

Magnetic Reduce Dipole



Hildenbrand, T.G. and Kucks, R.P., 1984a

Legend

- aPAT020289
- MAPINJWE Events
- WELL_TYP
- EOR
- IEOR
- IER
- ISWD
- SM
- SWD

GEOLOGY:LOADER.eq_epicenters

MAG

- 2.000000 - 2.500000
- 2.500001 - 3.000000
- 3.000001 - 3.400000
- 3.400001 - 4.200000
- 4.200001 - 5.400000

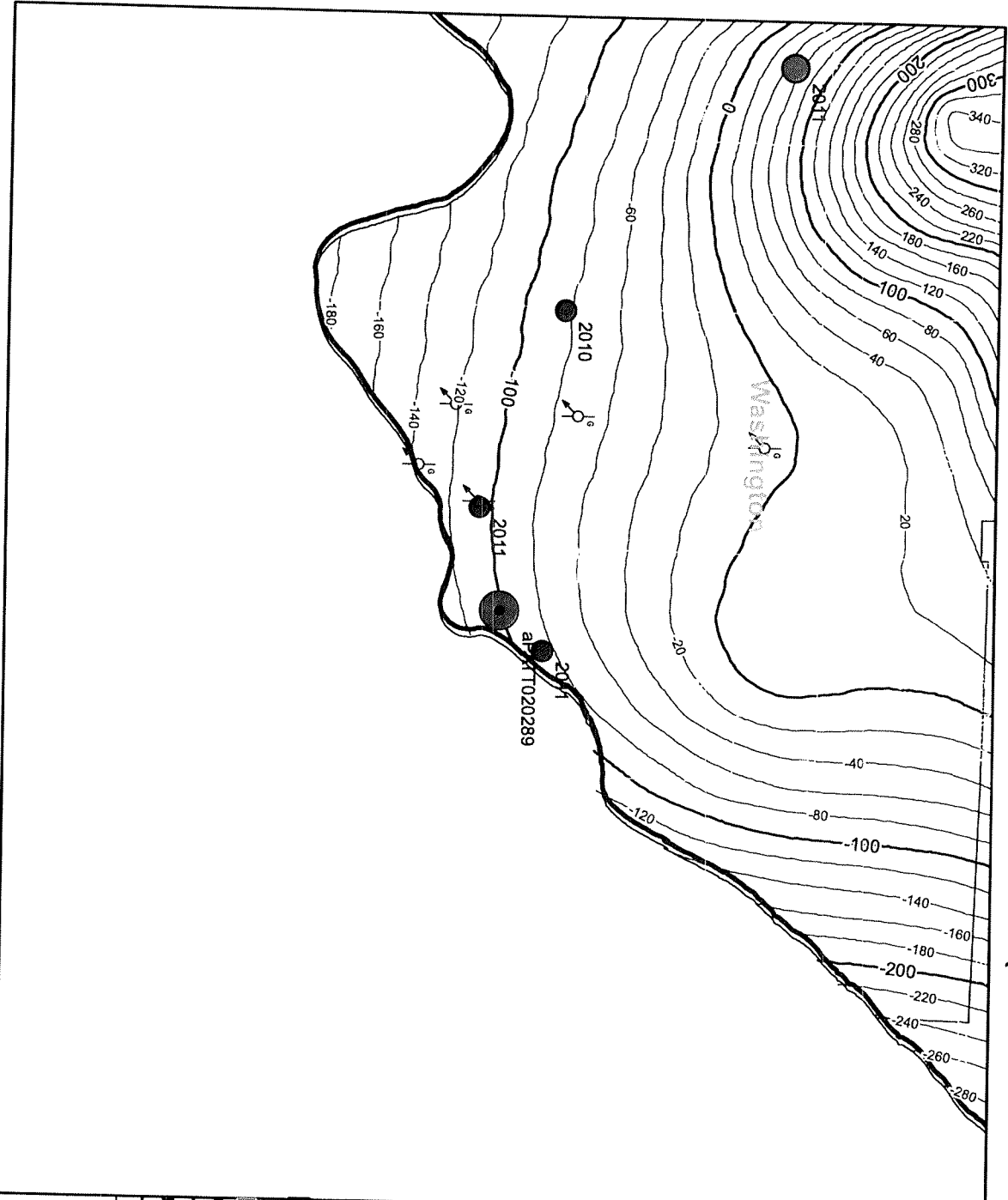
magredp Value

- High : 2265.63
- Low : -1623.9

Scale: 0 4 8 Miles

North Arrow: N

Upper Freeport Coal Structure (C.I. = 20 feet)



Ohio Division of Geological Survey, 2003

Legend

- aPATTO20299
- MAPINJWE Events
- WELL_TYP
- EOR
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- IER
- ISWD
- SM
- SMD

GEOLOGY.LOADER.eq_epicenters

MAG

- 2.000000 - 2.500000
- 2.500001 - 3.000000
- 3.000001 - 3.400000
- 3.400001 - 4.200000
- 4.200001 - 5.400000

State_Ohio

Countries_Ohio

BASEMAP.LOADER.Townships

Infrastructure

<all other values>

ELEVATION

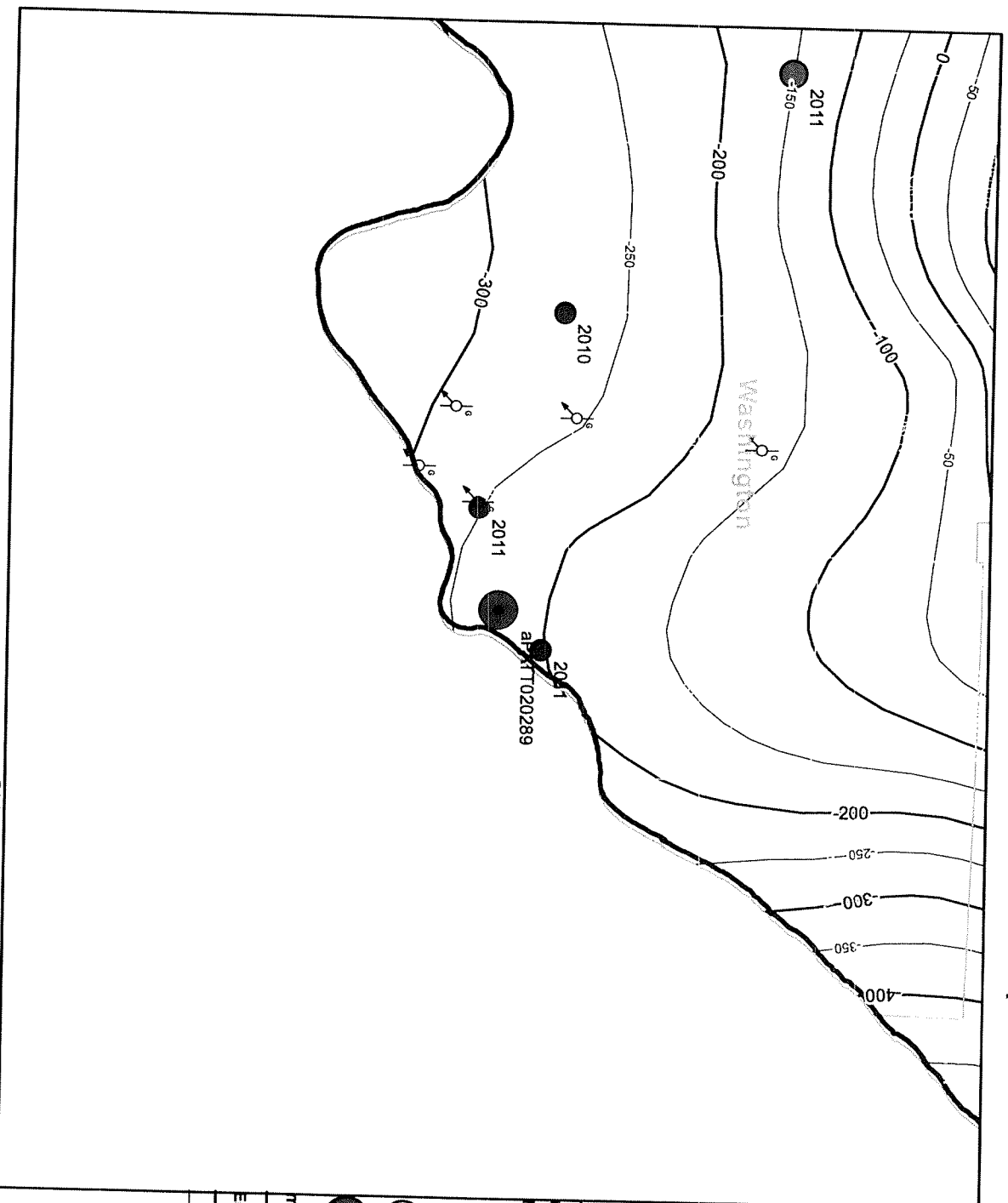
100's

20's

0 2 4 Miles

N

Middle Kittanning Coal Structure (C.I. = 50 feet)



