

DEPARTMENT OF ENVIRONMENTAL QUALITY

ORDER OF THE SUPERVISOR OF WELLS

IN THE MATTER OF

A HEARING TO BE HELD AT THE INITIATIVE OF THE SUPERVISOR)
OF WELLS TO DO THE FOLLOWING WITH RESPECT TO TRENTON)
AND BLACK RIVER FORMATION WELLS WITHIN A CERTAIN)
GEOGRAPHIC AREA: SET OIL AND GAS ALLOWABLES; ESTABLISH)
OR MAINTAIN SPACING AND LOCATION OF WELLS; CONSIDER THE) CAUSE 18-2007
DESIRABILITY OF RESTRICTING FLARING OR VENTING OF GAS;)
AND AMENDING OR ABROGATING CERTAIN PROVISIONS OF)
ORDERS (A) 9-7-84 AND (A) 4-10-88, WHICH PROVIDE FOR SPACING)
AND PRORATION OF TRENTON BLACK RIVER FORMATION WELLS)
IN CALHOUN, JACKSON AND HILLSDALE COUNTIES.)

OPINION AND ORDER

This case involves the request of Staff of the Office of Geological Survey (OGS), Michigan Department of Environmental Quality, for an order establishing spacing and allowables and restricting flaring within a certain geographic area for wells in the Trenton and Black River Formations. The basis for this request is the recent resurgence of interest in the Trenton and Black River Formations and the existence of at least 36 orders of the Supervisor of Wells (Supervisor) addressing spacing and allowables for Trenton Black River Formation wells in southern Michigan. In common Michigan oil and gas terminology, the Trenton Formation and Black River Formation are typically referred to collectively as the "Trenton-Black River Formation," and that term will be used herein where appropriate.

JURISDICTION

The development of oil and gas in this state is regulated under Part 615, Supervisor of Wells, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 615). MCL 324 61501 *et seq.* The purpose of Part 615 is to prevent the waste of oil and gas and foster the orderly development thereof. MCL 324 61502. To that end, the Supervisor may establish drilling units, well spacing, and oil and gas proration allowables. MCL 324.61513.

Order No. 9-7-84 established the Albion-Scipio Trenton-Black River Formation Field in parts of Calhoun, Jackson, and Hillsdale counties with wells to be drilled on 20-acre drilling units

formed by dividing a governmental surveyed quarter-quarter section of land into a west half and an east half. This Order also established the allowable production for full allowable wells as 110 barrels of oil per day (BOPD) and/or 150 thousand cubic feet of gas per day (MCFGPD).

Order No. 4-10-88 established a drilling unit size of 40 acres, consisting of a quarter-quarter section, and an allowable of 110 BOPD and/or 175 MCFGPD for wells in the Stoney Point Field, which consists of parts of Jackson and Hillsdale counties.

In its initial request for a hearing, Staff sought an order that would do the following:

1. Comprise a certain geographical area to include the following counties: Barry, Eaton, Ingham, Livingston, Oakland, Macomb, St. Clair, Wayne, Washtenaw, Jackson, Calhoun, Branch, Hillsdale, Lenawee, and Monroe.
2. Establish or maintain oil and gas allowables in the above mentioned geographic area equivalent to the current allowables in the Stoney Point Field of 150 BOPD and 175 MCFGPD.
3. Establish spacing for new wells and maintaining spacing for existing wells.
4. Restrict the flaring or venting of gas.
5. Amend or abrogate Order No. 9-7-84 and Order No. 4-10-88.

The evidentiary hearing is governed by the applicable provisions of the Administrative Procedures Act, 1969 PA 306, as amended, MCL 24.201 *et seq.* See also R 324.1203. After proper notice, a prehearing conference in this matter was held on December 18, 2007, and the hearing was held on June 3, 4, 5, 10, and 11, 2008, in Lansing, Michigan. Members of the Oil and Gas Advisory Committee attended the hearing at the request of the Supervisor.

PARTIES

Answers were filed by Continental Resources, Inc.; West Bay Group¹; Savoy Energy LP; Trendwell Energy Corp.; David Dzierwa; and Matrix Exploration & Development, LLC and Titan Energy, LLC

OGS Staff was represented by Mr. James Stropkai and Mr. Daniel Bock. Mr. Thomas Godbold testified on behalf of Staff during the hearing.

¹ The West Bay Group is a consortium of West Bay Exploration Co.; Jordan Exploration Co.; Rock Oil Co.; Energy Quest Inc.; Rainbow Oil and Gas, LLC; Queenmaya LLC; Scandia Energy Companies; Michigan Ventures, LLC; Antares Exploration Fund LP; and Meridian Production Services, LLC.

Continental Resources, Inc (Continental) was represented by Mr. Jack Sage. During the hearing, Continental presented testimony from: Mr. Lew Murray, Exploration Manager, recognized as an expert in geology; Mr. Richard H. Straeter, P E., President, Eastern Division, recognized as an expert in petroleum engineering; and Mr. Michael W. Barratt, Petroleum Geologist Consultant, Barratt Consulting, LLC.

