

BW - ___999___

Oilfield Wastes

BRINE WELL WORK GROUP

3/26/09 - Present

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, April 21, 2009 5:16 PM
To: 'Ken Davis'; James_Rutley@blm.gov; byrum.charles@epa.gov; Leissner.Ray@epamail.epa.gov; hugh.harvey@intrepidpotash.com; Imolleur@keyenergy.com; gveni@nckri.org; Jones, Brad A., EMNRD; VonGonten, Glenn, EMNRD; Griswold, Jim, EMNRD; Kostrubala, Thaddeus; balch@prcc.nmt.edu; leo.vansambeek@respec.com; rlbeauh@sandia.gov; grkirke@sandia.gov; reitze@socon.com; mcartwright@unitedbrine.com; dave.hughes@wipp.ws; Allen.Hains@wnr.com; ken.parker@wnr.com; Ron.Weaver@wnr.com; Veronica.Waldram@wipp.ws; RichardM@intrepidpotash.com; cgherri@sandia.gov; dwsnow@lotusllc.com; lyn.sockwell@basicenergyservices.com; dwpowers@evaporites.com; Sanchez, Daniel J., EMNRD
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Subject: RE: UIC Class III Brine Evaluation Work Group Draft Report Attached
Attachments: TXRRC Oilfield Wastes.pdf

Ken:

Thank you for your input and information submittal. I think the concern of the OCD is the UIC Class I Disposal Well designation and was based on comments from the EPA during the Work Group meeting regarding an application in TX where RCRA Subtitle "C" Hazardous Wastes was being proposed for disposal in a salt cavern. The application was eventually denied or prohibited and the discussion of the costs for any applicant may have to incur to model and address all of the Federal concerns with such a proposal seemed to be costly.

You will note that the brine well strategy indicated that there was interest for UIC Class I Waste Disposal into salt caverns. Similar to the EPA concerns with RCRA Hazardous Waste, the OCD regards oilfield non-exempt non-hazardous wastes, while being exempt from the hazardous Subtitle "C" RCRA Classification, to be inherently similar to it with similar concerns as the EPA when reviewing the aforementioned application in TX. I have attached a chapter on waste from the TX Railroad Commission (Waste Minimization Program) that clarifies the type of wastes that are oilfield non-exempt and oilfield wastes that are indeed considered hazardous for background for the Work Group.

The OCD will review the publication you attached to your e-mail in consideration of the final report related to your e-mail, but may not yield to a UIC Class I disposal well designation, but may consider these wells for oilfield exempt type wastes in our final report? The EPA had also mentioned the fact that brine wells that are backfilled may be classified as UIC Class V Wells; thus, the removal of the Class I Disposal Well nomenclature?

Also, please provide the Work Group with links for documentation on the LA Regulations and info. that may be pertinent to consider; however, LA has a different salt depositional environment (salt dome) than the bedded salt in SE NM.

Thanks again.

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(Pollution Prevention Guidance is under "Publications")

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Subject: RE: UIC Class III Brine Evaluation Work Group Draft Report Attached

Carl:
I reviewed the NMOCD Class III Brine Well Draft Report that was originally attached to this e-mail and suggest you might want to review the results of an Argonne National Laboratory Study. They developed a report titled "An Introduction to Salt Caverns & Their Use for Disposal of Oil Field Wastes". I have attached a scanned copy of the report for every-ones convenience.

The report indicates their findings were favorable to disposing of Oil Field Wastes in Salt Caverns. Additionally, the state of Louisiana developed very stringent regulations allowing this methodology that should also be considered. I suggest the OCD review these documents before banning Oil Field Waste Disposal in Salt Caverns.

I agree we should also consider the SMRI ongoing P&A research results.

Hope this information will be helpful.
Ken E. Davis

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Monday, April 20, 2009 7:10 PM
To: Chavez, Carl J, EMNRD; James_Rutley@blm.gov; byrum.charles@epa.gov; Leissner.Ray@epamail.epa.gov; hugh.harvey@intrepidpotash.com; Imolleur@keyenergy.com; gveni@nckri.org; Jones, Brad A., EMNRD; VonGonten, Glenn, EMNRD; Griswold, Jim, EMNRD; Kostrubala, Thaddeus; balch@prrc.nmt.edu; leo.vansambeek@respec.com; rlbeauh@sandia.gov; grkirke@sandia.gov; reitze@socon.com; mcartwright@unitedbrine.com; dave.hughes@wipp.ws; Allen.Hains@wnr.com; ken.parker@wnr.com; Ron.Weaver@wnr.com; Veronica.Waldram@wipp.ws; RichardM@intrepidpotash.com; cgherri@sandia.gov; dwsnow@lotusllc.com; lyn.sockwell@basicenergyservices.com; dwpowers@evaporites.com; Sanchez, Daniel J., EMNRD
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Subject: RE: UIC Class III Brine Evaluation Work Group Draft Report Attached

Ladies and Gentlemen:

Please find attached a copy of the Microsoft Word draft report. The report is still in very rough draft form as the OCD attempted to capture the essence of the comments recorded in the Brine Strategy Document from March 27, 2009. The OCD attempted to capture the Work Group comments in the recommendations for a path forward section near the end of the report. The OCD will ultimately have to comb over the sections to refine, add and/or delete items for the final report.

