

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

IN THE MATTER OF:

Chesapeake Appalachia, LLC	:	Violations of The Oil and Gas Act,
Tuscarora, Terry, Monroe, Towanda,	:	and The Clean Streams Law
and Wilmot Townships	:	
Bradford County	:	

CONSENT ORDER AND AGREEMENT

This Consent Order and Agreement is entered into this 16th day of May, 2011, by and between the Commonwealth of Pennsylvania, Department of Environmental Protection (hereinafter "Department"), and Chesapeake Appalachia, LLC (hereinafter "Chesapeake").

The Department has found and determined the following:

A. The Department is the agency with the duty and authority to administer and enforce the Oil and Gas Act, Act of December 19, 1984, P.L. 1140, as amended, 58 P.S. §§ 601.101-601.605 ("Oil and Gas Act"); The Clean Streams Law, Act of June 22, 1937, P.L. 1987, as amended, 35 P.S. §§ 691.1-691.1001 ("Clean Streams Law"); Section 1917-A of the Administrative Code of 1929, Act of April 9, 1929, P.L. 177, as amended, 71 P.S. §§ 510-17 ("Administrative Code"); and the rules and regulations promulgated thereunder (hereinafter "Regulations").

B. Chesapeake Appalachia, LLC (hereinafter "Chesapeake") is an Oklahoma Limited Liability Company authorized to do business in Pennsylvania which maintains a business address of P.O. Box 18496, Oklahoma City, OK 73154-0496.

C. Chesapeake constitutes a "person" as that term is defined by Section 103 of the Oil and Gas Act, 58 P.S. § 601.103, and by Section 1 of the Clean Streams Law, 35 P.S. § 691.1.

D. Chesapeake is the "owner" and "operator," as those terms are defined by Section 103 of the Oil and Gas Act, 58 P.S. § 601.103, of certain gas wells within the areas defined by the Department as follows: the _____ area of Towanda Township, Bradford County (hereinafter "_____ Area"); the _____ area in Tuscarora Township, Bradford County (hereinafter "_____ Area"); the Paradise Road area of Terry Township, Bradford County (hereinafter "Paradise Road Area"); the _____ area in Monroe Township, Bradford County (hereinafter "_____ Area"); the Sugar Run area of Wilmot Township, Bradford County (hereinafter "Sugar Run Area"); the Spring Hill Road area of Tuscarora Township, Bradford County (hereinafter "Spring Hill Road Area"); and the _____ residence. Maps of the _____ Area, _____ Area, Paradise Road Area, _____ Area, Sugar Run Area, Spring Hill Road Area, and _____ Area, are attached as Exhibit A and incorporated herein.

Area

E. In February of 2010, _____ contacted Chesapeake to complain about his water supply well producing black water and "churning."

F. Chesapeake responded and provided _____ with temporary replacement water.

G. On February 26, 2010, Chesapeake contacted the Department about the water well and the actions Chesapeake intended to take in response to _____ complaint.

H. The Department reviewed Chesapeake's planned tasks and asked that additional measures be taken, including on-site gas screening of residences, low lying areas, and springs/streams; and that the annulus pressures at the Miller, Farr and Kent well pads be checked.

I. Chesapeake carried out the additional measures requested by the Department.

J. On March 1, 2010, informed Chesapeake that a pond on his property was bubbling.

K. On March 3, 2010, Chesapeake installed a PVC riser pipe (vent stack) on the water well. An elevated concentration of methane was detected in the well headspace. Methane also was detected at low levels in the basement and upstairs of the residence.

L. On March 4, 2010, Chesapeake installed a methane monitor in the basement of the residence.

M. On March 24, 2010, a second landowner, , contacted Chesapeake about problems with his water well. Chesapeake responded and notified the Department.

N. Chesapeake installed methane monitoring equipment in a total of five residential locations in the area.

O. On March 29, 2010, with the approval of the Department, Chesapeake began remedial work at the Miller gas wells.

P. On April 13, 2010, the Department issued Chesapeake a Notice of Violation for the failure to prevent the migration of gas into sources of fresh groundwater and for defective casing or cementing of the Miller gas wells.

Q. By approximately April 20, 2010, visible water disturbance had subsided in the pond. Chesapeake drilled a new water well for the residence in May, 2010.

Area

R. On June 25, 2010, the Department received a complaint of bubbling in a beaver pond in Tuscarora Township, Bradford County.

S. The nearest gas wells to the beaver pond are operated by Chesapeake. Chesapeake's Sivers well pad is 1,700 feet from the pond and Chesapeake's Mowry 2 well pad is 3,600 feet from the beaver pond.

T. The Department notified Chesapeake of this complaint on June 30, 2010 and Chesapeake initiated an investigation.

U. On July 26, 2010, Chesapeake provided the Department with a summary of its investigation relating to the Sivers well pad, including an isotopic analysis of the gas emitted from the beaver pond and of gas found in the annular space of the surface casing of Chesapeake's wells on three surrounding pads. A plan of action was also submitted that called for modifying the wellbore construction, particularly with respect to cementing; additional testing; and implementing a 3-string casing design.

V. On August 6, 2010, the Department issued Chesapeake a Notice of Violation for the unpermitted discharge of polluting substances and failure to prevent the migration of gas into sources of fresh groundwater for the Sivers area.

W. On August 7, 2010, Chesapeake instituted a monitoring plan which included inspections of the beaver pond, private residences, and gas wells in the Sivers area.

X. Gas emitted from the beaver pond had similar characteristics to gas found in the annular space of the surface casing of Chesapeake's Mowry 2 gas well.

Y. Bubbling at the beaver pond continued from June 25, 2010, in diminishing amounts, to August 26, 2010.

Z. Chesapeake completed remedial work on their nearby gas wells between August 18, 2010, and August 30, 2010.

AA. Since August 26, 2010 to the present, no bubbling has been observed at the beaver pond.

Paradise Road Area

AB. On July 13, 2010, the Department became aware of water supply complaints by _____ and _____, who reside on Paradise Road, Terry Township, Bradford County.

AC. On July 15, 2010, the Department investigated the complaints and collected groundwater samples at the _____ residences.

AD. On July 21, 2010, the Department became aware of a water supply complaint by _____ also on Paradise Road, Terry Township, Bradford County. The Department investigated and collected samples of the _____ well on the same day.

AE. On August 2 and 3, 2010, Chesapeake collected water samples and installed methane alarm systems at the _____ residences.

AF. On August 6, 2010, the Department issued Chesapeake a Notice of Violation for the unpermitted discharge of polluting substances and failure to prevent the migration of gas into sources of fresh groundwater for the Paradise Road Area.

AG. Chesapeake has provided temporary replacement water, installed water well vent stacks, drilled replacement wells, and installed water treatment systems at the _____ residences.

AH. Isotopic analyses of gas from a residence and water wells in the Paradise Road Area indicate that the gas at the homes is not microbial in origin and is consistent with isotopic analyses of gas found in the annular space of surface casing of Chesapeake's Welles gas wells.

Area

AI. On August 4, 2010, Chesapeake responded to a landowner complaint of possible methane intrusion in a water supply at a home on Brockton Road, Monroe Township, Bradford

County. Chesapeake responded and, that same day, notified the Department that methane was detected in three private water supplies and one home along Brockton Road.

AJ. On August 6, 2010, the Department confirmed the presence of methane in the headspace of the three home water wells along Brockton Road.

AK. On August 6, 2010, Chesapeake instituted a monitoring plan of certain residences in the area of Chesapeake's Dan Ellis well pad, which is located approximately 4,700 feet to the South.

AL. On August 6, 2010, the Department issued Chesapeake a Notice of Violation for the unpermitted discharge of polluting substances and the failure to prevent the migration of gas into sources of fresh groundwater for the Dan Ellis area.