The West Bay Group (West Bay) was represented by Mr. James R. Neal. West Bay presented testimony from: Mr. William Stelzer, Geological Petroleum Consultant, recognized as an expert in petroleum geology; Mr. Timothy J. Brock, Registered Professional Engineer, recognized as an expert in petroleum engineering; and Mr. Randall L. Schroeder, Consulting Petroleum Engineer, recognized as an expert in petroleum engineering.

Savoy Energy LP (Savoy) was represented by Mr. John Norris and presented no testimony during the hearing, limiting its involvement to cross-examining the other parties' witnesses.

Trendwell Energy Corporation (Trendwell) was represented by Mr. William Horn. Trendwell presented testimony from Mr. Richard A. Sandtveit, Registered Professional Engineer, recognized as an expert in petroleum engineering.

Mr. David J. Dzierwa appeared *pro se* and testified as a geophysicist and explorationist.

Matrix Exploration & Development, LLC and Titan Energy, LLC (Matrix/Titan) were represented by Mr. Peter J. Zirnhelt. Matrix/Titan presented testimony from: Mr. Brian D. Deans, Managing Member of both Matrix Exploration & Development, LLC, and Titan Energy, LLC, recognized as an expert in geology of the Trenton-Black River Formation; Mr. Claude Woods, Geophysics Consultant, recognized as an expert in geophysics; and Mr. Ronald R. Suckle, Consulting Petroleum Engineer, recognized as an expert in petroleum engineering.

FINDINGS OF FACT

To provide context to the Petition and relief sought, it is helpful to examine the history of Trenton-Black River Formation hydrocarbon development in the Albion-Scipio and Stoney Point Fields. The Albion-Scipio Field was discovered in the mid 1950s. The Albion-Scipio Trend extends for about 35 miles in a northwest-southeast direction across parts of Hillsdale, Jackson, and Calhoun counties in southern Michigan. It is comprised of several narrow, linear oil fields located on, or along, a probable deep-seated fault or fracture zone. Oil and gas are produced

from a dolomitized fracture zone in the Trenton-Black River Formation of Middle Ordovician age.² The current Albion-Scipio well spacing pattern of 20-acre drilling units, consisting of half a quarter-quarter section, was established by Order No. 9-7-84, effective September 17, 1984.

The Stoney Point Field is made up of heterogeneous and discontinuous reservoirs. Permeability, porosity, and reservoir quality change significantly over very short distances. The producing trend is linear, narrow, and elongate in nature. Permeability barriers exist throughout the field, which is noted for such isolated discontinuous productive zones. The reservoir rock is fractured. The great productivity of the field is attributed to the presence of natural fractures and associated vugular or cavernous porosity. It is well established that drainage patterns are non-radial and that low permeability areas (barriers) prevent uniform and predictable drainage patterns. The reservoir contains dual porosity: one component related to fracture and vugular or cavernous features and the second component related to the matrix of the rock. Spacing in the Stoney Point Field was established by Order No. 4-4-84, as 40-acre drilling units with the well located in the southeast quarter.

Recently, a few productive wells associated with the Albion-Scipio and Stoney Point Fields have caused a renewed interest in the area. This hearing was the result of a desire to standardize spacing and proration in the two fields, as well as in other areas of potentially similar Trenton-Black River reservoirs, while maintaining flexibility for well locations due to the narrow nature of the fields. A recurring concern, repeated by many witnesses in this matter, is the need for flexibility in locating wells over the targeted bottom hole location. Today with the increased use of 2D and 3D seismic, bottom hole targets can be more precisely identified.

Stipulations

At the evidentiary hearing, the parties stipulated to the geographic area of this Order to include Barry, Eaton, Ingham, Livingston, Oakland, Macomb, St. Clair, Wayne, Washtenaw, Jackson, Calhoun, Branch, Hillsdale, Lenawee, and Monroe.

The parties also stipulated to the formation to be covered by this Order as follows:

The interval from the base of the Utica Shale Formation at a measured depth of 4,911 feet on the gamma ray log to the top of the Glenwood Formation at a measured depth of 5,638 feet for the Mobil Oil Corporation Reeve Unit No. 1,

² "Structures Associated with the Albion-Scipio Oil Field Trend" by Garland D. Ells

Schlumberger Compensated Formation Density Log, Permit No. 29672, in Section 36, T1N, R1W, Leslie Township, Ingham County.

Abrogation of Existing Spacing Orders

OGS Staff recommended that the five unitization orders that apply to the North Stoney Point Field and South Stoney Point Field (Orders No. (A) 1-1-90, (A) 1-1-90 Supplemental, (A) 21-7-91, (A) 26-9-91, and (A) 26-9-91 Supplemental) remain in effect. OGS Staff requested the abrogation of all existing Trenton-Black River Formation spacing orders in the stipulated geographic area, except that the spacing provisions of those orders would remain in effect with respect to any unit associated with an existing well. However, the existing order would be abrogated at such time as the well is plugged, and the lands in the unit would then be subject to this new Order. Staff further requested that an order issued in this cause shall apply to all lands not part of an existing Trenton-Black River drilling unit. There was general support for Staff's position with regard to abrogation of existing Trenton-Black River Formation spacing orders at least to the extent they varied from the respective party's position.