The OCD notices that there was some concepts and ideas sent in e-mails for a solution to the I&W Brine Well #6 problem in Carlsbad and your final input would be appreciated for finding a solution to this problem. Although the solution appears to be on a fast track with the Office of Homeland Security, OCD, DOT, and other stakeholders in the area, I think the Work Group should chime in with recommendations at this point on a possible solution or you could cast a vote on the solutions below?. The solutions proposed thus far appear to be:

- 1) Restrict access as it could collapse at any moment, implement monitoring (laser level on well head, could include re-drilling into abandoned well to monitor fluid level and keep cavern filled), create safe zone in area (remove persons or businesses if necessary), and work on contingency plan for if and when well collapses. Could sink \$5 Million into project and could collapse anyway....?

- 2) Pipe in salt waste slurry from Intrepid Potash at nominal fee per bbl. (~ 1 Million barrels) to fill salt cavern or via rail cars or trucks.
- 3) Induce collapse of cavern and fill up with solids, including special polymers, cement, etc. using heavy earth moving equipment?
- 4) EPA proposal to drill wells into bottom of cavern, seek operator to manage the injection of acceptable oilfield non-hazardous wastes (i.e., BLM tailings, salt wastes from potash companies, drill cuttings, slurry sand, solids, etc.) into cavern over long-term.
- 5) Salt bath steam concept from bottom to top of cavern?
- 6) Other?

The OCD looks forward to your comments. Please save the document under your name and track changes if you wish to send it back with your comments. The OCD requests your comments by COB this Friday, April 24, 2009 or sooner if possible. The OCD will issue one last draft on COB Tuesday April 28, 2009. The above dates are tentative, but we hope to give you a chance to comment before issuing the final report, which you will be copied on to the Secretary of the EMNRD. Yes, it appears that the report is to the Secretary and not the Oil Conservation Commission.

Please contact me if you have questions. Thank you.

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**HAZARDOUS AND NONHAZARDOUS
OIL AND GAS WASTE**

OIL AND GAS WASTES

The Railroad Commission has jurisdiction over oil and gas wastes, which include all wastes generated in association with the following activities:

- drilling, operation, and plugging of wells associated with the exploration, development, or production of oil and gas, including oil and gas wells, fluid injection wells used in enhanced recovery projects, and disposal wells;
- separation and treatment of produced fluids in the field or at natural gas processing plants;
- storage of crude oil before it enters a refinery;
- underground storage of hydrocarbons and natural gas;
- transportation of crude oil or natural gas by pipeline;
- solution mining of brine; and
- storage, hauling, disposal, or reclamation of wastes generated by these activities.

The Railroad Commission regulates *all* oil and gas waste in Texas, both hazardous and nonhazardous. Statewide Rule 30, "Memorandum of Understanding Between the Railroad Commission of Texas (RRC) and the Texas Natural Resource Conservation Commission (TNRCC)," provides additional guidance for determining jurisdiction over waste in Texas.

RCRA AND THE E&P EXEMPTION

The federal Resource Conservation and Recovery Act (RCRA), originally enacted in 1976, authorizes EPA to regulate the management of wastes resulting from industrial, commercial, mining, agricultural, and community activities. RCRA Subtitle C contains a comprehensive program for the regulation of hazardous wastes. Nonhazardous wastes are subject to regulation under RCRA Subtitle D. Railroad Commission Statewide Rule 98, "Standards for Management of Hazardous Oil and Gas Wastes," establishes equivalent requirements for generators and transporters of hazardous oil and gas waste.

Recognizing the unique characteristics of oil and gas wastes, in 1980, Congress specifically exempted "drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas or geothermal energy"⁵ from regulation under RCRA Subtitle C as hazardous wastes. This exemption is commonly called the "E&P Exemption." Statewide Rule 98 also provides the E&P exemption. The E&P exemption is explained in the following section.

Produced waters make up about 98% of all oil and gas wastes. In Texas, we estimate that 98% of these produced waters are injected in wells regulated under the federally approved underground injection control program administered by the Railroad Commission. Drilling fluids and other associated wastes make up about 1.6% and 0.4% of oil and gas wastes, respectively.

The exempt oil and gas wastes are unique, which is the rationale for the exemption. They are generated in large quantities, but are relatively low in toxicity. Exempt oil and gas wastes are generated by a large number of individual oil and gas operations—around 250,000 wells and 12,500 operators in Texas. Oil and gas wastes are generated in diverse operational and environmental settings—compare the Gulf Coast to the Panhandle, or the Permian Basin to the East Texas Field. Finally, exempt oil and gas wastes are adequately regulated under state and federal programs (other than RCRA Subtitle C) that have evolved over the years.

