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*Attorneys for Appellants*

IN THE SEVENTH JUDICIAL DISTRICT COURT OF THE STATE OF WYOMING,
IN AND FOR THE COUNTY OF NATRONA

| | |
|---|---|
| POWDER RIVER BASIN RESOURCE COUNCIL, WYOMING OUTDOOR COUNCIL, EARTHWORKS, and CENTER FOR EFFECTIVE GOVERNMENT (formerly OMB WATCH),<br><br>Appellants,<br><br>v.<br><br>WYOMING OIL AND GAS CONSERVATION COMMISSION,<br><br>Appellee,<br><br>and<br><br>HALLIBURTON ENERGY SERVICES, INC.,<br><br>Intervenor-Appellee. | Docket No. 94650-C<br>Judge: Hon. Catherine E. Wilking<br><br>**NOTICE OF APPEAL** |

Powder River Basin Resource Council, Wyoming Outdoor Council, Earthworks, and Center for Effective Government (formerly OMB Watch) (collectively, "Appellants") hereby submit their notice of appeal to the Wyoming Supreme Court of the Natrona County District Court's March 21, 2013, Order in the above-captioned matter.

Appellants certify pursuant to Wyo. R. App. P. 2.05 that there exists no transcript or recording of the hearing, and that they intend to provide a statement of proceedings pursuant to Wyo. R. App. P. 3.03.

Respectfully submitted this 15th day of April, 2013.

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*Attorneys for Appellants*

**APPENDIX TO NOTICE OF APPEAL**
**PURSUANT TO WYO. R. APP. P. 2.07(b)**

| | |
|---|---|
| Attachment 1 | March 22, 2012, Petition for Review of Administrative Action; Complaint for Declaratory Relief |
| Attachment 2 | May 14, 2012, HES Motion to Intervene |
| Attachment 3 | March 21, 2013, Order of District Court |

# Attachment 1

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*Local Counsel for Petitioners*

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*Counsel for Petitioners, applications for Pro Hac Vice pending*

IN THE SEVENTH JUDICIAL DISTRICT COURT OF THE STATE OF WYOMING,
IN AND FOR THE COUNTY OF NATRONA

| | |
|---|---|
| POWDER RIVER BASIN RESOURCE COUNCIL, WYOMING OUTDOOR COUNCIL, EARTHWORKS, and OMB WATCH,<br><br>Petitioners,<br><br>v.<br><br>WYOMING OIL AND GAS CONSERVATION COMMISSION,<br><br>Respondent. | Docket No.<br>Judge:<br><br>**PETITION FOR REVIEW OF ADMINISTRATIVE ACTION; COMPLAINT FOR DECLARATORY RELIEF** |

## INTRODUCTION

1. Powder River Basin Resource Council, Wyoming Outdoor Council, Earthworks, and OMB Watch ("Petitioners") hereby petition the Court, pursuant to W.R.A.P. 12, for judicial review of Wyoming Oil and Gas Commission's ("WOGCC") partial denial of a request made by Petitioners pursuant to the Public Records Act, Wyo. Stat. § 16-4-201 *et seq.*, related to documents submitted to WOGCC by manufacturers of products and chemicals used in the industrial process of hydraulic fracturing.[1] WOGCC attempted to justify its failure to disclose certain documents and information based on unsupported and overly broad claims of trade secret or confidential commercial information status for hydraulic fracturing products and chemicals. Because WOGCC was required to produce these documents under the Public Records Act, Wyo. Stat. § 16-4-203, and WOGCC's Rules, Wyo. Admin. Code OIL GEN Ch. 3 § 45, its partial denial of Petitioners' request was arbitrary, capricious, an abuse of discretion, and not in accordance with the law. See Wyo. Stat. § 16-3-114(c)(ii)(A).

## JURISDICTION AND VENUE

2. This Court has jurisdiction to hear Petitioners' Petition for Review of WOGCC's final administrative action, dated February 24, 2012, pursuant to Wyoming's Administrative Procedure Act, Wyo. Stat. § 16-3-114, and W.R.A.P. 12.

3. Venue in Natrona County is proper pursuant to the Public Records Act,

[1] Petitioners specifically challenge WOGCC's denial of access to requested documents submitted to WOGCC by Baker Hughes and its predecessor BJ Services Company; CESI Chemical; Champion Technologies; Core Laboratories; Halliburton Energy Services, Inc.; NALCO Company; SNF, Inc.; and Weatherford International.

Wyo. Stat. § 16-4-203(f), because the documents sought are located in Natrona County.

## FACTUAL AND LEGAL BACKGROUND

4. Wyoming requires an owner or operator of an oil or gas well that will be hydraulically fractured to provide to WOGCC "detailed information" about the products and chemicals used, including the identities of all chemical additives and compounds. Wyo. Admin. Code OIL GEN Ch. 3 § 45.

5. Under Wyoming's Public Records Act, the information supplied to WOGCC by oil and gas well operators are public records that must be made available for public inspection except in certain narrowly defined circumstances. Wyo. Stat. § 16-4-202(a); see Sheridan Newspapers, Inc. v. City of Sheridan, 660 P.2d 785, 794 (Wyo. 1983) (recognizing liberal construction in favor of disclosure). One exception from disclosure is allowed for trade secrets and confidential commercial information. Wyo. Stat. § 16-4-203(d)(v). To the extent that it is consistent with this exception, owners and operators of oil and gas wells may request that certain hydraulic fracturing product information be kept confidential. Wyo. Admin. Code OIL GEN Ch. 3 § 45(f).

6. On November 15, 2011, Petitioners submitted a request under the Public Records Act to WOGCC seeking access to records regarding the identity of hydraulic fracturing chemicals used in Wyoming and the applicability of disclosure exemptions. See Exhibit A.

7. Petitioners sought disclosure of the entire documents or, alternatively, disclosure of redacted versions of the documents with the information disclosing trade secrets or confidential commercial information redacted. See Exhibit A.

8. On January 10, 2012, WOGCC provided some of the requested documents to Petitioners but declined to disclose "those chemical formulations designated 'trade secrets.'" Exhibit B. WOGCC noted that it approved fifty trade secret or confidential commercial information exemptions in 2010 and 2011. The documents provided by WOGCC included original trade secret or confidential commercial information claims submitted by hydraulic fracturing product manufacturers. Many of these claims were insufficiently justified and/or sought confidentiality for information that is not within the proper scope of Wyoming's trade secret or confidential commercial information exceptions. Nonetheless, WOGCC approved nearly all such claims.

9. WOGCC's January 10, 2012, response to Petitioners' request also stated that "the submitted Chemical Abstract Services (CAS) numbers are not considered confidential." Exhibit B. However, some documents disclosed by WOGCC in its response to Petitioners' request and on its website did not disclose CAS numbers.

10. Petitioners submitted another request to WOGCC on January 12, 2012, seeking disclosure of all CAS numbers associated with WOGCC's fifty trade secret or confidential commercial information exemption approvals. See Exhibit C.

11. On January 20, 2012, WOGCC responded that certain CAS numbers are withheld from public disclosure because they constitute trade secrets or confidential commercial information, reversing its prior position that CAS numbers are not considered confidential. See Exhibit D.

12. On February 8, 2012, Petitioners requested a new determination on their public records request and provided WOGCC with additional information regarding the

proper breadth of trade secret and confidential commercial information exemptions from disclosure and the countervailing need for maximum public disclosure. See Exhibit E.

13. WOGCC responded on February 24, 2012, by reaffirming its original partial denial of Petitioners' request. See Exhibit F. Petitioners are challenging the February 24, 2012, decision on the basis of the record that was before WOGCC.

**LEGAL CLAIMS**

14. WOGCC unlawfully withheld from disclosure as trade secrets or confidential commercial information the identities of hydraulic fracturing chemicals and products based on applications by Baker Hughes and its predecessor BJ Services Company; CESI Chemical; Champion Technologies; Core Laboratories; Halliburton Energy Services, Inc.; NALCO Company; SNF, Inc.; and Weatherford International that did not provide factual support for the trade secret or confidential commercial information status of the chemicals and products. See Wyo. Stat. §§ 16-3-114(c)(ii)(A), 16-4-202, 16-4-203(d)(v); Wyo. Admin. Code OIL GEN Ch. 3 § 45.

15. WOGCC further withheld information about all the components within a hydraulic fracturing product instead of withholding from disclosure only the identities or descriptions of components that qualify as trade secrets or confidential commercial information, thus allowing exemptions from disclosure that are unlawfully broad. See Wyo. Stat. §§ 16-3-114(c)(ii)(A), 16-4-202, 16-4-203(d)(v); Wyo. Admin. Code OIL GEN Ch. 3 § 45.

## PRAYER FOR RELIEF

Therefore, Petitioners respectfully request that this Court:

1. Compel WOGCC to show cause, pursuant to Wyo. Stat. § 16-4-203(f), why its partial denial of Petitioners' public records request is lawful;

2. Declare that WOGCC's actions were arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with the law;

3. Set aside WOGCC's approval of insufficiently supported and overly broad trade secret and confidential commercial information exemptions, and order WOGCC to make new determinations consistent with the Public Records Act and WOGCC's Environmental Rules; and

4. Grant Petitioners such other and further relief as the Court deems just and proper.

Respectfully submitted this 22nd day of March, 2012.

Shannon Anderson (Wyo. Bar # 6-4402)
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*Counsel for Plaintiffs*

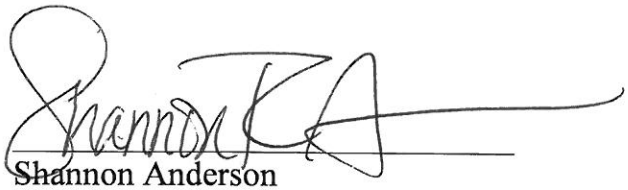
## CERTIFICATE OF SERVICE

I certify that on the 22nd day of March, 2012, I caused to be served a true and correct copy of the forgoing by first-class mail and electronic mail to:

Thomas E. Doll, Supervisor
Wyoming Oil and Gas Conservation Commission
2211 King Boulevard
Casper, WY 82604
tom.doll@wyo.gov

Eric A. Easton, Senior Assistant Attorney General
P.O. Box 1507
Casper, WY 82602
eric.easton@wyo.gov

*Attorney for WOGCC*



Shannon Anderson

# Exhibit A

EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON, DC INTERNATIONAL

Via electronic and first-class mail

November 15, 2011

Tom Doll, Supervisor
Wyoming Oil and Gas Conservation Commission
2211 King Blvd.
Casper, WY 82601
Fax: 307-234-5306
Email: tom.doll@wyo.gov

RE: Public Records Act Request

Dear Mr. Doll:

This is a request made under Wyoming's Public Records Act, Wyo. Stat. § 16-4-202(a), *et seq.*, on behalf of Powder River Basin Resource Council, Wyoming Outdoor Council, and the Oil & Gas Accountability Project. We request that the following records be available to our organizations for public inspection at the Wyoming Oil and Gas Conservation Commission ("WOGCC") office:

> 1) All records, including electronic records, WOGCC has in its possession that list or identify the type, chemical compound name, and/or Chemical Abstract Services (CAS) number of chemicals or other constituents that have been or will be injected through hydraulic fracturing or other well stimulation operations in Wyoming since September 15, 2010, by the following companies and that have not been disclosed on the WOGCC website: CHEM EOR; CESI Chemical, Inc.; Nalco Company; CalFrac Well Services; Multi-Chem Group; Baker Hughes; Kroff Well Service; Halliburton Energy; BJ Services Company; Core Lab Reservoir Optimization; SNF, Inc.; Spectrum Tracer Services; Water Mark Technologies; and Weatherford. In responding to this request, please include records provided to WOGCC by any subsidiary or agent companies.
>
> 2) All records, including correspondence, memoranda, reports, and WOGCC staff notes that are not otherwise available on the WOGCC website that discuss WOGCC's determinations regarding the applicability of public disclosure exemptions, including trade secret or confidential business information exemptions, for the companies listed above.

Any exemptions to public disclosure under the Public Records Act are to be construed narrowly. *Laramie River Conservation Council v. Dinger*, 567 P.2d 731, 733 (Wyo. 1977). The Public Records Act provisions receive liberal construction in favor of disclosure and against withholding. *Sheridan Newspapers v. City of Sheridan*, 660 P.2d 785, 794 (Wyo. 1983); *see also*

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*Herrick v. Garvey*, 298 F.3d 1184, 1189 (10th Cir. 2002) (A reviewing court should "narrowly construe" FOIA exemptions in favor of disclosure, and the agency "bears the burden of justifying nondisclosure."); *Sublette County Rural Health Care Dist. v. Miley*, 942 P.2d 1101, 1103 (Wyo. 1997) (The Wyoming PRA and the FOIA are read coextensively, and both statutes have the objective "that disclosure, not secrecy, should prevail.").

Because of the presumption in favor of public disclosure, records should be immediately available to the public and the WOGCC should *presume* that records are not exempt. Only if the company clearly requests confidentiality based on established statutory exemptions, and WOGCC reviews the records and determines that they are in fact exempt, should the records be exempt from public disclosure.

If you believe any of the requested records are exempt from disclosure, please provide us with a written response detailing the reasons for the exemption and a complete list of records being withheld. We understand that these companies have received trade secrets exemptions for multiple formulas used in well stimulation activities, as indicated on the WOGCC website. However, the Public Records Act requires WOGCC to assess the confidentiality of each part of the information and to provide redacted versions of records provided to the agency if parts are not found to be confidential.

Moreover, the identities of specific chemicals used in hydraulic fracturing fluids are not trade secrets. *See Anderson v. Dep't of Health & Human Servs.*, 907 F.2d 936, 943 (10th Cir. 1990) (adopting a narrow definition of trade secret in the context of FOIA exemptions, limited to a "secret, commercially valuable plan, formula, process, or device"). Thus, the identities of the chemicals used in the hydraulic fracturing fluids, including type, name, and CAS number, may only be exempted from disclosure if disclosure is likely to either substantially impair the government's future ability to obtain necessary information or to cause substantial harm to the disclosing company's competitive position. *Sublette County*, 942 P.2d at 1103. The parties opposing disclosure must show actual competition and the likelihood of substantial competitive injury to justify exemption from disclosure. *See, e.g., Public Citizen Health Research Group v. Food & Drug Admin.*, 704 F.2d 1280, 1291 (D.C. Cir. 1983).

Additionally, even if a record – or a portion of a record – meets the exemption criteria, if it has otherwise been disclosed to other parties or the general public, the company may no longer claim that the records are "trade secrets" or "confidential." *See, e.g., Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 1002 (1984) (noting that public disclosure of trade secrets extinguishes the owner's property right in the information); *In re Iowa Freedom of Info. Council*, 724 F.2d 658, 662 (8th Cir. 1983) (stating that if trade secrets "are disclosed or revealed, they are destroyed").

Please let me know when the records will be available for public inspection.

Sincerely,

Laura Beaton

# Exhibit B

# *State of Wyoming*
# *Oil and Gas Conservation Commission*

**Governor Matthew H. Mead, Chairman**

**Commissioners**
Ryan Lance, Bruce Williams,
Tom Drean, Don Basko

**State Oil and Gas Supervisor**
Thomas E. Doll

January 10, 2012

Ms. Laura Beaton
EarthJustice
313 Main Street
Bozeman, MT 59715

RE: Public Records Request
(Ref. EarthJustice Public Records Act Request dated November 15, 2011)

Dear Ms. Beaton:

This letter is in response to a Wyoming Public Records request dated November 15, 2011. In that letter, you requested all records, including electronic records, that the Wyoming Oil and Gas Conservation Commission (WOGCC) has in its possession that list or identify the type, chemical compound name, and/or CAS number of chemical or constituents that have been or will be injected through hydraulic fracturing or other well stimulation operations in Wyoming since September 15, 2010, that have not been otherwise disclosed on the WOGCC website.

**Response to Public Records Act request.**

Pursuant to Chapter 3, Section 45(d) of the WOGCC Rules, operators and third party suppliers are required to disclose information about base stimulation fluids used in well stimulation operations in the State of Wyoming. While supplying this information to the Supervisor, operators have requested that certain chemical formulations be considered confidential "trade secrets," therefore exempt from public disclosure. The Supervisor has reviewed these requests for "trade secret" status pursuant to WOGCC Rules, Chapter 3, Section 45(f) and the Wyoming Public Records Act, W.S. § 16-4-203(d)(v). The Supervisor has determined that eighteen (18) submittals in 2010 and thirty two (32) submittals in 2011 were "trade secrets," and were exempt from public disclosure. The submitting company and trade name are listed on the spreadsheet include here as "Attachment A."

As we have determined that the disclosures are trade secrets and exempt from public disclosure, we respectfully decline to disclose those chemical formulation in this request for public records.

We would like to emphasize that operators and third party suppliers of well stimulation products and fluids have provided to the Supervisor base descriptions of stimulation fluids used in well stimulation operations, and except for those chemical formulations designated "trade secrets," base descriptions of stimulation fluids used in well stimulation operations have been disclosed on the WOGCC website, or in this response. The chemical composition of those fluids determined to be "trade secrets," while not

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disclosed in this request, are on file with the WOGCC. No operator or third party supplier has been authorized to utilize well stimulation fluids that have not been disclosed to the WOGCC.

**Justification for refusal to disclose documents as a "trade secret" exception to the Public Records Act.**

WOGCC Rule Chapter 3, Section 45 requires an Owner/Operator to provide detailed information about base stimulation fluid to the Supervisor. Chapter 3, Section 45(f) provides that upon prior written request justifying and documenting the nature and extent of proprietary information, confidentiality protection will be provided consistent with Wyoming Public Records Act, WYO. STAT. § 16-4-203(d)(v).

The Wyoming Public Records Act, WYO. STAT. § 16-4-203(d)(v) provides that: "...the custodian shall deny the right of inspection of the following records, unless otherwise provided by law: (v) Trade secrets, privileged information and confidential commercial, financial, geological or geophysical data furnished by or obtained from any person."

"Trade Secret" is not defined in the Wyoming Public Records Act. A definition of "trade secret" is found in the Uniform Trade Secret Act, WYO. STAT. § 40-24-101(A)(iv), which provides:

> "Trade secret" means information, including a formula, pattern, compilation, program device, method, technique or process that: (A) Derives independent economic value, actual or potential, from not being generally known to and not being readily ascertainable by proper means by other persons who can obtain economic value from its disclosure or use; and (B) is subject to efforts that are reasonable under the circumstances to maintain its secrecy.

The Wyoming Supreme Court has not addressed the issue of "trade secrets" in the context of the Public Records Act.

Other states have addressed similar public records exceptions. The state of New York addressed the disclosure of confidential information/trade secrets, and adopted a multi-part requirement for consideration as trade secret. The Oil and Gas Conservation Commission has utilized this as a model to evaluate requests for trade secret status:

a. The extent to which the information is known outside the business of the person submitting the information;

b. The extent to which it is known by the person's employees and other involved in the business;

c. The extent of measures taken by the person to guard the secrecy of the information;

d. The value of the information to the person and his competitors;

e. The amount of effort or money expended by the person in developing the information; and,

f. The ease or difficulty with which the information could be properly acquired or duplicated by others.

The initial determination of a request for confidential status is made by the Oil and Gas Supervisor. A letter requesting confidential status and justification is submitted to the Supervisor, with the particular chemical formulation listed on a separate attachment. If a particular formulation is granted "Trade Secret" status, that attachment is placed in a separate file under the direct control of the Supervisor. The application for and justification for confidential status/ trade secret status, and the submitted Chemical Abstracts Services (CAS) numbers are not considered confidential. The letter requesting trade secret status and justification, and CAS numbers, are filed with other public documents and have been posted on the WOGCC website with other well information.

With specific reference to your Public Records request, I respectfully decline to release the specific formulations you requested. Pursuant WOGCC Rule in Chapter 3, Section 45, I have determined that these documents have met the requirements of Chapter 3, Section 45(f) and are entitled to confidentiality protection consistent with Wyoming Public Records Act, WYO. STAT. § 16-4-203(d)(v).

Sincerely,

Thomas E. Doll
Oil & Gas Supervisor

cc: E. Easton

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Casper, Wyoming 82602-2640

Phone: 307-234-7147
Fax: 307-234-5306
Internet: http://wogcc.state.wy.us

# Exhibit C

EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON, DC INTERNATIONAL

Via electronic and first-class mail

January 12, 2012

Tom Doll, Supervisor
Wyoming Oil and Gas Conservation Commission
2211 King Blvd.
Casper, WY 82601
Fax: 307-234-5306
Email: tom.doll@wyo.gov

RE: Public Records Act Request

Dear Mr. Doll:

Thank you for responding to our November 15, 2011, Public Records Act request made on behalf of the Powder River Basin Resource Council, Wyoming Outdoor Council, and the Oil & Gas Accountability Project. In that request, we requested WOGCC records listing or identifying chemical compound names and/or Chemical Abstract Services (CAS) numbers of chemicals or other constituents that have been or will be injected through hydraulic fracturing or other well stimulation operations in Wyoming.

