



Tulane Environmental Law Clinic

November 19, 2014

By Email to: dnrinfo@la.gov
Commissioner James Welch
Office of Conservation
c/o Engineering Division
Louisiana Department of Natural Resources

Re: Written Comments on Helis Drilling Application; Docket No. 14-626

Dear Commissioner Welch:

The Town of Abita Springs and the Concerned Citizens of St. Tammany (CCST) (collectively, “Citizens”) offer written comments detailing why the Office of Conservation (“Conservation”) must deny the drilling permit application of Helis Oil & Gas Company, LLC (“Helis”) to drill a vertical well, to be followed by horizontal fracturing, in St. Tammany Parish. These comments supplement the oral comments Citizens provided at the November 12, 2014, hearing. Citizens note that the only information available to the public on Helis’s drilling permit application before November 12, 2014, was a total of fourteen pages: Helis’s September 3, 2014, five-page drilling permit application and Helis’s October 24, 2014, nine-page position paper.

I. THE DNR IS REQUIRED UNDER ARTICLE IX, SECTION 1, OF THE LOUISIANA CONSTITUTION TO CONDUCT AN ENVIRONMENTAL IMPACT ANALYSIS ON THE HELIS DRILLING AND FRACKING PROJECT BEFORE PERMITTING THE PROJECT.

Conservation’s Constitutional duty under Article IX, section 1 of the Louisiana Constitution mandates that it conduct an environmental impact analysis on Helis’s current proposal as well as on its clearly-stated future plans. Among the factors Conservation must consider and analyze is whether there are alternative sites which offer more protection to the environment than Helis’s proposed site without unduly curtailing nonenvironmental benefits. This analysis should reveal available alternative sites that do not require drilling through a sole source drinking water aquifer, which would offer more protection for the environment. Further, Conservation must determine whether the potential and real adverse environmental impacts of Helis’s proposed project have been minimized or avoided as much as possible consistently with the public welfare. As explained by Citizens’ expert witness Mark Quarles, the potential and

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real adverse impacts of Helis's project have not been avoided to the maximum extent practicable. Attached as Exhibit A.

Louisiana's Constitution mandates that "the natural resources of the state, including air and water, and the healthful, scenic, historic, and esthetic quality of the environment shall be protected, conserved, and replenished insofar as possible and consistent with the health, safety, and welfare of the people." LA. CONST. Art. IX, § 1 (1974).

In 1984, the Louisiana Supreme Court interpreted that Constitutional mandate as "requir[ing] an agency or official, before granting approval of proposed action affecting the environment, to determine that adverse environmental impacts have been minimized or avoided as much as possible consistently with the public welfare." Save Ourselves, Inc. v. Louisiana Env'tl. Control Comm'n, 452 So. 2d 1152, 1157 (La. 1984). This decision, and the holdings of subsequent courts interpreting it (*see, e.g., In re Rubicon, Inc.*, 670 So.2d 475 (La. App. 1 Cir. 1996)), is applicable to the DNR and its divisions (including Conservation). Three Louisiana district court decisions support that DNR must comply with this Constitutional duty articulated in Save Ourselves. *See Lake Peigneur Preservation, et al., v. Thompson*, 19th Judicial District Court, State of Louisiana, 409,139, Aug 26, 1996, Amended Oral Reasons for Judgment (attached as Exhibit B); Bertrand, et al., v. Louisiana Department of Natural Resources, 19th Judicial District Court, State of Louisiana, 587-065, Sept. 9, 2010, Judgment (attached as Exhibit C); Save Lake Peigneur, Inc. et al. v. Louisiana Department of Natural Resources, et al., 16th Judicial District Court, State of Louisiana, Oct. 10, 2014, Judgment and Reasons for Judgment (attached as Exhibit D).

Subsequent court decisions have summarized the Save Ourselves holding to articulate five issues that agencies must address when evaluating proposed actions affecting the environment. These are:

First, have the potential and real adverse environmental effects of the proposed facility been avoided to the maximum extent possible? Second, does a cost benefit analysis of the environmental impact costs balanced against the social and economic benefits of the proposed facility demonstrate that the latter outweighs the former? Third, are there alternative projects which would offer more protection to the environment than the proposed facility without unduly curtailing non-environmental benefits? Fourth, are there alternative sites which would offer more protection to the environment than the proposed facility site without unduly curtailing non-environmental benefits? Fifth, are there mitigating measures which would offer more protection to the environment than the facility as proposed without unduly curtailing non-environmental benefits?