SCOPE OF THE E&P EXEMPTION

On July 6, 1988, after performing the study of oil and gas wastes mandated by Congress, EPA published its regulatory determination⁶ (see Appendix A). In its regulatory determination, EPA concluded that the exemption for produced water, drilling fluids, and associated wastes should continue. EPA also made its first efforts

to define the scope of the exemption. EPA reviewed both the statutory language and the legislative history and determined that the exemption for wastes associated with the exploration, development, and production of oil and gas covers only those wastes **uniquely associated with primary field operations**. Primary field operations include primary, secondary, and tertiary production of oil or gas.

With respect to **oil production**, primary field operations include activities occurring at or near the wellhead or production facility, but before the point where the custody of the oil is transferred from an individual field facility or a centrally located facility to a carrier for transport to a refiner. In the event no custody transfer occurs, the primary field operation ends at the last point of separation. Crude oil stock tanks are considered separation devices for the purpose of defining areas of primary field operations.

With respect to **natural gas production**, primary field operations are those activities occurring at or near the wellhead, production facility, or gas plant (including gathering lines to the plant), but before the point of transfer of the gas from an individual field facility, a centrally located facility, or a gas plant to a carrier for transport to market, or before the point of the use of natural gas in a manufacturing process.

In order to be covered under the E&P exemption, wastes from primary field operations must also be unique to E&P operations. Clearly, wastes such as produced water and drilling fluid are unique. However, other wastes commonly generated in E&P operations are used in other types of industries. For example, cleaning wastes, painting wastes, and waste lubricating oil are commonly generated in activities other than E&P activities (i.e., are not unique) and are, therefore, not covered by the E&P exemption.

In March 1993⁷, EPA provided clarification of the regulatory determination regarding the status of certain oil and gas wastes (see Appendix B). In that clarification, exempt waste was more precisely defined:

In particular, for a waste to be exempt from regulation as a hazardous waste under RCRA Subtitle C, it must be associated with operations to locate or remove oil and gas from the ground or to remove impurities from such substances and it must be intrinsic to and uniquely associated with oil and gas exploration, development or production operations (commonly referred to as exploration and production or E&P); the waste must not be generated by transportation or manufacturing

operations ... One common belief is that any wastes generated by, in support of, or intended for use by the oil and gas E&P industry ... are exempt. This is not the case; in fact, only wastes generated by activities uniquely associated with the exploration, development or production of crude oil or natural gas ... (i.e., wastes from down-hole or wastes that have otherwise been generated by contact with the production stream during the removal of produced water or other contaminants from the product) are exempt from regulation under RCRA Subtitle C ...

In its March 1993 clarification, EPA addressed the applicability of the E&P exemption to wastes generated by crude oil reclaimers, service companies, gas plants and feeder pipelines, crude oil pipelines, and underground gas storage fields. The clarification included the following explanations of the E&P exemption.

- For the purpose of defining primary field operations, the change of custody criterion refers to product (e.g., crude oil and natural gas), not waste.
- The off-site transport of exempt waste from a primary field site for treatment, reclamation, or disposal does not negate the exemption.
- Wastes derived from the treatment of an exempt waste, including any recovery of product from an exempt waste (e.g., crude oil reclamation from tank bottoms), generally remain exempt from the requirements of RCRA Subtitle C.
- Vacuum truck and drum rinsate from trucks and drums transporting or containing exempt waste is exempt, provided that the trucks or drums only contain E&P exempt wastes and that the water or fluid used in the rinsing is not subject to RCRA Subtitle C (i.e., is itself nonhazardous).
- Wastes generated by a service company that do not meet the basic criteria listed in the regulatory determinations (i.e., are not uniquely associated with oil and gas E&P operations) are not exempt from Rule 98 and Subtitle C. However, an oil and gas waste generated by a service company in primary field operations, and that is also uniquely associated with E&P, is an exempt oil and gas waste.
- The removal of elemental sulfur from hydrogen sulfide gas at a gas plant is considered treatment of an exempt waste.
- Wastes uniquely associated with operations to recover natural gas from underground gas storage fields are covered by the exemption.

EPA included a list of exempt wastes and a list of nonexempt wastes in its regulatory determination. These lists are not comprehensive. They were intended only to provide examples of the types of wastes that fall under the exempt and nonexempt categories. Generators will need to make individual determinations regarding the status of a number of other incidental wastes. The Railroad Commission or the EPA should be contacted for guidance in the event the regulatory status of a waste is in doubt.

Exempt Wastes

Exempt wastes make up the bulk (over 99.9%) of all wastes that are regulated by the Railroad Commission. Table 1 is a list of wastes designated as exempt in EPA's regulatory determination dated July 6, 1988⁶. It is a listing of most, but not all, oil and gas wastes that are exempt from hazardous waste regulation.

Although many oil and gas wastes are exempt from hazardous waste regulation, other regulations will apply, such as Railroad Commission Statewide Rule 8.

Nonexempt Wastes

The wastes that EPA has determined are not covered under the exemption may be hazardous wastes subject to regulation under Rule 98 and RCRA Subtitle C. Nonexempt wastes include, no matter where generated, those wastes that *are not uniquely associated* with an exploration and production activity, such as cleaning wastes or lubricating oil. Further, *all* wastes that are not associated with primary field operations, such as wastes associated with pipeline transportation or manufacturing (e.g., refining) activities, are nonexempt. Table 2 provides the list of nonexempt wastes in EPA's regulatory determination⁶. This is a listing of most, but not all, oil and gas wastes that are not exempt from regulation as hazardous wastes.