Ohio Division of Geological Survey, 2003

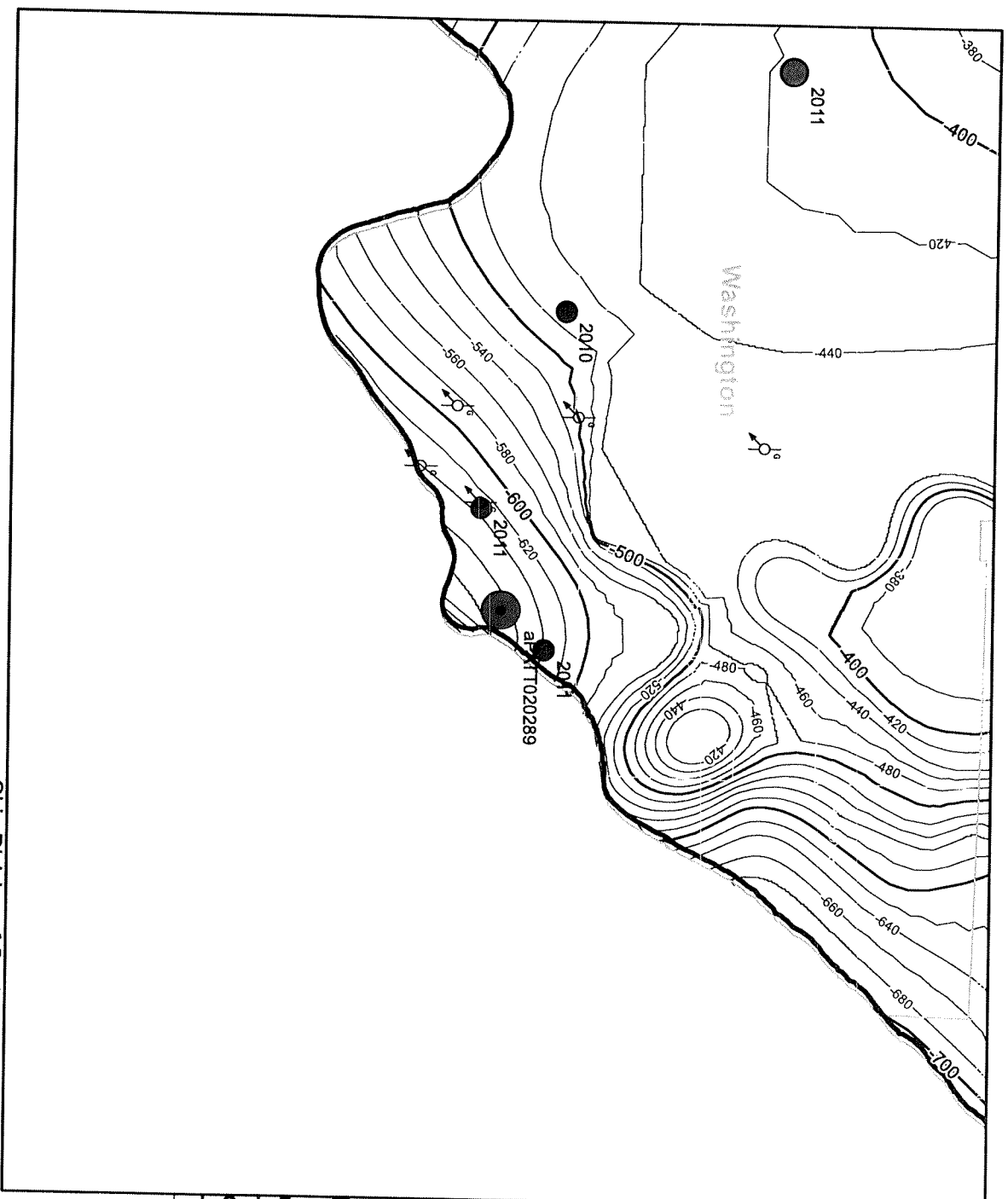
Legend

- APATT020289
- MAPINJWE Events**
- ▲ EOR
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- IER
- ISWD
- SM
- SWD
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- MAG**
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- 2,500001 - 3,000000
- 3,000001 - 3,400000
- 3,400001 - 4,200000
- 4,200001 - 5,400000
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- <all other values>
- ELEVATION**
- 100's
- 50's

Scale: 0 2 4 Miles

North Arrow: N

Mississippian/Pennsylvanian Unconformity Surface Countours (C.I. = 20 feet)



Legend

- aPATT020289
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- SWD

GEOLOGY.LOADER.eq_epicenters

MAG

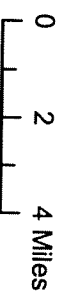
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- 4,200001 - 5,400000

mpstructure_clip

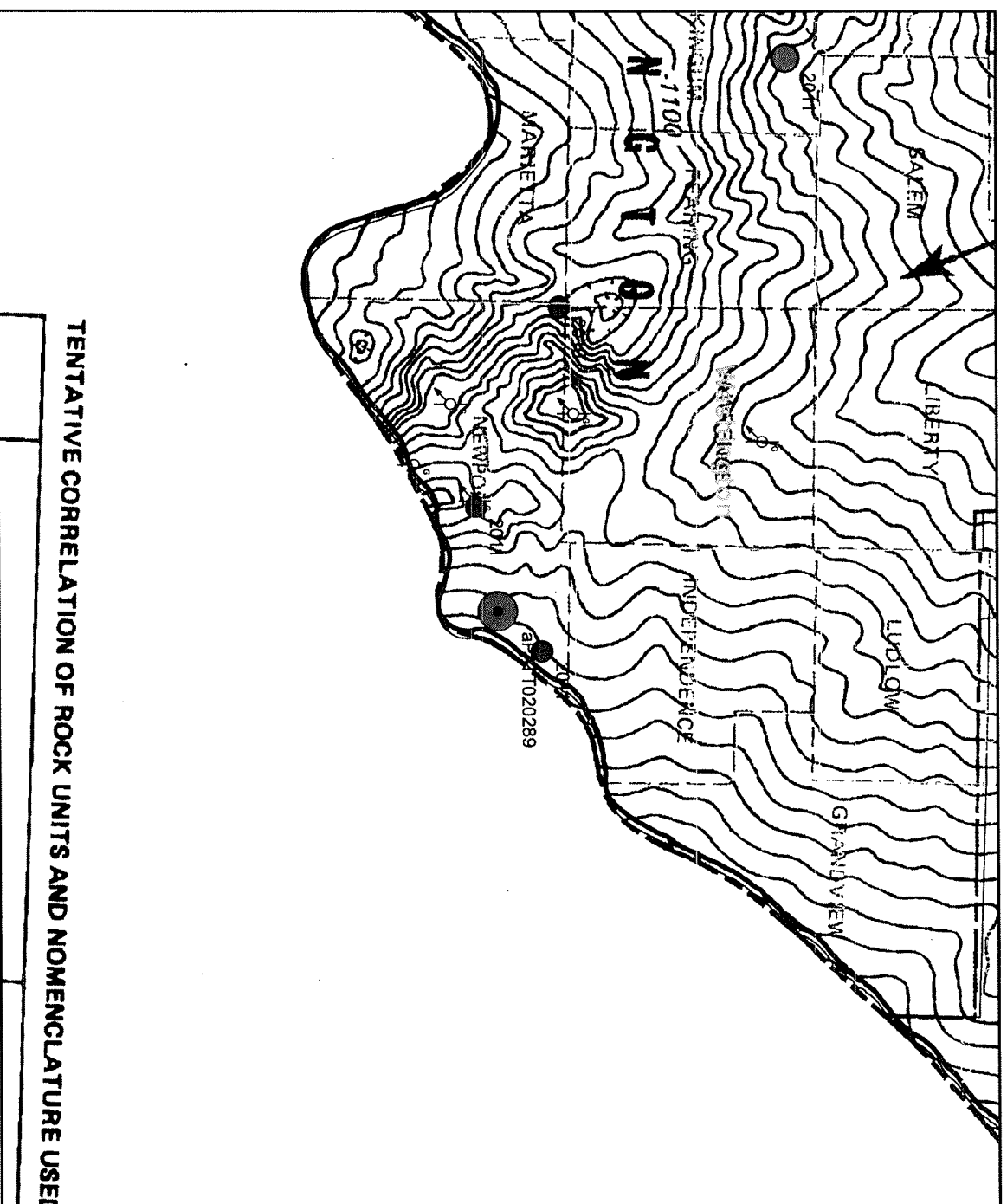
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CONTOUR