Blackett v. La. Dep't of Env'tl. Quality, 506 So. 2d 749, 754 (La. App. 1 Cir. 1987).

Conservation has not addressed these issues. Evidence indicates that the potential and real adverse impacts of Helis's project have not been avoided to the maximum extent possible and that alternative sites offer more protection to the environment without unduly curtailing non-environmental benefits. For these reasons, Helis's application should be denied.

A. Conservation Has Not Met Its Legal Obligation to Analyze Alternative Sites to Helis's Proposed Location.

The site Helis has proposed for its vertical exploratory and subsequent horizontal fracturing well presents numerous risks to the environment, including those associated with drilling for oil and gas through a sole-source drinking water aquifer and in wetlands. Further, Helis has not identified potential alternative sites to its current proposal, nor has Conservation complied with its Constitutional duty to do the same. Thus, Conservation must deny the application.

1. Sites Which Do Not Involve Drilling Through a Sole Source Drinking Water Aquifer Are More Protective of the Environment.

Helis's proposed well will be drilled through the Southern Hills Aquifer. The Southern Hills Aquifer system is an EPA-designated "Sole Source Aquifer." An aquifer receives this designation when it is "the 'sole or principal source' of drinking water for a given service area; that is, an aquifer which is needed to supply 50% or more of the drinking water for that area *and for which there are no reasonably available alternative sources should the aquifer become contaminated.*" See EPA, *Designation of Sole Source Aquifers: Fact Sheet*, <http://www.epa.gov/region6/water/swp/ssa/factshee.htm> (last visited Nov. 18, 2014)(emphasis added).

In St. Tammany Parish, the public, agricultural users, and industry all depend on the aquifer for clean water. In 2005, 22.7 million gallons per day (Mgal/d) of groundwater were withdrawn within St. Tammany Parish alone and of that amount, 70% was for public water supplies and 28% was for private domestic water supplies. Water Resources of St. Tammany Parish, U.S. Geological Survey, Fact Sheet 2009-3064, Revised February 2012. According to a United States Geological Survey (USGS) report about the aquifer, in 2005, 100% of the water that was used to supply the public was taken from groundwater. *Id.* According to the Office of Conservation, that reliance of groundwater in St. Tammany Parish increased to between 25 and 50 Mgal/day, and St. Tammany Parish and neighboring parishes represented one of the most densely populated well use areas in the entire state. Exhibit A Quarles Affidavit (citing Reonas, State Water Management for Energy Development).

For the Town of Abita Springs in particular, its identity is inextricably intertwined with the artesian waters of the Southern Hills Aquifer. The clean water and healthy environment is what draws and keeps residents in Abita Springs, and an integral part of what makes it special. The Abita Springs Friends of the Park recently won an award from the AARP as one of the "Great Places in Louisiana." See http://www.greatplacesinlouisiana.org/wp-content/uploads/2013/04/GPA_Winner_AbitaSprings_2014.pdf. Consequently, the risk of contamination to the aquifer from Helis's project uniquely impacts Abita Springs. Abita Springs' supply well is located in the Southern Hills Aquifer.

Given St. Tammany Parish's reliance on the Southern Hills Aquifer as its sole source of drinking water, Helis should be required to find a place to drill along the TMS that does not require drilling through the Southern Hills Aquifer. Any oil and gas well operation poses risks of contamination to the surrounding subsurface and surface environment. The risks of contamination of the Southern Hills aquifer by Helis's proposed operation includes the risk to shallow as well as deeper aquifer resources used by the public for drinking water and agricultural uses. Public and private supply wells in the vicinity of Helis's project are recorded as drawing from depths as shallow as 50 feet to depths as great as 2,350 feet. November 12, 2014, Quarles Slide Presentation, Slide 13. Helis's own information states that there are 64 wells in a 2-mile radius of the site that are 530 feet deep and 48 wells that are 250 feet deep.

