STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

SUPERVISOR OF WELLS INSTRUCTION 1-2011

HIGH VOLUME HYDRAULIC FRACTURING WELL COMPLETIONS

Purpose

The purpose of this Supervisor of Wells Instruction is to clarify the requirements under Part 615, Supervisor of Wells, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), for permitting, drilling, completing, and records reporting for all oil and gas wells that utilize high volume hydraulic fracture completion technology.

Applicable Statutes and Rules

Part 615, Supervisor of Wells, of the NREPA, and the administrative rules promulgated thereunder.

Definitions

For purposes of this Instruction:

"High volume hydraulic fracturing well completion" means a well completion operation that is intended to use a total of more than 100,000 gallons of hydraulic fracturing fluid.

"Large volume water withdrawal" means a water withdrawal intended to produce a cumulative total of over 100,000 gallons of water per day when averaged over a consecutive 30-day period.

"Adverse resource impact," site-specific review," "assessment tool," "zone B withdrawal," "cold-transitional river system," "zone C withdrawal," and "zone D withdrawal" have the same meanings as in Part 327, Great Lakes Preservation, of the NREPA, MCL 324.32701 *et seq.*

Other terms have the same meanings as in Part 615 of the NREPA or administrative rules promulgated thereunder.

Background

Hydraulic fracturing is a well completion operation that involves pumping fluid and proppants into the target formation to create or propagate artificial fractures, or enhance natural fractures, for the purpose of improving the deliverability and production of hydrocarbons. The technique dates back over 60 years. However, in recent years some completion operations have utilized larger volumes of hydraulic fracturing fluids in conjunction with horizontal drilling. Such operations typically involve multiple fracturing stages and total volumes of fracturing fluid exceeding 100,000 gallons.

This type of well completion operation has created some unique conditions not typical of conventionally completed wells. These include: on-site large volume water withdrawals, fresh water pits, larger volumes of chemical additives, and larger volumes of flowback water. This Instruction applies to all high volume hydraulic fracturing well completions.

Permitting Instructions

The withdrawal of water for oil and gas operations is currently exempt from the requirements of Michigan's water withdrawal statute (Part 327). However, in order to assure that a proposed withdrawal will not adversely affect surface waters or nearby freshwater wells, the following items shall be provided to the Office of Geological Survey (OGS) prior to a large volume water withdrawal for well completion operations. The items may be included with the application for the permit to drill or may be provided to the appropriate OGS district supervisor at least 14 days before the water withdrawal begins.

1. A water withdrawal evaluation utilizing the assessment tool accessed at http://www.miwwat.org/. The generated withdrawal determination shall be provided. If the assessment tool determines that the proposed withdrawal is a zone B withdrawal in a cold-transitional river system, or a zone C or zone D withdrawal, the applicant or permittee may submit to the Department of Environmental Quality a request for a site-specific review. It should be noted that if the site-specific review, or the assessment tool if a site-specific review is not conducted, indicates that the proposed withdrawal is likely to cause an adverse resource impact, or designates the proposed withdrawal as a zone B withdrawal in a cold-transitional river system or a zone C or zone D withdrawal, the ability to utilize an on-site water supply well(s) may be impacted.

2. The following data and records:
    a. Proposed total volume of water needed for hydraulic fracturing well completion operations.
    b. Proposed number of water withdrawal wells.
    c. Aquifer type (drift or bedrock).
    d. Proposed depth of water withdrawal wells (feet below ground surface).
    e. Proposed pumping rate and pumping frequency (continuous or intermittent) of the water withdrawal wells.

3. A supplemental plat of the well site showing the following:
    a. Proposed location of water withdrawal wells (latitude/longitude).
    b. Location of all recorded fresh water wells and reasonably identifiable freshwater wells within 1,320 feet of water withdrawal location (latitude/longitude).
    c. Proposed freshwater pit location and dimensions.

Completion Instructions

Important considerations for well completion operations include the monitoring of any potential impact to area freshwater wells, the management of freshwater and flowback water, and the observation of induced well pressures. Therefore, operators shall conform to the following requirements for high volume hydraulic fracturing well completions:

1. If one or more freshwater wells are present within 1,320 feet of a proposed large volume water withdrawal, then the operator shall install a monitor well between the water withdrawal well(s) and the nearest freshwater well. The operator shall measure and record the water level in the monitor well daily during water withdrawal and weekly thereafter until the water level stabilizes. The operator shall report the water level data weekly to the OGS District Supervisor.

2. Freshwater pits should not create a site hazard and shall not remain on-site after well completion operations. Depending upon site conditions freshwater pits will be subject to soil erosion protective measures and may require fencing.

3. During hydraulic fracturing operations, the operator shall monitor and record the injection pressure at the surface and the annulus pressure between the injection string and the next string of casing unless the annulus is cemented to surface.

Reporting Instructions

An operator that conducts a high volume hydraulic fracturing well completion shall provide the following items with the record of well completion operations:

1. Material Safety Data Sheets provided by the service company for the chemical additives used and volume of each chemical additive used.
2. Service company fracturing records and associated charts showing fracturing volumes, rates, and pressures.
3. Annulus pressures recorded during fracturing operations.
4. The total volume of flowback water (formation and/or treatment water) to date at the time of record submittal, which shall be included in the Record of Well Completion (EQP 7130).

THIS INSTRUCTION IS EFFECTIVE JUNE 22, 2011.

Date: May 23, 2011

HAROLD R. FITCH
ASSISTANT SUPERVISOR OF WELLS