- 100's
- 20's



EGSP Berea Structure



TENTATIVE CORRELATION OF ROCK UNITS AND NOMENCLATURE USED

Gray, J.D., and others, 1982

Legend

aPATT020289

MAPINJWE Events

WELL_TYP

EOR

IEOR

IER

ISWD

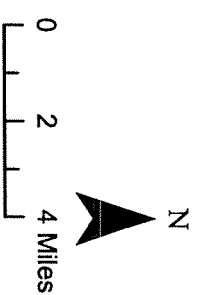
SM

SWD

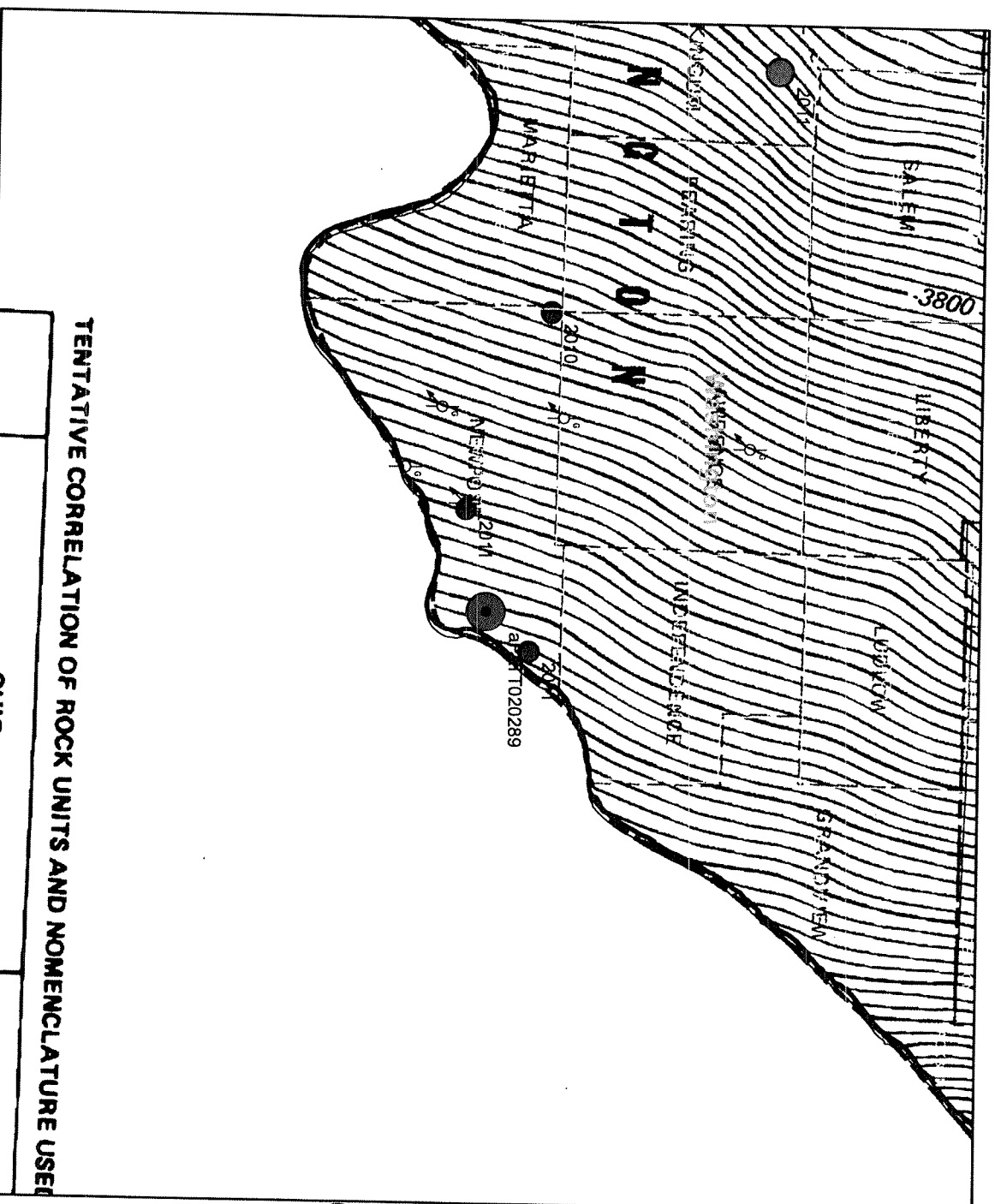
GEOLOGY.LOADER.eq epicenters

MAG

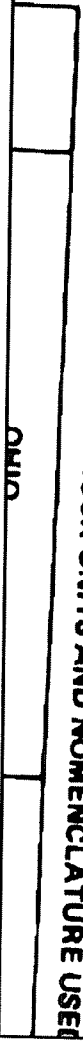
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- 2.500001 - 3.000000
- 3.000001 - 3.400000
- 3.400001 - 4.200000
- 4.200001 - 5.400000



EGSP Onondaga Structure



TENTATIVE CORRELATION OF ROCK UNITS AND NOMENCLATURE USED



Legend
 aPATT020289

MAPINJWE Events

WELL_TYP

EOR

IEOR

IER

ISWD

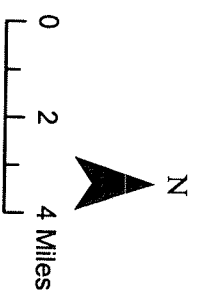
SM

SWD

GEOLOGYLOADER_eq_epicenters

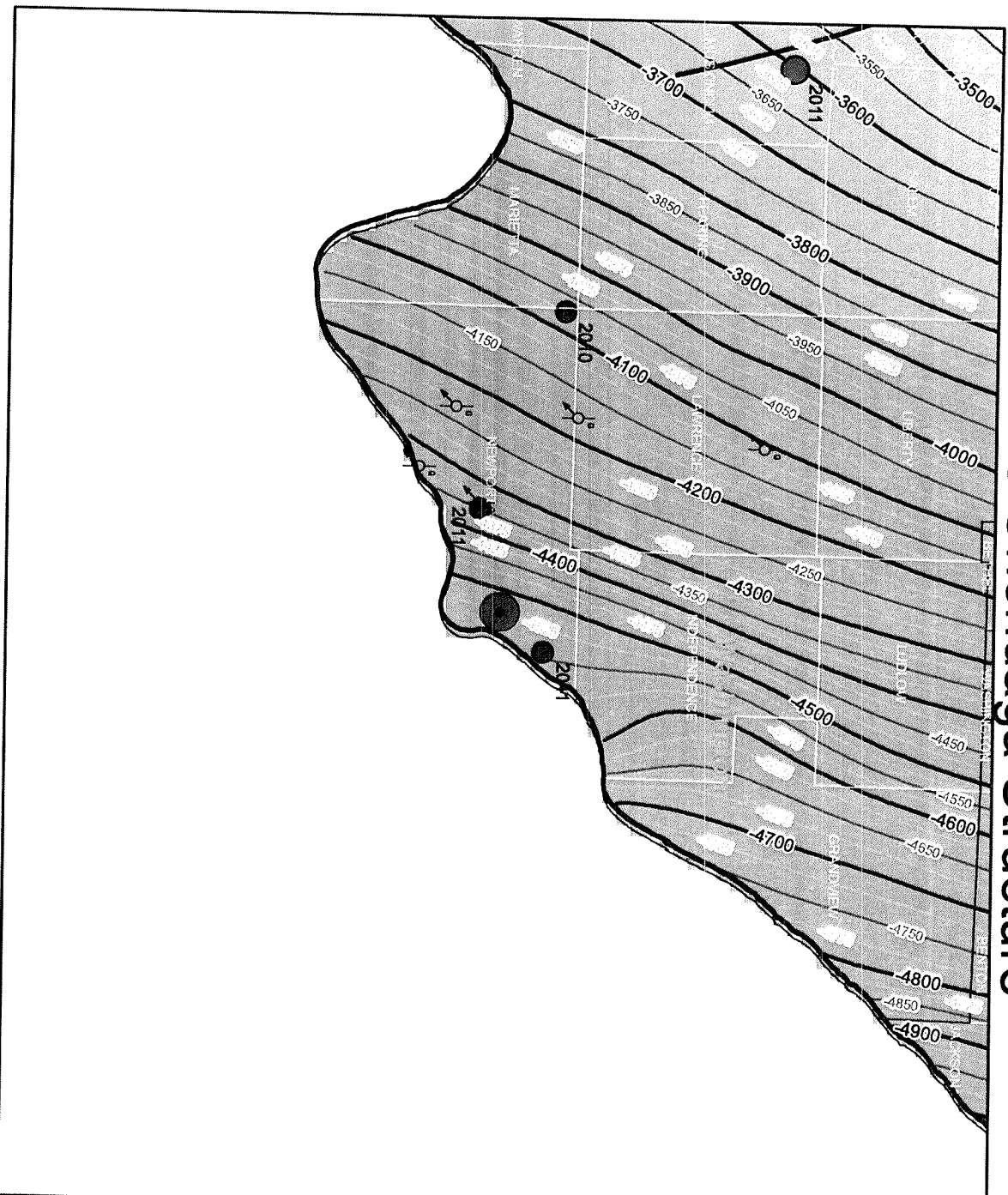
MAG

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- 3.000001 - 3.400000
- 3.400001 - 4.200000
- 4.200001 - 5.400000