Not all nonexempt wastes are hazardous wastes. For example, empty drums and insulation will probably not be hazardous waste. However, some wastes, such as paint wastes, spent solvents, unused fracturing materials that can no longer be used for their intended purpose, and contaminated media resulting from a spill from a transportation pipeline, may be hazardous. The following section, "Hazardous Oil and Gas Wastes," explains how an operator may identify a nonexempt waste as hazardous or nonhazardous.

TABLE 1. OIL AND GAS WASTES EXEMPT FROM RCRA HAZARDOUS WASTE REGULATION*

- Produced water
- Drilling fluids and drill cuttings
- Drilling fluids and cuttings from offshore operations disposed on-shore
- Rigwash
- Well completion, treatment, and stimulation fluids
- Workover wastes
- Basic sediment and water and other tank bottom sludge from storage facilities that hold product and exempt waste
- Accumulated materials such as hydrocarbons, solids, sand, and emulsion from production separators, fluid treating vessels, and production impoundments
- Pit sludges and contaminated bottoms from storage or disposal exempt wastes
- Gas plant dehydration wastes, including glycol-based compounds, glycol filters, filter media, backwash, and molecular sieves
- Gas plant sweetening wastes for sulfur removal, including amine, amine filters, amine filter media, backwash, precipitated amine sludge, iron sponge, and hydrogen sulfide scrubber liquid and sludge
- Cooling tower blowdown
- Spent filters, filter media, and backwash (assuming the filter itself is not hazardous and the residue in it is from an exempt waste stream)
- Packing fluids
- Produced sand
- Pipe scale, hydrocarbon solids, hydrates, and other deposits removed from piping and equipment prior to transportation
- Hydrocarbon-bearing soil
- Pigging wastes from gathering lines
- Wastes from subsurface gas storage and retrieval, except for the listed nonexempt wastes
- Constituents removed from produced water before it is injected or otherwise disposed of
- Liquid hydrocarbons removed from the production stream but not from oil refining
- Gases removed from the production stream, such as hydrogen sulfide and carbon dioxide, and volatilized hydrocarbons
- Materials ejected from a producing well during blowdown
- Waste crude oil from primary field operations and production
- Light organics volatilized from exempt wastes in reserve pits or impoundments or production equipment

*Note: All exempt waste *must* be generated in primary field operations. A more descriptive listing of exempt wastes, as well as lists of wastes subject to laws other than RCRA, is provide in Appendix C.

TABLE 2. RCRA NONEXEMPT OIL AND GAS WASTES*

- Unused fracturing fluids or acids
- Gas plant cooling tower cleaning wastes
- Painting wastes
- Oil and gas service company wastes, such as empty drums, drum rinsate, vacuum truck rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids
- Vacuum truck and drum rinsate from trucks and drums transporting or containing nonexempt waste
- Liquid and solid wastes generated by crude oil and tank bottom reclaimers**
- Used equipment lubrication oils
- Waste compressor oil, filters, and blowdown
- Used hydraulic fluids
- Waste solvents
- Waste in transportation pipeline-related pits
- Caustic or acid cleaners
- Boiler cleaning wastes
- Boiler refractory bricks
- Boiler scrubber fluids, sludges, and ash
- Incinerator ash
- Laboratory wastes
- Sanitary wastes
- Pesticide wastes
- Radioactive tracer wastes
- Drums, insulation, and miscellaneous solids

(EPA also included refinery wastes in this list. However, refinery wastes are not under the jurisdiction of the Railroad Commission.)

*NOTE: A more descriptive listing of nonexempt wastes, as well as lists of wastes subject to laws other than RCRA, is provided in Appendix C.

**NOTE: Residual material from reclamation of crude oil from exempt waste is also exempt (see third bullet item on page 3-4).

Implementing a waste minimization program can simplify compliance with the requirements of Rule 98 and RCRA and may reduce costs and future liability for the disposal of hazardous and nonhazardous wastes.

HAZARDOUS OIL AND GAS WASTE

RCRA required EPA to establish procedures for identifying wastes as either hazardous or nonhazardous, and promulgate requirements for the management of both. In order for a waste to be a hazardous waste, it must also be a solid waste as defined under federal law (40 CFR 261.2). A solid waste may be solid, semi-solid, liquid, or a contained gas. A nonexempt solid waste is classified as a hazardous waste if EPA has specifically listed it as such or if it tests positive for one of four hazardous waste characteristics. Rule 98 adopts the federal hazardous waste identification rules.

Nonexempt Listed Hazardous Oil and Gas Wastes

EPA has listed numerous solid wastes as hazardous wastes because they:

- typically exhibit one or more of the characteristics of hazardous waste (described below);
- have been shown to meet certain human toxicity criteria; or
- contain any one of the chemical compounds or substances listed by EPA as hazardous constituents.