I find that it is appropriate to abrogate all Trenton-Black River Formation spacing orders for the stipulated geographical area except with respect to units associated with an active permit or well. All Trenton-Black River units associated with an existing producible well or with an active permit for a well that has not been plugged before the effective date of this Order may continue as established drilling units under the provisions of the previous applicable order. Pending well permit applications for which a permit has not been issued prior to the effective date of this Order shall comply with the requirements of this Order. An operator who has a pending application may either withdraw the application or amend the application to comply with this Order.

Drilling Unit and Well Spacing Pattern

Mr. Godbold testified the Supervisor's Order should establish drilling units consisting of quarter-quarter sections of land containing 40 acres, more or less, with the well being located anywhere within the drilling unit, but no closer than 330 feet from the unit boundary. This recommendation was based on the current requirements established for the Stoney Point Field in Order No. 4-4-84, and Mr. Godbold's opinion that the Supervisor's previous findings regarding the Stoney Point Field also generally describe the Trenton-Black River Formation in the area of

consideration. In its closing argument, OGS Staff states it would also support the position of West Bay of combining two 20-acre parcels to form a square 40-acre drilling unit.

Continental, West Bay, and Trendwell also supported 40-acre drilling units, with some differences in the make-up of those 40-acre units. West Bay and Trendwell supported square 40-acre units made up of 20-acre building blocks consisting of the north, south, east, or west halves of a quarter-quarter section, with the well being located no closer than 330 feet from the unit boundary and a distance of 660 feet between wells. Mr. Stelzer testified this drilling unit configuration would result in 75 percent of a theoretical section being drillable, whereas 40-acre drilling units comprised of quarter-quarter sections would result in 75 percent of the section not being drillable. Mr. Brock testified that the recovery of original oil in place to date for the Stoney Point Field, with the existing 40-acre spacing, is 37.5 percent, which is considered very good recovery. He further testified that after review of production data for some recently drilled Trenton-Black River Formation wells in Calhoun County, he has no reservations that 40 acres will be efficiently drained by one well throughout the 15-county area. Mr. Brock also testified that based on his economic assumptions for Trenton-Black River Formation development, 40 acres per well is a more efficient use of capital and results in a better return on investment than 20 acres per well. Mr. Sandtveit testified 40-acre drilling units generally provide the most efficient development pattern. He discussed the potential for draining areas outside a drilling unit boundary through acidizing and fracturing treatments, but concluded that a 330-foot setback from the unit boundary would adequately protect correlative rights. Mr. Sandtveit also testified that, in his opinion, a second well was not necessary on a 40-acre drilling unit due to the ability to more accurately pick well locations using 2-D and 3-D seismic.

Continental supported square 40-acre drilling units comprised of 10-acre quarter-quarter-quarter section building blocks, with the well being located no closer than 330 feet from the unit boundary and a distance of 660 feet between wells unless the operator can prove the wells are on separate reservoirs. In Mr. Murray's opinion, a 40-acre drilling unit is appropriate and fair; and by adding flexibility as to how to build that unit, environmental exposure will be limited, reservoir efficiencies will improve, and correlative rights will be dealt with more fairly. Mr. Murray also testified that drilling a second well on a 40-acre drilling unit may be appropriate if an operator could show their 40 acres was not being drained by one well. Mr. Straeter testified a second well would also increase the ultimate recovery of oil where there are two

separate reservoirs in the same unit, or where the first well drilled is on the edge of a reservoir and the operator wishes to drill into a better portion of the reservoir to recover more oil. In his opinion, a second well may also be necessary to prevent drainage and protect correlative rights due to the location of an offset well. Mr. Straeter also stated a horizontal well could possibly drain an entire reservoir across more than one drilling unit.

Mr. Dzierwa testified in favor of 20-acre drilling units with the ability to expand them to 40-acre, or larger, drilling units, with the well being located no closer than 330 feet from the unit boundary and a distance of 800 feet between wells. His testimony cited the improved success rate of wells drilled on 20-acre units. Matrix/Titan recommended maintaining 20-acre drilling units for the Albion-Scipio area previously spaced on 20-acre units and for any areas where the Trenton Formation is greater than 4,000 feet in depth from the surface, with the well being located no closer than 165 feet from the unit boundary and a distance of 330 feet between wells. Mr. Deans testified 40-acre drilling units would be acceptable in areas where the Trenton Formation is less than 4,000 feet in depth; however, fractures are narrower and more sharply defined at greater depths, which favors 20-acre spacing.