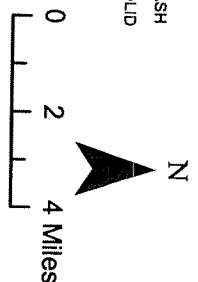
Gray, J.D., and others, 1982

Fine Onondaga Structure

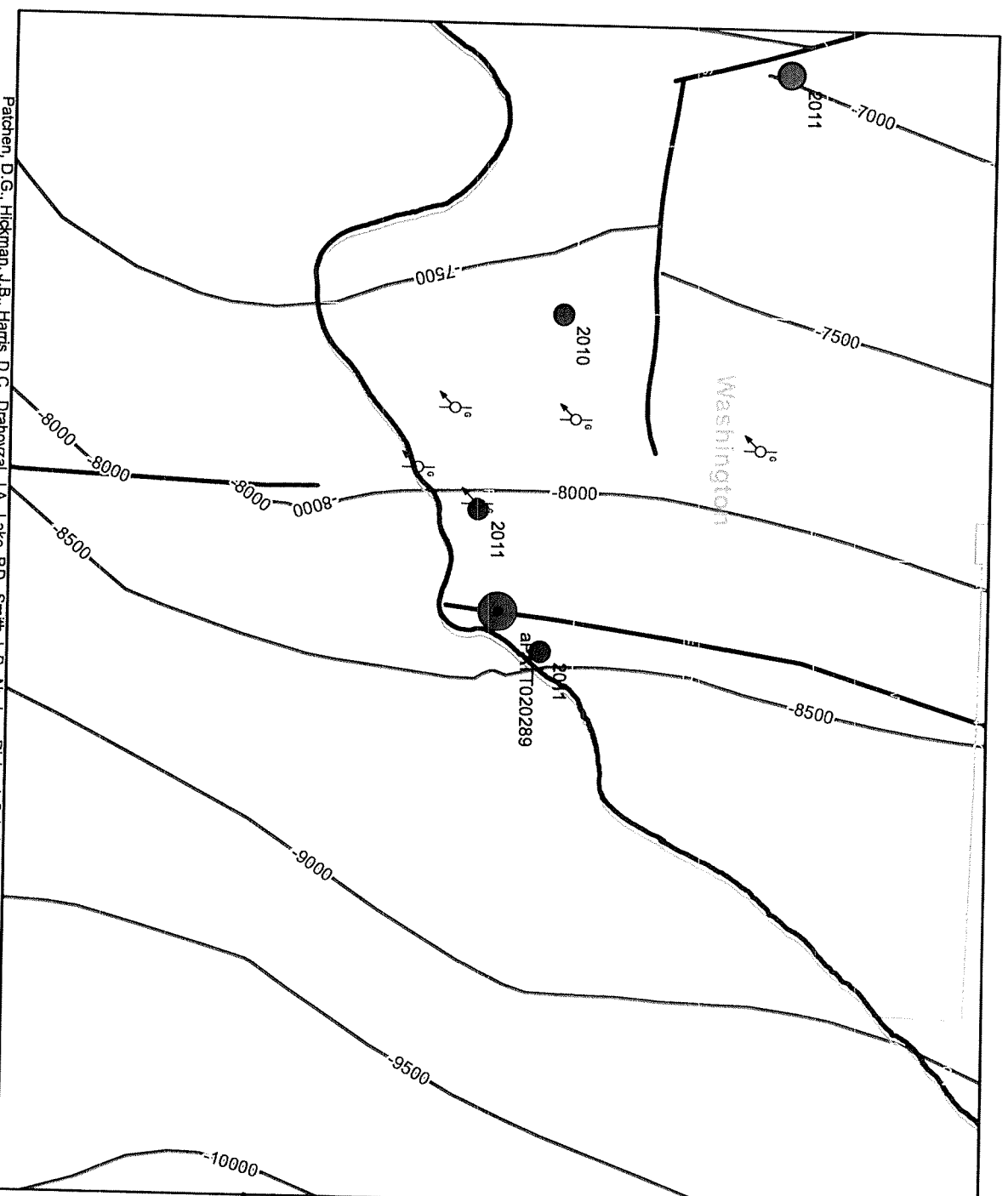


Legend

- aPAT020289
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- GEOLOGY/LOADERreq_epicenters**
- MAG
 - 2,000000 - 2,500000
 - 2,500001 - 3,000000
 - 3,000001 - 3,400000
 - 3,400001 - 4,200000
 - 4,200001 - 5,400000
- ondg_str25
- CONTOUR**
- 100's
- 50's
- 25's
- ondg_fit
- STYLE
 - - - DASH
 - SOLID



Trenton Structure Contours (C.I. = 500 feet)



Patchen, D.G., Hickman, J.B., Harris, D.C., Drahovzal, J.A., Lake, P.D., Smith, L.B., Nyahay, Richard, Schulte, Rose, Riley, R.A., Baranowski, M.T., Wickstrom, L.H., Laughrey, C.D., Kostelnik, Jaime, Harper, J.A., Avary, K.L., Boean, John, Hohn, M.E., and McDowell, Ronald, 2006

Legend

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- EOR
- IEOB
- IER
- ISWD
- SM
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GEOLOGY.LOADER.eq_epicenters

