

**STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
SUPERVISOR OF WELLS**

IN THE MATTER OF

THE PETITION OF LAMBDA ENERGY RESOURCES)
LLC FOR AN ORDER OF THE SUPERVISOR OF)
WELLS APPROVING A PLAN OF UNITIZATION FOR)
ENHANCED OIL RECOVERY OF OIL, GAS, AND)
RELATED HYDROCARBONS FOR THE BEAR LAKE) ORDER NO. 10-2023
27 FIELD AND ABROGATING EXISTING SPACING)
AND PRORATION ORDERS AND RULES FOR SUCH)
FIELD IN BEAR LAKE TOWNSHIP,)
MANISTEE COUNTY, MICHIGAN.)

OPINION AND ORDER

This case involves the Petition of Lambda Energy Resources LLC (Lambda Energy or Petitioner), requesting (a) approval of a unitization operation pursuant to Part 617, Unitization, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); (b) approval of an enhanced secondary recovery operation pursuant to Section 61506(i), Part 615, Supervisor of Wells, of the NREPA and R 324.612; and (c) approval to operate the proposed Unit Area as an exception to the applicable spacing provisions of Part 615 of the NREPA, its administrative rules, and any applicable spacing orders. The proposed Unit Area consists of approximately 320 acres, and is described as:

Section 27: SE/4, E/2 SW/4 and SW/4 NE/4

Section 34: NW/4 NE/4

T23N-R15W, Bear Lake Township, Manistee County, Michigan.

JURISDICTION

The development of oil and gas in this state is regulated under Part 615, Supervisor of Wells; and Part 617, Unitization; of the NREPA, MCL 324.61501, *et seq.* and MCL 324.61701, *et seq.* The purpose of Parts 615 and 617 is to ensure the orderly development and production of the oil and gas resources of this state, with a view to the ultimate recovery of the maximum production of these natural resources.

MCL 324.61502. To the end of maximizing recovery, the Supervisor of Wells (Supervisor) regulates the various methods for recovery of oil and gas, including the unit operations of a pool and the introduction of substances into producing formations for purposes of enhancing production. MCL 324.61506(i). A person proposing secondary recovery by injection of a substance into a producing formation must file a petition for a public evidentiary hearing. 1996 AACCS, R 324.612. Part 617 directs the Supervisor to issue an order providing for unitization pursuant to a hearing if certain criteria are met. MCL 324.61704(4). 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 1996 AACCS, R 324.1203. The evidentiary hearing in this matter was set for October 23, 2023.

FINDINGS OF FACT

The Petitioner specifically requests that the Supervisor issue an Order forming a 320-acre Unit Area as the Bear Lake 27 Unit; and allowing the Petitioner to inject dry natural gas and other approved substances into the Guelph Dolomite/Ruff formation (formerly referred to as the Salina and Niagara Groups), the productive zone, for purposes of secondary and enhanced oil and gas recovery; and exempting the proposed Unit Area from the applicable spacing and proration rules and orders.

The Supervisor determined that the Notice of Hearing was properly served and published. No answers were received. The Supervisor designated the hearing to be an uncontested evidentiary hearing pursuant to R 324.1205(1)(b) and directed evidence be presented in the form of verified statements.

In support of its case, the Petitioner offered the sworn testimony of Rodney Schoolcraft, Land Manager for Lambda Energy, and Jason Ewing, Chief Development Officer for Lambda Energy.

I. Unitization

Mr. Schoolcraft testified that the leased oil, gas, and mineral interests in the proposed Unitized Formation beneath the proposed Unit Area are subject to recorded oil and gas leases owned by Lambda Energy. Mr. Schoolcraft sponsored Exhibit B, which is a list of unleased oil, gas, and mineral interests, comprising approximately 10.07 acres,

and asked that the unleased owners be made subject to the Petitioner's Plan of Unitization. Mr. Schoolcraft sponsored Exhibit C, the Petitioner's Plan of Unitization. Mr. Schoolcraft testified that the Plan of Unitization constitutes a plan of unit operations containing all of the required terms and conditions as set forth in subsections 61705(a)-(j) of Part 617 of the NREPA, and expressly provides for the unitized operation of the proposed Unit Area for purposes of enhanced oil recovery and pressure maintenance operations.

Mr. Schoolcraft sponsored Exhibit D showing that the Plan of Unitization has been approved and ratified by sufficient owners to meet the requirements of Part 617, specifically that the Exhibit shows that the petitioner has met all three of the ratification thresholds set forth in MCL 324.61706.

I find that the Petitioner is qualified to be named Unit Operator and has obtained sufficient approval to support entry of a final order approving the Plan of Unitization and approving unit operations pursuant to Part 617 of the NREPA.