I find the most efficient and orderly drilling unit configuration to be a square 40-acre unit consisting of a north half and south half, or an east half and west half, of governmental quarter-quarter sections, with the well being located anywhere in the drilling unit no closer than 330 feet from the unit boundary. This spacing plan will allow operators to assemble units that best cover the interpreted reservoir while minimizing the inclusion of unproductive acreage and precluding 10-acre stranded parcels. To provide the flexibility necessary to produce in a narrow and potentially compartmentalized reservoir, a second well should be allowed on a 40-acre drilling unit.

Stranded Acreage

With the establishment of 40-acre drilling units, it is recognized that stranded 20-acre tracts may occur. OGS Staff recommended a well be allowed on a stranded 20-acre drilling unit provided it is drilled at least 330 feet from the unit boundary. Continental stated the Supervisor should provide a hearing, on a case-by-case basis, for any stranded parcels smaller than 40 acres to balance spacing regulations with flexibility to access the reservoir. West Bay was agreeable to allow a well to be drilled on a stranded 20-acre drilling unit provided the well is not less than 300 feet from the unit boundary. Trendwell was also in favor of allowing a well to be

drilled on a stranded 20-acre drilling unit with a 330-foot setback; however, a well drilled within 12.5 feet of either side of the long central axis of the unit would be permissible.

I find that allowing a well to be drilled on a stranded 20-acre drilling unit will protect correlative rights and prevent waste. The well shall be no closer than 330 feet from a "short" side and 300 feet from a "long" side of the rectangular drilling unit boundaries.

Fractionals and Areas of Private Claims

OGS Staff recommends that no well be allowed within one mile of an undersized fractional quarter-quarter section or a private claim³ until an appropriate drilling unit has been determined by the Supervisor at a hearing. Staff also recommends that this Order apply to fractionals and private claim areas except for the drilling unit size. It is Staff's opinion that undersized fractional quarter-quarter sections that cannot accommodate a well which is no closer than 330 feet from the unit boundary should be considered undrillable and should be combined with an adjacent quarter-quarter section. Oversized fractional quarter-quarter sections that can accommodate a well, which is no closer than 330 feet from the unit boundary, shall be treated as a full drilling unit. Continental and Trendwell generally agreed with Staff's recommendations.

For areas of private claims Staff recommends that, if the Supervisor opts to establish spacing under the terms of this Order, that drilling units be determined by superimposing the governmental survey grid, wherever feasible, into the private claim area; and that where that is not feasible, to establish units approximately 40 acres in size with boundaries parallel and perpendicular to the private claim boundaries.

I find fractionals may be adequately addressed on an individual well-by-well basis within the other provisions of this order. I find it is appropriate to form drilling units by extending government survey lines into immediately adjacent private claims areas.

Proration Allowables

OGS Staff recommends extending the allowables of 150 BOPD and 230 MCFGPD established for the Stoney Point Field in Order No. 4-4-84. These allowables were based on

³ A private claim is a parcel established prior to the first governmental survey, typically having lateral boundaries generally perpendicular to a river or lakeshore

extensive expert testimony. In its closing argument, Staff stated they would also support West Bay's position of 200 BOPD and 230 MCFGPD.

Continental proposed a gas/oil ratio (GOR) based maximum allowable of 1500 cubic feet of gas per one barrel of oil (1500:1); and if a well exceeds that GOR, then it would be assigned a gas allowable. Mr. Murray testified this means a well should be able to produce at any rate determined by the operator as long as the GOR of the well never exceeds a ratio of 1500:1. In his opinion, that is far below the rate that would cause any damage to the reservoir or create waste, yet is sufficient to accelerate the recovery of reserves without undue or unnecessary protracting of operations. Mr. Murray stated that Continental's testing showed that reservoir energy would be maintained, efficient recovery of oil would occur, and waste would not be created at production rates determined by a GOR allowable. Mr. Murray testified the problem with a fixed allowable is that when the well reaches its maximum gas allowable rate, the GOR starts to climb. This, in effect, makes the reservoir inefficient because the operator is producing a disproportionate percentage of the gas from the reservoir at the expense of oil.

Continental's witnesses also testified to the heterogeneous nature of the Trenton-Black River Formation in the designated 15-county area and determined a GOR based allowable was the best way to address these differences while protecting correlative rights and preventing waste. Mr. Straeter testified Continental's Exhibit 13 shows that by producing the McArthur 1-36 well at 500 BOPD instead of 200 BOPD, abandonment would be reached approximately three years earlier thereby minimizing environmental risk, surface use, waste of other energies in producing the well, and saving operating costs.

West Bay recommended a proration allowable of 200 BOPD and/or 230 MCFGPD for wells on 40-acre drilling units and 100 BOPD and/or 115 MCFGPD for wells on stranded 20-acre drilling units. This would be an increase from the current Stoney Point Field allowables of 150 BOPD and 230 MCFGPD set in Order No. 4-4-84; Mr. Brock testified it is based on a study of past practices in the Stoney Point Field and more recent development in the Marengo 12 Field. Mr. Brock's study of the Stoney Point Field indicates the reservoir was very efficient at recovering oil while minimizing the GOR. This means the reservoir energy was conserved until late in the life of the reservoir when most of the oil recovery was obtained anyway. It is Mr. Brock's opinion that a 1500:1 GOR allowable could result in premature abandonment of the reservoir when significant reservoir energy remains. He testified a set allowable, as

recommended by West Bay, would provide for the most efficient drainage of the reservoir without a large reduction in pressure resulting from high withdrawal rates. This slower withdrawal would allow time for lower permeability portions of the reservoir to feed into the rest of the reservoir while there is still sufficient reservoir energy.