MAG

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- 4.200001 - 5.400000

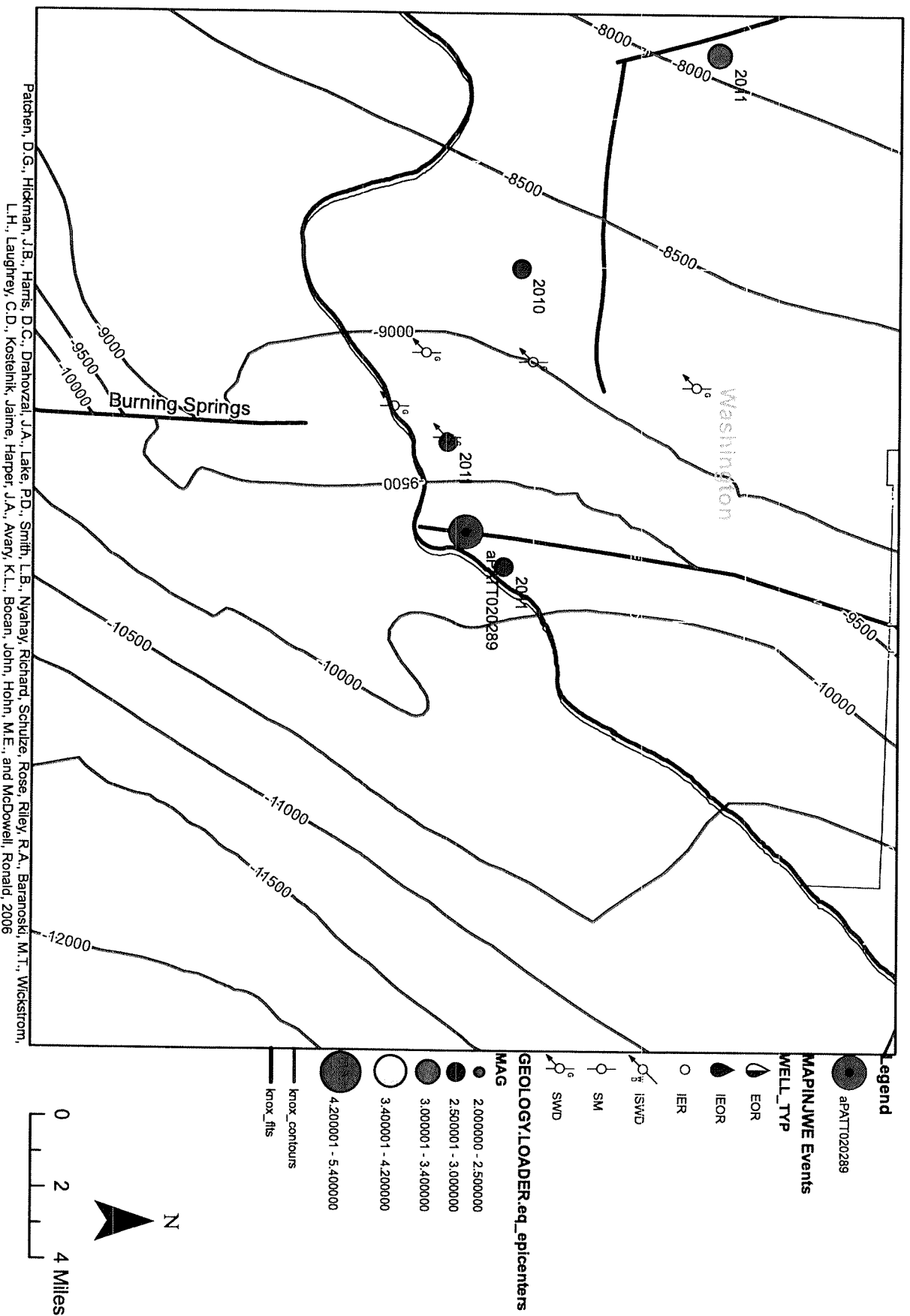
TRNT_Contours

tnt_fils

0 2 4 Miles

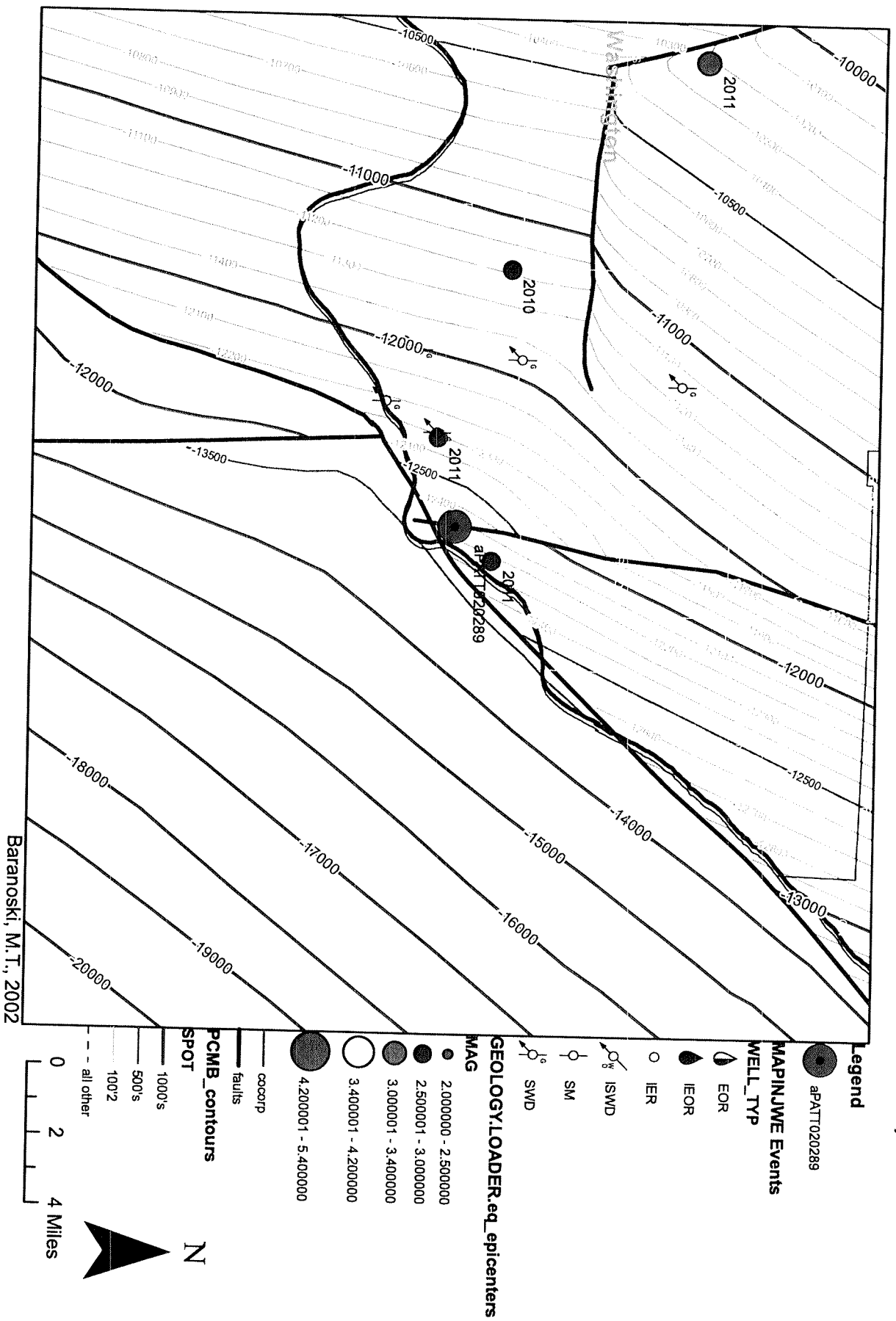
N

Knox Structure (C.I. = 500 feet)

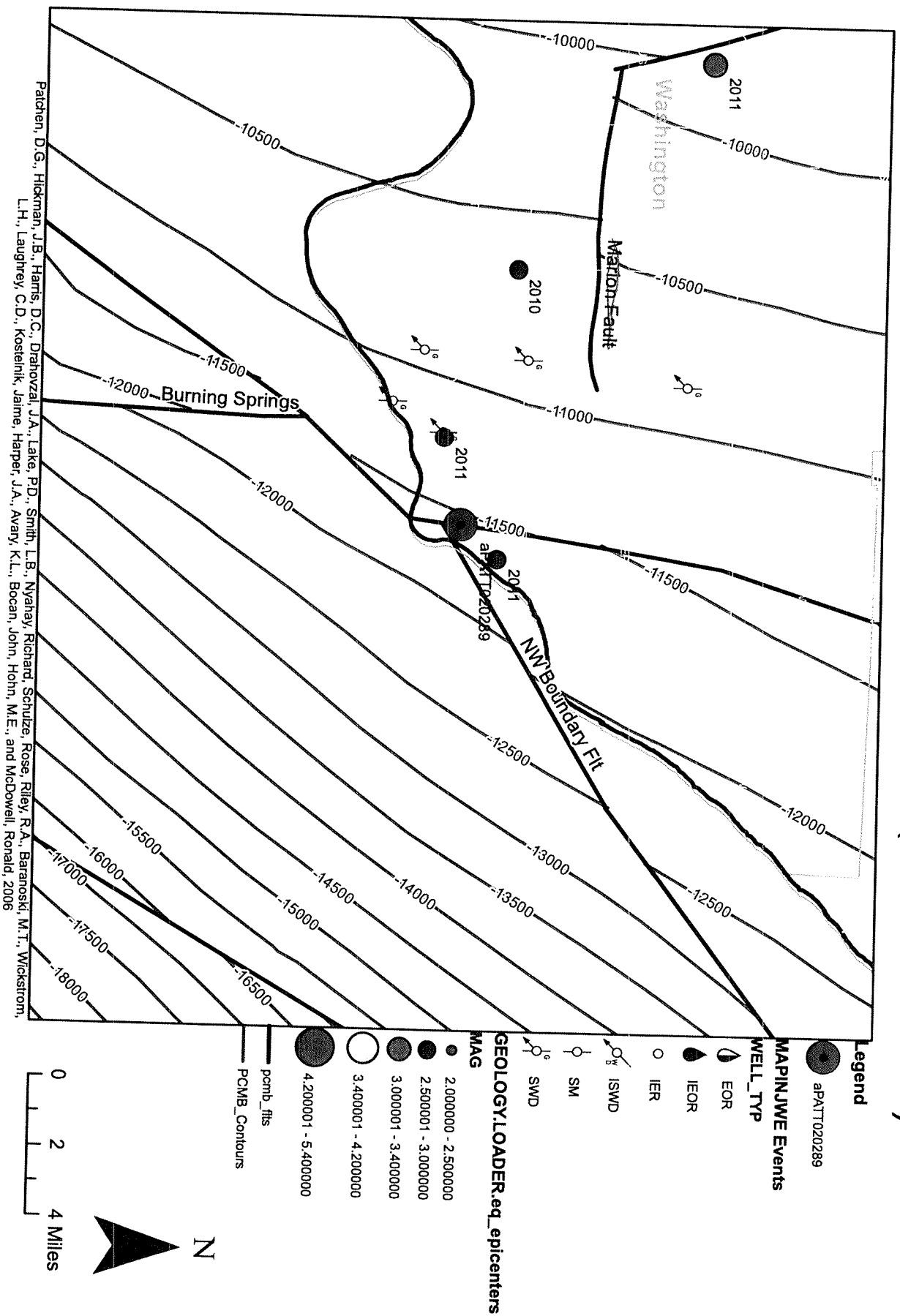


Patchen, D.G., Hickman, J.B., Harris, D.C., Drahovzal, J.A., Lake, P.D., Smith, L.B., Nyahay, Richard, Schulte, Rose, Riley, R.A., Baranoski, M.T., Wickstrom, L.H., Laughrey, C.D., Kostelnik, Jaime, Harper, J.A., Avary, K.L., Bocan, John, Hohn, M.E., and McDowell, Ronald, 2006

Precambrian Structure Contours from PG-23 (C.I. = 100 feet)