Sugar Run Area

AM. On September 2, 2010, the Department received information of bubbling in the Susquehanna River near the community of Sugar Run, in Wilmot Township, Bradford County.

AN. On September 3, 2010, the Department inspected the Sugar Run Area and found gas bubbling at numerous locations in the Susquehanna River. A sample of the gas was collected and sent to an independent laboratory to be analyzed. In addition, the Department inspected numerous residential dwellings in the Sugar Run Area and found methane in several water supply wells.

AO. On September 3, 2010, Chesapeake began screening the locations of bubbling in the river, certain residential water wells, and soils in the Sugar Run Area.

AP. On September 7, 2010, the Department collected water samples from the potentially impacted water wells in the Sugar Run Area.

AQ. Chesapeake installed vent stacks on water supply wells at residences in the Sugar Run Area owned or occupied by

and . Chesapeake also provided temporary replacement water for

AR. On September 9, 2010, the Department issued Chesapeake a Notice of Violation for the unpermitted discharge of polluting substances and the failure to prevent the migration of gas into sources of fresh groundwater for the Sugar Run Area.

Spring Hill Road Area

AS. On September 16, 2010, Chesapeake notified the Department that methane gas was detected in a water supply located along Spring Hill Road in Tuscarora Township, Bradford County.

AT. The nearest drilled Marcellus well, Chesapeake's Champdale well, is approximately 880 feet from the water supply referenced in paragraph AT, above.

AU. On September 24, 2010, the Department issued Chesapeake a Notice of Violation for the unpermitted discharge of polluting substances and the failure to prevent the migration of gas into sources of fresh groundwater for the Spring Hill Road Area, and for defective casing or cementing of the Champdale/Champluvier gas wells.

Residence

AV. On or about June 24, 2010, contacted Chesapeake with a complaint about their water at in Granville Township, Bradford County. Chesapeake initiated an investigation and determined that an elevated concentration of methane gas was present in the well headspace.

AW. A water sample collected from the water supply on June 26, 2010, indicated an elevated level of methane.

AX. On July 8, 2011, filed a complaint with the Department alleging her water supply had been impacted by gas drilling activity.

AY. On July 14, 2010, methane was detected in the headspace of the water well.

AZ. On September 15, 2010, the Department issued Chesapeake a Notice of Violation for the unpermitted discharge of polluting substances and the failure to prevent the migration of gas into sources of fresh groundwater.

Additional Investigations

AAA. Since August of 2010, the Department has inspected various Chesapeake gas wells in the Sivers, Dan Ellis, Paradise Road, Sugar Run, and Spring Hill Road Areas. As a follow-up and precaution, Chesapeake has perforated and squeezed additional cement behind the casing in a number of its gas wells in the subject areas.

AAB. In the course of its investigation, the Department has collected water samples from drinking water wells at residences in the Paradise Road, Dan Ellis, Sugar Run, and Spring Hill Road Areas. The Department also has collected isotopic gas samples to compare the gas from various gas wells drilled by Chesapeake to gas from various locations.

Determination of Discharge of Natural Gas into the Groundwater

AAC. Chesapeake has caused or allowed the unpermitted discharge of natural gas, a polluting substance, into the groundwater, which constitutes a "water of the Commonwealth" as that term is defined in 35 P.S. §691.1, in violation of Section 401 of the Clean Streams Law, 35 P.S. §691.401.

AAD. As of the date of this Consent Order and Agreement, Chesapeake has taken certain actions approved by the Department to prevent the ongoing, unpermitted discharge of natural gas into the waters of the Commonwealth.

Determination of Gas Migration Violations

AAE. Chesapeake failed to properly case and cement the gas wells and to prevent the migration of gas into sources of fresh groundwater in violation 25 Pa. Code §§ 78.73(a), 78.81(a), and 78.86, as in effect prior to February 5, 2011.

AAF. The violations described in Paragraphs AAC through AAE, above constitute unlawful conduct under the laws and regulations administered by the Department, including Section 509, of the Oil and Gas Act, 58 P.S. § 601.509 and Section 611 of the Clean Streams Law, 35 P.S. § 691.611; constitute a public nuisance under Section 502 of the Oil and Gas Act, 58 P.S. § 601, and Section 401 of the Clean Streams Law, 35 P.S. § 691.401; require restoration or replacement of certain water supplies pursuant to Section 208 of the Oil and Gas Act, 58 P.S. § 601.208 and 25 Pa. Code § 78.51; and subject Chesapeake to civil penalty liability under Section 506, of the Oil and Gas Act, 58 P.S. § 601.506 and Section 605 of the Clean Streams Law, 35 P.S. §§ 691.605.

Order

After full and complete negotiation of all matters set forth in this Consent Order and Agreement, and upon mutual exchange of the covenants contained herein, the parties desiring to avoid litigation and intending to be legally bound, it is hereby ORDERED by the Department and AGREED to by Chesapeake as follows:

1. **Authority.** This Consent Order and Agreement is an Order of the Department authorized and issued pursuant to Section 503, of the Oil and Gas Act, 58 P.S. § 601.503; Section 5 of the Clean Streams Law, 35 P.S. § 691.5; and Section 1917-A of the Administrative Code, supra.

2. Findings.

a. Chesapeake agrees that the findings in Paragraphs A through AAB above are true and correct and, in any matter or proceeding involving Chesapeake and the Department, Chesapeake shall not challenge the accuracy or validity of these findings.

b. The parties do not authorize any other persons to use the findings in this Consent Order and Agreement in any matter or proceeding.

c. Chesapeake disagrees with the determinations stated in Paragraphs AAC through AAF above.

3. Corrective Actions.

a. Within fourteen (14) days after the date of this Consent Order and Agreement, Chesapeake shall submit to the Department, for review and approval, a plan which:

1) includes a list of all gas wells drilled by or on behalf of Chesapeake in the areas depicted on Exhibit A and identifies the number of casings used in each well and the depth to which the strings of casing are set;

2) includes the defined logging protocol (hereinafter "wellbore evaluations") which Chesapeake shall employ to evaluate the integrity of wells appearing on the list submitted pursuant to Paragraph 3.a.1), identification of a hierarchy of the wells that will be so evaluated, and an explanation of the rationale for selecting the hierarchy of such wells, above;

3) includes an implementation schedule not to exceed six (6) months which sets forth, at a minimum, the date on which Chesapeake shall commence the wellbore evaluation on the wells identified for evaluation pursuant to Paragraph 3.a.2), above; and

4) identifies the actions Chesapeake shall take to analyze each and every gas well identified for evaluation pursuant to Paragraph 3.a.2), above, and recommendations for the rehabilitation work necessary to control and mitigate shut-in surface casing pressure and stray gas from those wells;

b. Within five (5) days of approval by the Department, Chesapeake shall implement the plan submitted pursuant to Paragraph 3.a., above, as approved by the Department;

c. Within seven (7) days of the date of the approval of the plan submitted pursuant to Paragraph 3.a, above, Chesapeake shall begin pressure testing of each accessible annuli on each of the gas wells identified for evaluation pursuant to Paragraph 3.a.2), above. Chesapeake shall pressure test each annuli for forty-eight (48) consecutive hours, and shall provide the test results for each tested well within five (5) days of completion of the pressure test on each respective well. At least twenty-four (24) hours before Chesapeake begins pressure testing in accordance with this Paragraph, Chesapeake shall provide the Department written notice of the gas well to be tested, and the date and approximate time that Chesapeake shall begin such pressure test.

d. Within sixty (60) days of the date of the approval of the plan submitted pursuant to Paragraph 3.a, above, in all cases Chesapeake shall have completed the 48-hour pressure test of the annuli on all of the gas wells identified pursuant to Paragraph 3.a.2), above, and shall provide the Department with the results of the pressure tests for all of those wells.

e. Every other Monday following the approval of the plan submitted pursuant to Paragraph 3.a., above, Chesapeake shall submit a report containing the following information for each well identified pursuant to Paragraph 3.a.2):

1) the status of the work at each well (i.e., 'Deemed Finished,' 'In Progress,' or 'Scheduled');

2) Chesapeake's analysis of each well's logs and recommended actions to be taken based on all of the information available to Chesapeake.