Matrix/Titan concurred with West Bay's recommended allowables of 200 BOPD and/or 230 MCFGPD. Mr. Suckle testified that rate equates to a GOR of 1150:1, which in his opinion is more appropriate than a 1500:1 GOR.

Trendwell supports the oil allowable of 200 BOPD proposed by West Bay but recommended a gas allowable of 300 MCFGPD. In Mr. Sandtveit's opinion, the typical Trenton-Black River Formation reservoir will not be damaged with production rates of 200 BOPD and 300 MCFGPD. He believes the higher gas allowable will delay, by six months to a year, the need for an operator to request higher gas allowables from the Supervisor to keep producing its wells.

Mr. Dzierwa recommended no fixed daily allowable for oil or gas in the absence of any technical reason to justify them. He states there is no proof producing gas at any rate will reduce recoverable reserves.

After considerable discussion with the Oil and Gas Advisory Committee of the objectives of establishing parameters to conserve reservoir energy and maximize oil recovery, and upon the recommendation of the Committee that a conservative gas allowable be established in this Order due to the considerable areal extent covered by the Order, I find, based on production history and GOR trends in the Stoney Point and Albion-Scipio Fields, that a fixed allowable of 200 BOPD and/or 200 MCFGPD is appropriate to preserve reservoir energy, protect correlative rights and prevent waste. The gas allowable should be based on the total gross gas production. A 200 MCFGPD allowable generally will not limit oil production rates except late in the life of some wells, when it will help to promote ultimate oil recovery from the reservoir. The 200 BOPD and/or 200 MCFGPD allowable is to be considered a unit allowable. I find that a separate allowable for a second well on a drilling unit shall only be granted pursuant to a petition for a hearing before the Supervisor, upon a finding that the well is in a separate, distinct reservoir. Also, the request for a higher allowable for horizontal drainholes extending beyond one drilling unit shall be by petition for a hearing before the Supervisor. I further find that due to the

variability of reservoirs, bottom hole pressure data is helpful to the OGS and shall be submitted as requested by the Supervisor.

Restrictions on the Flaring of Gas

Given the size of the geographic area at issue in this matter, OGS Staff recognizes that it may not be economically feasible to construct pipelines and build gas plants to sell the gas from some wells. However, Staff feels that operators should take all reasonable steps necessary to market gas from their wells. Therefore, Staff recommends that, as long as gas is not gathered and marketed from a well, flaring of gas be limited to one-half the basic daily gas allowable for that well. This recommendation is consistent with Order No. 4-4-84.

Additionally, Staff made the following recommendations regarding flaring of gas: A permittee of a well that is flaring shall, within 30 days of a letter of request from the Supervisor, submit to the Supervisor data necessary to determine whether the well can economically market gas. If data is not timely submitted to the Supervisor, the Supervisor may direct the permittee to shut in the well. Using the data supplied by the permittee and when possible, after meeting with the permittee, the Supervisor or his authorized representative shall inform the permittee in writing whether the well is capable of economically marketing gas. Within 90 days of a determination in the affirmative, the well determined to be capable of economically marketing gas shall cease the flaring of gas. If the permittee disputes the Supervisor's determination, the permittee may file a petition and request a hearing; but the filing of such petition shall not stay the effectiveness of the determination. The permittee of a well determined to be incapable of marketing gas shall be allowed to continue flaring gas up to one-half the daily gas allowable applicable to the well.

Staff further recommended that in the event of a temporary or short-term interruption of the availability of an economic gas marketing arrangement, or in the event of a long-term interruption with permission from the Supervisor, the permittee may commence or resume flaring of gas subject to the forgoing provisions.

West Bay supported the recommendation of OGS Staff for flaring up to one-half (115 MCFGPD) the full daily gas allowable proposed by Staff and West Bay (230 MCFGPD). Trendwell supports the recommendation for flaring up to one-half the gas allowable proposed by Staff and West Bay.

Matrix/Titan supports flaring up to 115 MCFGPD but also proposes that the marketing of gas be deemed not economic when an operator provides reasonable evidence to the Supervisor that the cost to connect a well to a pipeline or facility for the transportation and processing of gas will take in excess of two years to pay out based upon the average monthly natural gas production sales. This two-year payout test was also supported by Continental. For a well incapable of economically marketing gas, Continental recommends the well be allowed to flare at 125 MCFGPD.

Mr. Dzierwa testified an operator should be allowed to flare all its gas if there is no economic market for gas sales, but flaring should be limited while waiting for a sales line connection or during a sales line interruption.