In your response dated January 10, 2012, you explained that certain records are withheld from public disclosure because your agency has determined that they constitute trade secrets and are thus exempt from disclosure under the Public Records Act. However, your agency did disclose portions of the records associated with these trade secret requests and approvals, and in your response letter, you stated:

> The application for and justification for confidential status/trade secret status, and the submitted Chemical Abstract Services (CAS) numbers are not considered confidential. The letter requesting trade secret status and justification, and the CAS numbers, are filed with other public documents and have been posted on the WOGCC website with other well information.

We agree with your determination that the CAS numbers for individual chemical constituents should not be withheld from public disclosure. However, after your response, we examined the records associated with the trade secrets submittals and approvals on the WOGCC website and discovered that only some submittals have disclosed the CAS numbers. Some submittals do not disclose any CAS numbers and other submittals contain only a partial list of CAS numbers.

In light of your determination that CAS numbers associated with the trade secrets submittals are not confidential, we hereby submit a new Public Records Act request for all of the CAS numbers

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associated with the fifty (50) submittals listed in Attachment A of your response dated January 10, 2012.

Please let us know when these records will be available for public inspection.

Sincerely,

Laura Beaton

# Exhibit D

# Wyoming Oil & Gas Conservation Commission

2211 King Boulevard, Casper, WY 82604
P O Box 2640, Casper, WY 82602-2640

Commissioners
Donald B. Basko
Ryan Lance
G. Bruce Williams
Thomas A. Drean

Governor Matthew H. Mead, Chairman  Thomas E. Doll, State Oil & Gas Supervisor


January 20, 2012

Ms. Laura Beaton
EarthJustice
313 Main Street
Bozeman MT 59715

RE: January 12, 2012 Letter – Public Records Act Request

Dear Laura:

Redacted CAS numbers

I reviewed your letter of January 12 and want to provide clarification to our response dated January 10, 2012. WOGCC Rules require the submittal of the chemical compound name, chemical compound type, CAS number, and concentration as part of the permit approval process prior to the initiation of the well stimulation and are also required post stimulation as part of the completion report. This information, including CAS number, is not considered confidential and is posted on the WOGCC web page.

If a chemical company submits a request for confidentiality under the Wyoming Public Records Act and such a request is granted, then the chemical compound name, chemical compound type, CAS number, and concentration related to the specific "trade secret" formulations are held confidential. OGCC stands by our determination as presented in our response on January 10 that certain records, including the CAS number, are withheld from public disclosure as they constitute "Trade Secrets" and as such are exempt from disclosure under the Wyoming Public Records Act.

In your letter you stated "...only some submittals have disclosed the CAS numbers. Some submittals do not disclose any CAS numbers and other submittals contain on a partial list of CAS numbers." CAS numbers are required as stated above. Several chemical companies have provided a partial listing of publically available chemical compounds and associated CAS numbers but redacted those chemical compounds that are trade secrets. If you would provide us specific examples, we would be happy to walk through the records to verify that all disc losable CAS numbers have been filed.

New process to access well completion information

Public access to the well stimulation data from the WOGCC web page previously required knowledge of the API number, and/or the well location ( such as 1/4-1/4 Section, Township and Range), and/or the Operator name. Recently the web page has been simplified to find well stimulation data. From the web page http://wogcc.state.wy.us select "Completions" in the center of the right hand column. The screen is two calendars. Select "Beginning Date" and "Ending Date" from the appropriate calendar. Note that all completions received between the selected dates will be downloaded and presented on the next screen. If desired, type in "Company Name" to limit the search to that specific Operator. If no "Company Name" is entered, the listing will be alphabetical by Operator. Select "Go Find". Note that the colors of the rows are "white" for fee minerals, "blue" for State minerals, and "yellow" for federal minerals. Scroll through the listing for individual wells. "View Permit" provides Form 1, "Application for Permit to Drill". Use back arrow in upper left of page to return to the list. "Display All" provides all Forms received by WOGCC; to view select the icon. "pdf" provides Form 3,"Completion Report"; select icon and scroll down to view well completion and stimulation detail. "API Number" provides access to all data scanned for that specific well; to view select number then select from table. "Formation" provides well production data.

Sincerely,

Thomas E. Doll, PE
State Oil and Gas Supervisor

TED/lam

cc: Eric Easton

# Exhibit E

EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON, DC INTERNATIONAL

Via electronic mail

February 8, 2012

Tom Doll, Supervisor
Wyoming Oil and Gas Conservation Commission
2211 King Blvd.
Casper, WY 82601
Fax: 307-234-5306
Email: tom.doll@wyo.gov

RE: Public Records Act Request – Request for Reconsideration

Dear Mr. Doll:

Thank you for responding to our November 15, 2011, and January 12, 2012, Public Records Act requests made on behalf of the Powder River Basin Resource Council, Wyoming Outdoor Council, and the Oil & Gas Accountability Project. In those letters, we requested all WOGCC records listing or identifying chemical compound names and/or Chemical Abstract Services (CAS) numbers of chemicals or other constituents that have been or will be injected through hydraulic fracturing or other well stimulation operations in Wyoming.

In your responses, you explained that certain information, including the names and CAS numbers of some hydraulic fracturing chemicals, is withheld from public disclosure because your agency has determined that information constitutes trade secret or confidential commercial information and is thus exempt from disclosure under the Public Records Act. We have attached our two previous requests and your responses to this letter and incorporate them by reference into this new request.

We now request that you reconsider your decision to withhold from public disclosure certain information as trade secret or confidential commercial information. As we discussed with Senior Assistant Attorney General Eric Easton, this request supersedes our previous Public Records Act requests. We ask that you reconsider your decision in light of documentation we have attached to this letter. These documents provide information regarding the proper breadth of trade secret and confidential commercial information claims and the countervailing need for maximum public disclosure. The attached documents include:

- A report from a company that specializes in deformulation, or reverse engineering, of products, discussing the information necessary for or useful to deformulating products;
- A report discussing the unreliability of MSDSs for identifying human health hazards;
- A notice in the Federal Register from the U.S. Environmental Protection Agency, explaining why individual chemical identities should not be held confidential if

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disclosure of the chemical's identity does not reveal information about the process for manufacturing the chemical; and

- An article discussing the public health concerns related to natural gas operations, including hydraulic fracturing, and the limitations on public health research and knowledge caused by the dearth of disclosure of products' component chemicals.

Specifically, we continue to maintain that the mere identification of names and CAS numbers of hydraulic fracturing chemicals is not a trade secret pursuant to Wyoming's Public Records Act.[1]

If, after reviewing your previous decisions in light of the attached documents, you still believe any of the previously withheld information remains exempt from disclosure, please provide us with a written response detailing the reasons for the exemption. If you determine any previously withheld information is no longer subject to withholding from disclosure, please identify those records that we may now access.

Sincerely,

Laura Beaton

[1] We are not seeking chemical concentration amounts, hydraulic fracturing chemical formulas, or other information that might qualify as a trade secret.

# Exhibit 1

EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON, DC INTERNATIONAL

Via electronic and first-class mail

November 15, 2011

Tom Doll, Supervisor
Wyoming Oil and Gas Conservation Commission
2211 King Blvd.
Casper, WY 82601
Fax: 307-234-5306
Email: tom.doll@wyo.gov

RE: Public Records Act Request

Dear Mr. Doll:

This is a request made under Wyoming's Public Records Act, Wyo. Stat. § 16-4-202(a), *et seq.*, on behalf of Powder River Basin Resource Council, Wyoming Outdoor Council, and the Oil & Gas Accountability Project. We request that the following records be available to our organizations for public inspection at the Wyoming Oil and Gas Conservation Commission ("WOGCC") office:

> 1) All records, including electronic records, WOGCC has in its possession that list or identify the type, chemical compound name, and/or Chemical Abstract Services (CAS) number of chemicals or other constituents that have been or will be injected through hydraulic fracturing or other well stimulation operations in Wyoming since September 15, 2010, by the following companies and that have not been disclosed on the WOGCC website: CHEM EOR; CESI Chemical, Inc.; Nalco Company; CalFrac Well Services; Multi-Chem Group; Baker Hughes; Kroff Well Service; Halliburton Energy; BJ Services Company; Core Lab Reservoir Optimization; SNF, Inc.; Spectrum Tracer Services; Water Mark Technologies; and Weatherford. In responding to this request, please include records provided to WOGCC by any subsidiary or agent companies.
>
> 2) All records, including correspondence, memoranda, reports, and WOGCC staff notes that are not otherwise available on the WOGCC website that discuss WOGCC's determinations regarding the applicability of public disclosure exemptions, including trade secret or confidential business information exemptions, for the companies listed above.

Any exemptions to public disclosure under the Public Records Act are to be construed narrowly. *Laramie River Conservation Council v. Dinger*, 567 P.2d 731, 733 (Wyo. 1977). The Public Records Act provisions receive liberal construction in favor of disclosure and against withholding. *Sheridan Newspapers v. City of Sheridan*, 660 P.2d 785, 794 (Wyo. 1983); *see also*

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*Herrick v. Garvey*, 298 F.3d 1184, 1189 (10th Cir. 2002) (A reviewing court should "narrowly construe" FOIA exemptions in favor of disclosure, and the agency "bears the burden of justifying nondisclosure."); *Sublette County Rural Health Care Dist. v. Miley*, 942 P.2d 1101, 1103 (Wyo. 1997) (The Wyoming PRA and the FOIA are read coextensively, and both statutes have the objective "that disclosure, not secrecy, should prevail.").

Because of the presumption in favor of public disclosure, records should be immediately available to the public and the WOGCC should *presume* that records are not exempt. Only if the company clearly requests confidentiality based on established statutory exemptions, and WOGCC reviews the records and determines that they are in fact exempt, should the records be exempt from public disclosure.

If you believe any of the requested records are exempt from disclosure, please provide us with a written response detailing the reasons for the exemption and a complete list of records being withheld. We understand that these companies have received trade secrets exemptions for multiple formulas used in well stimulation activities, as indicated on the WOGCC website. However, the Public Records Act requires WOGCC to assess the confidentiality of each part of the information and to provide redacted versions of records provided to the agency if parts are not found to be confidential.

Moreover, the identities of specific chemicals used in hydraulic fracturing fluids are not trade secrets. *See Anderson v. Dep't of Health & Human Servs.*, 907 F.2d 936, 943 (10th Cir. 1990) (adopting a narrow definition of trade secret in the context of FOIA exemptions, limited to a "secret, commercially valuable plan, formula, process, or device"). Thus, the identities of the chemicals used in the hydraulic fracturing fluids, including type, name, and CAS number, may only be exempted from disclosure if disclosure is likely to either substantially impair the government's future ability to obtain necessary information or to cause substantial harm to the disclosing company's competitive position. *Sublette County*, 942 P.2d at 1103. The parties opposing disclosure must show actual competition and the likelihood of substantial competitive injury to justify exemption from disclosure. *See, e.g., Public Citizen Health Research Group v. Food & Drug Admin.*, 704 F.2d 1280, 1291 (D.C. Cir. 1983).

Additionally, even if a record – or a portion of a record – meets the exemption criteria, if it has otherwise been disclosed to other parties or the general public, the company may no longer claim that the records are "trade secrets" or "confidential." *See, e.g., Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 1002 (1984) (noting that public disclosure of trade secrets extinguishes the owner's property right in the information); *In re Iowa Freedom of Info. Council*, 724 F.2d 658, 662 (8th Cir. 1983) (stating that if trade secrets "are disclosed or revealed, they are destroyed").

Please let me know when the records will be available for public inspection.

Sincerely,

Laura Beaton

# Exhibit 2

# *State of Wyoming*
# *Oil and Gas Conservation Commission*

**Governor Matthew H. Mead, Chairman**

**Commissioners**
Ryan Lance, Bruce Williams,
Tom Drean, Don Basko

**State Oil and Gas Supervisor**
Thomas E. Doll

January 10, 2012

Ms. Laura Beaton
EarthJustice
313 Main Street
Bozeman, MT 59715

RE: Public Records Request
(Ref. EarthJustice Public Records Act Request dated November 15, 2011)

Dear Ms. Beaton:

This letter is in response to a Wyoming Public Records request dated November 15, 2011. In that letter, you requested all records, including electronic records, that the Wyoming Oil and Gas Conservation Commission (WOGCC) has in its possession that list or identify the type, chemical compound name, and/or CAS number of chemical or constituents that have been or will be injected through hydraulic fracturing or other well stimulation operations in Wyoming since September 15, 2010, that have not been otherwise disclosed on the WOGCC website.

**Response to Public Records Act request.**

Pursuant to Chapter 3, Section 45(d) of the WOGCC Rules, operators and third party suppliers are required to disclose information about base stimulation fluids used in well stimulation operations in the State of Wyoming. While supplying this information to the Supervisor, operators have requested that certain chemical formulations be considered confidential "trade secrets," therefore exempt from public disclosure. The Supervisor has reviewed these requests for "trade secret" status pursuant to WOGCC Rules, Chapter 3, Section 45(f) and the Wyoming Public Records Act, W.S. § 16-4-203(d)(v). The Supervisor has determined that eighteen (18) submittals in 2010 and thirty two (32) submittals in 2011 were "trade secrets," and were exempt from public disclosure. The submitting company and trade name are listed on the spreadsheet include here as "Attachment A."

As we have determined that the disclosures are trade secrets and exempt from public disclosure, we respectfully decline to disclose those chemical formulation in this request for public records.

We would like to emphasize that operators and third party suppliers of well stimulation products and fluids have provided to the Supervisor base descriptions of stimulation fluids used in well stimulation operations, and except for those chemical formulations designated "trade secrets," base descriptions of stimulation fluids used in well stimulation operations have been disclosed on the WOGCC website, or in this response. The chemical composition of those fluids determined to be "trade secrets," while not

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Internet: http://wogcc.state.wy.us

disclosed in this request, are on file with the WOGCC. No operator or third party supplier has been authorized to utilize well stimulation fluids that have not been disclosed to the WOGCC.

**Justification for refusal to disclose documents as a "trade secret" exception to the Public Records Act.**

WOGCC Rule Chapter 3, Section 45 requires an Owner/Operator to provide detailed information about base stimulation fluid to the Supervisor. Chapter 3, Section 45(f) provides that upon prior written request justifying and documenting the nature and extent of proprietary information, confidentiality protection will be provided consistent with Wyoming Public Records Act, WYO. STAT. § 16-4-203(d)(v).

The Wyoming Public Records Act, WYO. STAT. § 16-4-203(d)(v) provides that: "...the custodian shall deny the right of inspection of the following records, unless otherwise provided by law: (v) Trade secrets, privileged information and confidential commercial, financial, geological or geophysical data furnished by or obtained from any person."

"Trade Secret" is not defined in the Wyoming Public Records Act. A definition of "trade secret" is found in the Uniform Trade Secret Act, WYO. STAT. § 40-24-101(A)(iv), which provides:

> "Trade secret" means information, including a formula, pattern, compilation, program device, method, technique or process that: (A) Derives independent economic value, actual or potential, from not being generally known to and not being readily ascertainable by proper means by other persons who can obtain economic value from its disclosure or use; and (B) is subject to efforts that are reasonable under the circumstances to maintain its secrecy.

The Wyoming Supreme Court has not addressed the issue of "trade secrets" in the context of the Public Records Act.

Other states have addressed similar public records exceptions. The state of New York addressed the disclosure of confidential information/trade secrets, and adopted a multi-part requirement for consideration as trade secret. The Oil and Gas Conservation Commission has utilized this as a model to evaluate requests for trade secret status:

a. The extent to which the information is known outside the business of the person submitting the information;

b. The extent to which it is known by the person's employees and other involved in the business;

c. The extent of measures taken by the person to guard the secrecy of the information;

d. The value of the information to the person and his competitors;

e. The amount of effort or money expended by the person in developing the information; and,

f. The ease or difficulty with which the information could be properly acquired or duplicated by others.

The initial determination of a request for confidential status is made by the Oil and Gas Supervisor. A letter requesting confidential status and justification is submitted to the Supervisor, with the particular chemical formulation listed on a separate attachment. If a particular formulation is granted "Trade Secret" status, that attachment is placed in a separate file under the direct control of the Supervisor. The application for and justification for confidential status/ trade secret status, and the submitted Chemical Abstracts Services (CAS) numbers are not considered confidential. The letter requesting trade secret status and justification, and CAS numbers, are filed with other public documents and have been posted on the WOGCC website with other well information.

With specific reference to your Public Records request, I respectfully decline to release the specific formulations you requested. Pursuant WOGCC Rule in Chapter 3, Section 45, I have determined that these documents have met the requirements of Chapter 3, Section 45(f) and are entitled to confidentiality protection consistent with Wyoming Public Records Act, WYO. STAT. § 16-4-203(d)(v).

Sincerely,

Thomas E. Doll
Oil & Gas Supervisor

cc: E. Easton

2211 King Boulevard
P.O. Box 2640
Casper, Wyoming 82602-2640

Phone: 307-234-7147
Fax: 307-234-5306
Internet: http://wogcc.state.wy.us

# Exhibit 3

EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON, DC INTERNATIONAL

Via electronic and first-class mail

January 12, 2012

Tom Doll, Supervisor
Wyoming Oil and Gas Conservation Commission
2211 King Blvd.
Casper, WY 82601
Fax: 307-234-5306
Email: tom.doll@wyo.gov

RE: Public Records Act Request

Dear Mr. Doll:

Thank you for responding to our November 15, 2011, Public Records Act request made on behalf of the Powder River Basin Resource Council, Wyoming Outdoor Council, and the Oil & Gas Accountability Project. In that request, we requested WOGCC records listing or identifying chemical compound names and/or Chemical Abstract Services (CAS) numbers of chemicals or other constituents that have been or will be injected through hydraulic fracturing or other well stimulation operations in Wyoming.

In your response dated January 10, 2012, you explained that certain records are withheld from public disclosure because your agency has determined that they constitute trade secrets and are thus exempt from disclosure under the Public Records Act. However, your agency did disclose portions of the records associated with these trade secret requests and approvals, and in your response letter, you stated:

> The application for and justification for confidential status/trade secret status, and the submitted Chemical Abstract Services (CAS) numbers are not considered confidential. The letter requesting trade secret status and justification, and the CAS numbers, are filed with other public documents and have been posted on the WOGCC website with other well information.

We agree with your determination that the CAS numbers for individual chemical constituents should not be withheld from public disclosure. However, after your response, we examined the records associated with the trade secrets submittals and approvals on the WOGCC website and discovered that only some submittals have disclosed the CAS numbers. Some submittals do not disclose any CAS numbers and other submittals contain only a partial list of CAS numbers.

In light of your determination that CAS numbers associated with the trade secrets submittals are not confidential, we hereby submit a new Public Records Act request for all of the CAS numbers

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associated with the fifty (50) submittals listed in Attachment A of your response dated January 10, 2012.

Please let us know when these records will be available for public inspection.

Sincerely,

Laura Beaton

# Exhibit 4

# Wyoming Oil & Gas Conservation Commission

2211 King Boulevard, Casper, WY 82604
P O Box 2640, Casper, WY 82602-2640

Commissioners
Donald B. Basko
Ryan Lance
G. Bruce Williams
Thomas A. Drean

Governor Matthew H. Mead, Chairman  Thomas E. Doll, State Oil & Gas Supervisor


January 20, 2012

Ms. Laura Beaton
EarthJustice
313 Main Street
Bozeman MT 59715

RE: January 12, 2012 Letter – Public Records Act Request

Dear Laura:

Redacted CAS numbers

I reviewed your letter of January 12 and want to provide clarification to our response dated January 10, 2012. WOGCC Rules require the submittal of the chemical compound name, chemical compound type, CAS number, and concentration as part of the permit approval process prior to the initiation of the well stimulation and are also required post stimulation as part of the completion report. This information, including CAS number, is not considered confidential and is posted on the WOGCC web page.

If a chemical company submits a request for confidentiality under the Wyoming Public Records Act and such a request is granted, then the chemical compound name, chemical compound type, CAS number, and concentration related to the specific "trade secret" formulations are held confidential. OGCC stands by our determination as presented in our response on January 10 that certain records, including the CAS number, are withheld from public disclosure as they constitute "Trade Secrets" and as such are exempt from disclosure under the Wyoming Public Records Act.

In your letter you stated "...only some submittals have disclosed the CAS numbers. Some submittals do not disclose any CAS numbers and other submittals contain on a partial list of CAS numbers." CAS numbers are required as stated above. Several chemical companies have provided a partial listing of publically available chemical compounds and associated CAS numbers but redacted those chemical compounds that are trade secrets. If you would provide us specific examples, we would be happy to walk through the records to verify that all disc losable CAS numbers have been filed.

New process to access well completion information

Public access to the well stimulation data from the WOGCC web page previously required knowledge of the API number, and/or the well location ( such as 1/4-1/4 Section, Township and Range), and/or the Operator name. Recently the web page has been simplified to find well stimulation data. From the web page http://wogcc.state.wy.us select "Completions" in the center of the right hand column. The screen is two calendars. Select "Beginning Date" and "Ending Date" from the appropriate calendar. Note that all completions received between the selected dates will be downloaded and presented on the next screen. If desired, type in "Company Name" to limit the search to that specific Operator. If no "Company Name" is entered, the listing will be alphabetical by Operator. Select "Go Find". Note that the colors of the rows are "white" for fee minerals, "blue" for State minerals, and "yellow" for federal minerals. Scroll through the listing for individual wells. "View Permit" provides Form 1, "Application for Permit to Drill". Use back arrow in upper left of page to return to the list. "Display All" provides all Forms received by WOGCC; to view select the icon. "pdf" provides Form 3,"Completion Report"; select icon and scroll down to view well completion and stimulation detail. "API Number" provides access to all data scanned for that specific well; to view select number then select from table. "Formation" provides well production data.