EPA's regulations contain four lists of hazardous wastes (refer to Table 3, Listed RCRA Hazardous Oil and Gas Wastes). These lists contain over 400 hazardous wastes. Some are considered acutely hazardous wastes, which are wastes that EPA has determined to be so dangerous that small amounts of them are regulated the same way as larger amounts of other hazardous wastes.

If a nonexempt oil and gas waste is identified on any of these four lists, the waste must be managed as a listed hazardous waste. For example, waste solvent from use of the solvent as a degreaser on surface equipment is nonexempt; and if it is found to be a "listed" hazardous waste, it must be managed as such. Remember, however, that

the same solvent used to remove paraffin in a well is an exempt oil and gas waste when it is recovered. If an oil and gas waste is exempt, it is an exempt waste even if it appears on one of the four lists. Though the waste is not subject to regulation as a hazardous waste, other regulations apply and good waste management practices (including waste minimization) should be employed.

TABLE 3: LISTED RCRA HAZARDOUS OIL AND GAS WASTES

| EPA LIST | TYPE OF WASTE | EXAMPLES OF OIL AND GAS WASTES THAT MIGHT BE FOUND ON EPA LISTS * |
|-----------------|---|---|
| F List | Hazardous wastes from non-specific sources | Spent solvents (trichloroethylene, methylene chloride, tetrachloroethylene, xylene, acetone, benzene, ethyl benzene, methyl ethyl ketone, nbutyl alcohol, methanol, toluene, and solvent mixtures/blends that contain more than 10% of these solvents) |
| K List | Hazardous wastes from specific sources | None identified |
| P List | Acute hazardous wastes (Commercial chemical products that become acute hazardous waste when disposed of) | Acrolein, beryllium, carbon disulfide, parathion, vanadium pentoxide |
| U List | Toxic hazardous wastes (Commercial chemical products that become toxic hazardous wastes when disposed of) | Acetone, benzene, carbon tetrachloride, chloroform, chrysene, formaldehyde, formic acid, hydrogen fluoride, hydrogen sulfide, lindane, mercury, methanol, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene, xylene |

* Note: The examples given are not a complete list. Additional oil and gas wastes may be found on one of the four lists, depending upon the operations.

Nonexempt Characteristically Hazardous Oil and Gas Wastes

If a nonexempt oil and gas waste is not listed, it must be determined if the waste exhibits a hazardous waste characteristic. Typically, characteristically hazardous oil and gas wastes are a more common concern to operators of E&P facilities. A nonexempt oil and gas waste is classified as hazardous if it exhibits any one of following four hazardous waste characteristics:

- ignitability,
- corrosivity,
- reactivity, and
- toxicity.

Table 4 provides a description of the four hazardous waste characteristics.

The generator can either test the waste material using an accepted EPA analytical method or can apply process knowledge in determining whether the waste in question is characteristically hazardous. A generator who relies on process knowledge in determining if a waste is characteristically hazardous should be prepared to demonstrate that this determination is reasonable in terms of the materials and process used. If there is any reasonable doubt as to whether a nonexempt oil and gas waste exhibits one or more hazardous waste characteristics, the generator is encouraged to verify the waste classification by testing so that the waste may be properly managed. It is prudent to determine whether or not a waste exhibits hazardous characteristics any time a change is made in process or materials. The generator is subject to civil and criminal penalties if a hazardous waste is misidentified and, thus not managed according to hazardous waste regulations.

A characteristically hazardous waste may be decharacterized; however, it will probably remain subject to land disposal restrictions of 40 CFR Part 268. As a general rule, the dilution of a hazardous waste for the purpose of eliminating the characteristic is prohibited. Dilution is not considered by EPA to be an acceptable treatment method for characteristically hazardous waste.

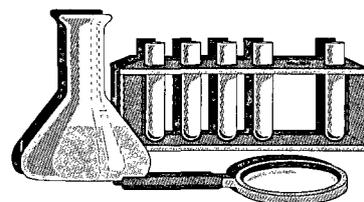


TABLE 4: RCRA AND RULE 98 HAZARDOUS WASTE CHARACTERISTICS**► IGNITABILITY**

- Liquids with a flash point less than 140°F
- Ignitable compressed gas
- Materials other than liquids that at standard conditions are capable of causing fire by spontaneous chemical changes, by absorption of moisture, or through friction.

Examples: certain cleaning solvents (may also be listed hazardous wastes), certain degreasers, certain transportation-pipeline pigging wastes, certain paint wastes

► CORROSIVITY

- Aqueous materials with a pH of less than or equal to 2.0 or greater than or equal to 12.5.
- Liquid materials that corrode steel (SAE 1020) at a rate greater than 0.250 inch per year at a test temperature of 130°F.

Examples: certain acid or caustic cleaning wastes, unused well acidizing fluids (that have not been down the borehole), certain rust removers, waste battery acid

► REACTIVITY

- Any waste that reacts violently with water, forms explosive mixtures with water, or generates any toxic fumes with water
- Any waste that is explosive at standard conditions or if heated
- Any waste that contains cyanide or sulfide at a concentration that will emit toxic cyanide or sulfide gases when exposed to a pH of 2.0 to 12.5.