I find it is appropriate to allow flaring of gas at a rate of one-half the gas allowable if the operator can show it is not economic to build a pipeline within a reasonable time. The volume restriction should apply to the net volume of gas flared not including fuel gas used. The approval to flare gas does not grant an exception to any other required permits or approvals.

Other Issues

In addition to the issues of geographic area, formation, spacing, allowables, and flaring that were noticed as issues to be discussed at the hearing, West Bay recommended two other issues be included in this Order. First, West Bay feels multi-stage cementing tools or a DV tool should be required by the Supervisor to obtain an acceptable cement job when a well loses circulation in the production hole. I find this issue is more appropriately addressed in each individual well permit and not in this Order.

Second, West Bay requested the Order allow permits to be issued on drilling units not totally leased, pooled or communitized on condition that the application for permit is accompanied by a certified statement establishing that a good faith effort had been made to obtain the lease or leases or to obtain a communitization agreement to form the full drilling unit and that such effort failed. Should a well be completed on such a drilling unit as a producer, a pooled unit shall be formed by voluntary or compulsory pooling. I find that allowing the drilling of wells on partially leased drilling units will not cause waste and is appropriate.

CONCLUSIONS OF LAW

Based on the stipulations and the findings of fact, I conclude, as a Matter of Law:

1. To prevent the drilling of unnecessary wells, the Supervisor may establish a drilling unit for each pool. A drilling unit is the maximum area that may be efficiently and economically drained by one well. MCL 324.61513(2).
2. Drilling unnecessary wells in the Trenton-Black River Formation would cause waste. MCL 324.61513(3).
3. The establishment of proration limits on daily oil and gas production is necessary to prevent waste and to protect correlative rights. MCL 324.61506(j).
4. Restrictions on the flaring of gas are necessary to prevent waste. MCL 324.61501(q)(ii).
5. The Supervisor has jurisdiction of the subject matter and the persons interested therein.
6. Due notice of the time, place, and purpose of the hearings was given as required by law and all interested persons were afforded an opportunity to be heard. 1996 MR 9, R 324.1204.

DETERMINATION AND ORDER

Based on the Findings of Fact and Conclusions of Law, the Supervisor determines that a special spacing order for the Trenton-Black River Formation is necessary and desirable.

NOW, THEREFORE, IT IS ORDERED:

1. This Order applies to the following 15 counties:
Barry, Eaton, Ingham, Livingston, Oakland, Macomb, St. Clair, Calhoun, Jackson, Washtenaw, Wayne, Branch, Hillsdale, Lenawee, and Monroe.
2. This Order applies to the following formation:
The interval from the base of the Utica Shale Formation at a measured depth of 4,911 feet on the gamma ray log to the top of the Glenwood Formation at a measured depth of 5,638 feet for the Mobil Oil Corporation Reeve Unit No. 1, Schlumberger Compensated Formation Density Log, Permit No 29672, in Section 36, T1N, R1W, Leslie Township, Ingham County.

3. This Order hereby abrogates all existing Trenton Black River Formation spacing orders in the geographic area that is subject to this Order except with respect to units associated with an active permit or well.

A. The following Supervisor of Wells Orders are abrogated in their entirety and are superseded by this Order:

Order No. 11-9-61 ("Spacing Order for Wells Drilled for Oil and Gas and Natural Dry Gas in the Partello Salina-Niagaran and Lower Formation Pools," effective November 9, 1961)

Order No. (A) 1-2-72
Order No. (A) 2-1-79
Order No. (A) 18-8-79
Order No. 1-4-80
Order No. (A) 20-11-80
Order No. 13-10-82
Order No. 32-9-83
Order No. (A) 35-9-84
Order No. (A) 59-12-85
Order No. (A) 28-8-86
Order No. 3-3-87
Order No. (A) 9-2-88
Order No. (A) 18-4-88
Order No. (A) 40-6-88
Order No. (A) 27-11-89
Order No. 7-8-90
Order No. (A) 1-1-91
Order No. (A) 2-1-91
Order No. (A) 4-2-96
Order No. (A) 9-4-05

B. The following Supervisor of Wells Orders are abrogated and superseded by this Order with respect to any area that is not within a unit established by either an existing producible well or an active permit to drill and operate for a well that has not been plugged as of the effective date of this Order:

Order No. 15-12-82
Order No. 4-4-84
Order No. 9-7-84
Order No. (A) 12-3-85
Order No. 4-10-88
Order No. 4-10-88 Amended

For areas where the above existing Orders remain in effect due to the existence of a producible well or active permit, the existing Order shall be abrogated and shall be

superseded by this Order with respect to spacing and well location requirements at such time as the well is plugged or the permit is terminated; however, the provisions of this Order are in effect immediately with respect to proration (paragraph 8) and flaring of gas (paragraph 10)

C. This Order shall be in effect for each respective area subject to the following existing unitization Orders at such time as the unit is dissolved under the terms of the existing Order:

- Order No. (A) 1-1-90
- Order No. (A) 1-1-90 Supplemental
- Order No. (A) 21-7-91
- Order No. (A) 26-9-91
- Order No. (A) 26-9-91 Supplemental

D This Order supersedes the provisions of Special Order No. 1-73 and Special Order No. 1-73 Amended with respect to the formation described in paragraph 2.