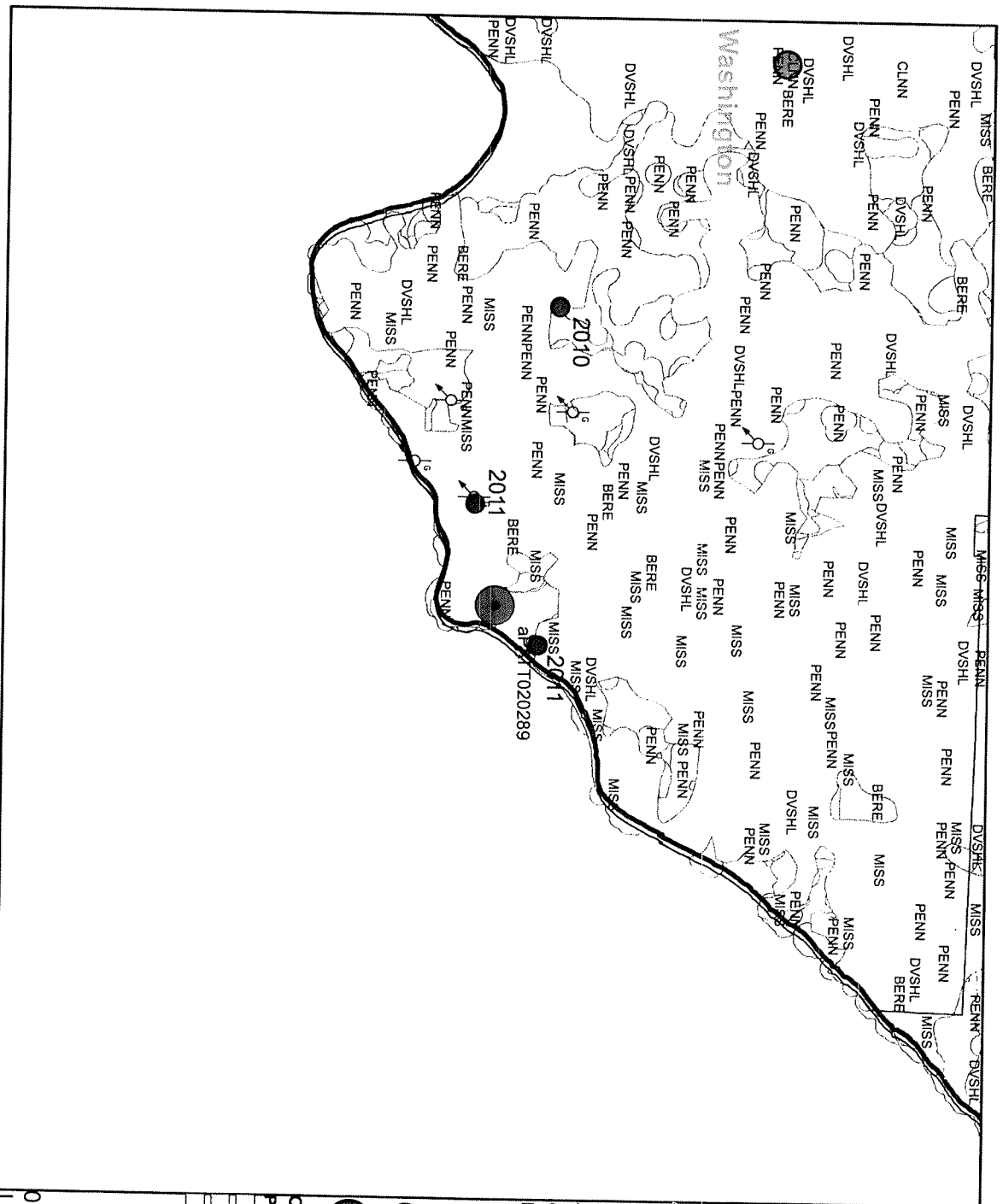


Precambrian Structure Contours (C.I. = 500 feet)



Patchen, D.G., Hickman, J.B., Harris, D.C., Drahovzal, J.A., Lake, P.D., Smith, L.B., Nyahay, Richard, Schultze, Rose, Riley, R.A., Baranoski, M.T., Wickstrom, L.H., Laughtrey, C.D., Kostelnik, Jaime, Harper, J.A., Avari, K.L., Bocan, John, Hohn, M.E., and McDowell, Ronald, 2006

Oil and Gas Fields



Legend

- aPATT020289
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- ISWD
- SM
- SWD

GEOLOGY.LOADER.eq_epicenters

MAG

- 2.000000 - 2.500000
- 2.500001 - 3.000000
- 3.000001 - 3.400000
- 3.400001 - 4.200000
- 4.200001 - 5.400000

OG_FIELDS

Production Type

- OIL
- GAS
- CBM

Scale: 0, 2, 4 Miles

North Arrow: N

Disclaimer

The products of the Ohio Department of Natural Resources, Division of Geological Survey, both digital maps and printed maps and any other associated documents are intended to provide general geologic information only and should not be used for any other purpose. It is not intended for resale or to replace site-specific investigations. These data were compiled by the Ohio Division of Geological Survey, which reserves the publication rights to this material. If these data are used in the compilation of other data sets or maps for distribution or publication, this source must be referenced.

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Interoffice Memo

Environmental
Protection Agency

To: Thomas Tugand, Deputy Chief, ODNR - DOGRM
From: Michael Baker, Chief, Ohio EPA - DDAGW
Date: February 22, 2012
Re: Class II Permit Reviews

Ohio EPA Division of Drinking and Ground Waters has completed its review of four Class II underground injection well permits:

- Washington Co., Newport Twp., Ohio Oil Gathering, #1 Sawmill Run Disposal Well;
- Athens Co., Troy Twp., K&H Partners, #1 K&H Partners;
- Portage Co., Deerfield Twp., Fortis Energy Partners #1 Washington SWD
- Washington Co. existing permit number: 34-167-2-9618-00-00

Our review of the permits focused on well construction relative to the protection of underground sources of drinking water (USDW). More specifically, our review assessed the placement of surface casing and cement relative to the lowest most USDW and location of the surface facilities relative to public water system source water protection areas and other sensitive hydrogeologic settings.

We saw nothing during our review that should cause delay in approving the permits, however, we do have a couple overarching comments. None of the permits reviewed specify the type of cement being used or the use of centralizers. Ohio EPA would recommend that a class A cement with appropriate additives be specified as well as the use of centralizers when placing cement.

Please call me or Chuck Lowe at 614-644-2752 if you have any questions or need additional information.

Washington County, Ohio - Seismicity

9611 - Not converted

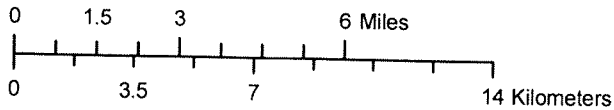
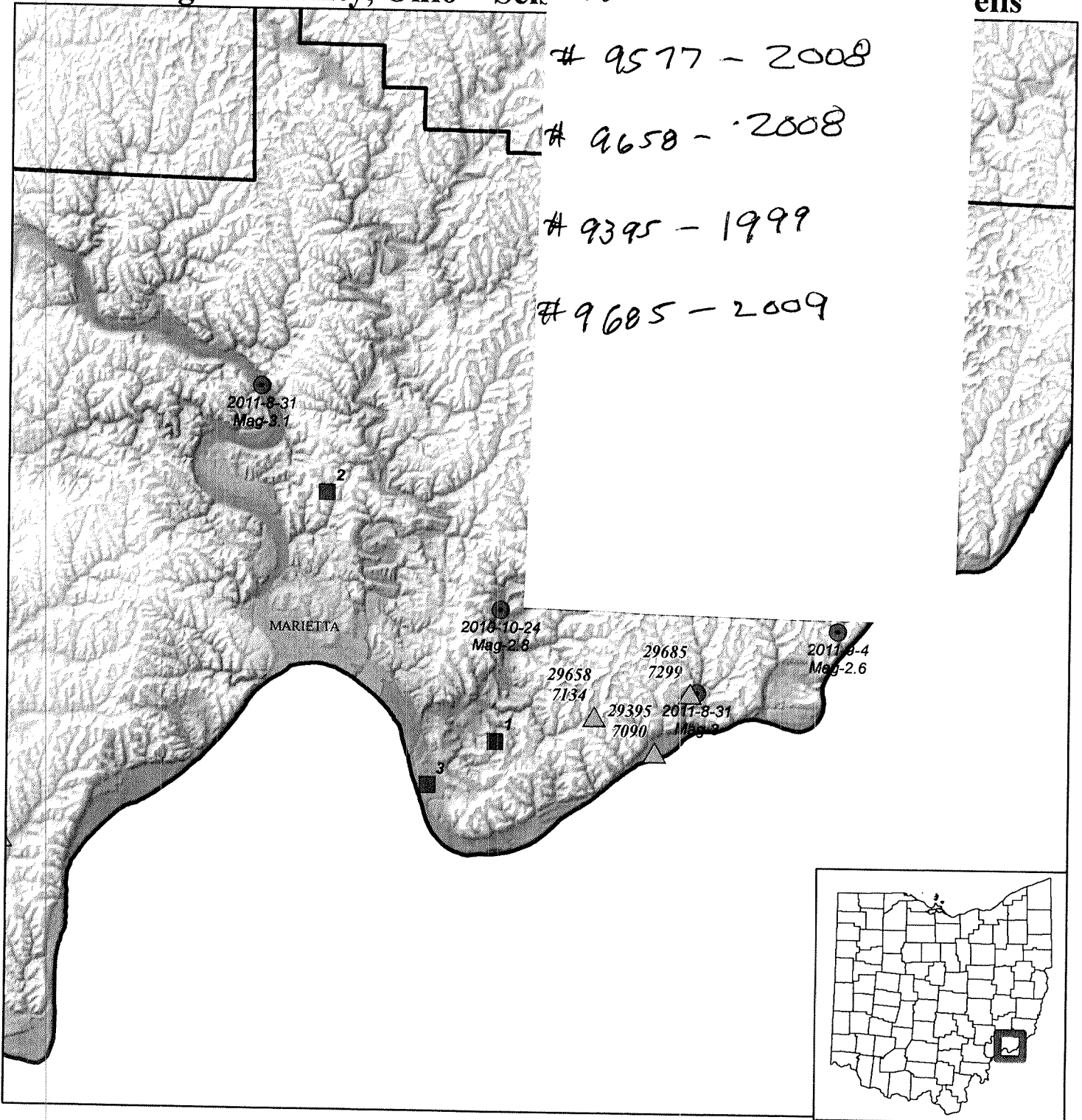
9577 - 2008