Examples: certain waste oxidizers

► TOXICITY

Potential to contaminate ground water by leaching as determined in a laboratory using the Toxicity Characteristic Leaching Procedure (TCLP) Test.

Table 4 continues on the next page.

TABLE 4: RCRA HAZARDOUS WASTE CHARACTERISTICS (CONTINUED)

TCLP leachable components* that cause a waste to test hazardous are:

| | | |
|-----------------------|------------------------------|------------|
| Organics: | Benzene | 0.5 mg/l |
| | Carbon tetrachloride | 0.5 mg/l |
| | Chlordane | 0.03 mg/l |
| | Chlorobenzene | 100.0 mg/l |
| | Chloroform | 6.0 mg/l |
| | o-Cresol | 200.0 mg/l |
| | m-Cresol | 200.0 mg/l |
| | p-Cresol | 200.0 mg/l |
| | Cresol | 200.0 mg/l |
| | 2,4-D | 10.0 mg/l |
| | 1,4-Dichlorobenzene | 7.5 mg/l |
| | 1,2-Dichloroethane | 0.5 mg/l |
| | 1,1-Dichloroethylene | 0.7 mg/l |
| | 2,4-Dinitrotoluene | 0.13 mg/l |
| | Endrin | 0.02 mg/l |
| | Heptachlor (and its epoxide) | 0.008 mg/l |
| | Hexachlorobenzene | 0.13 mg/l |
| | Hexachlorobutadiene | 0.5 mg/l |
| | Hexachloroethane | 3.0 mg/l |
| | Lindane | 0.4 mg/l |
| | Methoxychlor | 10.0 mg/l |
| | Methyl ethyl ketone | 200.0 mg/l |
| | Nitrobenzene | 2.0 mg/l |
| | Pentachlorophenol | 100.0 mg/l |
| | Pyridine | 5.0 mg/l |
| | Tetrachloroethylene | 0.7 mg/l |
| | Toxaphene | 0.5 mg/l |
| Trichloroethylene | 0.5 mg/l | |
| 2,4,5-Trichlorophenol | 400.0 mg/l | |
| 2,4,6-Trichlorophenol | 2.0 mg/l | |
| 2,4,5-TP (Silvex) | 1.0 mg/l | |
| Vinyl chloride | 0.2 mg/l | |
| Metals: | Arsenic | 5.0 mg/l |
| | Barium | 100.0 mg/l |
| | Cadmium | 1.0 mg/l |
| | Chromium | 5.0 mg/l |
| | Lead | 5.0 mg/l |
| | Mercury | 0.2 mg/l |
| | Selenium | 1.0 mg/l |
| | Silver | 5.0 mg/l |

Examples of types of wastes that may test hazardous include:

- unused pipe dope (lead)
- unused biocides (chromium)
- cleaning wastes or solvents (benzene)
- transportation pipeline pigging wastes (benzene)

* Note: When at concentrations equal to or greater than the respective value given in the table.

MIXING EXEMPT AND NONEXEMPT WASTES

Mixing exempt and nonexempt wastes creates a special set of problems. Whenever possible, mixing nonexempt wastes with exempt wastes should be avoided because the resulting mixture may become a hazardous waste and require management under RCRA Subtitle C regulations. Furthermore, mixing a characteristically hazardous waste with a nonhazardous or exempt waste *for the purpose of rendering the hazardous waste nonhazardous or less hazardous* is considered by EPA to be a treatment process; which is subject to the appropriate RCRA Subtitle C hazardous waste regulations, including permitting requirements.

Below are some basic guidelines for determining the status of a mixture of exempt and nonexempt wastes.

- ◆ Mixing a nonhazardous (exempt or nonexempt) waste with an exempt waste results in a mixture that is nonhazardous.

Example: If nonhazardous wash water from rinsing road dust off equipment or vehicles is mixed with the contents of a reserve pit containing exempt drilling waste, the wastes in the pit are not subject to hazardous waste regulations regardless of the characteristics of the waste mixture in the pit.

- ◆ If, after mixing a nonexempt characteristically hazardous waste with an exempt waste, the resulting mixture exhibits any of the same hazardous characteristics as the hazardous waste (ignitability, corrosivity, reactivity, or toxicity due to a particular constituent), then the mixture is a nonexempt hazardous waste.

Example: If nonexempt caustic soda (corrosive) is mixed with exempt waste and the resultant mixture exhibits the hazardous characteristics of corrosivity as determined from pH or steel corrosion tests, then the entire mixture becomes a nonexempt hazardous waste.

Example: If a nonexempt solvent that is characteristically hazardous because of benzene toxicity is mixed with an exempt waste, and the resultant mixture exhibits the hazardous characteristic of benzene toxicity, then the entire mixture becomes a nonexempt hazardous waste.