Sincerely,

Thomas E. Doll, PE
State Oil and Gas Supervisor

TED/lam

cc: Eric Easton

# Exhibit 5

CHEMIR
A Division of Evans Analytical Group

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MATERIALS IDENTIFICATION
FAILURE ANALYSIS
LITIGATION SUPPORT
CONSULTING

February 8, 2012

Ms. Jenny Harbine
Earthjustice
313 East Main Street
Bozeman, MT 59715

Re: Chemical Deformulation and Analysis
Chemir Analytical Job #: V1CFA562

Dear Ms. Harbine:

On February 3, 2012, we spoke on the telephone and you asked me a series of questions regarding the chemical deformulation process and contaminant identification. The answers to your questions are below.

Chemir Analytical Services, a division of Evans Analytical Group, is an independent analytical chemistry laboratory that serves a wide variety of industries by providing quantitation, deformulation (reverse engineering), materials identification, failure analysis, chemical testing, polymer analysis, custom synthesis, litigation support, and consulting services. I have a Ph.D. in chemistry and have worked at Chemir since 2005. My full *curriculum vitae* is attached.

Approximately 10 – 20% of the projects at Chemir involve deformulation of chemicals. Also known as reverse engineering, deformulation is the separation, identification, and quantitation of ingredients in a formulation. Deformulation analysis uses instrumental techniques and gravimetric solvent extraction methods to identify and quantify the components of a complex mixture. The components may include polymers, plasticizers, fillers, stabilizers, lubricants, antioxidants, flame retardants, etc. The base price for a chemical deformulation is typically $20,000. Costs may be greater for complex formulations with a large number of ingredients or less for a simple formulation with just a few known ingredients.

Deformulation involves two primary steps. The first phase focuses on first identifying the constituent components in the product. The second phase quantifies the amount of each component as a percentage of a product. Ultimately, our goal is to identify quantities of components that add up to 100%. Typically, because of margins of error associated with different analytical processes, component quantities add up to between 97 and 103%.

The deformulation process requires an actual physical sample of that product or formulation. Even if we have no information about the components of a formulation or its purpose, we can determine some chemical information about it. Some products, however, are too complicated to deformulate. This may happen when a product contains a highly cross-linked polymer, which will not go into solution, or when a product contains significant quantities of natural products materials (e.g., cellulose derivatives or plant extracts).

We would not consider a partial, or even a complete, list of ingredients a true deformulation because it does not contain quantitative information and often the information provided may be incomplete or inaccurate. While knowledge about the identities of ingredients may simplify the first step of the deformulation process by narrowing the screening techniques necessary for identification, it does not eliminate the quantification step.

You also asked me about the ease of detecting or identifying potential contaminants in water samples. Such contaminant identification can be difficult because often, the concentration of the contaminant in a water sample is relatively low. This difficulty is exacerbated when the identity of the potential contaminant is unknown. In addition, the costs of identifying contaminants in a water sample may be much greater when the identity of potential contaminants is unknown because more screening techniques may be required. In such cases, being provided information about the chemical family for potential contaminants may aid in the identification process by narrowing down the relevant screening techniques required.

Sincerely,
**Chemir Analytical Services**

Carolyn J. Otten, Ph.D.
Senior Director – Specialized Services

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Enclosures

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# Carolyn J. Otten, Ph.D.

**Deposition and Testimonies**

- US District Court For Maryland (Northern Division) Case No. 06-CV-01792 JFM Brandon S. Jones, R. Scott Jones, and Cynthia K. Jones (Plaintiffs) vs. The Sportsman's Guide, Inc., et al. (Defendant), January 24, 2008.

- US District Court for Eastern District of North Carolina (Western Division) Civil Action No. 5:09-CV-00205-D. Lord Corporation (Plaintiff) v. S&B Technical Products, Inc., Terramix S.A., and Mark A. Weih (Defendants), October 11, 2010.

- US District Court Eastern District of Missouri (Eastern Division) Case No. 4:09-cv-00844-HEA. St. Anthony's Medical Center (Plaintiff) v. National Service Industries, Inc., d/b/a National Linen Service (Defendant), November 3, 2010.

- US District Court for Eastern District of Missouri Civil Action No. 09-5118 (action pending in another district: Western District of Arkansas). Great Creations, LLC (Plaintiff) v. Dickinson Frozen Foods, Inc., et al. (Defendant), December 13, 2010.

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CONSULTING

# Carolyn J. Otten, Ph.D.

## Education

**Ph.D., Chemistry**, Washington University, St. Louis
Dissertation Title: Synthesis and Characterization of Boron-based One-Dimensional Nanostructures
Advisor: William E. Buhro
**A.M., Chemistry**, Washington University, St. Louis
**B.S. Chemistry**, *magna cum laude* University of Missouri-Rolla
Minor: English Literature

## Experience

2011–present **Senior Director – Specialized Services**
Chemir - A Division of Evans Analytical Group, LLC
- Discuss potential projects with new clients
- Design technical plans to address customer's needs and discuss pricing
- Write and issue quotations for projected analytical services
- Consult with Marketing and represent Chemir at trade shows
- Strategize with management on how to achieve quality, sales, and scientific excellence
- Lead new hire recruiting efforts at Chemir site
- Target personnel needs and interview candidates
- Manage three to five chemists (Bachelors, Masters, and Ph.D. level)
- Consult, plan, and supervise projects
- Communicate results to clients
- Responsible for technical accuracy of projects

2007–2011 **Director – Specialized Services**
Chemir Analytical Services
- Consult with Marketing and represent Chemir at trade shows
- Strategize with management on how to achieve quality, sales, and scientific excellence
- Target personnel needs and interview candidates
- Manage three to five chemists (Bachelors, Masters, and Ph.D. level)
- Consult, plan, and supervise projects
- Communicate results to clients
- Responsible for technical accuracy of projects

2006–2007 **Project Leader – Specialized Services**
Chemir Analytical Services
- Manage three to five chemists (Bachelors, Masters, and Ph.D. level)
- Consult, plan, and supervise projects
- Communicate results to clients
- Responsible for technical accuracy of projects

2005–2006 **Senior Analytical Chemist**
Chemir Analytical Services
- Performed deformulations, contaminant ID's, failure analyses, legal projects
- Authored proposal for new SEM/EDXA, approved and purchased in December 2005
- Primary operator of FT-IR and SEM/EDXA instruments, responsible for instrument maintenance, qualification, and employee training

## Teaching

2004–2005 **Teaching Lecturer in Chemistry**
Washington University in St. Louis
Chemistry 111 and 112
- Held weekly office hours and help sessions, wrote exam questions, evaluated quizzes, assembled problem sets and solutions, led three recitation sections per week for core freshmen chemistry course with 500–600 enrolled students.

Summer 2004 **Adjunct Instructor**
East Central College, Union, MO
Physical Science III Lecture and Lab (5 credit hours)
- Sole instructor for a survey course covering physics, chemistry, astronomy, and geology, designed for education majors. Designed syllabus, prepared and delivered lectures, wrote and graded exams, selected and set-up laboratory experiments, conducted problem solving and review sessions.

1998–2000 **Graduate Teaching Assistant**
Washington University, St. Louis, MO
General Chemistry (two semesters)
- Attended lectures and weekly TA meetings. Led three recitation sections per week that involved a weekly quiz, discussion of key topics, problem solving, and question and answer sessions. Graded quizzes and exams.

General Chemistry Laboratory (three semesters)
- Attended lectures and weekly TA meetings. Responsible for organizing chemicals and equipment, delivering brief introductory lab lecture, enforcing laboratory safety issues, encouraging students to manage time effectively, and answering questions. Also held weekly office hours to help with computer tutorials.

## Research

2004–2005 **Postdoctoral Associate**
- Investigation of surface chemistry in quantum-confined InP nanowires by $^{31}$P-NMR.

1999-2004 **Graduate Research Assistant**
Washington University, St. Louis, MO
- Synthesis of boron and boron nitride nanostructures by CVD. Characterization by XRD, SEM, EDS, TEM, SAED, and EELS.
- Developed separation and suspension protocol to create nanowire samples suitable for electron transport measurements.
- Participated in semiconductor nanowire device fabrication through photolithography with electrical engineers at UC-Irvine.

1998 **Research and Development Chemist**
Reliable Biopharmaceutical Corporation, St. Louis
- Synthesized 35S and 14C radiolabelled versions of sulfated amino sugar for use as potential orally administrable anticoagulant drug at Washington University Medical School.
- Determined effectiveness of drug using human blood plasma and fibrometer.
- Participated in animal trial administering drug to rabbit.

1996 and 1997 **Summer Intern**
Reliable Biopharmaceutical Corporation, St. Louis
- Synthesized a series of sulfated amino sugars for use as potential orally administrable anticoagulant drug. Assayed intermediates using IR, polarimetry, HPLC, Karl Fischer, and UV-Vis.
- Developed titration using SDS titration to determine extent of sulfation achieved.
- Determined effectiveness of different amine linkers by correlating concentration of drug in human blood plasma with clotting time.

**Publications**

- William M. Iko, Jenny Berven, Laurie A. Baeten, Colleen E. Rostad, David W. Rutherford, **Carolyn J. Otten**, and Paul Winter. United State Geological Survey Report. "Adverse Effects to Northern Shovelers from Exposure to Treated Wastewater from Central Front Range, Colorado, Wastewater Treatment Plants." Released July 27, **2010**.
- **C. Jones Otten**, D. Wang, J. G. Lu, W. E. Buhro. "Electrical Properties of Boron Nanowires" *Modern Aspects of Main Group Chemistry.* Eds M. Lattman and R. A. Kemp. Washington DC: ACS books, 362-375 **(2005).**
- D. Wang, **C. Jones Otten**, W. E. Buhro and J. G. Lu. "Rectifying effect in boron nanowire devices." *IEEE T. Nanotechnol.* **(2004)** 3(2), 328-330. Also appeared in IEEE-NANO 2003 Conference Proceedings. Vol. 1, 48-51.
- D. Wang, J. G. Lu, **C. J. Otten** and W. E. Buhro. "Electrical transport in boron nanowires" *Appl. Phys. Lett.* **(2003)** 83 (25), 5280-5282. Also selected to appear in AIP's Virtual Journal of Nanoscale Science & Technology, Dec. 29, 2003
- **C. J. Otten**, O. R. Lourie, M-F. Yu, J. M. Cowley, M. J. Dyer, R. S. Ruoff, and W. E. Buhro. "Crystalline boron nanowires" *J. Am. Chem. Soc.* **(2002)** 124 (17), 4564-4565.
- O. R. Lourie, **C. R. Jones**, B. M. Bartlett, P. C. Gibbons, R. S. Ruoff, and W. E. Buhro. "CVD growth of boron nitride nanotubes" *Chem. Mater.* **(2000)** 12, 1808-1810.

# Exhibit 6

# Material safety data sheets: Are they reliable in identifying human hazards?

**Jonathan A. Bernstein, MD** *Cincinnati, Ohio*

**The material safety data sheet (MSDS) is an integral part of a worker's evaluation for suspected occupational asthma and dermatitis. However, established US federal guidelines for creating an MSDS do not require that certain key information relevant to the diagnosis of these disorders be included. This rostrum is intended to highlight the limitations of MSDSs as they pertain to the diagnosis of occupational asthma and occupational dermatitis so that future consideration can be given to modification of the existing MSDS guidelines. This article summarizes the origins of MSDS documents, provides an overview of their format, and discusses some of their inherent limitations, which at times impede proper medical evaluation by physicians and other health care professionals. MSDSs are an essential part of making the workplace a safer environment. More complete disclosure about both irritation and sensitization risks in these documents would facilitate the evaluation of workers for OA and OD. Their current ambiguity often delays the diagnosis of these occupational diseases and places the worker at further risk for development of occupational-related long-term disorders. Health care professionals have an obligation to better educate themselves regarding the interpretation of MSDSs and to recognize that they sometimes provide incomplete data. (J Allergy Clin Immunol 2002;110:35-8.)**

Occupationally induced lung and skin diseases are of special interest to allergists, immunologists, and dermatologists. These entities encompass both irritant and sensitization effects, which in most cases can be distinguished by using appropriate diagnostic tests. Under certain conditions, acute exposure to a toxic agent can lead to chronic dermatitis or a spectrum of pulmonary conditions, including reactive airways dysfunction syndrome.[1]

Contact dermatitis, either irritant or allergic, is the most common occupationally related disease. Myriads of occupational chemicals have been implicated. These have been extensively reviewed elsewhere.[2] Prospectively performed patch testing with suspected agents is required to distinguish between irritant and allergic varieties.

Occupational lung disease registries designed to compile more information on work-related respiratory diseases are now available in Europe and North America.[3,4]

*Abbreviations used*
HCS: Hazard Communication Standard
MSDS: Material safety data sheet
OA: Occupational asthma
OD: Occupational dermatitis
OSHA: Occupational Safety and Health Administration
PEL: Permissible exposure level

All of these databases indicate that occupational asthma (OA) is the most widely reported disorder among occupationally induced lung diseases. Although the common causes of OA differ geographically around the world, there is a clear consensus that the prevalence of asthma in the workplace is increasing worldwide.[5] An explanation for this rising trend might be due in part to a surge of sophisticated technology that introduces new chemicals into the workplace each year. In fact, it is now estimated that over 250 chemical agents in the workplace might induce OA.[6] Asthma proven to be exclusively the result of workplace exposure might be irritant as a result of volatile organic products (reactive airways dysfunction syndrome) or IgE mediated. In the latter instance sensitization to both high- and low-molecular-weight compounds (eg, polyisocyanates and acid anhydrides) has been demonstrated.[1,7-9] When the appropriate causative agent has been determined, diagnosis is confirmed in some cases by means of specific IgE tests, and if this is not applicable, confirmation is obtained by means of workplace or laboratory challenge.[9]

The material safety data sheet (MSDS) is an essential part of a worker's evaluation for possible agents that can cause OA or occupational dermatitis (OD). However, established US federal guidelines for preparing an MSDS do not require inclusion of certain key information relevant to the diagnosis of these disorders. This might include data about materials not considered hazardous by the manufacturer or proprietary information. This rostrum is intended to highlight the limitations of MSDSs as they pertain to the diagnosis of OA and OD in the hope that existing MSDS guidelines can be revised. Such changes should facilitate the identification of specific agents known to induce OA and OD.

## THE ORIGINS OF MSDSs

Regulations for safeguarding workers from hazardous materials in the workplace have been in effect only since 1970, when the Occupational Safety and Health Act (29 USC Chapter 15) was passed by Congress.[10-13] This leg-

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islative act led to the establishment of the Occupational Safety and Health Administration (OSHA) as an agency within the US Department of Labor. By 1986, OSHA introduced its first major regulatory document, the Hazard Communication Standard (HCS) or 29 CFR (Code of Federal Regulation) 1910.1200. The HCS (also referred to as the Worker Right to Know Legislation) was created to inform employees about dangers of hazardous chemicals in the workplace and what actions should be taken to protect themselves from harmful exposure. Originally this law was limited to the manufacturing industry, but subsequent modifications of the HCS have expanded its scope to include all sectors of the workforce.[10-18]

The HCS is divided into 6 categories: (1) chemical labeling; (2) MSDSs; (3) hazard determination; (4) written implementation program; (5) employee training; and (6) trade secrets. Each category has formal guidelines to be implemented in the workplace. Failure to comply with these requirements can lead to a monetary penalty imposed by OSHA.[18]

The MSDS was designed to make information about specific hazardous materials available to the employee. It is the responsibility of the manufacturer of the agent to determine all hazards associated with the agent, to prepare the MSDS sheet according to OSHA standards, and to distribute the MSDS to clients who purchase the agent. The employer-purchaser is responsible for making the MSDS accessible to employees and for providing safety training before working with the agent. Finally, the employee is expected to read and understand the MSDS about any chemical agent used in the workplace.[12-18]

## FORMAT OF MSDSs

OSHA has set relatively general guidelines for creating MSDS documents. Table I is an example of a typical MSDS format.[16,18] The minimal requirements for an MSDS must include information regarding (1) both chemical and common (trade) names of all hazardous ingredients; (2) physical and chemical characteristics of the agent or agents; (3) physical hazards, such as flammability or explosive reactivity; (4) medical symptoms, signs, or known diseases that can be caused or aggravated by exposure; (5) primary route or routes of entry; (6) legal time-weighted exposure limits and toxicity information established by OSHA; (7) carcinogenicity; (8) precautions for safe handling and use, including appropriate hygienic practices, personal protective equipment, and procedures for clean up of spills and leaks; (9) engineering control requirements; (10) emergency and first-aid measures; (11) dates of MSDS preparation, edits, and updates; and (12) manufacturer contact information.[16-18] It is noteworthy that Canadian MSDSs also require data about skin and respiratory tract sensitization.[14] Beyond providing this basic information, OSHA does not require that MSDSs follow a standardized format. Therefore MSDSs for a similar chemical prepared by 2 different manufacturers might be limited by lack of specificity, use of improper terminology, confusion about dose-response effects, and failure to list the possibility of a human disease. These problems were encountered in an independent survey of toluene diisocyanate MSDSs.[19]

## LIMITATIONS OF MSDSs

There are 4 major limitations of MSDSs. First is omission of vital information regarding the generic chemical names and formulas of hazardous agents because OSHA permits exclusion of information deemed solely by the manufacturer as not hazardous or protected as a trade secret. Second is omission of the listing of potential respiratory and skin sensitizing agents that are known to induce reactions through a specific immune response. This is especially true for many high- and low-molecular-weight substances because they are not ordinarily classified as toxic or irritant substances and therefore not considered hazardous. Third is failure to update current permissible exposure levels (PELs) for 212 agents that are higher than the PELs set by OSHA in 1989.[10,15] Finally, failure to require documented clinical information regarding specific occupational lung (ie, OA or hypersensitivity pneumonitis) or cutaneous diseases associated with a specific agent is also a major limitation. A survey of MSDSs for toluene diisocyanate revealed lack of factual information that exposure could cause OA.[19]

## SUGGESTIONS TO IMPROVE MSDSs

The current heterogeneity of MSDS formatting is often the focus of medicolegal controversy. OSHA should formulate more uniform semantic guidelines for preparers of MSDSs. There should be no basis for misinterpretation of dose-response effects or precise description of diseases caused by particular substances. For example, in the case of polyisocyanates, a standardized statement about isocyanate-induced OA should be required on all MSDSs for this class of chemical compound.[20] Determination of nonhazard status for any component should not be at the sole discretion of the manufacturer. In particular, OSHA should consider alternative strategies for access to information about proprietary (trade secret) substances that could possibly have irritative or sensitization potential. A more consistent approach to updating time-weighted exposure levels (as listed by National Institute of Occupational Safety and Health) should be adopted.

PELs are time-weighted averages that should not be exceeded during any 8-hour work shift of a 40-hour workweek. Current PELs enforced by OSHA might not be adequate for some chemical agents. For example, the PEL of toluene diisocyanate is set at 0.02 ppm (20 ppb). However, isocyanates, which are the most common cause of OA in the United States, have been reported to induce OA in workers after PELs of less than 5 ppb.[21] The reactive nature of these chemical haptens and the frequency with which they induce OA warrants reconsideration of the current PELs enforced by OSHA. At a minimum, some notation that isocyanates can induce OA at levels

**TABLE I.** MSDS format

| | | | | |
|---|---|---|---|---|
| **Section 1: Name and product** | | | | |
| Manufacturer's name and address | | Issue date | | |
| Phone no. for more information | | Emergency phone no. | | |
| Product name | | | | |
| Formula | | Chemical family | | |
| **Section 2: Hazardous ingredients** | % Content | OSHA PEL | ACGIH TLV | Other levels |
| *(NB: Does not include all products; only lists those considered hazardous)* | | | | |
| **Section 3: Physical data** | | | | |
| Boiling points, vapor pressures, etc. | | | | |
| **Section 4: Fire and explosion data** | | | | |
| **Section 5: Health hazard data** | | | | |
| Route(s) of entry: inhalation/skin/ingestion | | | | |
| Carcinogenicity | | | | |
| Health hazards: acute and chronic | | | | |
| Signs and symptoms of overexposure | | | | |
| Medical conditions aggravated by overexposure | | | | |
| **Section 6: First-aid procedures** | | | | |
| **Section 7: Reactivity data** | | | | |
| **Section 8: Spill and leak procedures** | | | | |
| **Section 9: Special protection** | | | | |
| **Section 10: Special precautions or other comments** | | | | |
| Transportation information | | | | |

*OSHA,* Occupational Safety and Health Administration; *PEL,* permissible exposure limit; *ACGIH,* American Conference of Governmental Industrial Hygienists; *TLV,* threshold limit value.

less than PELs should be included on MSDSs for these agents. Similar scrutiny should be given to other chemical agents or groups that are known to induce OA through immunologic mechanisms.