9658 - 2008

9395 - 1999

9685 - 2009

ells



- ▲ Injection wells (Permit # / injection depth(ft))
- Epicenters
- Portable Seismometer Stations



The information contained herein has not been technically reviewed for accuracy and conformity with present Ohio Division of Geological Survey standards for published or open-file materials. The Ohio Division of Geological Survey does not guarantee this information to be free from errors, omissions, or inaccuracies and disclaims any responsibility or liability for interpretations or decisions based thereon.

December 9, 2011

Ohio Department of Natural Resources
Division of Mineral Resource Management
2045 Morse Road, Building H-3
Columbus, Ohio 43229-6605

Re: OOGC Disposal Company Salt Water Disposal Well Drilling Application

Dear Sirs,

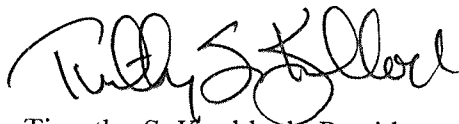
Enclosed please find the following information for the subject permit application as requested by OOGC Disposal Company:

- **Form 1** – Original and two copies
- **Surveyors plat** – Original and four copies
- **Form 4** – Original and one copy
- **Salt Water Disposal Permit Check** - \$1,000 payable to Division of Mineral Resources Management
- **Form 5** – Original
- **Salt Water Injection Affidavit**
- **Form 210** – Original
- **Maps** – Showing ¼ mile, ½ mile, and 1 mile radius around proposed well
- **List of Wells** included in area of review.

Should any additional information be required, please advise.

Sincerely,

James Knobloch Petroleum Consultants Inc.

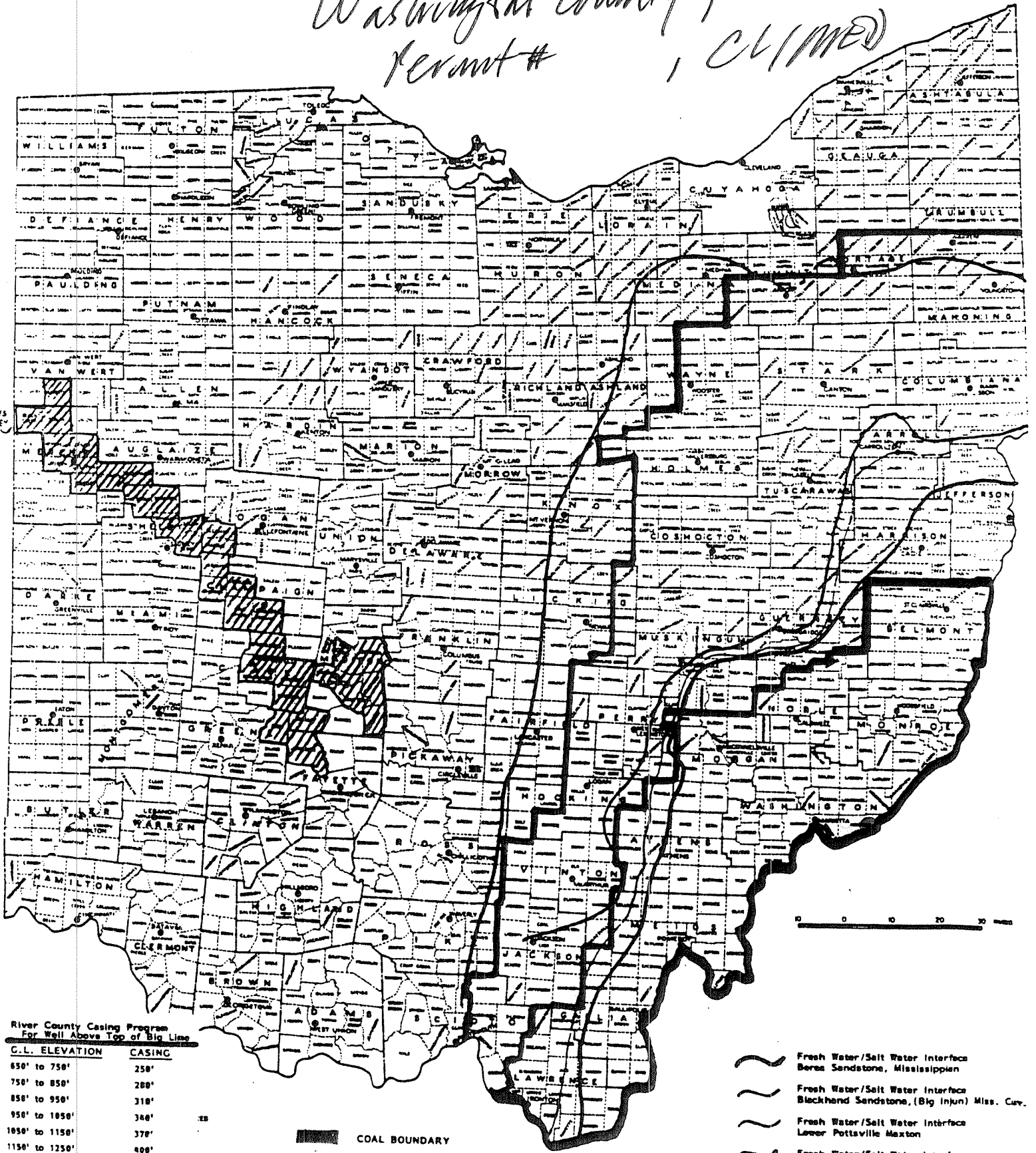


Timothy S. Knobloch, President

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Washington County, SWW #16
 Permit # , CL(MED)



River County Casing Program
 For Well Above Top of Big Lime

C.L. ELEVATION	CASING
650' to 750'	250'
750' to 850'	280'
850' to 950'	310'
950' to 1050'	340'
1050' to 1150'	370'
1150' to 1250'	400'
1250' to 1350'	430'
OVER 1350'	500'

COAL BOUNDARY

- Fresh Water/Salt Water Interface
Berea Sandstone, Mississippian
- Fresh Water/Salt Water Interface
Blackhard Sandstone, (Big Injun) Miss. Cov.
- Fresh Water/Salt Water Interface
Lower Pottsville Maxton
- Fresh Water/Salt Water Interface
Upper Allegheny 2nd Cow Run

APPLICATION FOR A PERMIT (Form 1)
 OHIO DEPARTMENT OF NATURAL RESOURCES
 DIVISION OF OIL AND GAS RESOURCES MANAGEMENT
 2045 Morse Road, Building H-3
 COLUMBUS, OHIO 43229-6693
 (614) 265-6633

a P 40 20289

SEE INSTRUCTIONS ON PAGE 2 (BACK)