- ◆ If, after mixing a nonexempt characteristically hazardous waste with an exempt waste, the resulting mixture does not exhibit any of the same hazardous

characteristics as the hazardous waste, the mixture is not subject to regulation as a hazardous waste. Even if it exhibits some other characteristic of a hazardous waste, it is still not subject to regulation as a hazardous waste. However, remember that the elimination of the hazardous characteristic(s) exhibited by the nonexempt waste as a result of mixing may be considered treatment. Treatment of a hazardous waste is strictly regulated under RCRA Subtitle C and may require a permit.

Example: If, after mixing nonexempt hydrochloric acid (corrosive characteristic only) with an exempt waste, the resultant mixture does *not* exhibit the hazardous characteristic of corrosivity, then the mixture is not subject to hazardous waste regulations (even if it exhibits some *other* hazardous characteristic, such as toxicity). Note, however, that such a mixture may be made only under specific hazardous waste regulation provisions.

Example: If, after mixing a nonexempt waste exhibiting the hazardous characteristic of lead toxicity with an exempt waste exhibiting the hazardous characteristic of benzene toxicity, the resultant mixture exhibits the hazardous characteristic for benzene but not for lead, then the mixture is not subject to hazardous waste regulations. Such a mixture may be made only under specific provisions of the hazardous waste regulations.

- ◆ Generally, if a *listed* hazardous waste is mixed with an exempt waste, regardless of the proportions, the mixture is a nonexempt hazardous waste.

Example: Adding collected nonhazardous stormwater to a partially filled drum of vanadium peroxide solution would result in a mixture that is the listed hazardous waste, vanadium peroxide.

As illustrated above, an operator's waste management practices should preclude mixing exempt and nonexempt nonhazardous oil and gas waste with any hazardous oil and gas waste. Such practice will help an operator avoid stricter regulatory control and higher waste management costs.

EPA's regulations also state that a solid waste (such as sludge or ash) *derived from* a listed hazardous waste is a hazardous waste. In addition, EPA's regulations require that a waste (such as soil or absorbent material) that *contains* a listed hazardous waste be managed as if it *were* a hazardous waste. Therefore, if an operator spills a listed hazardous waste, such as unused methanol, the contaminated soil "contains" a listed hazardous waste and must itself be managed as a hazardous waste.

MANAGEMENT OF NONHAZARDOUS OIL AND GAS WASTES

The Railroad Commission regulates both exempt and nonexempt oil and gas wastes. In Texas, oil and gas wastes must be managed in accordance with the Railroad Commission's rules and guidelines. Statewide Rule 8 governs the transportation, storage, and disposal (other than by underground injection) of exempt and nonexempt nonhazardous oil and gas wastes. Cleanup requirements for crude oil spills into soil in nonsensitive areas are contained in Statewide Rule 91. Statewide Rules 9 and 46 establish permitting requirements for underground injection. Reclamation of E&P tank bottoms and other exempt hydrocarbon wastes is regulated under Statewide Rule 57. The Water Protection Manual and Underground Injection Control Manual, both available from the Commission, contain the Commission's waste management rules and guidelines.

Some oil and gas wastes may be managed at facilities permitted by the Texas Natural Resource Conservation Commission (TNRCC). Appendix D provides, for your reference, a description of TNRCC waste classifications and the TNRCC and Railroad Commission's joint guidelines for disposal of oil and gas wastes in municipal landfills permitted by the TNRCC.

MANAGEMENT OF HAZARDOUS OIL AND GAS WASTES

As you now know, hazardous oil and gas wastes are those oil and gas wastes that are not RCRA-exempt and that are listed hazardous wastes or characteristically hazardous under RCRA Subtitle C and Rule 98. Because the Railroad Commission has not yet been delegated RCRA authority by the Environmental Protection Agency (EPA), these wastes are regulated both by the Railroad Commission under Rule 98 and by EPA under federal law. The Commission intends to obtain authorization from EPA to administer the federal hazardous waste program for hazardous oil and gas waste. (Note that until EPA's delegation of RCRA Subtitle C authority to the Railroad Commission, hazardous waste generated at natural gas processing plants, pressure maintenance plants, and repressurization plants are excluded from the definition of "oil and gas waste" and are solid waste subject to TNRCC jurisdiction.)

RCRA Subtitle C mandated that EPA develop and adopt regulations for management of hazardous wastes. The regulations adopted by EPA under RCRA Subtitle C are very complex and lengthy. These regulations are contained in 40 Code of Federal

Regulations (CFR) Parts 260 through 270. These regulations apply to the generation, transportation, treatment, storage and disposal of hazardous waste.

The Railroad Commission's Statewide Rule 98 establishes regulations for generators and transporters of hazardous oil and gas wastes. The Commission's hazardous waste rule tracks certain parts of EPA's hazardous waste regulations. The definition of hazardous waste and the standards applicable to generators and transporters of hazardous waste are prime examples. However, because the management of hazardous oil and gas wastes presents some special challenges, the Commission has tailored its hazardous waste rules accordingly.

An operator's status as a hazardous waste generator and the applicable hazardous waste management requirements will depend on the quantity of hazardous oil and gas waste generated. In general, the less nonexempt hazardous oil and gas waste generated, the less imposing the requirements and operational limitations of the hazardous waste regulations.