II. Unit Area

Mr. Schoolcraft sponsored Exhibit A as showing all of the proposed Unit Area, and the three existing Niagaran wells within the unit that will be subject to the Plan of Unitization. These wells are the Olson 1-27 (PN 30149), the Hilliard Et Al 3-27 (PN 30681), and the Anderson-Lutz 1-27A (PN 43802). Based on review of the available well logs and well data, Mr. Ewing sponsored Exhibit G, a structure contour map of the reservoir. Mr. Ewing stated that the productive part of the reef is entirely contained within the proposed Unit Area in his opinion.

Mr. Ewing testified that the Petitioner plans to conduct unitized operations within the Unitized Formation described as the stratigraphic equivalent of that portion of the Guelph Dolomite/Ruff formation (formerly referred to as the Salina and Niagara Groups) encountered in the interval from 4379' measured depth (MD) to 4883' MD in the Compensated Formation Density Log run on December 23, 1975 in the Hilliard 3-27 well (Permit No. 30681), for a total interval of 504 feet, or the correlative equivalent of that interval.

I find the boundary of the proposed Unit Area and unitized formation as proposed by the Petitioner are reasonable and that all production portions of the reservoir are within

the Proposed Unit Area and should be approved. I find that the terms of the Petitioner's Plan of Unitization are fair, reasonable, and equitable.

III. Secondary Recovery

Mr. Ewing testified that 5 wells have been drilled into the Bear Lake 27 Field, of which three are capable of producing oil. Two of the wells have been plugged. Mr. Ewing sponsored Exhibit J showing total well production data. The total primary recovery has been a cumulative production of 1,591 million barrels of oil (MBO) from the Bear Lake 27 Field. Mr. Ewing sponsored Exhibit L showing that the current estimated economic recovery of the reef would be 1610 MBO (19 MBO of additional recovery). The Petitioner believes significantly more oil and natural gas liquids will be recovered as a result of dry natural gas injection. The Petitioner proposes to inject dry natural gas and/or other approved substances into the field utilizing one or more of the existing wellbores. Mr. Ewing testified that dry natural gas injection into the Bear Lake 27 Field would result in approximately 405 MBO of incremental liquids being recovered, shown in Exhibit N. Mr. Ewing testified that the dry natural gas to be injected will be purchased and sourced from the DTM gas header at Norwalk. The proposed facilities schematic and EOR process diagram are presented as Exhibit E. Mr. Ewing testified that the incremental recovery (Exhibit M) and analysis of economics indicate that the project will be profitable, with an estimated net profit of \$4.8 Million (Exhibit O). Mr. Ewing testified that in his professional opinion, the proposed EOR project will economically recover oil and natural gas liquids that would not otherwise be produced and will prevent waste.

Based on the Petitioner's analysis, there is evidence of significant amounts of oil and natural gas liquids remaining in the reservoir. I find the testimony indicates the proposed Unit Area contains an accumulation of hydrocarbons that will not be recovered by further primary production of the wells in the field but may be recovered by the injection of dry natural gas enhanced oil recovery operations conducted as part of the unitized operation. I find the estimated additional cost of unitized operations will not exceed the value of the additional hydrocarbons recovered and the unitization requested is reasonably necessary to substantially increase ultimate recovery of oil and natural gas liquids from the proposed Unit Area.

The Petitioner's Plan of Unitization (Exhibit B) allocates unit production among the

five tracts comprising the Proposed Unit. Mr. Ewing testified that Lambda Energy allocates Tract Participation by a combination of the following weighted factors:

- 1) 50%: Original Hydrocarbons in Place as calculated off Phi-H map in Exhibit H
- 2) 30%: Average Gross Revenue for past 12 months
- 3) 20%: Available Wellbore Count

Mr. Ewing testified as to the technical analysis and reasoning used by Lambda Energy to calculate the stated tract factors in the Plan of Unitization.

Mr. Ewing further testified that this combination of weighted allocation factors was designed to credit mineral owners for Original Hydrocarbons in Place under their lease while protecting against lopsided re-allocation of production from active proved producing wells with steady payments to mineral owners. It is Mr. Ewing's opinion that the tract factors represent each tract's fair, reasonable, and equitable share of future unit production.

I find the allocation of production to the separately owned tracts is fair, reasonable, and equitable as required by Section 61705 of Part 617 of the NREPA. I further find the type of operations contemplated by the Petitioner are feasible, will prevent underground waste, and will protect correlative rights. I find abrogation of the existing spacing orders is necessary to implement the Plan of Unitization and proceed with unitized operations, except no producing well shall be completed in the Unitized Formation at a location closer than 330 feet from the outside boundary of the proposed Unit Area.

CONCLUSIONS OF LAW

Based on the findings of fact, I conclude, as a matter of law:

1. The applicable spacing, well location, and proration requirements for the proposed Unit Area are established by Special Order No. 1-73. Exceptions to this order may be granted by the Supervisor.
2. The Supervisor shall issue an order providing for the unit operation of a Unit Area if he or she finds all of the following:
 - a. That the unitization requested is reasonably necessary to substantially increase the ultimate recovery of oil and gas from the Unit Area.