The most relevant concern for allergists-immunologists and dermatologists is the fact that respiratory tract and cutaneous sensitization data are not included as requirements for MSDSs.[22,23] Although high- and low-molecular-weight materials might not constitute toxic hazards for the majority of exposed workers, they might be potentially allergenic. It should be emphasized that any irritant can also be a potential sensitizer or allergen capable of eliciting a specific immune response.[24] For example, in the platinum-refining industry, chlorine gas, which is required in the manufacturing process of chloroplatinate salts, is an irritant that actually confers allergenicity to the finished product.[25] The term *allergic mediated*, although often used synonymously with *IgE mediated*, has a broader-based definition because it refers to any potential specific immune-mediated mechanism, especially cell-mediated mechanisms responsible for allergic contact OD. It is often difficult to differentiate between irritating and sensitizing agents given the limitations of available clinical in vitro and in vivo laboratory diagnostic tests. However, every effort should be made to differentiate between them because symptoms induced by irritants are reversible and allow the employee to return to the workplace provided proper remediation of the work environment has been achieved. In contrast, workers sensitized to a specific agent might be at risk for disease progression, even at low levels of exposure, and therefore might have to be permanently removed from the workplace.

## SUGGESTED APPROACHES TO EVALUATION OF CURRENT MSDSs

If an MSDS is not readily available, several major MSDS Internet sites (eg, the Cornell MSDS Web site) might provide relevant information. When the constituents listed on the MSDS total less than 100%, this should alert the physician that the manufacturer might have omitted materials they deem nonhazardous or proprietary. This should trigger a phone call to the manufacturer using the phone number provided on the MSDS to inquire about missing information. In an emergency OSHA requires the release of trade secrets. When health professionals designate an emergency on the basis of potential risk to health, the OSHA area director contacts the manufacturer for disclosure. If request for disclosure is denied in a nonemergency situation, the OSHA area office should be contacted for enforcement proceedings. Information regarding time-weighted exposure levels might be found in a National Institute of Occupational Safety and Health publication.[11] The sensitization potential of many low- and high-molecular-weight compounds is discussed at length in several textbooks.[2,7-9,25] Health care providers should be persistent in obtaining this information because failure to do so can further delay the diagnosis or exclusion of occupational diseases, such as OA and OD.

## THE ROLE OF ORGANIZED MEDICINE VIS-A-VIS MSDSs

As advocates of public and patient health, major medical societies are obliged to refocus attention by regulatory agencies on how to improve the potential utility of MSDSs. To this end, societies such as the American Academy of Dermatology, the Society for Occupational and Environmental Health, the Society of Toxicology, and the American Academy of Allergy, Asthma and Immunology could cosponsor a symposium with OSHA, the National Institute of Occupational Safety and Health, the National Institute of Allergy and Infectious Diseases, and the National Institute Environmental Health Sciences for the purpose of establishing state-of-the-art principles for revisions of MSDSs.

## CONCLUSIONS

The reliability of information in MSDSs is intended to be a cornerstone of workplace safety. Current guidelines of preparing these documents give employers the right to exclude key information about nonhazardous components, proprietary contents, sensitization potential, and the specific disease consequences that are known to occur. Such omissions are often critical for the evaluation of workers presenting with occupationally related lung and skin diseases. Moreover, delays in obtaining such information often place the worker at further risk for development of more serious long-term sequelae associated with these occupational disorders. Health care professionals should better educate themselves regarding the interpretation of MSDSs. They should be aware that MSDSs often provide incomplete data and that it is frequently necessary to contact the manufacturer or, at times, OSHA directly for a complete listing of ingredients and other relevant information.

Members of the AAAAI Occupational Lung Disease Working Committee were as follows: David I. Bernstein, MD; I. Leonard Bernstein, MD; Andre Cartier, MD; John R. Cohn, MD; Timothy Craig, DO; Mark Dykewicz, MD; A. Jordon Fink, MD; Lawrence Mihalas, MD; Harold Novey, MD; Susan Tarlo, MD; and Chester R. Zeiss, MD.

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# Exhibit 7

appropriate means, such as on the related collection instrument or form, if applicable. The display of OMB control numbers in certain EPA regulations is consolidated in 40 CFR part 9.

*Abstract:* The New Source Performance Standards (NSPS) for the Graphic Arts Industry (40 CFR part 60, subpart QQ) were proposed on October 28, 1980, and promulgated on November 8, 1982. The affected entities are subject to the General Provisions of the NSPS at 40 CFR part 60, subpart A and any changes, or additions to the Provisions specified at 40 CFR part 60, subpart QQ.

Owners or operators of the affected facilities must make an initial notification, performance tests, periodic reports, and maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of an affected facility, or any period during which the monitoring system is inoperative. Reports, at a minimum, are required semiannually.

*Burden Statement:* The annual public reporting and recordkeeping burden for this collection of information is estimated to average 37 hours per response. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements which have subsequently changed; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

*Respondents/Affected Entities:* Graphic arts facilities.

*Estimated Number of Respondents:* 19.

*Frequency of Response:* Initially, occasionally, and semiannually.

*Estimated Total Annual Hour Burden:* 1,718.

*Estimated Total Annual Cost:* $163,005, which includes $163,005 in labor costs exclusively. There are no annualized capital/startup costs or O&M costs associated with this ICR.

*Changes in the Estimates:* There is no change in the number of hours in the total estimated burden currently identified in the OMB Inventory of Approved ICR Burdens.

Dated: May 21, 2010.

**John Moses,**

*Director, Collection Strategies Division.*

[FR Doc. 2010–12769 Filed 5–26–10; 8:45 am]

**BILLING CODE 6560–50–P**

## ENVIRONMENTAL PROTECTION AGENCY

**[EPA–HQ–OPPT–2010–0446; FRL–8827–3]**

## Claims of Confidentiality of Certain Chemical Identities Contained in Health and Safety Studies and Data from Health and Safety Studies Submitted Under the Toxic Substances Control Act

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Notice.

**SUMMARY:** EPA will begin a general practice of reviewing confidentiality claims for chemical identities in health and safety studies, and in data from health and safety studies, submitted under the Toxic Substances Control Act (TSCA) in accordance with Agency regulations at 40 CFR part 2, subpart B. Section 14(b) of TSCA does not extend confidential treatment to health and safety studies, or data from health and safety studies, which, if made public, would not disclose processes used in the manufacturing or processing of a chemical substance or mixture or, in the case of a mixture, the release of data disclosing the portion of the mixture comprised by any of the chemical substances in the mixture. Where a chemical identity does not explicitly contain process information or reveal portions of a mixture, EPA expects to find that the information would clearly not be entitled to confidential treatment. This builds on similar efforts regarding confidentiality of chemical identities listed on the public version of the TSCA Chemical Substances Inventory (TSCA Inventory) and submitted in notifications pursuant to TSCA section 8(e), discussed in the **Federal Register** of January 21, 2010.

**DATES:** EPA expects to begin reviews of confidentiality claims — both newly submitted and existing claims — in accordance with this guidance on August 25, 2010. Though EPA is not required to solicit comment for this action, comments received before this date will inform these reviews.

**ADDRESSES:** Submit your comments, identified by docket identification (ID) number EPA–HQ–OPPT–2010–0446, by one of the following methods:

• *Federal eRulemaking Portal*: *http://www.regulations.gov*. Follow the on-line instructions for submitting comments.

• *Mail*: Document Control Office (7407M), Office of Pollution Prevention and Toxics (OPPT), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460–0001.

• *Hand Delivery*: OPPT Document Control Office (DCO), EPA East Bldg., Rm. 6428, 1201 Constitution Ave., NW., Washington, DC. Attention: Docket ID Number EPA–HQ–OPPT–2010–0446. The DCO is open from 8 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. The telephone number for the DCO is (202) 564–8930. Such deliveries are only accepted during the DCO's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

*Instructions*: Direct your comments to docket ID number EPA–HQ–OPPT–2010–0446. EPA's policy is that all comments received will be included in the docket without change and may be made available on-line at *http://www.regulations.gov*, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through regulations.gov or e-mail. The regulations.gov website is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through regulations.gov, your e-mail address will be automatically captured and included as part of the comment that is placed in the docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

*Docket*: All documents in the docket are listed in the docket index available at *http://www.regulations.gov*. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available electronically at

*http://www.regulations.gov*, or, if only available in hard copy, at the OPPT Docket. The OPPT Docket is located in the EPA Docket Center (EPA/DC) at Rm. 3334, EPA West Bldg., 1301 Constitution Ave., NW., Washington, DC. The EPA/DC Public Reading Room hours of operation are 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number of the EPA/DC Public Reading Room is (202) 566–1744, and the telephone number for the OPPT Docket is (202) 566–0280. Docket visitors are required to show photographic identification, pass through a metal detector, and sign the EPA visitor log. All visitor bags are processed through an X-ray machine and subject to search. Visitors will be provided an EPA/DC badge that must be visible at all times in the building and returned upon departure.

**FOR FURTHER INFORMATION CONTACT:** *For technical information contact*: Scott M. Sherlock, Environmental Assistance Division, Office of Pollution Prevention and Toxics, Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460–0001; telephone number: (202) 564–8257; e-mail address: *sherlock.scott@epa.gov*.

*For general information contact*: The TSCA-Hotline, ABVI-Goodwill, 422 South Clinton Ave., Rochester, NY 14620; telephone number: (202) 554–1404; e-mail address: *TSCA-Hotline@epa.gov*.

**SUPPLEMENTARY INFORMATION:**

## I. General Information

### *A. Does this Action Apply to Me?*

This document is directed to the public in general, though it does not directly impose any binding requirements on parties outside the Agency. It may, however, be of particular interest to you if you manufacture (defined by statute to include import) and/or process chemical substances and mixtures subject to TSCA (15 U.S.C. 2601 *et seq.*). You may be identified by the North American Industrial Classification System (NAICS) codes 325 and 32411. Because this document is directed to the general public and other entities may also be interested, the Agency has not attempted to describe all the specific entities that may be interested in this action. If you have any questions regarding the applicability of this action to a particular entity, consult the technical person listed under **FOR FURTHER INFORMATION CONTACT**.

### *B. What Should I Consider as I Prepare My Comments for EPA?*

1. *Submitting CBI.* Do not submit this information to EPA through regulations.gov or e-mail. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD-ROM that you mail to EPA, mark the outside of the disk or CD-ROM that you mail to EPA, mark the outside of the disk or CD-ROM as CBI and then identify electronically within the disk or CD-ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

2. *Tips for preparing your comments.* When submitting comments, remember to:

i. Identify the document by docket ID number and other identifying information (subject heading, **Federal Register** date and page number).

ii. Follow directions. The Agency may ask you to respond to specific questions or organize comments by referencing a Code of Federal Regulations (CFR) part or section number.

iii. Explain why you agree or disagree; suggest alternatives and substitute language for your requested changes.

iv. Describe any assumptions and provide any technical information and/or data that you used.

v. If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.

vi. Provide specific examples to illustrate your concerns and suggest alternatives.

vii. Explain your views as clearly as possible, avoiding the use of profanity or personal threats.

viii. Make sure to submit your comments by the comment period deadline identified.

## II. What Action is the Agency Taking?

The Agency expects to respond to certain confidentiality claims regarding chemical identities in health and safety studies and in data from health and safety studies with a determination letter under 40 CFR 2.306(d), 40 CFR 2.204(d)(2), and 40 CFR 2.205(f) that such information is clearly not entitled to confidential treatment. This **Federal Register** document only serves to announce an impending general Agency practice, and this document does not constitute a final Agency action; rather, any determination letter issued by EPA will constitute the Agency's final determination that the chemical identity at issue is not entitled to confidential treatment under TSCA section 14 (15 U.S.C. 2613), and the recipient of such a determination letter may seek judicial review under 5 U.S.C. 701 *et seq*.

At this time, EPA expects to issue these determination letters when the chemical identity claimed as confidential:

1. Was submitted as part of a health and safety study, or of data from a health and safety study, submitted under TSCA that is subject to TSCA section 14(b)(1).

2. Does not explicitly contain process information.

3. Does not reveal data disclosing the portion of the mixture comprised by any of the chemical substances in the mixture.

Each determination letter will provide a contact person within the Agency whom the recipient of the letter can contact with any questions or concerns about the determination related to the submission.

The TSCA Inventory is a list of chemical substances subject to TSCA that are in commerce in the United States, and the fact that a chemical substance is on the TSCA Inventory may be claimed as confidential. Release of a chemical identity under TSCA section 14(b) may correspondingly affect the validity of a confidentiality claim for presence on the TSCA Inventory. EPA expects to examine TSCA Inventory confidentiality claims for chemical identity at the time it makes determinations under TSCA section 14(b). EPA will issue determinations on confidential inventory status when appropriate.

This action is part of a broader effort to increase transparency and provide more valuable information to the public by identifying data collections where information may have been claimed and treated as confidential in the past but is not in fact entitled to confidentiality under TSCA. For such information, EPA is considering what actions might be appropriate in accordance with its confidentiality regulations at 40 CFR part 2, subpart B. EPA believes these actions will make more health and safety information available to the public and support an important mission of the Agency to promote public understanding of the potential risks posed by chemical substances in commerce.

**III. What is the Agency's Authority for Taking this Action?**

Under TSCA section 3(6) (15 U.S.C. 2602(6)):

> The term "health and safety study" means any study of any effect of a chemical substance or mixture on health or the environment or on both, including underlying data and epidemiological studies, studies of occupational exposure to a chemical substance or mixture, toxicological, clinical, and ecological studies of a chemical substance or mixture, and any test performed pursuant to this chapter.

Health and safety studies may be submitted under various sections of TSCA, such as TSCA section 8(d) rules explicitly requiring submission of health and safety studies, notices of substantial risk under TSCA section 8(e), and TSCA section 4 rules requiring persons to perform testing. (15 U.S.C. 2603, 2607(d), and 2607(e)) Premanufacture notices submitted under TSCA section 5 must include test data in the possession or control of the person submitting the notice. (15 U.S.C. 2605(d)(1)(B)) Chemical identity is part of a health and safety study. See, e.g., 40 CFR 716.3 and 40 CFR 720.3(k).

Section 14(b)(1) of TSCA provides that health and safety studies and data from health and safety studies are not entitled to confidential treatment unless such information, if made public, would disclose processes used in the manufacturing or processing of a chemical substance or mixture or in the case of a mixture, the portion of the mixture comprised by any of the chemical substances in the mixture. (15 U.S.C. 2613(b)(1)) This document discusses the disclosure of process information element only, and does not deal with the portion of a mixture information element, which pertains to the concentrations of the components of a mixture.

Section 14(b)(1) of TSCA is limited to health and safety studies and data submitted with respect to chemical substances or mixtures that have been offered for commercial distribution and those for which testing is required under TSCA section 4 or for which notification is required under TSCA section 5.

Until recently, EPA has not announced the Agency's views regarding when disclosure of chemical identities may in turn disclose process information. In the **Federal Register** issue of January 21, 2010 (75 FR 3462) (FRL–8807–9), EPA announced that "[w]here a health and safety study submitted under section 8(e) of TSCA involves a chemical identity that is already listed on the public portion of the TSCA Chemical Substances Inventory, EPA expects to find that the chemical identity clearly is not entitled to confidential treatment."

In that January 21, 2010 **Federal Register** document the Agency stated that:

> "Where the identity of a chemical substance is already contained on the public portion of the TSCA Chemical Substances Inventory, which is publicly available from the National Technical Information Service and other sources, EPA believes that the identity itself, even assuming it might otherwise be CBI, as well as any information that might be derived from it about processes or portions, has already been disclosed."

*Id.*

The January 21, 2010 **Federal Register** document did not, however, address chemical substances not on the public TSCA Inventory. With respect to such chemical substances, EPA is aware that some companies believe their competitors are sufficiently knowledgeable that if EPA were to disclose the chemical identity, the competitors would be capable of ascertaining on their own how the chemical substance might be manufactured or processed, and therefore this would in effect disclose process information.

EPA, however, questions the assertion that when disclosing a chemical identity of a chemical substance inspires a competitor to ascertain a process for manufacturing the chemical substance, such disclosure is equivalent to disclosing the process itself. Disclosing the end product of a process (i.e., a chemical identity) is not the same thing as disclosing the process to make that end product. The process information would come from the competitor's expertise, research, or publicly available sources, not from EPA. Although some companies might find such use of a chemical identity undesirable, EPA does not believe that TSCA section 14(b) was intended to limit the uses of information from a health and safety study.

Interpreting TSCA section 14(b)(1) otherwise might for all intents and purposes exclude chemical identities in health and safety studies from the disclosure provisions of TSCA section 14(b). Carried to its logical conclusion, the argument that the manufacturing process for chemical substances can be figured out by someone knowledgeable in the area and for that reason disclosure of chemical identities is considered equivalent to disclosing process information, would yield the perverse result that chemical identities would rarely, if ever be subject to TSCA section 14(b) disclosure.

Chemical identify has been claimed as confidential in a significant number of health and safety submissions. The result, in the context of substantial risk notices under TSCA section 8(e) for example, has been that the public is able to see that some unidentified chemical substance might present a substantial risk of injury to health or the environment. EPA believes that Congress generally intended for the public to be able to know the identities of chemical substances for which health and safety studies have been submitted. Congress did not specifically exempt chemical identities from TSCA section 14(b), and EPA believes that interpreting TSCA section 14(b) in such a manner would be inconsistent with the intent of Congress in enacting the provision.

It is EPA's view that as a general matter disclosure of a chemical identity does not disclose process information except where the identity explicitly contains process information. For example, a name such as "formaldehyde" (Chemical Abstracts Service (CAS) No. 50–00–0) reveals nothing about the process to make the chemical substance, even if any chemist could figure out independently that formaldehyde can be generated by oxidizing methanol.

In contrast, the names of some chemical substances — especially polymers and chemical substances of unknown or variable composition, complex reaction products and biological materials (known as UVCB substances) — do explicitly contain process information. An illustrative UVCB example is CAS No. 64742–28–5, specific chemical substance's name "Distillates (petroleum), chemically neutralized light paraffinic." A polymer example is CAS No. 68474–52–2, safflower oil, polymer with adipic acid, glycerol and phthalic anhydride. The monomers adipic acid, glycerol and phthalic anhydride are reactants, information pertaining to manufacture of the polymer. EPA expects that such names would not be subject to TSCA section 14(b) disclosure in those instances where the chemical substances' name were claimed as confidential in a study.

EPA intends to begin review of confidentiality claims for identities of chemical substances in health and safety studies, and data from health and safety studies, as described in this guidance, on August 18, 2010. The Agency solicits comments prior to that date regarding classes of chemical substances and attributes of chemical identities that do or do not disclose process information. Such comments will inform the Agency's reviews. Where process information in the chemical identity is unnecessary to

characterize the chemical substance or mixture, EPA may release a version of the chemical identity with the process information removed.

EPA premanufacture notification regulations at 40 CFR 720.90(c) state that EPA will deny a confidentiality claim for chemical identity in a health and safety study submitted as part of a premanufacture notice unless:

1. The information in turn discloses process information,

2. The information discloses portions of a mixture, or

3. "[t]he specific chemical identity is not necessary to interpret a health and safety study" (see also 40 CFR 725.92(c) regarding microbial commercial activity notices). Consistent with the intent of TSCA section 14(b) to allow broad public availability of health and safety data, with limited exceptions, EPA intends to interpret paragraph 3. narrowly.

## IV. Why is EPA Taking this Action?

Part of the Agency's mission is to promote public understanding of potential risks by providing understandable, accessible, and complete information on potential chemical risks to the broadest audience possible. In support of this mission, EPA posts useful information about chemical substances regulated under TSCA for the public on its website (*http://www.epa.gov/oppt/index.htm*). One important source of this information is health and safety studies submitted to the Agency. The TSCA section 14(b) exclusion from confidential protection for information from health and safety studies indicates the importance attributed by Congress to making such information available to the public. Chemical identities in particular constitute basic information that helps the public to place risk information in context. Making public chemical identities in health and safety studies whose confidentiality is precluded by TSCA will support the Agency's mission.

## List of Subjects

Environmental protection, Chemicals, Confidential Business Information, Health and safety, Reporting and recordkeeping.

Dated: May 20, 2010.

**Stephen A. Owens,**

*Assistant Administrator, Office of Chemical Safety and Pollution Prevention.*

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**BILLING CODE 6560–50–S**

## ENVIRONMENTAL PROTECTION AGENCY

**[FRL–9155–2]**

## New York State Prohibition of Discharges of Vessel Sewage; Final Affirmative Determination

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Notice of determination.

**SUMMARY:** Notice is hereby given that the Regional Administrator of the Environmental Protection Agency—Region 2, has determined that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available for the waters of the New York State (NYS) Canal System, including the 524 linear miles of navigable waterways within the Erie, Oswego, Champlain, and Cayuga-Seneca canal segments, and including Onondaga, Oneida, and Cross Lakes.

**SUPPLEMENTARY INFORMATION:** On April 30, 2009, the State of New York petitioned the Regional Administrator, EPA—Region 2, pursuant to Section 312(f)(3) of Public Law 92–500 as amended by Public Law 95–217 and Public Law 100–4, for a determination that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available for the NYS Canal System.