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Monday, March 09, 2009 2:04 PM
To: Jones, William V., EMNRD
Subject: Oilfield Exempt Non-Exempt Type Wastes

Will:

You may find this of interest:

Specifically, EPA's regulatory determination for exploration and production (E&P) wastes found that the following wastes are exempt from RCRA hazardous waste management requirements. The list below identifies many, but not all, exempt wastes. In general, E&P exempt wastes are generated in "primary field operations," and not as a result of maintenance or transportation activities. Exempt wastes are typically limited to those that are intrinsically related to the production of oil or natural gas.

- Produced water;
- Drilling fluids;
- Drill cuttings;
- Rigwash;
- Drilling fluids and cuttings from offshore operations disposed of onshore;
- Well completion, treatment, and stimulation fluids;
- Basic sediment and water, and other tank bottoms from storage facilities that hold product and exempt waste;
- Accumulated materials such as hydrocarbons, solids, sand, and emulsion from production separators, fluid treating vessels, and production impoundments;
- Pit sludges and contaminated bottoms from storage or disposal of exempt wastes;
- Workover wastes;
- Gas plant sweetening wastes for sulfur removal, including amine, amine filters, amine filter media, backwash, precipitated amine sludge, iron sponge, and hydrogen sulfide scrubber liquid and sludge;
- Cooling tower blowdown;
- Spent filters, filter media, and backwash (assuming the filter itself is not hazardous and the residue in it is from an exempt waste stream);
- Packing fluids;
- Produced sand;
- Pipe scale, hydrocarbon solids, hydrates, and other deposits removed from piping and equipment prior to transportation;
- Hydrocarbon-bearing soil;
- Pigging wastes from gathering lines;
- Wastes from subsurface gas storage and retrieval, except for the listed non-exempt wastes;
- Constituents removed from produced water before it is injected or otherwise disposed of;
- Liquid hydrocarbons removed from the production stream but not from oil refining;

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- Gases removed from the production stream, such as hydrogen sulfide and carbon dioxide, and volatilized hydrocarbons;
- Materials ejected from a producing well during the process known as blowdown;
- Waste crude oil from primary field operations and production; and
- Light organics volatilized from exempt wastes in reserve pits or impoundments or production equipment.

On March 22, 1993, EPA provided “clarification” regarding the scope of the E&P waste exemption for waste streams generated by crude oil and tank bottom reclaimers, oil and gas service companies, crude oil pipelines, and gas processing plants and their associated field gathering lines. (See 58 FR 15284-15287.) EPA stated that certain waste streams from these operations are “uniquely associated” with primary field operations and as such are within the scope of the RCRA Subtitle C exemption. EPA’s clarification cautioned, however, that these wastes may not be exempt if they are mixed with non-exempt materials or wastes.

EPA’s 1988 regulatory determination lists the following wastes as non-exempt. The list below identifies many, but not all non-exempt wastes, as well as transportation (pipeline and trucking) activities. While the following wastes are non-exempt, their regulatory status as “hazardous wastes” is dependent upon a determination of their characteristics or whether they are specifically listed as RCRA hazardous waste.

- Unused fracturing fluids or acids;
- Gas plant cooling tower cleaning wastes;
- Painting wastes;
- Oil and gas service company wastes, such as empty drums, drum rinsate, vacuum truck rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids;
- Vacuum truck and drum rinsate from trucks and drums transporting or containing non-exempt waste;
- Refinery wastes;
- Liquid and solid wastes generated by crude oil and tank bottom reclaimers;
- Used equipment lubrication oils;
- Waste compressor oil, filters, and blowdown;
- Used hydraulic fluids;
- Waste solvents;
- Waste in transportation pipeline-related pits;
- Caustic or acid cleaners;
- Boiler cleaning wastes;
- Boiler refractory bricks;
- Incinerator ash;

- Laboratory wastes;
- Sanitary wastes;
- Pesticide wastes;
- Radioactive tracer wastes; and
- Drums, insulation, and miscellaneous solids.

EPA did not specifically address, in its 1988 regulatory determination, the status of hydrocarbon-bearing material that is recycled or reclaimed by reinjection into a crude stream. However, under existing EPA regulations, recycled oil, even if it were otherwise hazardous, could be reintroduced into the crude stream, if it is from normal operations and is to be refined along with normal process streams at a petroleum refinery facility (40 CFR Part 261.6 (a)(3)(vi).)

The Agency also determined that produced water injected for enhanced recovery is not a waste for purposes of RCRA regulation and therefore is not subject to control under RCRA Subtitle C or Subtitle D. Produced water used in this manner is considered beneficially recycled and is an integral part of some crude oil and natural gas production processes. Produced water injected in this manner is already regulated by the Underground Injection Control program under the SDWA. However, if produced water is stored in surface impoundments prior to injection, it may be subject to RCRA Subtitle D regulations.

It is important to note that some states have adopted hazardous waste regulations which differ from those that EPA has promulgated. While different in many specific areas, those state programs, by law, still must be at least as stringent as the federal programs.

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