014

Abstract

This project focused on the conversion of paper well and outcrop records to a digital format so that they can both be preserved and made available through the internet. The DGS Paper well schedules were created in such a way that they serve as a folder on which data about the well/boring geographic position, construction, depth, samples taken, water quality information, and finishing are hand written. Much of these data are keyed into our Oracle WATSYS2 database. However, a fair amount of ancillary data that have great historical significance are put into the well schedule and then filed with the schedule in a cataloged binder system for retrieval. The same is true of our outcrop records, but they are single sheets where the back of the sheets hold hand written description data for outcrops and sketches that are not included in our WATSYS2 data base. These outcrop descriptions and sketches are now considered historically valuable as many locations are now lost to development. Although most of the location data for the outcrops is stored within an Oracle database, “extra information” such as outcrop descriptions and sketches and margin notations and comments from decades of researchers stand a chance of being lost if a disaster such as a fire or water damage were to affect these records. By scanning these well and outcrop records to PDF, there is a digital copy of the data and that will serve as a backup in case of irreparable damage. It will also allow the DGS to begin making these older historical data available to researchers and our stakeholders through the internet.

Comparison of Actual Accomplishments to the Goals for the Established Period

The original goal of this G13AP00100 Data Preservation grant was to completely scan our entire collection of approximately 5,000 outcrop description records and approximately 25,000 well description records. However, we did not receive the full amount requested for FY13, so we were able to complete scanning of 6,236 outcrop descriptions and approximately two thirds of 31,000 well (21,216) descriptions scanned. These records were scanned to TIF and then converted to PDF by a contractor. The contractor used a bar code system to track files from our office to there facility and through the scanning process. By doing this, the contractor was also able to tell us if paper records were missing from any of the outcrop or well data books/binders. This will prove helpful to us in making sure our database of outcrops and wells (WATSYS) will accurately reflect both missing paper records and missing database entries.

The binders were taken from the DGS room 208 (Data Room) in shipments of 20-25 binders per visit. Over the course of 15 weeks, all of the outcrop binders and two-thirds of the well binders were logged out of the room by Laura Wisk and sent to the Data Management Incorporated (DMI, contractor) facility. The pages were taken from the binders, coded, cleaned and tears repaired and then scanned. Many extra documents and sketches were scanned in association with the outcrop or well description so that the completed PDFs would document any and all available data for that particular outcrop or well. The binders were then reassembled and brought back to DGS and Laura Wisk checked them back into the data room and sent out the next shipment. Once completed for the amount of funding for FY13, DMI alerted us to the close of that scanning period. We waited to learn of FY14 funding to complete the scanning of the remaining 10,608 well descriptions. We received the funding and the new project started August 1, 2014. Beginning in September, DMI (contractor) is currently scanning the remaining well descriptions and out-of-state outcrop and well description records.

Attached are an example of an outcrop and well description.

TS

polished section

P244
#58175

DELAWARE GEOLOGICAL SURVEY
OUTCROP OR EXPOSURE SCHEDULE

DGS ID: Ad43b

Date Observed:

Record By: W. S. Schenck

WSS
code

GENERAL SITE DATA

County: 1 Kent, 3 New Castle, 5 Sussex — 3

Quadrangle: Wilmington North

WIN
code

Latitude: 39 51 41

Longitude: 75 32 19

Altitude: 370

Delaware Mod. Grid:

Altitude Method: A L M R — M

OWNER IDENTIFICATION

First:

M. I.:

Last:

Address:

code

City:

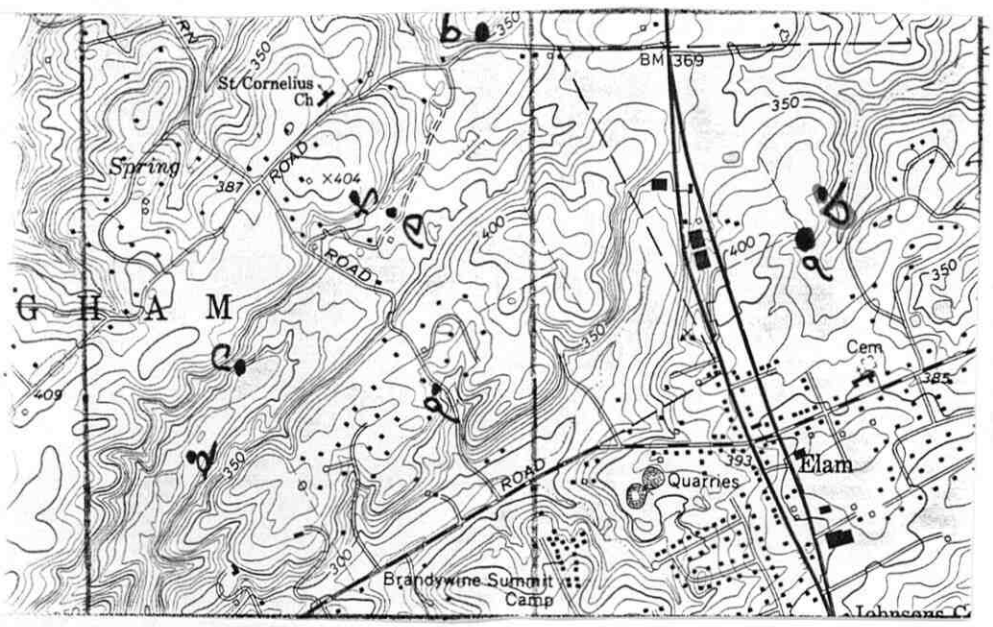
State:

Zip Code:

Telephone Number: ( ) -

Ad43-b

LOCATION SKETCH MAP OR LOCATION DESCRIPTION



SAMPLES, PHOTOS

NOTED BY #

DGS ID A d 4 3 b

DEPTH INTERVAL	SYMBOL DESCRIPTION	DESCRIPTION, COMMENTS, SKETCH OF OUTCROP

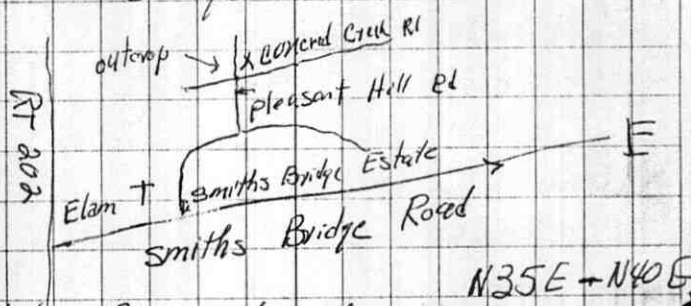
• Regular
• Thin section

P244 Wetherholt WNQ

Wetherholt
Concord Creek Rd
Smith's Bridge
Valley

Off Smith's B.

Pleasant Hill Rd
Smith Bridge Estates



N35E → N40E
80

Pelitic Gneiss / much sillimanite
Wonderful outcrop on corner of
Concord Creek Rd x Pleasant Hill Rd

Wasahuchs - folcaites - wrap
around qtz lens - pegmatites with
pink F. - very small garnets - also larger

lots of sill - Very aluminous rocks
migmatitic - lots of
sillimanite & partial melting
also sulfide present -
(pyrite, chalcopyrite.)

chalcopyrite

strike Fol N 35E
DIP 80SE

UNITS EXPOSED W1SS

PC

MI

DGS ID: Ad43b SAMPLE NO.: 58175 QUAD: WIN DATE:

FIELD NO.: P244 SLIDE PREPARED FOR:

LOCATION: Smiths Bridge Estate

ROCK UNIT: Wissahickon ORIEN. SEC.:

STAINED: K-feldspar: Plagioclase: Calcite: Cordierite:

LITHOLOGY: pelitic gneiss

MAJOR MINERALS	MODE (%)	ACCESSORY MINERALS
pla		sphene
qtz		
kspar		
bio		
sil		RETROGRADE MINERALS
opaques		
gar		

COMMENTS

myrmekites
deuteric alteration of plagioclase

TEXTURES

Garnet: rotated; quartz pressure shades; inclusions are biotite and kspar (not an earlier Ass.); elongated; inclusions of mus?, qtz, bio?, sil
Quartz: rexld; poly boundaries; some grains no U.E.
Sillimanite: prisms and blades
Plagioclase: twinned; some deuteric alteration; deformation twins; antiperthitic
K-feldspar: porphyroblasts; edges; not clean; biotite/sillimanite/quartz; fine-grain quartz
Biotite: dark brown; sheared; light brown
Myrmekites

FABRIC
foliated; phyroblasts of k-feldspar (rotated?); porphyro clasts; granulated rims; cataclastic; shear

DELAWARE GEOLOGICAL SURVEY
WELL SCHEDULE

DGS ID: Ad53-11 DNREC Id: 5116

Record By: KWR (code) Date Filed: 04-16-02

GENERAL SITE DATA

Data Source: D driller, G DGS, (N) DNREC, O owner, R other reported, S USGS, U unknown

Local Id: DRBC Id:

N 4409667.7 E 453534.3

Lat: Long: Lat-Long Method: S gps, L loran, (M) map, F field

Lat-Long Accuracy: (S) sec, F 5 sec, T 10 sec, W 20sec

County: 1 Kent, (3) New Castle, 5 Sussex

Quadrangle: WILMINGTON NORTH WIN (code)

Topo Setting: C stream channel, D depression, E dune, (F) flat, H hilltop, K sink, L lake, M marsh, O offshore, S hillside, U upland draw, V valley flat

Drainage Basin: 101 (code) Altitude: 365. Altitude Method: A altimeter, L level, (M) map, R relative

Delaware Mod. Grid: 12003780 Project: SMP02

OWNER IDENTIFICATION

First: Middle Initial: Last:

Address: 806 WOODALT (code)

Address:

City: State: Zip Code:

WELL DESCRIPTION

Drilling Contractor: POWELL 74

Date Drilled: 06-21-82 Depth Drilled: 180.