The NYS Department of Environmental Conservation (NYSDEC), in collaboration with the New York State Canal Corporation, the New York Department of State, and the New York State Environmental Facilities Corporation, prepared and submitted the petition, and NYSDEC certified the need for greater protection of the water quality in the NYS Canal System.

The waters of the proposed No Discharge Zone fall within the jurisdictions of the NYS Thruway Authority and NYS Canal Recreationway Commission, and include four distinct segments of the NYS Canal System. Adequate pumpout facilities are defined as one pumpout station for every 300 to 600 boats, pursuant to the Clean Vessel Act: Pumpout Station and Dump Station Technical Guidelines (59 FR 11290–02).

*Findings:* Potential vessel population in the NYS Canal System was determined using three sources of information: slips (6,896), boater registrations (21,201), and lockings (23,278). Based on the numbers determined through these sources and the number of pumpouts available (87), the following ratios were determined: using number of slips: 1:80, using NYS Boater Registrations 1:243, and using number of lockings: 1:267, respectively. Thus adequate pumpouts are available for all boaters using the NYS Canal System. For all vessel waste disposal from pumpouts, there are 87 NYS Clean Vessel Assistance Program (CVAP) completed projects, 4 dispose of wastes to an on-site septic system, 21 dispose to a holding tank and 62 dispose to a municipal wastewater treatment plant. Thus all vessel sewage will be either discharge into State approved and regulated septic tanks or holding tanks for transport to a sewage treatment plant. Online maps are provided at *http://www.nysefc.org/maps* and include Google maps of pumpout locations and marina sheets that provide boaters with detailed availability information. Based on the above, EPA Region 2, has determined that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available for the waters of the New York State (NYS) Canal System. The following is a summary of EPA's findings regarding the adequacy of pumpout facilities for the four Canal System segments at issue:

### Champlain Canal

The Champlain Canal encompasses an area from the Federal lock in Troy, NY, to Whitehall, NY. The Champlain Canal leads north to Lake Champlain. Lake Champlain is a large waterbody that is already designated as a No Discharge Zone (NDZ) for vessel sewage, and the direct disposal of greywater into the lake is also prohibited. The total travel distance of the canal area is 60 miles, and to travel the entire length takes approximately 7 hours. There are 276 slips available and 7 operating pumpouts on the Champlain Canal. The 1:300 ratio would only require one pumpout, if the calculation were based solely on the number of slips. The availability of seven pumpouts for this canal meets the criteria for sufficient pumpout access, even accounting for some additional demand from transient traffic. The NYS side of Lake Champlain has an additional 1,014 slips available and 8 additional pumpouts.

### Erie Canal

The Erie Canal stretches from Waterford (at the confluence of the Mohawk and Hudson Rivers) to the Tonawandas (at the Niagara River), traveling through Oneida Lake and Cross Lake, and connecting to Onondaga Lake along the way. This portion of the Canal is 338 miles long and has 44 pumpouts available for 2,555 slips. Achieving a 1:300 ratio would require a minimum of nine pumpouts for the

# Exhibit 8

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## Hazard Assessment Articles

# Natural Gas Operations from a Public Health Perspective

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**ABSTRACT**

The technology to recover natural gas depends on undisclosed types and amounts of toxic chemicals. A list of 944 products containing 632 chemicals used during natural gas operations was compiled. Literature searches were conducted to determine potential health effects of the 353 chemicals identified by Chemical Abstract Service (CAS) numbers. More than 75% of the chemicals could affect the skin, eyes, and other sensory organs, and the respiratory and gastrointestinal systems. Approximately 40–50% could affect the brain/nervous system, immune and cardiovascular systems, and the kidneys; 37% could affect the endocrine system; and 25% could cause cancer and mutations. These results indicate that many chemicals used during the fracturing and drilling stages of gas operations may have long-term health effects that are not immediately expressed. In addition, an example was provided of waste evaporation pit residuals that contained numerous chemicals on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Emergency Planning and Community Right-to-Know Act (EPCRA) lists of hazardous substances. The discussion highlights the difficulty of developing effective water quality monitoring programs. To protect public health we recommend full disclosure of the contents of all products, extensive air and water monitoring, coordinated environmental/human health studies, and regulation of fracturing under the U.S. Safe Drinking Water Act.

**Key Words:** drilling, health, hydraulic fracturing, natural gas, ozone, pollution.

## INTRODUCTION

Over the past two decades, in an effort to reduce dependence on imported fossil fuels, the U.S. government has supported increased exploration and production of

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natural gas. The responsibility for overseeing the nation's underground minerals lies with the U.S. Department of Interior, Bureau of Land Management (BLM) with some oversight from the U.S. Environmental Protection Agency (USEPA). Attempting to meet the government's need for energy self-sufficiency, the BLM has auctioned off thousands of mineral leases and issued permits to drill across vast acreages in the U.S. Rocky Mountain West. Since 2003, natural gas operations have increased substantially, with annual permits in Colorado alone increasing from 2,249 to 8,027 in 2008 (Colorado Oil and Gas Conservation Commission 2010).

In tandem with federal support for increased leasing, legislative efforts have granted exclusions and exemptions for oil and gas exploration and production from a number of federal environmental statutes, including the Clean Water Act, the Clean Air Act, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, better known as the Superfund Act), the Resource Conservation and Recovery Act (RCRA), the Toxic Release Inventory under the Emergency Planning and Community Right-to-Know Act (EPCRA), and the National Environmental Policy Act (NEPA) (Oil and Gas Accountability Project 2007). The most recent of these efforts was an amendment included in the 2005 Energy Policy Act that prevented the use of the Safe Drinking Water Act to regulate certain activities, known as hydraulic fracturing, which are involved in 90% of natural gas drilling.

The cumulative effect of these exemptions and exclusions has been to create a federal void in environmental authority over natural gas operations, leaving the responsibility primarily up to the states. Although some states have oil and gas commissions to watch over natural gas production activity, the primary mission of these agencies has been to facilitate natural gas extraction and increase revenues for the states. In addition, when states issue permits to drill, they have not traditionally required an accounting of how the resulting liquid and solid waste would be handled. In short, their focus has not typically been on health and the environment.

## The Need for Chemicals

In keeping with the rush to produce more natural gas, technological advances have permitted the industry to drill deeper and expand wider, tapping into gas reserves with greater facility and profitability. While these advances have allowed the mining of vast, newly discovered gas deposits, the new technology depends heavily on the use of undisclosed types and amounts of toxic chemicals.

Chemicals are used throughout operations to reach and release natural gas. First, combinations of chemicals are added to the "muds" used to drill the bore hole. Chemicals are added to increase the density and weight of the fluids in order to facilitate boring, to reduce friction, to facilitate the return of drilling detritus to the surface, to shorten drilling time, and to reduce accidents. After drilling, hydraulic fracturing (also known as fracking, frac'ing, or stimulation) is done to break up the zone in which the gas is trapped and make it easier for the gas to escape, increasing a well's productivity. In the U.S. West, approximately a million or more gallons of fluid containing toxic chemicals are injected underground during this operational stage. As with drilling, chemicals are used in fracking fluids for many purposes (Table 1). One well can be fracked 10 or more times and there can be up to 30 wells on one pad. An estimated 10% to 90% of the fracking fluid is returned to the surface during

**Table 1.** Functional categories of hydraulic fracturing chemicals.

| | |
|---|---|
| Acids | To achieve greater injection ability or penetration and later to dissolve minerals and clays to reduce clogging, allowing gas to flow to the surface. |
| Biocides | To prevent bacteria that can produce acids that erode pipes and fittings and break down gellants that ensure that fluid viscosity and proppant transport are maintained. Biocides can produce hydrogen sulfide (H2S) a very toxic gas that smells like rotten eggs. |
| Breakers | To allow the breakdown of gellants used to carry the proppant, added near the end of the fracking sequence to enhance flowback. |
| Clay stabilizers | To create a fluid barrier to prevent mobilization of clays, which can plug fractures. |
| Corrosion inhibitors | To reduce the potential for rusting in pipes and casings. |
| Crosslinkers | To thicken fluids often with metallic salts in order to increase viscosity and proppant transport. |
| Defoamers | To reduce foaming after it is no longer needed in order to lower surface tension and allow trapped gas to escape. |
| Foamers | To increase carrying-capacity while transporting proppants and decreasing the overall volume of fluid needed. |
| Friction reducers | To make water slick and minimize the friction created under high pressure and to increase the rate and efficiency of moving the fracking fluid. |
| Gellants | To increase viscosity and suspend sand during proppant transport. |
| pH control | To maintain the pH at various stages using buffers to ensure maximum effectiveness of various additives. |
| Proppants | To hold fissures open, allowing gas to flow out of the cracked formation, usually composed of sand and occasionally glass beads. |
| Scale control | To prevent build up of mineral scale that can block fluid and gas passage through the pipes. |
| Surfactants | To decrease liquid surface tension and improve fluid passage through pipes in either direction. |



well completion and subsequent production (BC Oil and Gas Commission 2010; New York State Department of Environmental Conservation Division of Mineral Resources 2009), bringing with it toxic gasses, liquids, and solid material that are naturally present in underground oil and gas deposits. Under some circumstances, none of the injected fluid is recovered.

In most regions of the country, raw natural gas comes out of the well along with water, various liquid hydrocarbons including benzene, toluene, ethylbenzene, and xylene (as a group, called BTEX), hydrogen sulfide ($H_2S$), and numerous other organic compounds that have to be removed from the gas. When the gas leaves the well it is passed through units called heater treaters that are filled with triethylene glycol and/or ethylene glycol that absorbs the water from the gas. Once the glycol solution becomes saturated with water, the heaters turn on and raise the temperature enough to boil off the water, which is vented through a closed system

and upon cooling, ends up in a nearby tank labeled "produced water." The glycol fluid, which has a higher boiling point than water, cools and is reused. During the heating process at critical temperatures the oily substances that came up with the gas become volatile and then re-condense into a separate holding tank. This is known as "condensate" water. The contaminated water can be re-injected underground on the well pad or off site, common practices in the eastern United States, or hauled off the well pad to waste evaporation pits in the U.S. West. Temporary pits are also constructed during drilling to hold the cuttings, used drilling mud which is often re-used, and any other contaminated water that comes to the surface while drilling. These reserve pits on well pads are supposed to be drained and covered with top soil or other suitable material within a month after drilling stops.



### An Unexpected Side Effect: Air Pollution

In addition to the land and water contamination issues, at each stage of production and delivery tons of toxic volatile compounds (VOCs), including BETX, other hydrocarbons, and fugitive natural gas (methane), can escape and mix with nitrogen oxides (NOx) from the exhaust of diesel-fueled, mobile, and stationary equipment, to produce ground-level ozone (CH2MHILL 2007; Colorado Department of Public Health and Environment [CDPHE] 2007; URS 2008; U.S. Congress, Office of Technology Assessment 1989). One highly reactive molecule of ground level ozone can burn the deep alveolar tissue in the lungs, causing it to age prematurely. Chronic exposure can lead to asthma and chronic obstructive pulmonary disease (COPD), and is particularly damaging to children, active young adults who spend time outdoors, and the aged (Islam *et al*. 2007; Tager *et al*. 2005; Triche *et al*. 2006). Ozone combined with particulate matter less than 2.5 micrometers produces smog (haze) that has been demonstrated to be harmful to humans as measured by emergency room admissions during periods of elevation (Peng *et al*. 2009). Gas field ozone has created a previously unrecognized air pollution problem in rural areas, similar to that found in large urban areas, and can spread up to 200 miles beyond the immediate region where gas is being produced (U.S. Congress, Office of Technology Assessment 1989; Roberts 2008). Ozone not only causes irreversible damage to the lungs, it is similarly damaging to conifers, aspen, forage, alfalfa, and other crops commonly grown in the western United States (Booker *et al*. 2009; Reich 1987; U.S. Congress, Office of Technology Assessment 1989). Adding to this air pollution is the dust created by fleets of diesel trucks working around the clock hauling the constantly accumulating condensate and produced water to large waste facility evaporation pits on unpaved roads. Trucks are also used to haul the millions of gallons of water from the source to the well pad.

## PROJECT DESIGN

The following project grew from a year 2004 request by OGAP (Oil and Gas Accountability Project) to TEDX (The Endocrine Disruption Exchange) to explore the potential health effects of chemicals used during drilling, fracking, processing, and delivery of natural gas. OGAP, a project of Earthworks, is a national non-profit

organization established in 1999 to watchdog the oil and natural gas industry. TEDX is a non-profit organization dedicated to compiling and disseminating technical information on chemicals that affect health and the environment.

## Data Sources

In order to find out what chemicals were being used to extract natural gas, we took advantage of the information on the Material Safety Data Sheets (MSDSs) that accompany each product used during natural gas operations. MSDSs detailing specific products in use were provided by multiple sources including the BLM, U.S. Forest Service, state government departments, and the natural gas industry. MSDSs are designed to inform those who handle, ship, and use products that contain dangerous chemicals. They provide information about the physical and chemical characteristics of the chemicals in a product, and the immediate and chronic health effects, in order to prevent injury while working with the products. They are also designed to inform emergency response crews in case of accidents or spills. In addition to the MSDSs, we also used State Tier II Reports that must be filed by storage facilities under EPCRA. This Act sets a minimum amount above which a product that contains a hazardous substance in a storage facility has to be reported. We also supplemented our analysis with product information from disclosures in Environmental Impact Statements, Environmental Assessment Statements, and accident and spill reports. At first we looked only at what was taking place in Colorado and over the course of several years we acquired information from Wyoming, New Mexico, Texas, Washington, Montana, Pennsylvania, and New York. The list of products and chemicals quickly grew, making it apparent that hundreds of different products serving many purposes were being used in natural gas operations across the country. The number of chemical products manufacturers has also grown, making this a highly competitive industry.

It should be clear that our list of products is not complete, but represents only products and chemicals that we were able to identify, through a variety of sources, as being used by industry during natural gas operations. For most products, we cannot definitively say whether they were used during drilling or during fracking. However, an accidental blow-out of the Crosby well in Wyoming provided a unique opportunity to analyze the chemicals used during drilling, as fracking had not yet begun on that well. When the blow-out occurred, methane and other gases, petroleum condensates, and drilling fluids (muds) were released from fissures in the ground adjacent to the well. During the 58 hours the eruption took place, 25,000 square feet of soil surface in the area were contaminated. The driller released copies of the MSDSs for the products used during the blow-out and later we found the names of several more products from remedial action work plans to clean up the site (Terracon 2007).

On another occasion we were provided data from a 2007 New Mexico study, sponsored by 19 oil and gas companies and conducted by a third party consultant and analytical laboratory. This gave us the opportunity to explore the health effects of chemicals in samples of pit solids drawn from six evaporation pits where gas operations were ceasing.

**Data Limitations**

MSDSs and Tier II reports are fraught with gaps in information about the formulation of the products. The U.S. Occupational Safety and Health Administration (OSHA) provides only general guidelines for the format and content of MSDSs. The manufacturers of the products are left to determine what information is revealed on their MSDSs. The forms are not submitted to OSHA for review unless they are part of an inspection under the Hazard Communication Standard (U.S. Department of Labor 1998). Some MSDSs report little to no information about the chemical composition of a product. Those MSDSs that do may only report a fraction of the total composition, sometimes less than 0.1%. Some MSDSs provide only a general description of the content, such as "plasticizer," "polymer," while others describe the ingredients as "proprietary" or just a chemical class. Under the present regulatory system all of the above "identifiers" are permissible. Consequently, it is not surprising that a study by the U.S. General Accounting Office (1991) revealed that MSDSs could easily be inaccurate and incomplete.

Tier II reports can be similarly uninformative, as reporting requirements vary from state to state, county to county, and company to company. Some Tier II forms include only a functional category name (*e.g.*, "weight materials" or "biocides") with no product name. The percent of the total composition of the product is rarely reported on these forms.

The most critical limiting factor in our research was that Chemical Abstract Service (CAS) numbers were often not provided on MSDSs. The American Chemical Society has established the CAS number system to identify unique chemical substances. A single substance can have many different names, but only one CAS number. CAS numbers identify substances that may be a single chemical, an isomer of a chemical, a mixture of isomers, polymers, biological sequences, or a mixture of related chemicals. For purposes of accuracy, our research into the health effects of chemicals used in natural gas operations was restricted to only chemicals for which a CAS number was available.

**Health Effects**

Information on the health effects associated with identified chemicals was obtained from MSDSs, as well as government toxic chemical databases such as TOXNET and the Hazardous Substances Database, and through literature searches of biomedical studies. Information available for some chemicals is limited due to lack of access to studies performed on the toxicity of the substance. For example, many laboratory studies submitted to USEPA for the registration of chemicals are not accessible on the basis that the information is proprietary to the industry.

Health effects were divided into 14 health categories, focusing on the main target organs or systems that are identified on MSDSs, government toxicological reports, and in medical literature. The categories include all seven priority health conditions identified by the Agency for Toxic Substances and Disease Registry (ATSDR 2010) associated with uncontrolled hazard waste sites listed as required by CERCLA, 1984, as amended (U.S. Environmental Protection Agency 1984). We reduced these to 12 categories by combining developmental and reproductive health impacts under endocrine disruption. The resulting 12 categories included: skin, eye and sensory

organ, respiratory, gastrointestinal and liver, brain and nervous system, immune, kidney, cardiovascular and blood, cancer, mutagenic, endocrine disruption, other, and ecological effects.

### Data Analysis

Using the data sources described earlier, we entered the names of all the products and chemicals into a spreadsheet. Initially, chemicals were separated according to the state in which the data source originated. Analysis of the profiles of health effects revealed minimal differences across states, thus for this report we combined all the data into one multi-state analysis. Using only the chemicals on the multi-state list for which CAS numbers were available, we produced a profile based on how often each of the 12 possible health effects were associated with the chemicals. We created separate profiles for the water soluble chemicals alone, and the volatile chemicals alone. We also did an analysis of the drilling chemicals from the Wyoming well-blowout and an analysis of the chemicals found in the New Mexico evaporation pits. Finally, we tested the utility of the spreadsheet for providing guidance for water quality monitoring, focusing on the most potentially harmful and frequently used chemicals. The spreadsheet is available at http://www.endocrinedistruption.org/chemicals.multistate.php.



## RESULTS

### Product Information

As of May, 2010, TEDX identified 944 products used in natural gas operations in the United States. Of these, between 95 and 100% of the ingredients were available for 131 (14%) of the products (Figure 1). For 407 (43%) of the products, less than 1% of the total product composition was available. For many of those 407 products, only the name of the product with no identifiable chemical name or percent composition was reported. A total of 632 chemicals were reported in the products and we were able to locate CAS numbers for 353 (56%) of them.

### Health Effects Profile

Using the health effect information for the 353 chemicals with CAS numbers, we created a profile of possible health effects that depicts the percentage of chemicals associated with each of the 12 health effect categories (Figure 2). Viewing the profile from left to right, more than 75% of the chemicals on the list can affect the skin, eyes, and other sensory organs, the respiratory system, the gastrointestinal system, and the liver. More than half the chemicals show effects on the brain and nervous system. These first four categories represent effects that would likely be expressed upon immediate exposure, such as eye and skin irritation, nausea and/or vomiting, asthma, coughing, sore throat, flu-like symptoms, tingling, dizziness, headaches, weakness, fainting, numbness in extremities, and convulsions. Products containing chemicals in powder form, irritants, or highly corrosive and volatile chemicals would all come with MSDS warnings in one or more of these categories. In all probability, none of the chemicals in these categories would normally be ingested during natural

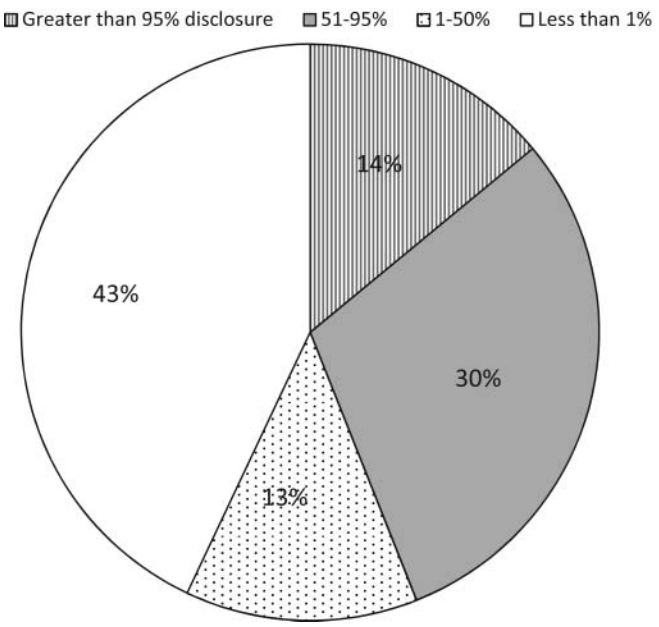


**Figure 1.** Percent of composition disclosed for 944 products used in natural gas operations.

gas operations, but immediate eye, nasal, dermal contact, and inhalation could lead to rapid absorption and cause direct exposure to the brain and other vital organ systems.