3) For wells In Progress:

i. the date logged; date or dates on which cement was squeezed; depth of squeezes; date and time the 48-hour casing pressure build-up test was started, supported by information in the form of a chart or digital recording;

ii. a daily well work activity summary, separate from any monitoring report, that includes a brief description of that work and of the wellhead's status; and

iii. Chesapeake's daily completion reports, including all of the days of work on each well.

f. Chesapeake's obligation to submit the weekly reports required in Paragraph 3.e. shall terminate when the Department determines in writing that Chesapeake has eliminated the unpermitted discharge of natural gas into the waters of the Commonwealth from any well owned and/or operated by Chesapeake within the areas of Bradford County identified in Paragraph D, above, in this Consent Order and Agreement.

4. **Specifications of New Wells.** All gas wells drilled by or on behalf of Chesapeake in the areas identified in Paragraph D, above on or after the date of this Consent Order and Agreement shall be cased and cemented in a manner consistent with the specifications and practices described in Exhibit D unless, based on conditions observed in advance of or at the time of drilling, Chesapeake determines that alternate specifications or practices are warranted.

In the event that Chesapeake determines that alternate specifications or practices are warranted, Chesapeake shall notify the Department of the alternate specifications or practices utilized.

5. **Installation of Pressure Gauges.** Within ninety (90) days after the date of this Consent Order and Agreement, Chesapeake shall install pressure gauges on all existing wells within the areas described in Paragraph D, above, at the surface and intermediate casing ports in a manner allowing pressures to be inspected at any time by the Department. Chesapeake shall install such gauges on all wells drilled by or on behalf of Chesapeake within the areas described in Paragraph D, above, on or after the date of this Consent Order and Agreement.

6. **Reporting Water Supply Complaints.** Attached as Exhibit B is a Protocol For Reporting Water Supply Complaints identifying (i) the procedures Chesapeake shall implement within the areas identified in Paragraph D, above, to report to the Department water supply complaints within twenty four (24) hours after Chesapeake receives any such complaint, in accordance with 25 Pa. Code § 78.51(h) (effective February 5, 2011); (ii) the actions Chesapeake shall take to investigate any such complaint; (iii) the information to be reported to the Department based on such investigation; and (iv) the timing and form of such reports. Chesapeake shall implement the plan for any future complaint within the areas identified in Paragraph D, above.

7. **Remediation of Water Supplies.**

a. Beginning upon execution of this Consent Order and Agreement, with respect to the water supplies listed on Exhibit C, Chesapeake shall:

- 1) at least once every two weeks, screen the well at each water supply listed in Exhibit C for percentage of free combustible gas, and sample the well at each of those water supplies, provided the landowner consents to such screening and sampling;

2) for each water sample collected at a water supply listed in Exhibit C, Chesapeake shall have the water sample analyzed in a Pennsylvania-accredited laboratory for dissolved methane, dissolved ethane, and dissolved propane;

3) Chesapeake shall continue to conduct the screening and sampling under Paragraph 7.a.1), above, once every two weeks at each water supply listed in Exhibit C, provided the landowner consents, until the results of the screenings and sampling done by the Department or by Chesapeake under Paragraph 7.a.1), above, show (A) that either no combustible free gas is present at the water supply's wellhead, or, that such levels of combustible free gas, if properly vented pursuant to applicable regulations and Department practice, do not pose a danger to persons or property *and* (B) that the concentration of dissolved methane is below 7 milligrams/liter. However, Chesapeake may petition the Department, based on information obtained in accordance with this Paragraph for a determination that the concentration of methane in the water supply is at background levels for the aquifer that supplies the water supply. Chesapeake may further petition the Department for a determination that the concentration of combustible free gas at the wellhead is at levels that do not present a danger to persons or property if properly vented according to applicable regulations and Department practice;

4) for each water supply that meets the standards under Paragraph 7.a.3), above, or for which a plan has been submitted and approved pursuant to Paragraph 7.b and 7.c, Chesapeake shall continue to screen each such water supply for free combustible gas and shall sample each such water supply at least once per quarter, and shall have the water sample analyzed in a Pennsylvania-

accredited laboratory for the parameters listed in Exhibit E, provided the landowner consents to such screening and sampling; and

5) unless the Department determines that the concentration of methane in the water supply is at background levels for the aquifer that supplies the water supply, Chesapeake shall continue such screenings and sampling under paragraph 7.a.4), above, for each quarter until the results of the screenings and sampling done by the Department and by Chesapeake under this Paragraph 7 show that, for eight consecutive quarters, seventy-five percent (75%) of the water samples within each monitoring point over time contain seven (7) milligrams per liter or less of dissolved methane (or meets the standard then prescribed by applicable regulations), and no individual water sample exceeds two times this standard.

b. If after 60 days beyond the date of this Consent Order and Agreement, the dissolved methane is equal to or greater than 7 mg/l, or the measured free gas in the headspace is greater than 25% of the L.E.L., then Chesapeake shall submit to the Department for review and approval a plan and schedule to address each water supply listed on Exhibit C, including such remedial actions as Chesapeake may already have implemented. The quality of a restored or replaced water supply will be deemed adequate if it meets the standards established under the Pennsylvania Safe Drinking Water Act (35 P.S. §§ 721.1—721.17), or is comparable to the quality of the water supply before it was affected if that water supply did not meet these standards. Despite the filing of such a plan, Chesapeake shall remain obligated to monitor and screen such water supplies as required by this Paragraph 7.

c. Within fourteen (14) days of the Department's approval of any plan submitted pursuant to Paragraph 7.b., above, Chesapeake shall fully implement that plan as approved by the Department, subject to any determination by the Department that the concentration of methane in the water supply is at background or otherwise acceptable levels for the aquifer that supplies the water supply and the concentration of combustible free gas at the wellhead is at levels that do not present a danger to persons or property if properly vented according to applicable regulations and Department practice.

d. In the event that the owner of a residence identified in Exhibit C does not allow Chesapeake to fully implement the plan approved by the Department pursuant to Paragraph 7.d., above, then for each such residence Chesapeake shall establish an escrow account, or a common account for all such residences, in an amount approved by the Department to be used for the exclusive purpose of funding all of the expenses associated with providing either a treatment system or a replacement permanent water supply to the residence(s).

e. Chesapeake shall be responsible for paying any fees, charges, or taxes associated with every required escrow account or any common account.

f. Chesapeake shall maintain each escrow account, or the common account, until such time as the occupants of the residence(s) for which the account has been established notify Chesapeake in writing that installation of a treatment system or a replacement permanent water supply either has occurred at the residence owner's expense, or the funds in the escrow account may be used to install a permanent water supply at the residence.

g. Within thirty (30) days of the Department's receipt of notice that the funds in an escrow account may be used to install a treatment system or a replacement

permanent water supply at a residence, Chesapeake shall make all necessary arrangements with any necessary vendors or contractors for the purchase and installation of a treatment system or replacement permanent water supply at the residence at issue. Chesapeake shall provide copies of the paid invoice(s) from the vendors or contractors to the Department.

h. Within fourteen (14) days of receiving the paid invoice(s) for the purchase and installation of the treatment system or replacement permanent water supply, the Department shall draw on the appropriate escrow account, or the common account, in the amount necessary to reimburse Chesapeake for the payments to the vendors or contractors for such.

i. Following the purchase and installation of any system or water supply using funds drawn against an escrow account, Chesapeake shall maintain the escrow account to secure the long term operation and maintenance expenses of such systems or supply.

j. In the absence of any notification referenced in Paragraph 7.g., Chesapeake shall maintain each escrow account, or the common account, until such time as other arrangements for disposition of the escrow account are made by the Department.