Drill Method: (A) air rotary, B bored, C cable tool, D dug, E augered, J jetted, M hydraulic rotary, P air percussion, R reverse rotary, U unknown, V driven, W wash-drive

Well Finish: C concrete, H horizontal gallery, N not finished, (O) open hole, P perforated or slotted, S screen, T sand point, U unknown, W walled

Ad53-11

Site Use	A	E	G	O	P	R	T	W	Z
	anode	eng. test boring	geo/hydro research	observation	oil or gas	recharge	test	withdrawal	other

Site Status	A	D	I	N	S	U
	abandoned	destroyed	in use	not in use	standby	unknown

Water Use	A	C	D	F	G	I	M	O	P	R	U
	agricultural	commercial	domestic	fire	geothermal	industrial	observation	other	public supply	irrigation	unknown

Replacement Well	Y	N

Replacement Reason	CL	FE	IW	NI	OT	WF
	chlorides	iron	inadequate quantity	nitrate	other	well failure

Geologic Unit _____ (code) _____

Aquifer Name _____ (code) _____

CASING

	top of casing	bottom of casing	diameter	material
1	0	21	6	S
2				
3				
4				

Casing Material	B	C	F	G	O	P	R	S	U
	brick	concrete	fiber-glass	galvanized	other	PVC	rock or stone	steel	unknown

OPENINGS

	top of opening	bottom of opening	diameter	material
1				
2				
3				
4				

Opening Material	A	B	C	F	G	M	N	P	R	S	U
	brass	bronze	concrete	fiber-glass	galvanized	monel	none	PVC	stainless steel	steel	unknown

806 Woodlt

RECEIVED

Ad53-11

JUN 1 1982

WATER SUPPLY

Press Hard · Write Clearly · Use Ball-Point Pen or Typewriter · Press Hard

y Section
Environmental Control
P.O. Box 1401
ware 19901
INT

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

APPLICATION FOR A PERMIT TO DRILL A WELL

To be completed by a licensed water well driller)

APPLICATION MUST BE SUBMITTED AND PERMIT RECEIVED BEFORE DRILLING IS STARTED.

odlawn Trustees

Number: 652-1805

lress: 610 N. Bancroft Park.

ington, Del.

w Castle 19806 Zip

Date of Application: 5 Mon. 28 Day 82 Year

Estimated Date of Construction: 6-3-82

Driller: Calvin E. Powell License No. 74

Pump Installer: Owner License No.

LL INFORMATION (circle one)

st Well (Permanent Well) Option to convert
astic · Public · Commercial
strial · Agriculture · Other

ribe Other:

lacement well? yes (no)

replacement: Old Spring House

loned well is to be sealed:

ication been made for an approved sewage
item? (yes) · no S 201-80

LOCATION MAPS

Beaver Valley Rd

100 Acres
Price 120.378
Drainage 101

Road Map

Rt 202

POSED WELL CONSTRUCTION

drilling: Air Rotary

te total depth of well: 150 ft.

quifer: Diabase

meter (s) ter (in.) 6"

terial: Black Iron

terial: None

creen Setting: between ___ and ___ ft.

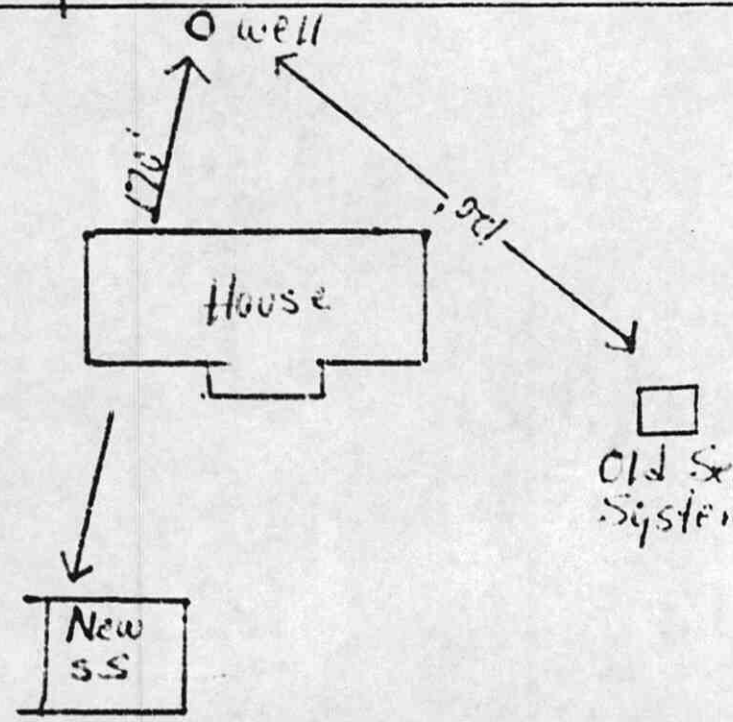
length of screen: ___ ft.