Health categories that reflect chronic and long-term organ and system damage comprise the middle portion of Figure 2. These include the nervous system (52%), immune system (40%), kidney (40%), and the cardiovascular system and blood (46%). More than 25% of the chemicals can cause cancer and mutations. Notably, 37% of the chemicals can affect the endocrine system that encompasses multiple organ systems including those critical for normal reproduction and development. The category of "other" is more common, and includes effects on weight, teeth, and bone and the ability of a chemical to cause death. More than 40% of the chemicals have been found to have ecological effects, indicating that they can harm aquatic and other wildlife.

### Volatile and Soluble Chemicals

Separate health category profiles are shown in Figure 3 for the volatile and water soluble chemicals. Approximately 37% of the chemicals are volatile and can become airborne. More than 89% of these chemicals can harm the eyes, skin, sensory organs, respiratory tract, gastrointestinal tract, or liver. Compared with the soluble chemicals, far more of the volatile chemicals (81%) can cause harm to the brain and nervous system. Seventy one percent of the volatile chemicals can harm the cardiovascular system and blood, and 66% can harm the kidneys. Overall, the volatile chemicals produce a profile that displays a higher frequency of health effects than the water soluble chemicals. In addition, because they vaporize, not only can

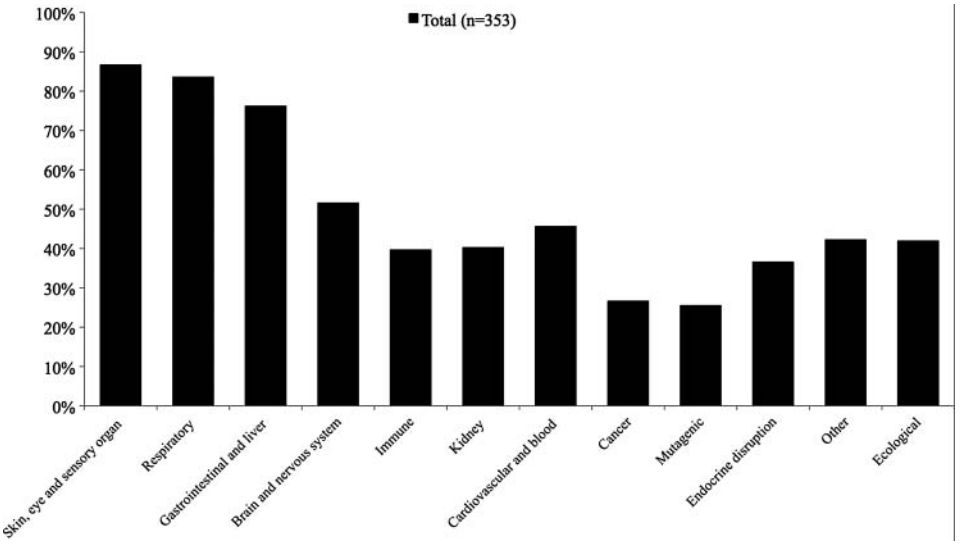


**Figure 2.** Profile of possible health effects of chemicals with CAS numbers used in natural gas operations.

they be inhaled, but also ingested and absorbed through the skin, increasing the chance of exposures.

### Drilling Chemicals

The profile for the 22 drilling chemicals identified from the well blow-out in Wyoming are shown in Figure 4. The profile was unique in the following ways. All

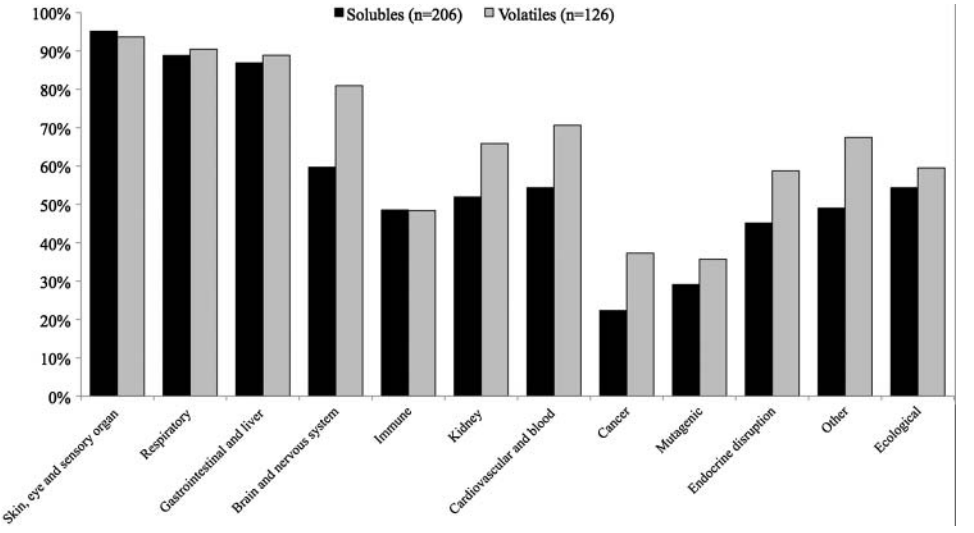


**Figure 3.** Profile of possible health effects of soluble and volatile chemicals with CAS numbers used in natural gas operations.

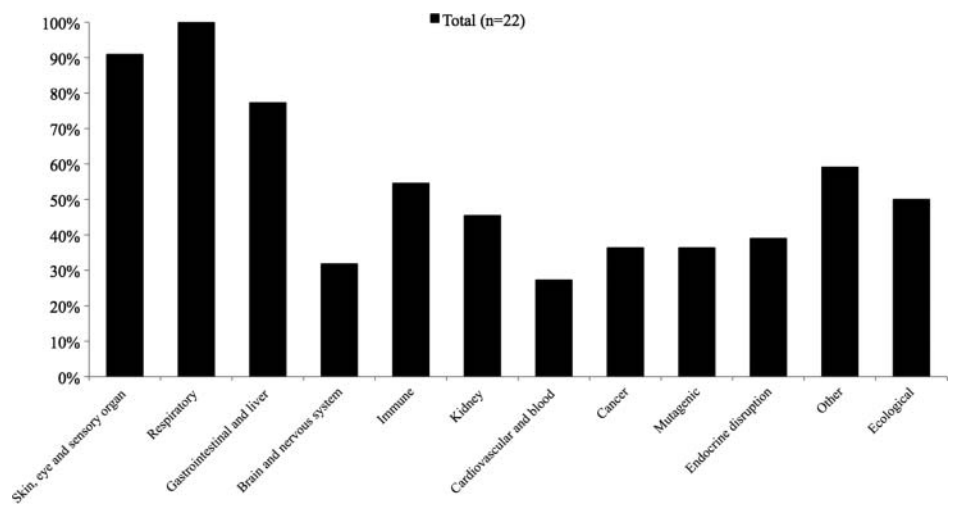


**Figure 4.** Profile of possible health effects of chemicals with CAS numbers used to drill the Crosby 25-3 well, Wyoming.

the chemicals used in the drilling fluids were associated with respiratory effects. Nearly 60% were associated with "other" effects, a category that includes outright mortality as an end point. A relatively high percentage of chemicals that affect the immune system were used.

### Evaporation Pit Chemicals

Shown in Figure 5 are the health effects of the 40 chemicals and metals reported in the New Mexico evaporation pits. These chemicals produced a health profile even

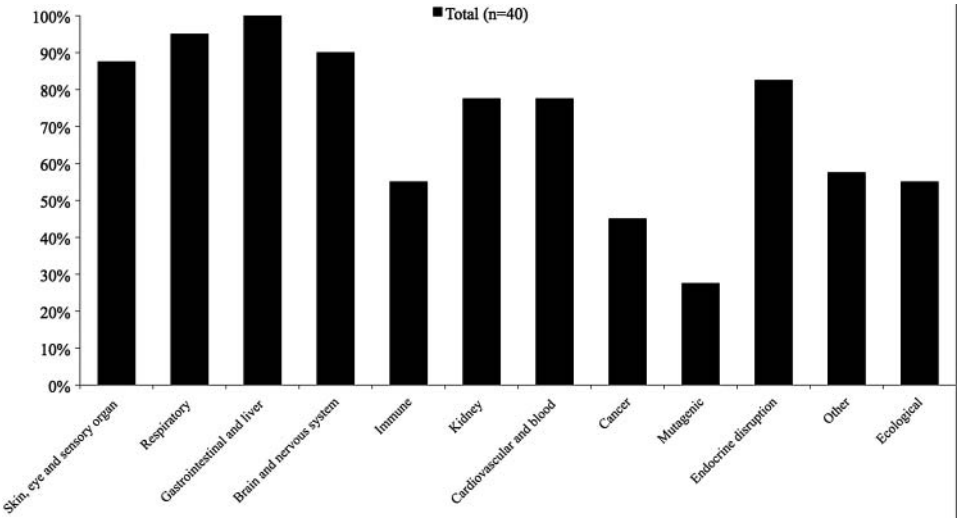


**Figure 5.** Profile of possible health effects of chemicals with CAS numbers found in six New Mexico drilling evaporation pits.

more hazardous than the pattern produced by the drilling and fracking chemicals. Upon further investigation, we discovered that 98% of the 40 chemicals found in the pits are listed on USEPA's 2005 CERCLA (Superfund) list and 73% are on the 2006 EPCRA List of Lists of reportable toxic chemicals. Of the nine chemicals found to exceed the New Mexico state limits, all are on the CERCLA list and all but one are on the EPCRA List of Lists.

### Analyses for Water Quality Monitoring

For the purpose of water quality monitoring guidance, we analyzed the data according to the most potentially harmful chemicals and the most frequently used chemicals. In Table 2 is provided a list of the most egregious chemicals, those with 10 or more health effects. Roughly half of these chemicals are used in only one product on our list, making it impractical and a waste of time and money to try to test water for the most harmful chemicals. A more practical approach would be to test for the most frequently used chemicals. Although we do not know how often each product is used, we assume that the more products that contain a given chemical, the more likely it is to be detected in a water sample. Shown in Table 3 are all the chemicals on our list that were found in at least seven different products. Many of these chemicals are relatively harmless. The most frequently cited chemical was crystalline silica (quartz), which was reported in 125 different products. Note that petroleum distillates and a variety of alcohols are found in numerous products, as are several forms of potassium, which is a relatively easy and inexpensive chemical to detect in water. This list may prove useful in devising a water monitoring program. Regardless of how many health effects a chemical has, elevated levels of frequently used chemicals found in a water source could provide evidence of communication between natural gas operations and water resources.

## DISCUSSION

Industry representatives have said there is little cause for concern because of the low concentrations of chemicals used in their operations. Nonetheless, pathways that could deliver chemicals in toxic concentrations at less than one part-per-million are not well studied and many of the chemicals on the list should not be ingested at any concentration. Numerous systems, most notably the endocrine system, are extremely sensitive to very low levels of chemicals, in parts-per-billion or less. The damage may not be evident at the time of exposure but can have unpredictable delayed, life-long effects on individuals and/or their offspring. Effects of this nature would be much harder to identify than obvious impacts such as skin and eye irritation that occur immediately upon contact. Health impairments could remain hidden for decades and span generations. Specific outcomes could include reduced sperm production, infertility, hormone imbalances, and other sex-related disorders. Further compounding this concern is the potential for the shared toxic action of these contaminants, especially those affecting the same and/or multiple organ systems.

It was difficult to arrive at a "short list" of chemicals that would be informative for water quality monitoring because of the vast array of products constantly being developed, and the wide selection of chemicals used in those products. We can,

**Table 2.** Chemicals with CAS numbers that have 10 or more adverse health effects.

| Chemical | CAS # | Number of products |
|---|---|---|
| (2-BE) Ethylene glycol monobutyl ether | 111-76-2 | 22 |
| 2,2′,2″-Nitrilotriethanol | 102-71-6 | 3 |
| 2-Ethylhexanol | 104-76-7 | 7 |
| 5-Chloro-2-methyl-4-isothiazolin-3-one | 26172-55-4 | 2 |
| Acetic acid | 1186-52-3 | 1 |
| Acrolein | 107-02-8 | 1 |
| Acrylamide (2-propenamide) | 79-06-1 | 6 |
| Acrylic acid | 79-10-7 | 2 |
| Ammonia | 7664-41-7 | 3 |
| Ammonium chloride | 12125-02-9 | 2 |
| Ammonium nitrate | 6484-52-2 | 2 |
| Aniline | 62-53-3 | 1 |
| Benzyl chloride | 100-44-7 | 2 |
| Boric acid | 10043-35-3 | 4 |
| Cadmium | 7440-43-9 | 1 |
| Calcium hypochlorite | 7778-54-3 | 1 |
| Chlorine | 7782-50-5 | 1 |
| Chlorine dioxide | 10049-04-4 | 2 |
| Dibromoacetonitrile | 3252-43-5 | 1 |
| Diesel 2 | 68476-34-6 | 19 |
| Diethanolamine | 111-42-2 | 4 |
| Diethylenetriamine | 111-40-0 | 1 |
| Dimethyl formamide | 68-12-2 | 1 |
| Epidian | 25068-38-6 | 1 |
| Ethanol | 64-17-5 | 8 |
| Ethyl mercaptan | 75-08-1 | 1 |
| Ethylbenzene | 100-41-4 | 7 |
| Ethylene glycol | 107-21-1 | 17 |
| Ethylene oxide | 75-21-8 | 2 |
| Ferrous sulfate | 7720-78-7 | 1 |
| Formaldehyde | 50-00-0 | 4 |
| Formic acid | 64-18-6 | 8 |
| Fuel oil #2 | 68476-30-2 | 9 |
| Glutaraldehyde | 111-30-8 | 11 |
| Glyoxal | 107-22-2 | 2 |
| Hydrodesulfurized kerosene | 64742-81-0 | 1 |
| Hydrogen sulfide | 7783-06-4 | 1 |
| Iron | 7439-89-6 | 3 |
| Isobutyl alcohol (2-methyl-1-propanol) | 78-83-1 | 3 |
| Isopropanol (propan-2-ol) | 67-63-0 | 47 |
| Kerosene | 8008-20-6 | 3 |
| Light naphthenic distillates, hydrotreated | 64742-53-6 | 2 |

**Table 2.** Chemicals with CAS numbers that have 10 or more adverse health effects. *(Continued)*

| Chemical | CAS # | Number of products |
|---|---|---|
| Mercaptoacetic acid | 68-11-1 | 2 |
| Methanol | 67-56-1 | 74 |
| Methylene bis(thiocyanate) | 6317-18-6 | 2 |
| Monoethanolamine | 141-43-5 | 5 |
| NaHCO3 | 144-55-8 | 5 |
| Naphtha, petroleum medium aliphatic | 64742-88-7 | 2 |
| Naphthalene | 91-20-3 | 18 |
| Natural gas condensates | 68919-39-1 | 1 |
| Nickel sulfate | 7786-81-4 | 1 |
| Paraformaldehyde | 30525-89-4 | 2 |
| Petroleum distillate/naptha | 8002-05-9 | 7 |
| Petroleum distillate/naphtha | 8030-30-6 | 1 |
| Phosphonium, tetrakis(hydroxymethyl)-sulfate | 55566-30-8 | 2 |
| Propane-1,2-diol | 57-55-6 | 6 |
| Sodium bromate | 7789-38-0 | 1 |
| Sodium chlorite (chlorous acid, sodium salt) | 7758-19-2 | 1 |
| Sodium hypochlorite | 7681-52-9 | 1 |
| Sodium nitrate | 7631-99-4 | 3 |
| Sodium nitrite | 7632-00-0 | 3 |
| Sodium sulfite | 7757-83-7 | 1 |
| Styrene | 100-42-5 | 1 |
| Sulfur dioxide | 7446-09-5 | 1 |
| Sulfuric acid | 7664-93-9 | 1 |
| Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione (Dazomet) | 533-74-4 | 3 |
| Titanium dioxide | 13463-67-7 | 2 |
| Tributyl phosphate | 126-73-8 | 1 |
| Triethylene glycol | 112-27-6 | 1 |
| Urea | 57-13-6 | 3 |
| Xylene | 1330-20-7 | 11 |



however, provide some guidance by pointing out four types of chemicals that are used in a relatively high number of products. These include (1) the silicas, which appear frequently as product components; (2) potassium based chemicals, which are also found in numerous products, although with relatively low toxicity; (3) petroleum derived products, which take on many different forms (including some without CAS numbers), and some of which are toxic at low concentrations and might be detected with diesel or gasoline range organics tests; and (4) the alcohols for which new detection technology is being developed, and because they are among the chemicals with the most health effects.

**Table 3.** Chemicals with CAS numbers found in the highest number of products.

| Chemical | CAS # | Number of products | Number of health effects |
|---|---|---|---|
| Crystalline silica, quartz | 14808-60-7 | 125 | 7 |
| Methanol | 67-56-1 | 74 | 11 |
| Isopropanol (propan-2-ol) | 67-63-0 | 47 | 10 |
| Petroleum distillate hydrotreated light | 64742-47-8 | 26 | 6 |
| (2-BE) Ethylene glycol monobutyl ether | 111-76-2 | 22 | 11 |
| Bentonite | 1302-78-9 | 20 | 6 |
| Diesel 2 | 68476-34-6 | 19 | 10 |
| Naphthalene | 91-20-3 | 18 | 12 |
| Aluminum oxide | 1344-28-1 | 17 | 3 |
| Ethylene glycol | 107-21-1 | 17 | 10 |
| Sodium hydroxide | 1310-73-2 | 17 | 5 |
| Barite (BaSO4) | 7727-43-7 | 15 | 5 |
| Heavy aromatic petroleum naphtha | 64742-94-5 | 15 | 5 |
| Crystalline silica, cristobalite | 14464-46-1 | 14 | 5 |
| Mica | 12001-26-2 | 14 | 3 |
| Sodium chloride | 7647-14-5 | 14 | 9 |
| Crystalline silica, tridymite | 15468-32-3 | 13 | 3 |
| Hydrochloric acid (HCl) | 7647-01-0 | 13 | 7 |
| Glutaraldehyde | 111-30-8 | 11 | 11 |
| Xylene | 1330-20-7 | 11 | 10 |
| Guar gum | 9000-30-0 | 10 | 3 |
| Iron oxide (ferric oxide) | 1309-37-1 | 10 | 5 |
| Potassium chloride | 7447-40-7 | 10 | 8 |
| Potassium hydroxide | 1310-58-3 | 10 | 7 |
| Xanthan gum | 11138-66-2 | 10 | 4 |
| Fuel oil #2 | 68476-30-2 | 9 | 11 |
| Hydrotreated heavy petroleum naphtha | 64742-48-9 | 9 | 8 |
| Limestone (calcium carbonate) | 1317-65-3 | 9 | 2 |
| Polyacrylamide/polyacrylate copolymer | 25085-02-3 | 9 | 3 |
| Sodium carboxymethylcellulose (polyanionic cellulose) | 9004-32-4 | 9 | 5 |
| Calcium hydroxide | 1305-62-0 | 8 | 8 |
| Crystalline silica (silicon dioxide) | 7631-86-9 | 8 | 4 |
| Ethanol | 64-17-5 | 8 | 12 |

**Table 3.** Chemicals with CAS numbers found in the highest number of products. *(Continued)*

| Chemical | CAS # | Number of products | Number of health effects |
|---|---|---|---|
| Formic acid | 64-18-6 | 8 | 11 |
| Graphite | 7782-42-5 | 8 | 4 |
| 2-Ethylhexanol | 104-76-7 | 7 | 11 |
| Acetic acid | 64-19-7 | 7 | 9 |
| Asphaltite (gilsonite, hydrocarbon black solid) | 12002-43-6 | 7 | 4 |
| Butanol (n-butyl alcohol, butan-1-ol, 1-butanol) | 71-36-3 | 7 | 8 |
| Calcium carbonate (sized) | 471-34-1 | 7 | 6 |
| Calcium chloride | 10043-52-4 | 7 | 8 |
| Ethoxylated nonylphenol | 9016-45-9 | 7 | 6 |
| Ethylbenzene | 100-41-4 | 7 | 11 |
| Petroleum distillate naphtha | 8002-05-9 | 7 | 12 |
| Propargyl alcohol (prop-2-yn-1-ol) | 107-19-7 | 7 | 9 |
| Tetramethylammonium chloride | 75-57-0 | 7 | 8 |



Detection of increasing or elevated concentrations of these chemicals near gas operations could indicate that communication between natural gas activities and a water resource such as a domestic well, creek, pond, wetland, and so on is occurring. If a longitudinal monitoring program were to reveal any increase in concentration in one of these target groups, even if the concentrations were well below any water quality standards, it should trigger more testing immediately.

For many years, drillers have insisted that they do not use toxic chemicals to drill for gas, only guar gum, mud, and sand. While much attention is being given to chemicals used during fracking, our findings indicate that drilling chemicals can be equally, if not more dangerous. What we have learned about the chemicals used in the Crosby well blowout provides insight into why citizens living nearby suffered severe respiratory distress, nausea, and vomiting and had to be evacuated from their homes for several days. It might also shed light on why other individuals living near gas operations have experienced similar symptoms during the gas drilling phase (prior to fracking).