- b. That the type of operations contemplated by the plan are feasible, will prevent waste, and will protect correlative rights.
 - c. That the estimated additional cost of conducting such operations will not exceed the value of the additional oil and gas so recovered. MCL 324.61704(4).
3. The Supervisor may regulate the secondary recovery methods of oil and gas, including pulling or creating a vacuum and the introduction of gas, air, water, and other substances into the production formations. MCL 32461506(i).
 4. A person desiring to inject water, gas, or other fluids into a producing formation or use other technology for the purpose of increasing the ultimate recovery of hydrocarbons from a reservoir shall file a petition for hearing, 1996 AACCS, R 324.612(1).
 5. The operator of a secondary recovery project shall keep accurate records of all oil, gas, and brine produced, volumes of fluids injected, and injection pressures. The operator shall file reports of the data and other data as may be required with the Supervisor at regular intervals, as specified. 1996 AACCS, R 324.612(2).
 6. The Supervisor has jurisdiction over the subject matter and the persons interested therein.
 7. Due notice of the time, place, and purpose of the hearing was given as required by law, and all interested persons were afforded an opportunity to be heard. 2015 AACCS, R 324.1204.

DETERMINATION AND ORDER

Based on the Findings of Fact and Conclusions of Law, the Supervisor determines that the proposed unitization and enhanced oil recovery project will prevent waste and maximize the ultimate recovery of hydrocarbons from the proposed Unit Area.

NOW, THEREFORE, IT IS ORDERED:

1. The Petition of Lambda Energy Resources LLC is granted, and the proposed Unit Area is created in accordance with, and subject to, this Order and the provisions of the Plan of Unitization, which is hereby incorporated by reference. The proposed Unit Area shall be hereafter known as the Bear Lake 27 Unit. All unleased owners shall be subject to the Plan of Unitization.
2. Special Order No. 1-73 is abrogated for the Bear Lake 27 Unit.

3. Lambda Energy Resources LLC is appointed Unit Operator.

4. The Bear Lake 27 Unit is described as the SE/4, E/2 SW/4 and SW/4 NE/4 of Section 27, and the NW/4 NE/4 of Section 34, T23N, R15W, Bear Lake Township, Manistee County, Michigan.

5. The Unitized Formation is described as the stratigraphic equivalent of that portion of the Guelph Dolomite/Ruff formation (formerly referred to as the Salina and Niagara Groups) encountered in the interval from 4379' MD to 4833' MD in the Compensated Formation Density Log run on December 23, 1975 in the Hilliard #3-27 Well (Permit No. 30681), for a total interval of 504 feet, or the correlative equivalent of that interval.

6. Lambda Energy Resources LLC shall notify the Supervisor between 30 and 60 days prior to the commencement of injection operations, and between 30 and 60 days prior to the anticipated date of permanent cessation of injection operations. The Petitioner shall comply with the filing requirements of R 324.610, R 324.612, and R 324.806 of the administrative rules of Part 615 of the NREPA and shall obtain such approvals as are necessary from the Department of Environment, Great Lakes, and Energy.

7. Each tract within the Bear Lake 27 Unit shall participate in the unit production and other benefits and burdens of unit operations in accordance with the Plan of Unitization.

8. Operation of the Bear Lake 27 Unit shall be conducted as an exception to all applicable spacing orders and rules, except no well may be completed in the Unitized Formation at a location closer than 330 feet from the outside boundaries of the Bear Lake 27 Unit. Lambda Energy Resources LLC is authorized to produce wells on the Unit Area at rates that result in the maximum efficient recovery of hydrocarbons and shall not be subject to the production allowable set forth in Special Order No. 1-73. All other parts of Special-Order No.1-73 and the administrative rules of Part 615 of the NREPA shall be adhered to.

9. The unitized operations shall initially be accomplished by the injection of dry natural gas. During recycling, whatever native natural gas is left in the Unitized Formation that becomes intermixed with the dry natural gas may be cycled into and out of the Unitized Formation or be sold. Other substances may only be injected with written

approval from the Supervisor.

10. The unitized operations shall initially be accomplished by use of the existing wells in the Unit. The Petitioner may drill additional wells in the Unit only with written approval from the Supervisor and not at a location closer than 330 feet from the outside boundaries of the Bear Lake 27 Unit.

11. The Plan of Unitization, which constitutes the plan for unit operations, is hereby approved; and unit operations thereunder may be commenced as of the effective date, but subject to the Unit Operator determination of an effective date consistent with Article 15 of the Plan of Unitization. Cessation of unit operations shall be in accordance with the Plan of Unitization and only with the written approval of the Supervisor.

12. The Supervisor retains continuing jurisdiction over the Bear Lake 27 Unit in order that the Supervisor may exercise such administrative control as is consistent with the powers and duties of the Supervisor, as established by Part 615 and Part 617 of the NREPA.

13. This Order is effective immediately.



Dated: December 1, 2023

Adam W. Wygant
ASSISTANT SUPERVISOR OF WELLS
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