8. **Sampling Protocol.** All water samples gathered and analyzed by or on behalf of Chesapeake, and submitted to the Department pursuant to this Consent Order and Agreement, shall be collected in accordance with the following protocol, or other method approved by the Department:

After purging the well, fill the 5 gallon bucket with water. Attach a nozzle and 12" length of ¼ inch diameter tubing to the end of the 5/8 inch hose connected to a faucet. Make sure that the flow rates through the tubing are low. Remove the cap of the 1 L bottle (or vial) and fill it

with water. Once the bottle filled, immerse it in the 5 gallon bucket full of water, keeping the tubing at the bottom of the bottle. Place the bottle at the bottom of the bucket under a head of water, and keep water flowing at a low rate until another 2 volumes of water have been displaced from the bottle. Then slowly lift the tubing out of the bottle and immediately cap it under water. No air should be allowed into the 1 L bottle. When finished, tape the cap to the bottle around the neck, pack the bottle upside down in ice, and ship it overnight.

9. **Submission of Documents.** With regard to any document that Chesapeake is required to submit pursuant to this Consent Order and Agreement, the Department will review Chesapeake's document and will approve, modify or disapprove the document, or a portion thereof, in writing. If the document, or any portion of the document, is found to be deficient by the Department, within 14 days of receipt of the deficiencies, Chesapeake shall submit a revised document to the Department that addresses the Department's concerns. The Department will approve, modify or disapprove the revised document in writing. Upon approval by the Department, the document, and any schedule therein, shall become a part of this Consent Order and Agreement for all purposes and shall be enforceable as such.

10. **Civil Penalty Settlement.** In settlement of any claim for civil penalties which the Department is authorized to pursue under law, including Section 506 of the Oil and Gas Act, 58 P.S. § 601.506, and Section 605 of the Clean Streams Law, 35 P.S. §§ 691.605, the Department hereby assesses a civil penalty of Seven Hundred Thousand Dollars (\$700,000) for the violations set forth in the Findings, above. The payment shall be made by corporate check or the like, made payable to the "Commonwealth of Pennsylvania," and forwarded to the Department pursuant to Paragraph 17, below, or by an alternate method approved by the Department, within five days of execution of the Consent Order and Agreement.

11. **Donation to Well Plugging Fund.** Chesapeake agrees to donate Two Hundred Thousand Dollars (\$200,000) to the Department's Well Plugging Fund. Chesapeake shall make such payment in the manner described in Paragraph 10, within five days of execution of the Consent Order and Agreement.

12. **Stipulated Civil Penalties.**

a. **If Chesapeake fails to comply with any provision of this Consent Order and Agreement, Chesapeake shall be in violation of this Consent Order and Agreement and, in addition to other applicable remedies, shall pay a civil penalty as follows:** If Chesapeake fails to comply with any obligation imposed upon it pursuant to this Consent Order and Agreement, Chesapeake shall be in violation of this Consent order and Agreement, and, in addition to other applicable remedies, shall pay a civil penalty in the amount of One Thousand Dollars (\$1000) per day for each day, or any portion thereof, that Chesapeake fails to comply with its obligation.

b. Stipulated civil penalties shall be due automatically without further notice on or before the 15th day of each succeeding month, shall be made by corporate check or the like made payable to "Commonwealth of Pennsylvania," and shall be sent to the Department at the address set forth in Paragraph 17, below.

c. Any payment under this Paragraph shall neither waive Chesapeake's duty to meet its obligations under this Consent Order and Agreement, nor preclude the Department from commencing an action to compel Chesapeake's compliance with the terms and conditions of this Consent Order and Agreement for which payment is made.

13. **Additional Remedies.**

a. In the event Chesapeake fails to comply with any provision of this Consent Order and Agreement, the Department may, in addition to the remedies

prescribed herein, pursue any remedy available for a violation of an order of the Department.

b. The remedies provided by this paragraph and Paragraph 12 (Stipulated Civil Penalties) are cumulative and the exercise of one does not preclude the exercise of any other. The failure of the Department to pursue any remedy shall not be deemed to be a waiver of that remedy. The payment of a stipulated civil penalty, however, shall preclude any further assessment of civil penalties for the violation for which the stipulated civil penalty is paid.

14. **Reservation of Rights.** The Department reserves the right to require additional measures to achieve compliance with applicable law. Chesapeake reserves the right to challenge any action which the Department may take to require those measures.

15. **Liability of Chesapeake.** Chesapeake shall be liable for any violations of the Consent Order and Agreement, including those caused by, contributed to, or allowed by its officers, directors, agents, employees, contractors, successors, and assigns.

16. **Transfer of Gas Wells.**

a. Chesapeake's duties and obligations under this Consent Order and Agreement shall not be modified, diminished, terminated or otherwise altered by the transfer of any legal or equitable interest in any of the gas wells identified on the list submitted pursuant to paragraph 3.a.1), above, or any other Chesapeake gas wells covered hereby.

b. If before the termination of this Consent Order and Agreement, Chesapeake intends to transfer any legal or equitable interest in any of the gas wells on the list submitted pursuant to paragraph 3.a.1), above, Chesapeake shall provide a copy of this Consent Order and Agreement to the prospective transferee at least thirty (30) days

prior to the contemplated transfer and shall simultaneously inform the Department of such intent at the address set forth in Paragraph 17, below.

c. The Department, in its discretion, may agree to modify or terminate Chesapeake's duties and obligations under this Consent Order and Agreement and may agree to a transfer upon determination that Chesapeake is in full compliance with this Consent Order and Agreement, including payment of any stipulated penalties owed, and upon the transferee entering into a Consent Order and Agreement with the Department concerning the gas wells at issue. Chesapeake agrees to waive any right that it may have to challenge the department's decision in this regard.

17. Correspondence with Department. All correspondence with the Department concerning this Consent Order and Agreement shall be addressed to:

Jennifer W. Means
Environmental Program Manager
Eastern Region Oil and Gas Management
Department of Environmental Protection
208 West Third Street – Suite 101
Williamsport, PA 17701-6448
Phone (business hours): (570) 321-6557
Phone (non-business hours): (570)327-3636
e-Mail: jenmeans@state.pa.us

18. Correspondence with Chesapeake. All correspondence with Chesapeake concerning this Consent Order and Agreement shall be addressed to:

Tal Oden
Regulatory Manager North, East Division
Chesapeake Energy Corporation
P.O. Box 18496
Oklahoma City, OK 73154
Phone: (405) 935-4073
e-Mail: tal.oden@chk.com

Chesapeake shall notify the Department whenever there is a change in the contact person's name, title, or address. Service of any notice or any legal process for any purpose under this

Consent Order and Agreement, including its enforcement, may be made by mailing a copy by first class mail to the above address.

19. **Severability.** The paragraphs of this Consent Order and Agreement shall be severable and should any part hereof be declared invalid or unenforceable, the remainder shall continue in full force and effect between the parties.

20. **Entire Agreement.** This Consent Order and Agreement shall constitute the entire integrated agreement of the parties. No prior or contemporaneous communications or prior drafts shall be relevant or admissible for purposes of determining the meaning or intent of any provisions herein in any litigation or any other proceeding.