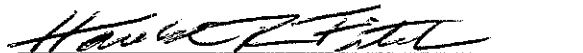
4. An operator who has a Trenton-Black River Formation well permit application pending within the geographic area that is subject to this Order, at the effective date of this Order, may elect to either withdraw the application or amend the application to comply with the provisions of this Order.
5. A standard drilling unit shall consist of 40 acres, more or less, in the form of a square, assembled by combining two 20-acre parcels, each of which shall consist of the north and south, or east and west halves of a quarter-quarter section or of adjacent quarter-quarter sections. The bottom hole location shall be anywhere on the drilling unit not less than 330 feet from the drilling unit boundaries.
6. If no 20-acre building block is available to combine with another 20-acre building block to form a square 40-acre drilling unit, then a drilling permit may be issued for a 20-acre drilling unit consisting of the north, south, east, or west half of a quarter-quarter section. The bottom hole location of any well drilled on a 20-acre drilling unit shall be anywhere on the drilling unit not less than 300 feet from the long boundaries of the drilling unit and 330 feet from the short boundaries of the drilling unit.

7. Properties or parts of properties in one or more private claims may be combined with immediately adjacent properties that are within a governmental survey to form a full 40-acre unit by extension of government survey lines into the private claims area. In areas of private claims where the governmental survey cannot be thus extended, units shall only be established pursuant to a Supervisor of Wells hearing.
8. The Supervisor, after receiving technical data that one well may not economically and efficiently drain a drilling unit, may allow a second well on a 40-acre drilling unit provided both wells are not less than 330 feet from the drilling unit boundaries.
9. Proration allowables for wells subject to this Order are hereby established at 200 BOPD and/or 200 MCFGPD for 40-acre drilling units. The gas allowable shall apply to the total gross volume of gas produced. Proration allowables for 20-acre drilling units shall be one-half the daily allowable for a standard 40-acre drilling unit. An additional allowable for a second well shall only be granted after a determination by the Supervisor, pursuant to a petition for a hearing, that the wells are in separate reservoirs.
10. For each well subject to this Order, the report of oil and gas produced, purchased, or transported required by rule under Part 615 shall include the gross volumes of oil and gas produced as well as the volume of gas utilized for lease fuel or other uses and the volumes of gas sold or flared.
11. The Supervisor may issue a permit to drill on a drilling unit described in this Order that is not totally leased, pooled, or communitized on condition that the application for permit is accompanied by a certified statement establishing that a good faith effort had been made to obtain the lease or leases or to obtain a communitization agreement to form the full drilling unit and that such effort failed. Should a well be completed on such drilling unit as a producer, a pooled drilling unit shall be formed by voluntary or compulsory pooling. This pooled unit shall conform to this Order or to a drilling unit adopted following a Supervisor's hearing.
12. Gas that is not reasonably marketable may be flared. The volume of gas flared is restricted to 100 MCFGPD for a 40-acre drilling unit or 50 MCFGPD for a 20-acre drilling

unit, which shall be the net volume of gas flared not including gas used for reasonable and necessary lease fuel purposes. The permittee of a well that is flaring gas shall, within 30 days of a letter of request from the Supervisor, submit to the Supervisor data necessary to determine whether the well can economically market gas. If data is not timely submitted to the Supervisor, the Supervisor may require the permittee to cease the flaring of gas. Based upon the data supplied by the permittee and other information available to the Supervisor, and after meeting with the permittee as necessary, the Supervisor or his authorized representative shall determine whether gas from the well can be economically marketed and shall inform the permittee in writing of that determination. Within 90 days of a determination in the affirmative, or at such later date as the Supervisor may specify, the permittee shall cease the flaring of gas from the well. If the permittee disputes the Supervisor's determination, the permittee may file a petition and request a hearing; but the filing of such petition shall not stay the effectiveness of the determination. If the Supervisor determines that gas from the well cannot be economically marketed, the permittee shall be allowed to continue flaring gas at the rate specified above. Permission to flare does not grant an exception to any other required permits or approvals.

13. Exceptions to the requirements of this Order may be granted after notice and hearing.
14. The Supervisor retains jurisdiction in this matter.
15. This Order is effective immediately.