ll be gravel packed? yes · no

ut: Cement From: 3 ft. to 27 ft.

pacity of the well: 8 gpm

daily use: 1000 gpd



Site Plan (include suitable plot plan if available)

affirm the information I have furnished
e and correct

Applicant (circle)
Representative

Permit No.

5116

For Official Use Only. -- Do Not Write Below This Line.

to provisions of 7 Delaware Code, Chapter 60, permission is hereby granted to construct and use a well as des-
ove. All current regulations governing well construction and water resource use must be followed. The following
must be observed: ( )

ut expires: 6/2/83

PLEASE RETURN TO:

WATER SUPPLY BRANCH
Blue Hen Mall Office
Box 1401
Dover, Delaware 19901

DOCUMENT 46-08/78/01/3

Ad53-11

WELL COMPLETION REPORT

umber: S / / / 4
well:

Alan Dunstee

ater: Domestic [X] Public [ ]
al [ ] Agricultural [ ] Irrigation [ ]
al [ ] Other

f Drilling: Jet [ ] Dug [ ]
]Rotary: Mud [ ] Rev. [ ] Air [X]

l [ ] Observation [ ] Production [X]

l Depth: 180 feet
pleted 6 / 21 / 82
Month Day Year

is a replacement well, how was well abandoned?

aterial: Steel [X] PVC [ ] Concrete [ ]
6 in. From 0 to 21' feet

terial: Steel [ ] PVC [ ] Concrete [ ]
iameter None inches
etting from to feet

Cement [X] Bentonite Clay [ ]

to 16' feet

11. Gravel pack: Type None
From to feet

12. Static Water Level: Date 6-21-82
31 Ft. (Below, Above) Ground Surface

13. Pumping Water Level: 130 Ft. below grade
after 1 hours at 8 gpm

14. Well Head Completion: Owner installed pump
Type: Pitless Adapter [ ] Other
inches above grade

15. Type of Permanent Pump Installed:

Pump Manuf.
Rated capacity
Pump intake setting Ft. below grade

	YES	NO
16. The completed well is		
a. at least 5' from any overhang	[X]	[ ]
b. at least 50' from any septic tank	[X]	[ ]
c. at least 10' from town sewer line	[ ]	[ ]
d. at least 100' from the nearest edge of any tilefield (if well is cased less than 50')	[X]	[ ]
e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth	[ ]	[ ]

17. The nearest neighbors (circle one) septic tank tile field, cesspool, or privy is from completed well. 100 Acre Farm

18. Is completed well located as shown on application form? [X] [ ]

If no, describe location change.....

5/16

Ad53-11

DRILLERS LOG	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Soil	8"	0"
Clay with traces sand & gravel	16'	16'8"
Diabase	164'	180'

RECEIVED
SEP 2 1982

DGSID	**Ad53-11**
Depth top	0.0
Date	4/17/02
Record by	KWR
LSE	365
Strat unit	Tbm
Depth bottom	16.75
Confidence	L
Pick method	DLG
Comments	0-16.75 Clay with trace of sand & gravel Could be partly saprolite

DGSID	**Ad53-11**
Depth top	16.8
Date	4/17/02
Record by	KWR
LSE	365
Strat unit	Bsmt rk
Depth bottom	180
Confidence	H
Pick method	DLG
Comments	16.75-180 Diabase

GRAVEL PACK

Y N

Top

Bottom

GROUT

Y N

DGS ID

Top 0.

Bottom 16.

Type B C G O U

bentonite cement cuttings other unknown

WATER-LEVEL DATA

Date 06-21-82

Time

Water Level 31.

Correction

Water Level A M O R S T W

air line m-scope other reported static level tape down water-level recorder

WELL YIELD DATA

Pumping Rate

Duration

Static Level

Pumping Level

LOG, TEST, AND SAMPLE DATA

Geologist's Log

Water Quality

Ditch Samples

Driller's Log ✓

Supplemental File

Core Samples

Aquifer Test

GEOPHYSICAL LOG DATA

Caliper

Gamma-Density

Single Point Electric

Differential Single Point

Gamma Spectral

Sonic

Differential Temperature

Induction

Spherically Focused

Flowmeter

Multiple Point

Temperature

Gamma

Neutron

Other

Date Filed

NOTES

LOCATION MAP