21. **Attorneys Fees.** The parties shall bear their respective attorney fees, expenses and other costs in the prosecution or defense of this matter or any related matters, arising prior to execution of this Consent Order and Agreement.

22. **Modifications.** No changes, additions, modifications, or amendments of this Consent Order and Agreement shall be effective unless they are set out in writing and signed by the parties hereto.

23. **Titles.** A title used at the beginning of any paragraph of this Consent Order and Agreement may be used to aid in the construction of that paragraph, but shall not be treated as controlling.

24. **Decisions under Consent Order and Agreement.** Except for Paragraph 16.c., above, any decision which the Department makes under the provisions of this Consent Order and Agreement, including a notice that stipulated civil penalties are due, is intended to be neither a final action under 25 Pa. Code § 1021.2, nor an adjudication under 2 Pa. C.S. § 101. Any objection which Chesapeake may have to the decision will be preserved until the Department enforces this Consent Order and Agreement.


25. **Termination.** Chesapeake's obligations, but not the Findings, of this Consent Order and Agreement shall terminate when the Department provides written notice that Chesapeake has completed all of the requirements of this Consent Order and Agreement, and has paid any outstanding stipulated civil penalties due under Paragraph 12, above.

26. **Execution of Agreement.** This Consent Order and Agreement may be signed in counterparts, each of which shall be deemed to be an original and all of which together shall constitute one and the same instrument. Facsimile signatures shall be valid and effective.

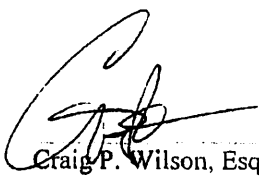
IN WITNESS WHEREOF, the parties hereto have caused this Consent Order and Agreement to be executed by their duly authorized representatives. The undersigned representatives of Chesapeake certify under penalty of law, as provided by 18 Pa. C.S. § 4904, that they are authorized to execute this Consent Order and Agreement on behalf of Chesapeake; that Chesapeake consents to the entry of this Consent Order and Agreement as a final Order of the Department; and that Chesapeake hereby knowingly waives its rights to appeal this Consent Order and Agreement and to challenge its content or validity, which rights may be available under Section 4 of the Environmental Hearing Board, the Act of July 13, 1988, P.L. 530, No. 1988-94, 35 P.S. § 7514; the Administrative Agency Law, 2 Pa. C.S. § 103(a) and Chapters 5A and 7A; or any other provision of law.

Signature by Chesapeake's attorney certifies only that the agreement has been signed after consulting with counsel.

FOR CHESAPEAKE APPALACHIA, L.L.C.:



John K. Reinhart
Vice President, Operations-Eastern Division

13 MAY 11
(Date)

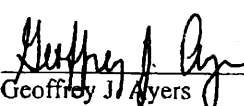

Craig P. Wilson, Esq.
Attorney for Chesapeake Appalachia, L.L.C.

5-13-11
(Date)

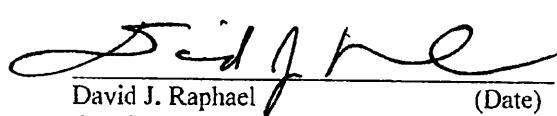
FOR THE COMMONWEALTH OF
PENNSYLVANIA, DEPARTMENT OF
ENVIRONMENTAL PROTECTION:


Jennifer W. Means
Environmental Program Manager
East Region Oil & Gas Management

5/13/11
(Date)


Geoffrey J. Ayers
Regional Counsel
Northcentral Region

5/13/2011
(Date)


David J. Raphael
Chief Counsel
Department of Environmental Protection

5/16/11
(Date)

Exhibit A

Maps of:

Miller/ Area

Sivers Area

Paradise Road Area

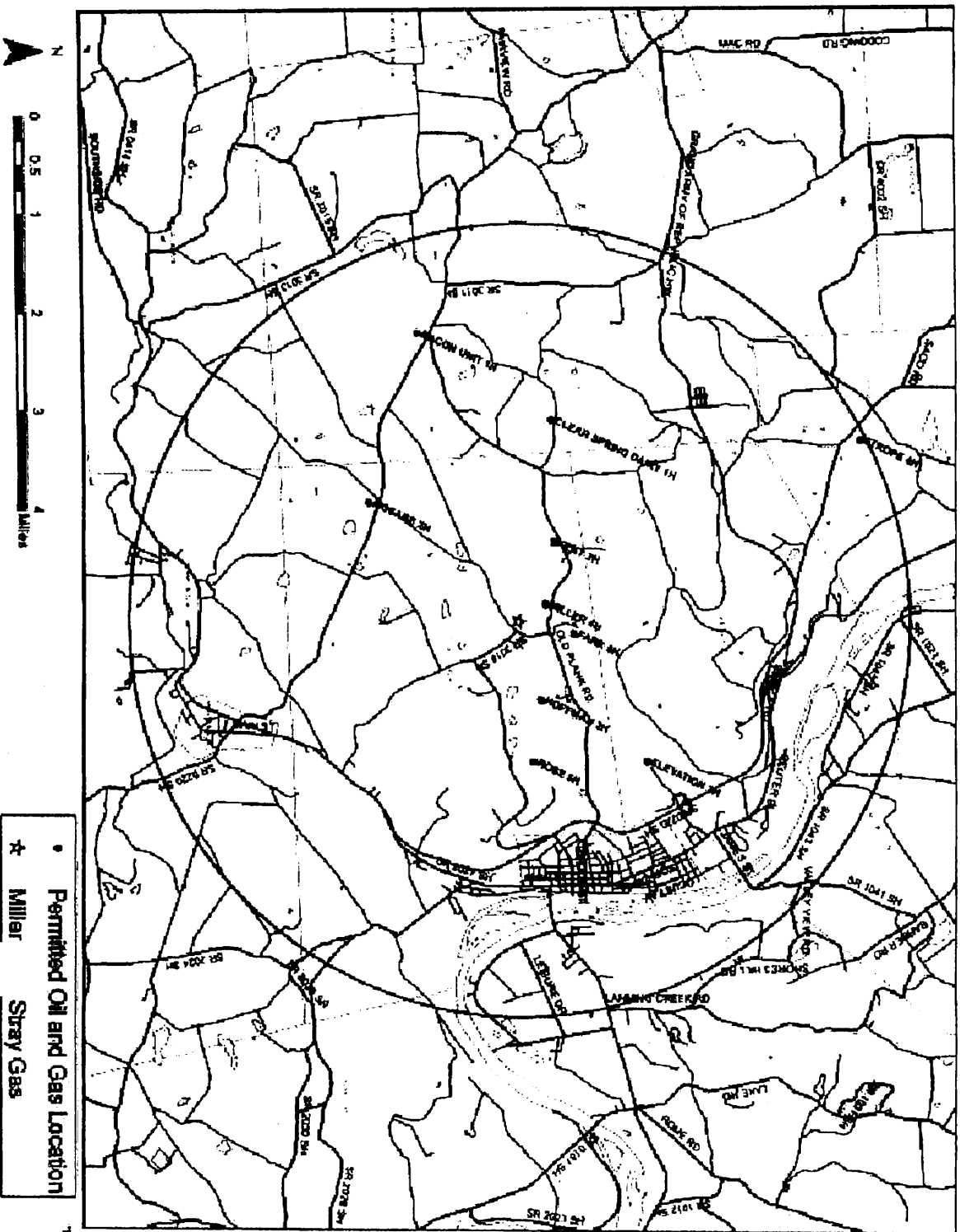
Dan Ellis Area

Sugar Run Area

Spring Hill Area

Area

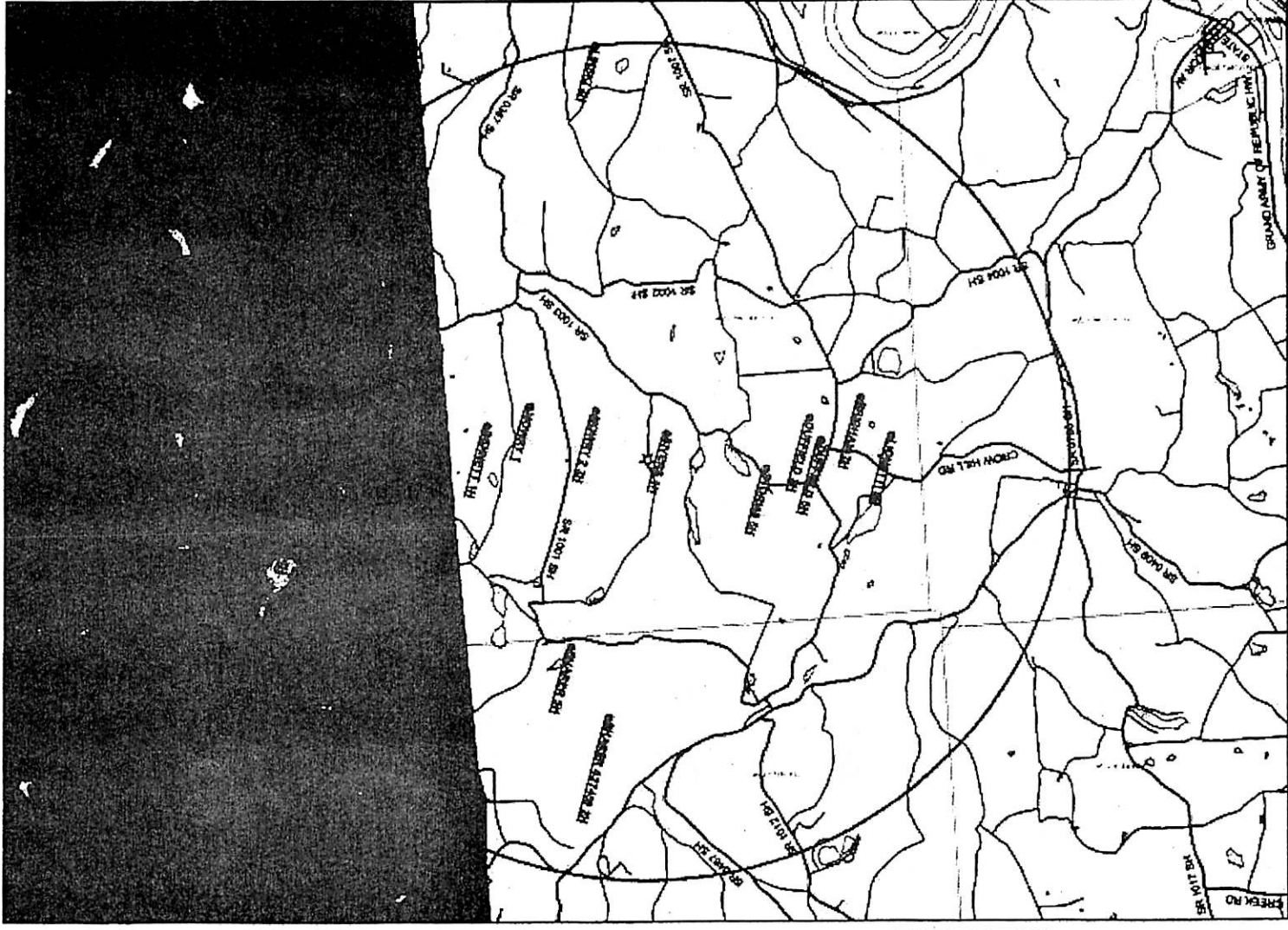
Miller / Stray Gas Area - 4 Mile Radius



• Permitted Oil and Gas Location
 ★ Miller Stray Gas

Permitted Oil and Gas Locations must contain multiple wells per location. Refer to attached table.

Sivers Beaver Pond Stray Gas Area - 4 Mile Radius

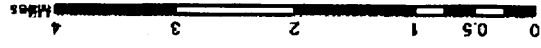


- ☆ Sivers Beaver Pond Stray Gas
- Permitted Oil and Gas Wells

0 0.5 1 2 3 4 Miles



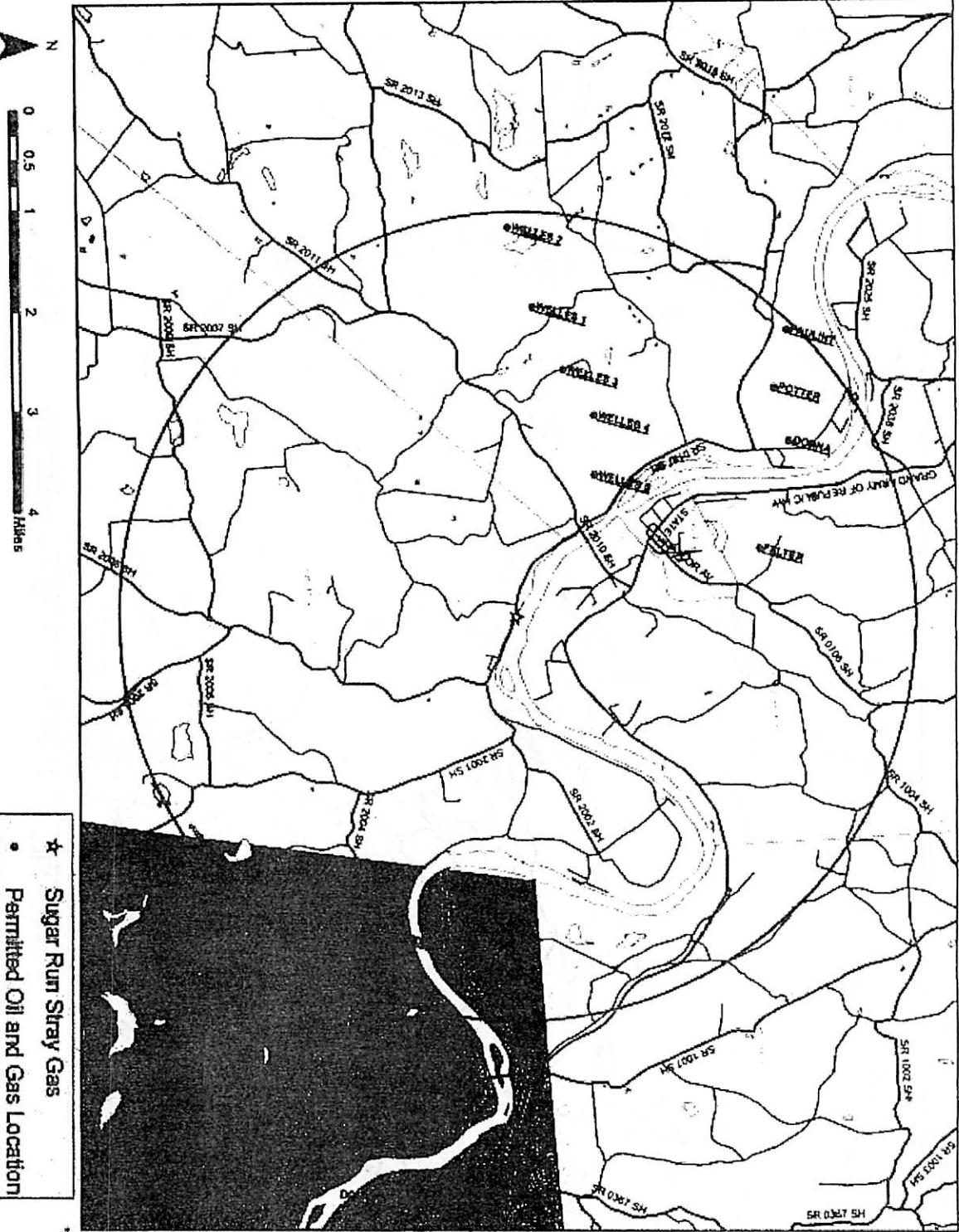
Permitted Oil and Gas Locations must contain multiple wells per location. Refer to attached table.