Dated: Dec. 26, 2008



HAROLD R. FITCH
Assistant Supervisor of Wells
Office of Geological Survey
P. O. Box 30256
Lansing, MI 48909

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

ORDER OF THE SUPERVISOR OF WELLS

IN THE MATTER OF:

A HEARING TO BE HELD AT THE INITIATIVE OF THE)
SUPERVISOR OF WELLS TO DO THE FOLLOWING WITH)
RESPECT TO TRENTON AND BLACK RIVER FORMATION)
WELLS WITHIN A CERTAIN GEOGRAPHIC AREA: SET OIL AND)
GAS ALLOWABLES; ESTABLISH OR MAINTAIN SPACING AND) ORDER NO. 18-2007
LOCATION OF WELLS; CONSIDER THE DESIRABILITY OF)
RESTRICTING FLARING OR VENTING OF GAS; AND AMENDING)
OR ABROGATING CERTAIN PROVISIONS OF ORDERS (A))
9-7-84 AND (A) 4-10-88, WHICH PROVIDE FOR SPACING AND)
PRORATION OF TRENTON BLACK RIVER FORMATION WELLS)
IN CALHOUN, JACKSON AND HILLSDALE COUNTIES.)

AMENDED OPINION AND ORDER

Order No. 18-2007 was issued December 26, 2008, with an effective date of December 26, 2008. It has come to the Supervisor of Wells attention that a typographical error was made in paragraph 3.B. of the Determination and Order section of the Opinion and Order.

DETERMINATION AND ORDER

NOW, THEREFORE, IT IS ORDERED THAT:

Paragraph 3. B. of the Determination and Order section of the original Opinion and Order, in Cause No. 18-2007 is hereby amended in its entirety to provide as follows:

3. B. The following Supervisor of Wells Orders are abrogated and superseded by this Order with respect to any area that is not within a unit established by either an existing producible well or an active permit to drill and operate for a well that has not been plugged as of the effective date of this Order:

Order No. 15-12-82
Order No. 4-4-84
Order No. 9-7-84
Order No. (A) 12-3-85
Order No. 4-10-88
Order No. 4-10-88 Amended

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

ORDER OF THE SUPERVISOR OF WELLS

IN THE MATTER OF:

A HEARING TO BE HELD AT THE INITIATIVE OF THE)
SUPERVISOR OF WELLS TO DO THE FOLLOWING WITH)
RESPECT TO TRENTON AND BLACK RIVER FORMATION)
WELLS WITHIN A CERTAIN GEOGRAPHIC AREA: SET OIL AND)
GAS ALLOWABLES; ESTABLISH OR MAINTAIN SPACING AND) ORDER NO. 18-2007
LOCATION OF WELLS; CONSIDER THE DESIRABILITY OF)
RESTRICTING FLARING OR VENTING OF GAS; AND AMENDING)
OR ABROGATING CERTAIN PROVISIONS OF ORDERS (A))
9-7-84 AND (A) 4-10-88, WHICH PROVIDE FOR SPACING AND)
PRORATION OF TRENTON BLACK RIVER FORMATION WELLS)
IN CALHOUN, JACKSON AND HILLSDALE COUNTIES.)

SECOND AMENDED OPINION AND ORDER

Order No. 18-2007 was issued December 26, 2008, with an effective date of December 26, 2008, and was amended to correct a typographical error. In 2018, staff of the Oil, Gas, and Minerals Division (OGMD) requested the Supervisor of Wells further amend Order No. 18-2007 to include Kalamazoo, St. Joseph, Cass, Berrien, Van Buren, and Allegan counties. An evidentiary hearing was held on this request on November 27, 2018. Mr. Mark Snow, Permits and Bonding Unit Supervisor, testified on behalf of OGMD staff. Answers in support of adding the southern tier of six counties identified above to Order No. 18-2007 were received from West Bay Exploration, Muskegon Development Company, Savoy Energy, L. P., Wolverine Gas and Oil Corporation, and Jordan Development Company, L.L.C, however, no other party testified at the hearing.

Mr. Snow testified that since Order No. 18-2007 was issued, over 500 permit applications have been submitted targeting the Trenton Black River Formation and approximately 30 permit applications have been submitted for wells outside the original 15 county area included in the Order. Applying the conditions of Order No. 18-2007 to the additional counties will provide more flexibility in locating wells and drilling units, impose limits on the daily allowable production and establish restrictions on flaring of natural gas. It is the belief of OGMD staff that applying this Order to the additional counties will effectively foster orderly development and prevent waste.

DETERMINATION AND ORDER

I have reviewed the testimony and Answers filed in support of the request to add the six counties listed above to Order 18-2007, and I find it is appropriate to amend Order No. 18-2007.

NOW, THEREFORE, IT IS ORDERED THAT:


Paragraph 1. of the Determination and Order section of the original Opinion and Order, in Cause No. 18-2007 is hereby amended in its entirety to provide as follows:

1. This Order applies to the following 21 counties:

Barry, Eaton, Ingham, Livingston, Oakland, Macomb, St. Clair, Calhoun, Jackson, Washtenaw, Wayne, Branch, Hillsdale, Lenawee, Monroe, Kalamazoo, St. Joseph, Cass, Berrien, Van Buren, and Allegan.

All other provisions of the original Opinion and Order No. 18-2007 and Amended Opinion and Order No. 18-2007, are reaffirmed.

DATED: Dec. 27, 2018


HAROLD R. FITCH
ASSISTANT SUPERVISOR OF WELLS
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