From the first day the drill bit is inserted into the ground until the well is completed, toxic materials are introduced into the borehole and returned to the surface along with produced water and other extraction liquids. In the western United States it has been common practice to hold these liquids in open evaporation pits until the wells are shut down, which could be up to 25 years. These pits have rarely been examined to ascertain their chemical contents outside of some limited parameters (primarily metals, chlorides, and radioactive materials). Our data reveal

that extremely toxic chemicals are found in evaporation pits and indeed, these and other similar sites may need to be designated for Superfund cleanup. In the eastern United States, and increasingly in the West, these chemicals are being re-injected underground, creating yet another potential source of extremely toxic chemical contamination. In other words, what ends up in evaporation pits in the West will in other parts of the country be injected underground.

## RECOMMENDATIONS

TEDX has collected the names of nearly a thousand products used in natural gas operations in the United States. We have no idea how many more products are in use. We have health data on only a small percentage of the chemicals in use because CAS numbers are often not provided on MSDSs and without a CAS number it is difficult to search for health data. Working under the assumption that our results underestimate the consequences of the health impacts to the labor force, residents living in close proximity to the wells, and those dependent upon potable and agricultural water that could be affected by natural gas operations, we make the following recommendations:

1. Product labels and/or MSDSs must list the complete formulation of each product, including the precise name and CAS number and amount of every chemical, as well as the composition of the vehicle used to fill the product container. To prevent serious injury and mortality the products used during natural gas operations should be exempt from confidentiality.
2. If an ingredient does not have a CAS number it must be clearly defined, leaving no doubt about its possible health impact(s).
3. Records should be kept for each drilling and fracking operation, listing the total volume of fluid injected, the amount of each product used, the depth at which the products were introduced, and the volume of fluid recovered.
4. The volume and concentration of all liquids and solids removed from the work sites should be made available to the public. Without this information the full health and environmental hazards posed by natural gas production cannot be predicted.
5. Air quality monitoring for individual VOCs as well as ozone must become standard procedure in any region where natural gas activity is taking place and must commence prior to initiation of operations to establish baseline levels. Estimating tonnage of VOCs and NOx released and ignoring ozone should no longer be the practice.
6. Comprehensive water monitoring programs should be established in every gas play across the United States both prior to and after gas production commences, that include new chemical species indicators based on toxicity and mobility in the environment, to monitor sub-surface and above-surface domestic and agricultural water resources, and all domestically used aquifers and underground sources of drinking water.
7. We recommend the development of labeled isotopic fingerprints of the chlorinated compounds in products used to drill and fracture. Each manufacturer

would have its own fingerprint. A plot of this isotopic data found down gradient of a hydraulically fractured well would aid a state or federal regulator in identifying the contamination source.

8. Given the general consistency of reported adverse health effects by citizens and laborers across many gas plays, public health authorities should establish an epidemiological monitoring program that merges at the state and national level in order to increase power and be able to reach conclusions early on. The design of the study should include environmental monitoring of air and water as well as any health changes in those living and working in regions of natural gas operations. The health monitoring should be able to detect early trends in parameters, such as asthma, hypertension, chemical sensitization, chronic skin and eye irritation, and neurological alterations, to mention a few.
9. As underground injection of waste is becoming the most frequent choice for waste disposal, rigid accounting of the date, volume, and source of all materials, and the exact location in the geological formation(s) in which it is injected should be become a part of permanent government records that will be publicly available for future generations.
10. Before a permit is issued to drill for natural gas, complete waste management plans should be reviewed and approved and become part of the permit.
11. The injection of hydraulic fracturing fluids should be regulated under the Safe Drinking Water Act. This is needed to assure mechanical integrity of the injection wells and isolation of the injection zone from underground sources of drinking water.



## ACKNOWLEDGMENTS

We thank The New York Community Trust, the Winslow Foundation, and the U.S. Environmental Protection Agency (Grant No. EQ-97838701) for their support. This data collection and analyses were partially funded through a USEPA grant.

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# Exhibit F

# Wyoming Oil & Gas Conservation Commission

2211 King Boulevard, Casper, WY 82604
P O Box 2640, Casper, WY 82602-2640

Commissioners
Donald B. Basko
Ryan Lance
G. Bruce Williams
Thomas A. Drean

Governor Matthew H. Mead, Chairman  Thomas E. Doll, State Oil & Gas Supervisor


February 24, 2012

Ms. Laura Beaton
EarthJustice
313 Main Street
Bozeman MT 59715

RE: February 8, 2012 Letter – Public Records Act Request – Request for Reconsideration

Dear Laura:

I received your letter of February 8, 2012 and now have completed a thorough review of the attachments to that letter. Your February 8, 2012 letter is a request to me to reconsider Wyoming Oil and Gas Conservation Commission (WOGCC) justification and decision to decline release of specific formulations requested by EarthJustice. Please refer to my previous correspondence by letter dated January 10, 2012, and January 20, 2012. I see no information in your recent request to compel me to change that decision.

Discussion of Attachments to EarthJustice Letter February 8, 2012:

Exhibit 5: The letter from Carolyn Otten to you, dated February 8, 2012, states that Chemir can separate, identify, and quantify ingredients in a formulation. She admits that the identification would be costly and difficult. The protection from and prevention of reverse engineering through deformulation of chemical compounds is the protection that providers of chemical compounds used in well stimulation are seeking. Deformulation or reverse engineering of chemical compounds would negatively impact those chemical providers. Protection of "trade secrets" is provided in Wyoming Public Records Act, W.S. 16-4-203(d)(v) and granted by the Supervisor pursuant to Chapter 3, Section 45(f) of the WOGCC Rules. The WOGCC process is clearly presented in the letters referenced above.

In Chapter 3, Section 45(d)(vi) "The Supervisor retains discretion to request from the Owner or Operator and/or the service company, the formulary disclosure for the chemical compounds used in the well stimulation(s)."

Exhibit 6: The Jonathan Bernstein paper "Material safety data sheets: Are they reliable in identifying human hazards?" dated July 2002, states that federal "OSHA permits exclusion of information deemed solely by the manufacturer as not hazardous or protected as a trade secret." This is one of many reasons the WOGCC Rule Chapter 3, Section 45 Well Stimulation language is specific that the chemical compound name, chemical compound type, and the Chemical Abstracts Service (CAS) number must be disclosed and does not contemplate use of the Material Safety Data Sheet, MSDS, for chemical compound disclosure.

Exhibit 7: The Federal Register, Vol. 75, No. 102/Thursday, May 27, 2010/Notices, "Claims of Confidentiality of Certain Chemical Identities Contained in Health and Safety Studies and Data Submitted Under the Toxic Substances Control Act". The Toxic Substances Control Act, TSCA, Chemical Substances Inventory was reviewed when the Commission considered rule language during 2009 and through mid-2010. The use of the CAS number was selected for inclusion in the WOGCC Rule Chapter 3, Section 45. The Federal Register referenced in Exhibit 7 refers to and is limited to EPA proposing a general review of confidentiality claims for chemical identities in health and safety studies submitted under TSCA as defined on page 29756.

Exhibit 8: The Theo Colborn paper "Natural Gas Operations from a Public Health Perspective" June 2010, presents the perspective of The Endocrine Disruption Exchange, TDEX, Paonia, Colorado. TDEX information was reviewed when the Commission considered rule language during 2009 and through mid-2010. The use of the CAS, number was selected for inclusion in the WOGCC Rule Chapter 3, Section 45.

I stand by the justification and decision to decline release of specific formulations requested by EarthJustice, as stated in my correspondence by letter dated January 10, 2012 and January 20, 2012.

Sincerely,

Thomas E. Doll, PE
State Oil and Gas Supervisor

TED

cc: Eric Easton

# Attachment 2

John A. Masterson #5-2386
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jmasterson@rothgerber.com

*Attorneys for Halliburton Energy Services, Inc.*

**IN THE SEVENTH JUDICIAL DISTRICT COURT OF THE STATE OF WYOMING
IN AND FOR THE COUNTY OF NATRONA**

| | | |
|---|---|---|
| POWDER RIVER BASIN RESOURCE COUNCIL WYOMING OUTDOOR COUNCIL, EARTHWORKS, AND OMB WATCH<br><br>Petitioners,<br><br>vs.<br><br>WYOMING OIL AND GAS CONSERVATION COMMISSION<br><br>Respondent. | ) | Civil Action No. 94650-c |



**MOTION OF HALLIBURTON ENERGY SERVICES, INC. TO INTERVENE AS INTERVENOR-RESPONDENT**

Pursuant to Wyoming Rule of Civil Procedure 24, Halliburton Energy Services, Inc. ("Halliburton") respectfully moves to intervene in this proceeding as an Intervenor-Respondent.

As set forth more completely in the *Memorandum in Support of the Motion of Halliburton Energy Services, Inc. to Intervene as Intervenor-Respondent* filed concurrently herewith and incorporated herein by this reference, Halliburton seeks leave to intervene as a matter of right under Wyo. R. Civ. P. 24(a)(2) as it claims an interest relating to the property or transaction which is the subject of the action herein, and Halliburton is so situated that the

disposition of the action may as a practical matter impair or impede Halliburton's ability to protect that interest. Further, Halliburton's distinct interest is not adequately represented by the existing parties.

In the alternative, Halliburton seeks leave to permissively intervene under Wyo. R. Civ. P. 24(b) as Halliburton's defense and the main action have questions of law or fact in common.

Pursuant to Rule 24(c), Halliburton states that it seeks to intervene in the claims set forth by the Petitioners in their *Petition for Review of Administrative Action; Complaint for Declaratory Relief* filed herein on March 26, 2012, as Halliburton is the owner of a significant portion of the confidential and proprietary information sought in Petitioners' underlying Public Records Act claim. The issue of whether this confidential and proprietary information should be released directly affects Halliburton and its ability to compete in the business of hydraulic fracturing and protect its trade secrets. Further support of this *Motion* is found in the Memorandum filed concurrently herewith.

The undersigned has personally contacted counsel for the Petitioners herein, the Powder River Basin Resource Council, the Wyoming Outdoor Council, Earthworks and OMB Watch, who have advised that they do not object to Halliburton's intervention. The undersigned has also personally contacted counsel for the Respondent herein, the Wyoming Oil and Gas Conservation Commission, and has been advised that they do not oppose intervention by Halliburton.

Halliburton further states that its intervention will not unduly delay or prejudice the adjudication of the rights of the original parties as no procedural or substantive action has taken place on the *Petition* as of the date of the filing of this *Motion*, and no briefing schedule or other hearings have been scheduled by this Court.

**WHEREFORE**, Halliburton Energy Services, Inc. respectfully requests that this Court grant it leave to intervene as Intervenor-Respondent in this matter as a matter of right under Wyo. R. Civ. P. 24(a), or in the alternative under Wyo. R. Civ. P. 24(b).

**DATED** this 14th day of May, 2012.

HALLIBURTON ENERGY SERVICES, INC.

By _____

John A. Masterson #5-2386
Rothgerber Johnson & Lyons LLP
123 W. 1st Street, Suite 200
Casper, WY 82601
307-232-0222

## CERTIFICATE OF SERVICE

I hereby certify that copies of the above and foregoing document was served by United States mail, postage prepaid, and via electronic mail, this 14th day of May, 2012 to the following at the addresses indicated.

Shannon Anderson #6-4402
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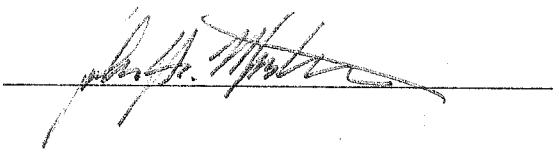

# Attachment 3

STATE OF WYOMING )
) ss.
COUNTY OF NATRONA )

IN THE DISTRICT COURT

SEVENTH JUDICIAL DISTRICT

Civil Action No. 94650-C

POWDER RIVER BASIN RESOURCE COUNCIL, WYOMING OUTDOOR COUNCIL, EARTHWORKS, AND OMB WATCH,

Petitioners,

vs.

WYOMING OIL AND GAS CONSERVATION COMMISSION,

Respondent,

and

HALLIBURTON ENERGY SERVICES, INC.,

Respondent-Intervenor.

FILED
MAR 2 1 2013
Gen Tuma Clerk of District Court
By Deputy

**ORDER AFTER HEARING**

THE ABOVE-CAPTIONED MATTER comes before the Court on the Petitioners' *Petition for Review of Administrative Action; Complaint for Declaratory Relief,* filed on March 23, 2012. On November 15, 2011, the Petitioners, pursuant to the Wyoming Public Records Act (WPRA), requested the Wyoming Oil and Gas Conservation Commission (WOGCC) provide them with all information the commission had received about the chemical formulations owners and operators (collectively "Operators") of wells were using to stimulate their wells or, in other words, conduct hydraulic fracturing operations. Petitioners sought identifying information about individual chemical ingredients in products, including Chemical Abstract Service (CAS) numbers.

A rule (Rule) promulgated by the WOGCC, effective August 17, 2010, required Operators to submit the chemical formulations of their hydraulic fracturing products to the commission prior to initiating and after completing any well stimulation

activity. Wyo. Admin. Code OIL GEN Ch. 3, § 45(d). The WPRA and the WOGCC Rule exempted this information from disclosure to the public if an Operator requested, and the WOGCC Supervisor found that the information was a trade secret. Wyo. Stat. Ann. § 16-4-203(d)(v) (West 2012); Wyo. Admin. Code OIL GEN Ch. 3 § 45(f).

On January 10, 2012, the WOGCC complied with the Petitioners request. The response referenced filings on the WOGCC website and provided copies of the emails and correspondence related to the confidentiality requests and justifications submitted to the commission by Operators. The WOGCC Supervisor, Thomas E. Doll, redacted documents containing information about chemical formulations and their ingredients that he found to be trade secrets, as mandated by Wyo. Stat. Ann. § 16-4-203(d) (West 2012). The redacted information included the specific chemical compound name, the chemical compound type, the CAS number, and the concentrations for each ingredient in a specific formula. The Supervisor included an explanation of the procedures he used in determining whether to grant trade secret status.

After further correspondence between the parties, the Petitioners filed this action to contest the Supervisor's decision to exempt the trade secrets from public disclosure.

## Issue Presented for Review

The Court finds the single issue to be determined is:

> I. Did the Wyoming Oil and Gas Conservation Commission Supervisor act arbitrarily and capriciously, or otherwise contrary to law when he found that individual ingredients of hydraulic fracturing formulas constituted trade secrets under the WOGCC public disclosure rule and the Wyoming Public Records Act, and denied the Petitioners the right to inspect those records?

## Factual Background

The WOGCC amended its Rules and Regulations in August of 2010. These rules went into effect on September 15, 2010. (Agency Record (AR) Trade Secret Correspondence (TSC) 000003, 0090.) The amendments included a requirement that

Operators submit to the commission "[t]he chemical additives, compounds and concentrations or rates proposed to be mixed . . . ." prior to initiating and after completing any well stimulation activity. Wyo. Admin. Code OIL GEN Ch. 3 § 45(d).[1] This information included a chemical compound's name, the types of ingredients, their CAS numbers, and the concentration of each ingredient. *Id.* CAS numbers are unique and specifically identify a chemical in a formula.

The amendment requiring disclosure of well stimulation fluids included a reference to the WPRA's exemptions for public disclosure of "trade secrets, privileged information and confidential commercial, financial, geological or geophysical data." Wyo. Stat. Ann. § 16-4-203(d)(v) (West 2012); Wyo. Admin. Code OIL GEN Ch. 3

[1] Wyo. Admin. Code OIL GEN Ch. 3 § 45(d) provides:

> (d) The Owner or Operator shall provide detailed information to the Supervisor as to the base stimulation fluid source. The Owner or Operator or service company shall provide to the Supervisor, for each stage of the well stimulation program, the chemical additives, compounds and concentrations or rates proposed to be mixed and injected, including:
>
> > (i) Stimulation fluid identified by additive type (such as but not limited to acid, biocide, breaker, brine, corrosion inhibitor, crosslinker, demulsifier, friction reducer, gel, iron control, oxygen scavenger, pH adjusting agent, proppant, scale inhibitor, surfactant);
> >
> > (ii) The chemical compound name and Chemical Abstracts Service (CAS) number shall be identified (such as the additive biocide is glutaraldehyde, or the additive breaker is aluminum persulfate, or the proppant is silica or quartz sand, and so on for each additive used);
> >
> > (iii) The proposed rate or concentration for each additive shall be provided (such as gel as pounds per thousand gallons, or biocide at gallons per thousand gallons, or proppant at pounds per gallon, or expressed as percent by weight or percent by volume, or parts per million, or parts per billion);
> >
> > (iv) The Owner or Operator or service company may also provide a copy of the contractor's proposed well stimulation program design including the above detail;
> >
> > (v) The Supervisor may request additional information under this subsection prior to the approval of the Application for Permit to Drill (Form 1) or of the Sundry Notice (Form 4);
> >
> > (vi) The Supervisor retains discretion to request from the Owner or Operator and/or the service company, the formulary disclosure for the chemical compounds used in the well stimulation(s).

§ 45(f).[2] The WPRA mandates information that is considered a trade secret be exempted from public disclosure. Wyo. Stat. Ann. § 16-4-203(d) (West 2012) ("[t]he custodian **shall** deny the right of inspection of the following records, unless otherwise provided by law . . . ." (emphasis added)). The WOGCC Supervisor, as custodian of the WOGCC records, determines whether the information the WOGCC has received is a trade secret. *See id.* By statute, the WOGCC Supervisor is a professional petroleum engineer or petroleum geologist. Wyo. Stat. Ann. § 30-5-108 (West 2012).[3]

After the promulgation of the Rule, the Supervisor, Thomas E. Doll, established various policies and procedures for reviewing trade secret protection requests and informed staff, Operators, and other interested parties of these procedures. (*See* AR TSC 000004-5, 0107-8.) He used a multi-factor test taken from the State of New York to evaluate trade secret requests. (AR TSC 000004-5.) The factors in the test are:

> a. The extent to which the information is known outside the business of the person submitting the information;
>
> b. The extent to which it is known by the person's employees and others involved in the business;
>
> c. The extent of measures taken by the person to guard the secrecy of the information;

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[2] Wyo. Admin. Code OIL GEN Ch. 3 § 45(f) reads:

> (f) Upon prior request via Application for Permit to Drill (Form 1), and/or a comprehensive drilling/completion/recompletion plan, or by Well Completion Report (Form 3), or by Sundry Notice (Form 4), **and/or by written letter to the Supervisor justifying and documenting** the nature and extent of the proprietary information, confidentiality protection shall be provided consistent with **Wyo. Stat. Ann. § 16-4-203(d)(v)** of the Wyoming Public Records Act for the following records: "trade secrets, privileged information and confidential commercial, financial, geological or geophysical data furnished by or obtained from any person."

(emphasis added).

[3] The Wyoming Legislature recently amended the qualifications for the State Oil and Gas Supervisor position. The amendment requires a person be a "qualified petroleum engineer or petroleum geologist with at least ten (10) years of experience in his respective field of expertise . . . ." 2013 Wyo. Sess. Laws. Ch. 4 (S.F. 3). Prior to the amendment, the only qualifications for the position were for a person to be a "qualified *and registered* professional petroleum engineer or petroleum geologist . . . ." Wyo. Stat. Ann. § 30-5-108 (West 2012) (emphasis added).

d. The value of the information to the person and his competitors;

e. The amount of effort or money expended by the person in developing the information; and

f. The ease or difficulty with which the information could be properly acquired or duplicated by others.

*Id.* Requests for trade secret protection also had to be written and include a separate attachment containing the product name, product type, the CAS number for each chemical component of the product, and their concentration in the product. (*See* AR TSC 000105, 0148, 0193, 0332, 0668.) If the information was found to be a trade secret, the attachment was redacted (detached from the letter requesting a trade secret exemption) while the rest of information submitted was published on the WOGCC's website and made available to the public. *Id.*

**Procedural Background**

On November 15, 2011, Petitioners filed a *Public Records Act Request* with the WOGCC. The request asked for the WOGCC to disclose all records "WOCGG has in its possession that list or identify the type, chemical compound name, and/or Chemical Abstract Service (CAS) number of chemicals or other constituents that have been or will be injected . . . ." by well Operators conducting hydraulic fracturing operations. (AR TSC 000001.)

Since adoption of the Rule by the commission and until the Petitioners' request, the WOGCC Supervisor granted sixty-four (64) trade secret requests for confidentiality. (AR Approved Trade Secrets (ATS) 000001-0659.) The Petitioners' disclosure request encompassed all of these confidentiality claims.

On January 10, 2012, the Supervisor responded to the Petitioner's request. (AR TSC 000003.) The response included the confidentiality requests and justifications submitted to the commission by fracturing product manufacturers. (AR TSC 000003-5.) The response did not disclose information the Supervisor found to be a trade secret and

outlined the procedures he used in determining whether to grant such status. *Id.* In addition, the response stated, "[t]he application for and justification for confidential status/trade secret status, and the submitted Chemical Abstracts Services (CAS) numbers are not considered confidential." *Id.*

On January 12, 2012, the Petitioners submitted a second request. The request asked for disclosure of all CAS numbers associated with trade secret approvals. (AR TSC 000006-7.)