<ul style="list-style-type: none"> • Permitted Oil and Gas Locations ★ Dan Ellis Brocktown Stray Gas
--

attached. Each Gas Location must contain multiple wells per location. Refer to attached table.

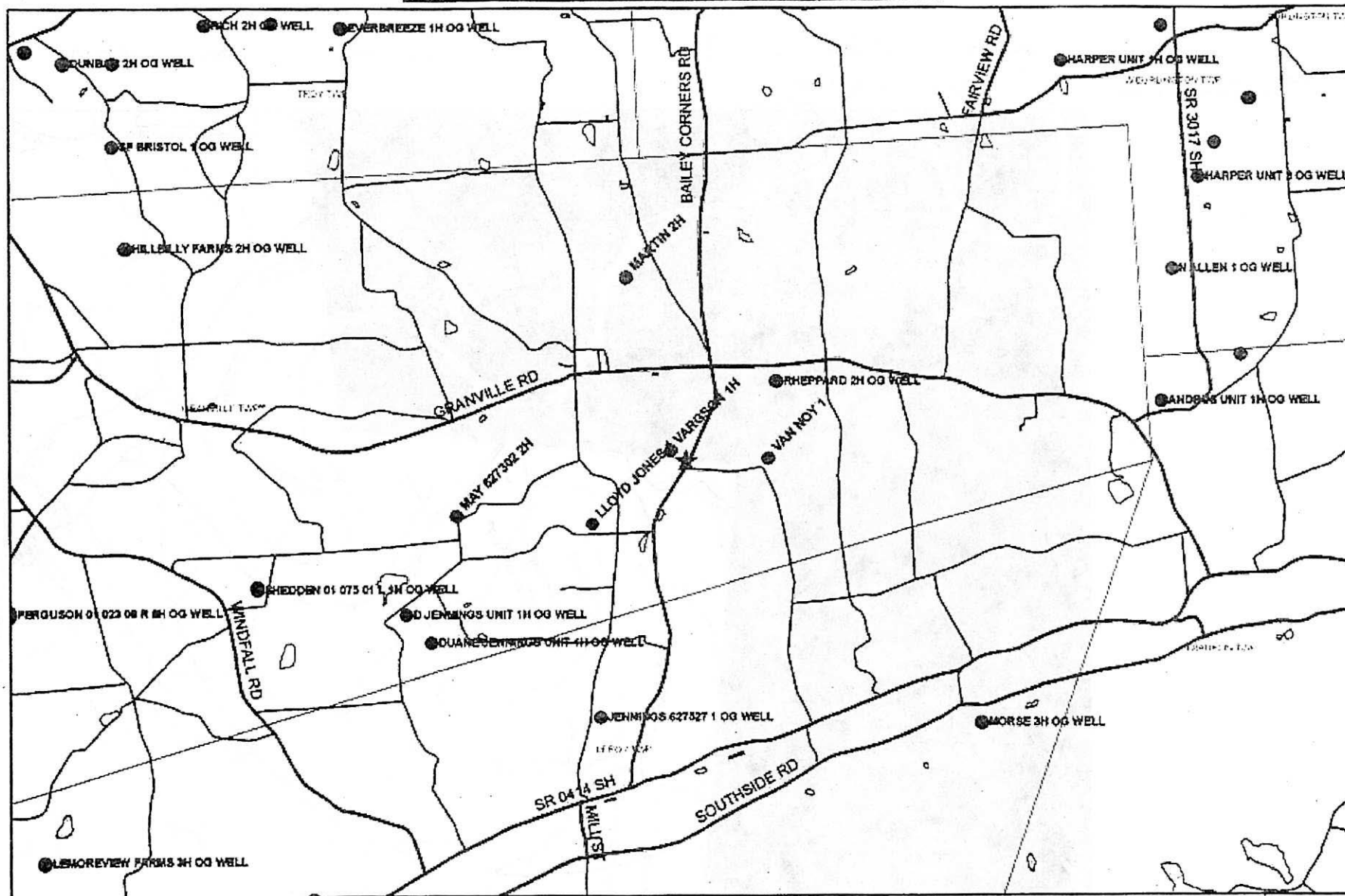
Sugar Run Stray Gas Area - 4 Mile Radius



Permitted Oil and Gas Locations may contain multiple wells per location. Refer to attached table.



- Granville Twp., Bradford County



0 0.5 1 2 3 4 Miles

- Investigated Gas Wells
- Oil and Gas Well
- ★ Water Supply

4/12/2011

EXHIBIT B

PROTOCOL FOR REPORTING WATER SUPPLY COMPLAINTS

(1) Reporting of water supply complaints – combustible gas detected = 10 % LEL

If combustible gas is detected inside a building or structure at a concentration equal to or greater than 10 % LEL, then (A) immediate notification shall be made to the Department, (B) a report shall be filed with the Department by phone and email within 24 hours after the interview with the complainant and field survey of the extent of natural gas, and (C) weekly reports shall be provided to the Department in accordance with (3) and (4) below.

(2) Investigating water supply complaints

All investigations of potential gas migration incidents shall be conducted in accordance with 25 Pa. Code § 78.89, or as subsequently prescribed by applicable regulation.

(3) Information to be reported to the Department

Weekly reports required by (1)(C) above shall include, in addition to what is required pursuant to 25 Pa. Code § 78.89, the following:

- (A) The location and type of all gas monitoring equipment installed;
- (B) Results of methane readings, if any, in tabular form and including % of methane by volume and % of LEL, from each potentially affected location (water wells, headspace, surface water);
- (C) Results of water chemistry data from water well samples and surface water samples, when available, including the location of each sampling point; and
- (D) An explanation of any corrective actions undertaken, including a description of any equipment installed.

The first weekly report submitted in connection with any investigation shall identify the nearest Chesapeake gas well and include the following well construction information: well depth, number of casings, length of each casing string, wellbore evaluation results, caliper logs, and cement returns.

The first weekly report submitted in connection with any investigation also shall identify the latitude and longitude and street address of each home, business, farm, water well, surface water body, and structure implicated by the complaint, and the owner or occupier of such.

(4) Timing and form of reports

Weekly reports required by (1)(C) above shall be submitted each Monday, beginning one week after the 24-hour report has been made to the Department in accordance with (1)(B) above. The obligation to submit weekly reports shall continue until a final report is submitted for the incident.