1. I, We (applicant) <u>OOGC DISPOSAL COMPANY</u>		2. Owner #: <u>2153</u>	
(address) <u>PO BOX 430, FRAZEYSBURG, OHIO 43822</u>		Phone #: <u>(740) 828-2891</u>	
hereby apply this date <u>1-Dec</u> , 20 <u>11</u> for a permit to:			
<input type="checkbox"/> Reissue (check appropriate blank)	<input type="checkbox"/> Revised Location	<input type="checkbox"/> Convert	
<input checked="" type="checkbox"/> Drill New Well	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Deepen	
<input type="checkbox"/> Drill Directionally	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Reopen	
<input type="checkbox"/> Drill Horizontally	<input type="checkbox"/> Orphan Well Program	<input type="checkbox"/> Temporary Inactive	
3. TYPE OF WELL:			
<input type="checkbox"/> Oil & Gas	<input type="checkbox"/> Annular Disposal	<input checked="" type="checkbox"/> Saltwater Injection	
<input type="checkbox"/> Stratigraphic Test	<input type="checkbox"/> Gas Storage	<input type="checkbox"/> Other (explain):	
<input type="checkbox"/> Solution Mining*	<input type="checkbox"/> Enhanced Recovery* (* if checked, select appropriate box below)		
<input type="checkbox"/> Input/Injection	<input type="checkbox"/> Water Supply	<input type="checkbox"/> Observation	<input type="checkbox"/> Production/Extraction
4. MAIL PERMIT TO: OOGC DISPOSAL COMPANY PO BOX 430 FRAZEYSBURG, OHIO 43822 ATTN: MR. BRIAN JONARD		20. TYPE OF TOOLS:	
		<input type="checkbox"/> Cable	<input type="checkbox"/> Air Rotary
		<input type="checkbox"/> Cable / Air Rotary	<input checked="" type="checkbox"/> Air / Fluid Rotary
		<input type="checkbox"/> Cable / Fluid Rotary	<input type="checkbox"/> Fluid Rotary
		<input type="checkbox"/> Cable / Air / Fluid Rotary	<input type="checkbox"/> Service Rig
5. COUNTY: <u>WASHINGTON</u>		21. PROPOSED CASING PROGRAM:	
6. CIVIL TOWNSHIP: <u>NEWPORT</u>			
7. SECTION: <u>29</u> 8. LOT:			
9. FRACTION:		11 3/4" - 100' CONDUCTOR	
10. QTR TWP:		5/8" - 2,000' (100' BELOW BERE A)	
11. TRACT / ALLOT:		1/2" - TOTAL DEPTH	
12. WELL #: <u>1</u>			
13. LEASE NAME: <u>SAWMILL RUN DISPOSAL WELL</u>			
14. PROPOSED TOTAL DEPTH: <u>~7,550'</u>			
15. PROPOSED GEOLOGICAL FORMATION: <u>CLINTON-MEDINA</u>		22. FIRE AND MEDICAL DEPARTMENT TELEPHONE NUMBERS: (closest to well site)	
16. DRILLING UNIT IN ACRES (must be same as acres indicated on plat):		Fire: <u>740-473-1506</u>	
		Medical: <u>740-373-2833</u>	
17. IF PERMITTED PREVIOUSLY:		23. MEANS OF INGRESS & EGRESS:	
API #: <u>NONE</u>		Township Road:	
OWNER:		County Road: <u>7N to 25N to 244E</u>	
WELL #:		Municipal Road:	
LEASE NAME:		State Highway:	
TOTAL DEPTH:			
GEOLOGICAL FORMATION:			
18. IF SURFACE RIGHTS ARE OWNED BY THE OHIO DEPARTMENT OF NATURAL RESOURCES		24. IS THE WELL LOCATION OR PRODUCTION FACILITIES WITHIN AN URBANIZED AREA AS DEFINED BY 1509.01(Y) ?	
Division Name:		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Division Phone:			
19. LANDOWNER ROYALTY INTEREST:			
Is There An Attached List? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Name:			
Address:			
Name:			
Address:			
Name:			
Address:			

I, the undersigned, being first duly sworn, depose and state under penalties of law, that I am authorized to make this application, that this application was prepared by me or under my supervision and direction, and that the facts stated herein are true, correct, and complete, to the best of my knowledge.

I, the undersigned, further depose and state that I am the person who has the right to drill on the tract or drilling unit and to drill into and produce from a pool and to appropriate the oil or gas that I produce therefrom either for myself or others as described in this application. And furthermore, I the undersigned, being duly sworn, depose and state at this time that I am not liable for any final nonappealable order of a court for damage to streets, roads, highways, bridges, culverts, or drainage ways pursuant to Section 5577.12 of the Ohio Revised Code (ORC). I, the undersigned, further depose and state that all notices required by 1509.06 (A) (9) ORC for this application have been duly provided by me. If applying for a permit to plug and abandon a well, I hereby certify that the written notices, as required in Section 1509.13, ORC, have been given.

That I hereby agree to conform with all provisions of Chapter 1509., ORC, and Chapter 1501., OAC, and all orders and conditions issued by the Chief, Division of Oil and Gas Resources Management.

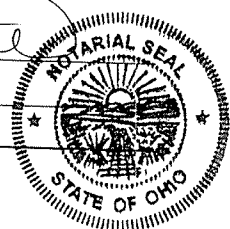
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Signature of Owner/Authorized Agent *Brian J. Jonard*
 Name (Type or Print) BRIAN J. JONARD Title PRESIDENT

If signed by Authorized Agent, a certificate of appointment of agent must be on file.
 Sworn to and subscribed before me this the 28 day of November, 2011

Desiree Milatovich
 (Notary Public)

 (Date Commission Expires)



DESIREE G. MILATOVICH
 Notary Public, State of Ohio
 My Commission Expires
 09-20-2014

**SUPPLEMENT TO APPLICATION
PERMIT FOR A SALTWATER INJECTION WELL (Form 210)**

Ohio Department of Natural Resources, Division of Oil and Gas Resources Management
2045 Morse Road, Bldg H3
Columbus, OH 43229-6693

AREA OF REVIEW. An application for a saltwater injection well (SWIW) will be evaluated on the basis of an "area of review" surrounding the proposed well. The area of review for wells in which injection of greater than two hundred barrels per day is proposed shall be the area circumscribed by a circle with the center point at the location of the injection well and a radius of one-half mile. The area of review for wells in which a maximum injection of two hundred barrels per day or less is proposed shall be the area circumscribed by a circle with the center point at the location of the injection well and a radius of one-quarter mile.

31. PROPOSED INJECTION ZONE

Geological Formation: CLINTON/MEDINA
 Injection Interval: From: 7207 feet to 7397
 Geologic description of injection zone: SANDSTONE

32. WELL CONSTRUCTION AND OPERATION

- A. Description of the proposed casing and cement program for new wells, or of the casing, cementing or sealing with prepared clay for existing wells to be converted:
11 3/4" CASING SET TO 100' AS CONDUCTOR AND CEMENTED TO SURFACE
8 5/8" CSG SET THROUGH BERE A (1809-1817) TO A DEPTH OF 1917 AND CEMENTED TO SURFACE
4 1/2" CSG SET THROUGH CLINTON/MEDINA TO A DEPTH OF 7550' CEMENTED ~500' ABOVE CLINTON
2 7/8" TUBING SET AT 7110' ON A PACKER
- B. Proposed method for testing the casing:
HYDRALIC PRESSURE TESTING OF TUBING CASING ANNULUS
- C. Description of the proposed method for completion and operation of the injection well:
PERFORATE SELECTED INTERVALS IN THE CLINTON AND MEDINA
ACIDIZE THE PERFORATIONS WITH 500 TO 1000 GALLONS OF ACID
FRACTURE STIMULATE THE CLINTON/MEDINA WITH ~200 SX OF SAND
- D. Description of the proposed unloading, surface storage, and spill containment facilities:
FLUIDS TO BE TRANSPORTED FROM OOG BELLS RUN FACILITY THROUGH A
HIGH PRESSURE PIPELINE CONSTANTLY MONITORED WITH SCADA SYSTEM
OOG TO MONITOR TUBING AND CASING ANNULUS WITH SCADA SYSTEM
OOG TO PERFORM PERIODIC PHYSICAL INSPECTION OF FACILITIES FOR POTENTIAL PROBLEMS

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33. PROPOSED INJECTION VOLUMES

- A. Indicate the estimated amount of saltwater to be injected into the proposed injection well per day:
 AVERAGE: 200BBL MAXIMUM: 1000BBL
- B. Indicate the method to be used to measure the actual amount of saltwater injected into the well:
METER

34. PROPOSED INJECTION PRESSURES

- A. Indicate the estimated pressure to be used for injection of saltwater into the proposed injection well:
 AVERAGE: 1800 MAXIMUM: 1973 **1970 psi**
- B. Indicate the method to be used to measure the actual daily injection pressure:
INJECTION VOLUMES AND ANNULAR PRESSURE TO BE REMOTELY MONITORED BY SCADA

35. PROPOSED CORRECTIVE ACTION

Explain any corrective action proposed for wells penetrating the proposed injection formation or zone within the area of review:
THERE ARE NO WELLS PENETRATING THE PROPOSED INJECTION ZONE WITHIN THE AREA OF REVIEW