On January 20, 2012, the Supervisor declined the second request. He clarified in a letter that:

> If a chemical company submits a request for confidentiality under the Wyoming Public Records Act and such a request is granted, then the chemical compound name, chemical compound type, CAS number, and concentration related to the specific trade secret formulations are held confidential.

(AR TSC 000008.)

On February 8, 2012, the Petitioners asked the Supervisor to reconsider his decision. (AR TSC 000010.) They asserted that,"[t]he mere identification of names and CAS numbers of hydraulic fracturing chemicals is not a trade secret pursuant to Wyoming's Public Records Act." *Id.* In support, the Petitioners provided a statement from the Environmental Protection Agency explaining why it will no longer consider chemical identities confidential under the Toxic Substances Control Act. (AR TSC 000038-41.) They also provided a memorandum from Carolyn J. Otten, Ph.D, who specializes in reverse engineering. (AR TSC 000026-30.) Dr. Otten explained that deformulation (reverse engineering) consists of two steps: (1) identifying the constituent components of a product, and (2) quantifying the amount of each component as a percentage of the product. *Id.* She clarified that a list of ingredients simply helps in the first step, but does not eliminate the quantification step. *Id.* The Petitioners also included two articles: one discussed the public health issues in hydraulic fracturing and

the other examined the deficiencies of MSDS sheets in identifying hazards. (AR TSC 000033-36, 0043-60.)

On February 24, 2012, the Supervisor declined to reconsider his decision and stood by his earlier denial of the Petitioners' request. (AR TSC 000061.) He stated, "[t]he protection from and prevention of reverse engineering through deformulation of chemical compounds is the protection that providers of chemical compounds used in well stimulation are seeking. Deformulation or reverse engineering of chemical compounds would negatively impact those chemical providers." *Id.*

On March 23, 2012, the Petitioners filed their *Petition for Review of Administrative Action; Complaint for Declaratory Relief* in the Seventh Judicial District Court for the State of Wyoming. The Court issued an *Order Granting Halliburton Energy Services, Inc.'s Motion to Intervene as Intervenor-Respondent* on May 15, 2012.

On May 23, 2012, the Court entered a briefing order in this appeal. All parties subsequently timely filed their briefs.

## Standard of Review

Agency decisions are reviewed pursuant to the Wyoming Administrative Procedures Act, it provides:

> c) To the extent necessary to make a decision and when presented, the reviewing court shall decide all relevant questions of law, interpret constitutional and statutory provisions, and determine the meaning or applicability of the terms of an agency action. In making the following determinations, the court shall review the whole record or those parts of it cited by a party and due account shall be taken of the rule of prejudicial error. The reviewing court shall:
>
> > (i) Compel agency action unlawfully withheld or unreasonably delayed; and
> >
> > (ii) Hold unlawful and set aside agency action, findings and conclusions found to be:
> >
> > > (A) Arbitrary, capricious, an abuse of discretion or otherwise not in accordance with law. . . .

Wyo. Stat. Ann. § 16-3-114(c) (West 2012). The Wyoming Supreme Court has stated the arbitrary and capricious standard requires:

> [t]he reviewing court to review the entire record to determine whether the agency reasonably could have made its finding and order based upon all the evidence before it. The arbitrary and capricious standard is more lenient and deferential to the agency than the substantial evidence standard because it requires only that there be a rational basis for the agency's decision.

*Northfork Citizens For Responsible Dev. v. Bd. of County Com'rs of Park County*, 2010 WY 41, ¶ 17, 228 P.3d 838, 845 (Wyo. 2010) (citing *Dale v. S & S Builders, LLC*, 2008 WY 84, ¶ 12, 188 P.3d 554, 5559 (Wyo.2008)).

The issue before the Court is one of statutory interpretation. Prior precedents all agree on the rules of statutory interpretation in Wyoming:

> This court interprets statutes by giving effect to the legislature's intent.... We begin by making an inquiry relating to the ordinary and obvious meaning of the words employed according to their arrangement and connection.... We give effect to every word, clause, and sentence and construe together all components of a statute *in pari materia* .... If a statute is clear and unambiguous, we simply give effect to its plain meaning. Only when we find a statute to be ambiguous do we resort to the general principles of statutory construction. An ambiguous statute is one whose meaning is uncertain because it is susceptible to more than one interpretation.

*Bear Cloud v. State*, 2013 WY 18, ¶ 30, 294 P.3d 36, 44 (Wyo. 2013) (citation omitted).

An agency's conclusions of law are affirmed only when they are in accordance with the law. *Worker's Comp. Claim of Stallman v. State ex rel. Wyoming Workers' Safety & Comp. Div.*, 2012 WY 147, ¶ 10, 288 P.3d 707, 712 (Wyo. 2012) (quoting *State ex rel. Wyo. Workers' Safety & Comp. Div. v. Singer*, 2011 WY 57, ¶ 5, 248 P.3d 1155, 1157 (Wyo. 2011)). Thus, the Court must correct any error made by the agency in either interpreting or applying the law and it does not grant the agency's determinations any deference. *Id.* While the interpretation of statutes and their implementing regulations is a question of law that is reviewed *de novo*, the Court defers to an agency's interpretation

of its own rules and regulations unless it is clearly erroneous or against the plain language of the rules. *Powder River Basin Res. Council v. Wyoming Dept. of Envtl. Quality*, 2010 WY 25, ¶ 6, 226 P.3d 809, 813 (Wyo. 2010) (citing *Pinther v. Wyoming Dep't of Admin. and Info.*, 866 P.2d 1300, 1302 (Wyo.1994)); *RME Petroleum Co. v. Wyoming Dep't of Revenue*, 2007 WY 16, ¶ 44, 150 P.3d 673, 689 (Wyo.2007)).

The parties have presented their arguments before the Court as motions for summary judgment. Summary judgment asks a court to foreclose all factual determinations and conduct a purely *de novo* review of the law. *City of Cheyenne v. Bd. of County Com'rs of County of Laramie*, 2012 WY 156, ¶ 4290 P.3d 1057, 1058 (Wyo. 2012). As such, given that the parties have asked the Court to interpret statutory language, which also requires the Court to apply a *de novo* standard, the requested procedural stance of the parties does not change the review to be conducted by the Court.

## Discussion

### A. WYOMING PUBLIC RECORDS ACT

The WPRA reads in pertinent part:

> **§ 16-4-202. Right of inspection; rules and regulations; unavailability**
>
> > (a) All public records shall be open for inspection by any person at reasonable times, during business hours of the state entity or political subdivision, except as provided in this act or as otherwise provided by law, but the official custodian of any public records may make rules and regulations with reference to the inspection of the records as is reasonably necessary for the protection of the records and the prevention of unnecessary interference with the regular discharge of the duties of the custodian or his office.
>
> **§ 16-4-203. Right of inspection; grounds for denial; access of news media; order permitting or restricting disclosure; exceptions**
>
> > (a) The custodian of any public records shall allow any person the right of inspection of the records or any portion thereof except on one (1) or more of the

following grounds or as provided in subsection (b) or (d) of this section . . . .

. . . .

. . . .

(d) The custodian shall deny the right of inspection of the following records, unless otherwise provided by law . . . .

. . . .

. . . .

. . . .

. . . .

(v) Trade secrets, privileged information and confidential commercial, financial, geological or geophysical data furnished by or obtained from any person . . . .

. . . .

(f) Any person denied the right to inspect any record covered by this act may apply to the district court of the district wherein the record is found for any order directing the custodian of the record to show cause why he should not permit the inspection of the record.

The Wyoming Supreme Court has stated, "when a demand to inspect public records is made, the custodian of the records must weigh the competing interests involved and determine whether permitting inspection would result in harm to the public interest which outweighs the legislative policy recognizing the public interest in allowing inspection." *Sheridan Newspapers, Inc. v. City of Sheridan*, 660 P.2d 785, 798 (Wyo. 1983) (citation omitted).

The Wyoming Supreme Court has been emphatic that the policy underlying the WPRA is one of disclosure:

> the policy behind the WPRA, like that behind FOIA [Freedom of Information Act], is one of disclosure, not secrecy, meaning the exemptions are to be narrowly construed . . . The legislature of this state has stressed the

> importance of making available to the public agency records. . . . With some necessary exceptions, recognized by Wyoming's records and meetings acts, state agencies must act in a fishbowl.

*Freudenthal v. Cheyenne Newspapers, Inc.*, 2010 WY 80, ¶ 18, 233 P.3d 933, 938 (Wyo. 2010) (internal quotations and citations omitted); *Laramie County Sch. Dist. No. One v. Cheyenne Newspapers, Inc.*, 2011 WY 55, ¶ 2, 250 P.3d 522, 524 (Wyo. 2011) ("[t]he Supreme Court has thus construed the WPRA to generally guarantee the public's right to access to documents which will reveal the details of operations of governmental entities, with some exceptions").

## B. AGENCY DEFERENCE

Wyoming's jurisprudence has long recognized a need to grant agency decisions deference:

> [t]he deference normally accorded to the findings of fact by a trial court is extended to the administrative agency, and the agency's decision as to the facts will not be overturned unless it is clearly contrary to the overwhelming weight of the evidence. Demonstrating evidentiary contradictions in the record does not establish the irrationality of the ruling, but we do examine conflicting evidence to determine if the agency reasonably could have made its finding and order based upon all of the evidence before it.

*Sweets v. State ex rel. Wyoming Workers' Safety & Comp. Div.*, 2002 WY 37, ¶ 13, 42 P.3d 461, 465 (Wyo. 2002) (internal citations omitted) (quoting *Ikenberry v. State ex rel. Wyoming Workers' Compensation Division*, 5 P.3d 799, 802 (Wyo.2000)).

Matters involving the specialized knowledge of an agency are accorded deference as well. "We defer to the Board's specialized knowledge and expertise regarding the use or nonuse of water and the technicalities involved in irrigation... However, we will disturb an agency's decision when it is clearly contrary to the overwhelming weight of the evidence on the record." *McTiernan v. Scott*, 2001 WY 87, ¶ 16, 31 P.3d 749, 756 (Wyo. 2001) (internal and externals citations omitted).

## C. DEFINITION OF TRADE SECRETS WITHIN THE WYOMING PUBLIC RECORDS ACT

The WPRA imposes a duty on state agencies to disclose public records. Wyo. Stat. Ann. § 16-4-201 through 16-4-205, 16-4-202(a) (West 2012). Under Chapter 3, Section 45, Subsection (d) of the Wyoming Oil and Gas Conservation Commission's rules and regulations, Operators of wells are required to disclose to the WOGCC the base stimulation fluid they plan to use when stimulating or hydraulic fracturing a well. Wyo. Admin. Code OIL GEN Ch. 3 § 45(d). Accordingly, this information would normally be available to the public via the WPRA.

The WPRA also requires custodians of public records to prevent disclosure of information they deem to be "trade secrets, privileged information and confidential commercial, financial, geological or geophysical data furnished by or obtained from any person." Wyo. Stat. Ann. § 16-4-203(d)(v) (West 2012). The WPRA exceptions were incorporated into WOGCC's Rule and were relied upon by the Supervisor in denying the Petitioners' request.

The WPRA does not define trade secrets. Wyo. Stat. Ann. § 16-4-201 (West 2012). Wyoming's case law and that from other jurisdictions is more helpful.

In *Sublette County Rural Health Care Dist. v. Miley*, the Wyoming Supreme Court found the WPRA exceptions for trade secrets and confidential commercial data are similar to comparable exceptions found in the Federal Freedom of Information Act (FOIA). 942 P.2d 1101, 110 (Wyo. 1997). The Court in *Miley* adopted a federal two-part test to determine whether commercial data is confidential. *Id.* (adopting the test articulated in *National Parks and Conservation Ass'n v. Morton*, 498 F.2d 765 (D.C.Cir.1974) for confidential commercial information). The Parties spend a great deal of time arguing about confidential commercial information, however, the Supervisor's refusal to disclose the requested individual chemical ingredients relied solely upon a finding that they represented trade secrets, not confidential commercial data. (AR ATS

000001-0659.) Therefore, the Court's analysis will focus on trade secrets rather than confidential commercial data.

In *Herrick v. Garvey*, the United States District Court for the District of Wyoming applied the FOIA definition of trade secrets. "[T]rade secrets should be defined in the narrower common law sense, as a secret, commercially valuable plan, formula, process, or device that is used for the making, preparing, compounding, or processing of trade commodities and that can be said to be the end product of either innovation or substantial effort." 200 F. Supp. 2d 1321, 1326 (D. Wyo. 2000) *aff'd*, 298 F.3d 1184 (10th Cir. 2002) (citation omitted). The *Herrick* court determined that materials -- such as individual blue prints depicting the design, materials, components, and geometry of an aircraft—submitted to the FAA's predecessor were trade secrets. *Id.* at 1328.

In *Briefing, Inc. v. Jones*, the Court cited to the exemptions in the WPRA as proof that trade secret protections are a well-established principle in this State. 2006 WY 16, ¶ 10, 126 P.3d 928 at 934 (Wyo. 2006) (citations omitted). The Court went on to adopt a broad definition of trade secrets as contained in Restatement (Third) of Unfair Competition § 39 (2012) when it recognized a common-law cause of action for misappropriation of trade secrets. *Id.* ¶¶ 8, 15, 126 P.3d at 933, 936. Restatement (Third) of Unfair Competition § 39 (2012) defines trade secrets as "any information that can be used in the operation of a business or other enterprise and that is sufficiently valuable and secret to afford an actual or potential economic advantage over others."

Wyoming's legislature adopted a similarly broad definition when it passed the Uniform Trade Secret Act (UTSA) in 2006. The UTSA reads:

> (iv) Trade secret means information, including a formula, pattern, compilation, program device, method, technique or process that:
>
> > (A) Derives independent economic value, actual or potential, from not being generally known to and not being readily ascertainable

> by proper means by other persons who can obtain economic value from its disclosure or use; and
>
> (B) Is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

Wyo. Stat. Ann. § 40-24-101 (West 2012). The Court "[p]resume[s] that the legislature [was] aware of all existing law on a particular subject relating to a newly enacted or amended statute." *In re DSB*, 2008 WY 15, ¶ 21, 176 P.3d 633, 638 (Wyo. 2008) (citation omitted).

The Supervisor relied on a multi-factor test taken from the State of New York to evaluate trade secret requests. (AR TSC 000004-5.) It included:

> a. The extent to which the information is known outside the business of the person submitting the information;
>
> b. The extent to which it is known by the person's employees and others involved in the business;
>
> c. The extent of measures taken by the person to guard the secrecy of the information;
>
> d. The value of the information to the person and his competitors;
>
> e. The amount of effort or money expended by the person in developing the information; and
>
> f. The ease or difficulty with which the information could be properly acquired or duplicated by others.

*Id.* The record demonstrates the test elicited sufficient information for the Supervisor to rationally determine if trade secret protection was appropriate. Operators often adopted the format of the test when submitting their requests or otherwise included the relevant information within their requests. (*See* AR ATS 000007-9, 0016-18, 0032-33, 0085-88, 0096-97, 0112-15, 0256, 0300-0303, 0314-16, 0321-24, 0344-46, 0411, 0421, 0521, 0538-39, 0563-64.)

The confidentiality requests by Operators show each company strove to maintain the secrecy of their products from the public, competitors, and in some cases,

their own employees. (e.g. AR TSC 000624, 0677, 0780.) Emails from the Petitioners and the public to the WOGCC further prove that the public was not privy to lists of individual ingredients or CAS numbers that comprised fracturing products. (*See* AR TSC 000110, 0144, 0335, 0528 0531, 0540.)

The Operators also described the highly competitive nature of the hydraulic fracturing product industry and the substantial danger of competitive injury if the WOGCC were to disclose chemical ingredient information to the public. (*See* AR ATS 000007-9, 0016-18, 0032-33, 0085-88, 0096-97, 0112-15, 0256, 0300-0303, 0314-16, 0321-24, 0344-46, 0411, 0421, 0521, 0538-39, 0563-64.) Nothing in the record suggests otherwise.

The justification letters included attachments containing the product name, product type, the CAS number for each chemical component of the product, and their concentration in the product. (AR TSC 00105, 0148, 0193, 0332, 0668.) After receiving this information, the Supervisor (a professional petroleum engineer) reviewed the data and determined whether it was a trade secret under the WPRA. As such, the record demonstrates the Supervisor acted rationally when he reviewed highly technical information to determine if a product should be granted trade secret protection. That determination is entitled to deference by the Court.

The Petitioners' expert in reverse engineering, Dr. Otten, suggests the Supervisor acted within the bounds of reasons as well. She asserted that a list of individual ingredients constitutes the first step (out of two) in reverse engineering a product and would simplify the process. (AR TSC 000026.) As stated by the Supervisor, "[t]he protection from and prevention of reverse engineering through deformulation of chemical compounds is the protection that providers of chemical compounds used in well stimulation are seeking. Deformulation or reverse engineering of chemical compounds would negatively impact those chemical providers." (AR TSC 000061.)

The Petitioners' argue the Supervisor's decisions were arbitrary, capricious, or otherwise not in accordance with the law because they run contrary to federal precedent. They contend federal authority only rarely finds—in the FOIA context—that identifying information for individual ingredients of fracturing stimulants and their CAS numbers constitute trade secrets. (Petitioners' Br. 11-12.)

In support of their position, the Petitioners rely on *Nw. Coal. for Alternatives to Pesticides v. Browner*, 941 F. Supp. 197, 202 (D.D.C. 1996). The *Browner* court considered a challenge to the Environmental Protection Agency's (EPA) refusal to disclose—in response to a FOIA request—the common names and chemical abstract numbers for inert ingredients in pesticides on trade secret and "confidential commercial information" grounds. 941 F. Supp. at 201. It found that the EPA's claim of protection under FOIA's trade secret exemption for CAS numbers and the common name of inert ingredients lacked factual support. *Id.* That court specifically noted:

> [n]either defendant has demonstrated, however, that the common name and CAS numbers of inert ingredients are trade secrets. In fact, ACPA's submission effectively acknowledges that the release of general identifying information about inert ingredients does not reveal formulas. Both defendants have also conceded that disclosing the common name of an inert ingredient may not reveal exactly which one of a class of ingredients sharing the same common name is used in a particular pesticide.

*Id.* at 202 (internal citations omitted). The *Browner* court's findings rest on stipulations and facts not before this Court. In this case, the Operators' justification letters asserted, and the Supervisor agreed, that release of CAS numbers and the identification of individual ingredients would reveal critical information about the hydraulic fracturing products of the Operators. This is unlike the position of the parties in *Browner*, who ostensibly stipulated that the release of general information about inert ingredients would not reveal a formula to competitors. *Id.* Additionally, the *Browner* court did not hold that individual ingredients could not be considered trade secrets under the federal definition. *Id.*

Wyoming federal precedent indicates that individual ingredients may very well constitute trade secrets. For example, the *Herrick* court found that individual materials and components of an aircraft design were trade secrets under the same definition used in *Browner*. 200 F. Supp. 2d at 1326, 1328.

Individual ingredients, including their CAS numbers, would also qualify as trade secrets under the definition in the Restatement (Third) of Unfair Competition § 39 (2012) and in the UTSA. The Restatement definition includes "any information . . ." Restatement (Third) of Unfair Competition § 39 (2012). The UTSA's definition of trade secrets encompasses information that, like a formula, has economic value and is the subject of efforts at keeping the information secret. Wyo. Stat. Ann. § 40-24-101 (West 2012).

## D. CONCLUSIONS

The Court is keenly aware that the divergent positions of the parties implicate important issues of public policy. The Petitioners argue that the identity of hydraulic fracturing chemicals is key to understanding the potential environmental and health impacts of hydraulic fracturing. (Petitioners' Br. 11-12.) Conversely, the Respondent-Intervenor highlights the positive economic impact hydraulic fracturing has had on the State of Wyoming and the danger disclosure represents to that industry. (Respondent-Intervenor's Br. 7-8, 30-31.) Both positions have substantial merit, however the Court feels these competing concerns are best addressed through legislative action, or further rule promulgation and are not properly within the Court's purview.

The Court finds that the WOGCC Supervisor acted reasonably when he established a policy for evaluating trade secret protection requests and that policy is in accordance with the Wyoming Public Records Act.

The Court further finds the Petitioners have failed to demonstrate that the Supervisor's decisions to grant trade secret protection requests were arbitrary, capricious, or not in accordance with the law.

NOW THEREFORE, IT IS HEREBY ORDERED that the decision of the WOGCC Supervisor to withhold the release of information he deemed to be trade secrets is hereby affirmed.

DATED: March 21st, 2013.

BY THE COURT:

Catherine E. Wilking
District Court Judge

copies to: Shannon Anderson
Eric A. Easton
Steven Leifer
John A. Masterson
Timothy J. Preso

## CERTIFICATE OF SERVICE

I certify that on this 15th day of April, 2013, I caused a true and correct copy of the foregoing **NOTICE OF APPEAL** and the attached **APPENDIX** to be served by United States mail, postage prepaid, to:

Clerk's Office
Natrona County District Court
115 N. Center Street, Suite 100
Casper, WY 82601

Clerk's Office
Wyoming Supreme Court
2301 Capitol Avenue
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