EXHIBIT C

List of Water Supplies

Determination letters pursuant to Section 208(b) of the Oil and Gas Act

Sugar Run

Sugar Run, PA	18846
Sugar Run, PA	18846
Sugar Run, PA	18846
Sugar Run, PA	18846
Sugar Run, PA	18846
Sugar Run, PA	18846
Gettysburg, PA	17325

Paradise Rd

Wyalusing, PA	18853
Wyalusing, PA	18853
Wyalusing, PA	18853

Brocktown/Dan Ellis

Monroeton, PA	18832
Monroeton, PA	18832
Monroeton, PA	18832

Springhill Rd

Laceyville, PA	18623
Laceyville, PA	18623

Vargson

Granville Summitt, PA	16926
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No determination letter

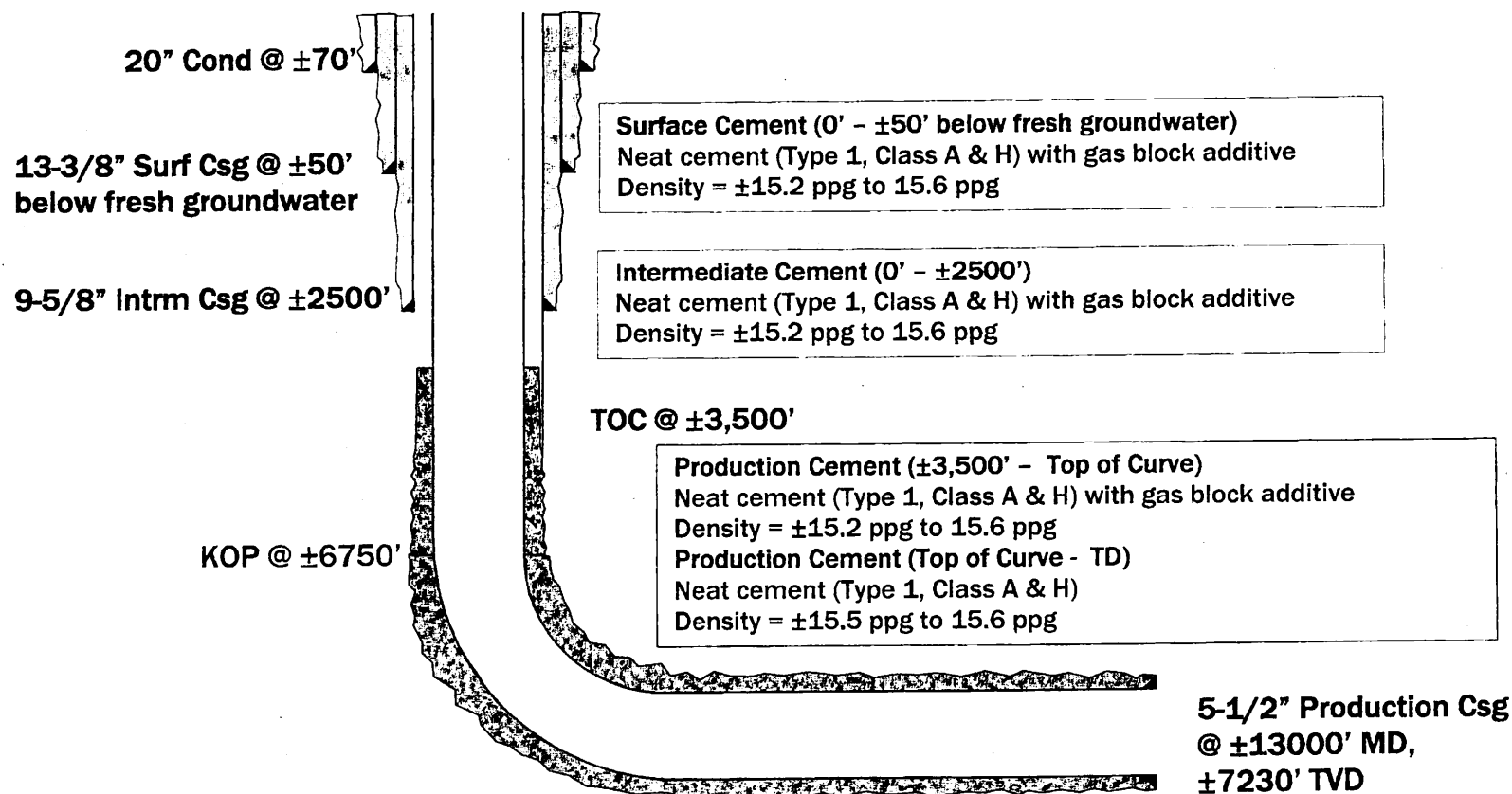
Sugar Run

Sugar Run, PA	18846
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EXHIBIT D

SPECIFICATIONS AND PRACTICES FOR CASING AND CEMENTING

Well Casing and Cement Illustration



Cementing Practices

Conductor

- 26" Hole to minimum depth of $\pm 70'$.
- 20" Conductor to be cemented with High Density Cement.
- Record all fresh ground water encountered in the Driller's Log Book.

Surface Section

- 17-1/2" hole to be drilled to minimum of $\pm 50'$ below base of fresh ground water. In the absence of other data, the depth of fresh ground water is determined primarily by using the known depths of surrounding water wells within a $\pm 2500'$ radius, and correcting for elevation differences.
- Record all fresh ground water encountered in the Driller's Log Book.
- Circulate and condition hole.
- Run new string of 13-3/8" surface casing.
- Run centralizers in the middle and top of the first joint, top of third joint, and every third to surface.
- Pump ± 35 bbls of gelled spacer, ± 100 bbls of fresh water, drop bottom plug.
- Pump High Density Cement with gas block additive.
- Drop top plug and displace with water at maximum rate.
- Record volume of cement to surface in the Driller's Log Book.
- Wait on cement for 8 hrs.
- Performing FIT to 15 ppg EMW on surface casing (squeeze shoe if less than 15 ppg EMW).

Cementing Practices (continued)

Intermediate Section

- 12-1/4" hole to be drilled to intermediate casing depth. Intermediate depth is typically at a minimum of $\pm 2000'$, but is well specific and is based on various data sources and geologic interpretation.
- Circulate and condition hole.
- Run new string of 9-5/8" intermediate casing.
- Run centralizers in the middle and top of the first joint, top of third joint, and every third to surface.
- Reciprocate casing throughout the cement job.
- Pump ± 35 bbls of gelled spacer, ± 100 bbls of fresh water, drop bottom plug.
- Pump High Density Cement with gas block additive.
- Drop top plug and displace with water at maximum rate.
- Record volume of cement to surface in the Driller's Log Book.
- Wait on cement for 8 hrs.
- Performing FIT to 16 ppg EMW on intermediate casing (squeeze shoe if less than 16 ppg EMW).

Cementing Practices (continued)

Production Section

- 8-3/4", 8-1/2", or 7-7/8" hole to be drilled to casing depth.
- Run new string of 5-1/2" production casing.
- Run centralizers at least from end of curve to TOC on every second joint.
- Prior to cementing, circulate at least three bottoms up annular volumes.
- If possible, reciprocate and rotate casing throughout the cement job.
- Pump minimum of ± 50 bbls of weighted chem wash at ± 14.0 ppg.
- Drop bottom plug.
- Pump High Density Cement with gas block additive from above curve to TOC.
- Drop top plug and displace with water at maximum rate.
- Wait on cement for 8 hrs and attempt to hold 250 psi on annulus.

EXHIBIT E

STANDARD ANALYSIS CODE 942 LIST OF PARAMETERS

SPECIFIC CONDUCTIVITY @ 25.0 C

pH, LAB (ELECTROMETRIC)

ALKALINITY TOTAL AS CaCO_3 (TITRIMETRIC)

TOTAL DISSOLVED SOLIDS (TDS)

HARDNESS TOTAL (Calculated)

CALCIUM, TOTAL BY TRACE ELEMENTS IN WATERS & WASTES

MAGNESIUM, TOTAL BY TRACE ELEMENTS IN WATERS &

SODIUM, TOTAL BY TRACE ELEMENTS IN WATERS & WASTES

POTASSIUM, TOTAL BY TRACE ELEMENTS IN WATERS &

CHLORIDE, TOTAL

BARIUM, TOTAL BY TRACE ELEMENTS IN WATERS & WASTES

IRON, TOTAL BY TRACE ELEMENTS IN WATERS & WASTES BY

MANGANESE, TOTAL BY TRACE ELEMENTS IN WATERS &

STRONTIUM, TOTAL BY TRACE ELEMENTS IN WATERS &

TURBIDITY

METHANE

ETHANE

PROPANE