Contamination to the aquifer, shallow and deep, can result from well failures, blowouts, and migration of fracking fluids vertically. Nor is well failure an uncommon occurrence in the industry. A recent study published in *Marine and Petroleum Geology* examining oil and gas operations worldwide and focusing on fracking revealed highly variable rates of well barrier or integrity failure ranging as high as 75%. Davies, R.J., et al., *Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation*, MARINE AND PETROLEUM GEOLOGY (2014), available at <http://dx.doi.org/10.1016/j.marpetgeo.2014.03.001> (hereinafter "2014 Well Study"). Looking specifically at the Marcellus Shale in Pennsylvania, the 2014 Well Study (often using information compiled in other studies) found that of the 8030 wells inspected between 2005 and 2013, "6.3% of these have been reported to the authorities for infringements related to well barrier or integrity failure." *Id.* at 1. Further, according to the researchers: "In a separate study of 3533 Pennsylvanian wells monitored between 2008 and 2011, there were 85 examples of cement or casing failures, 4 blowouts and 2 examples of gas venting." *Id.*

Additionally, "[l]eaking oil and gas wells have long been recognized as a potential mechanism for subsurface migration of thermogenic and biogenic methane, as well as heavier n-alkanes, to the surface." Ingraffea, A.R., et al., *Assessment and risk analysis of casing and cement impairment in oil and gas wells in Pennsylvania, 2000-2012*, PNAS, available at <http://www.pnas.org/content/111/30/10955.full.pdf+html> and attached as Exhibit E (hereinafter, "2014 Casing and Cement Study"). According to the same study, loss of well integrity

can lead to direct emissions to the atmosphere through one or more leaking annuli and/or subsurface migration of fluids (gas and/or liquid) to groundwater, surface waters or the atmosphere. *Cement barriers may fail at any time over the life of a well for a number of reasons*, including hydrostatic imbalances caused by inappropriate cement density, inadequately cleaned bore holes, premature gelation of the cement, excessive fluid loss in the cement, high permeability in the cement slurry, cement shrinkage, radial cracking due to pressure fluctuations in the casings, poor interfacial bonding, and normal deterioration with age. Casings may fail due to failed casing joints, casing collapse, and corrosion.

A recent study, cited by Mark Quarles, showed that these failures have led to groundwater contamination: "A peer-reviewed study in 2013 concluded that natural gas wells in

the Marcellus and Barnett Shale formations in eight (8) discrete clusters in two states have contaminated overlying aquifers due to gas leakage through failures of annulus cement, faulty production casings, and gas well failure.” Exhibit A (citing Duke Study).

Notably, reports by the industry itself show that well failures are common. See Autumn 2003 “From Mud to Cement – Building Gas Wells,” Oilfield Review (attached as Exhibit F). The risks to the aquifer posed by Helis’s drilling project are covered in detail in the attached affidavit of Mark Quarles (Exhibit A).

As stated by Mark Quarles: “The drilling permit applications submitted by Helis provided no specificity about the plan to protect the Sole Source Aquifer or its plan to drill the horizontal portion of the well that will be hydraulically fractured with chemicals. **This lack of specificity does not allow the Office of Conservation or the public to evaluate the potential and real adverse impacts associated with the well.**” (Emphasis added). Exhibit A.

Consequently, Conservation must deny Helis’s permit application because it does not present an alternative as to why it cannot drill anywhere else except through St. Tammany Parish’s sole source of drinking water.

2. *Sites Which Do Not Involve Subsurface Faults Offer More Protection to the Environment Than the Proposed Site.*

The Helis site is located in an active fault zone. An active fault zone is defined as “[a] fault that has undergone movement in recent geologic time (the last 10,000 years) and may be subject to future movement.” See Quarles Affidavit, Exhibit A. The presence of active faults near a drilling site greatly concerns Citizens because faults can allow contamination to spread through horizontal and vertical layers of the aquifer. Id.

Many of these faults have been mapped and even an Army Corps of Engineers report confirms that there are numerous faults within St. Tammany Parish, many of which are near Helis’s proposed drilling site. See Sherwood M. Gagliano, et al., *Active Geological Faults and Land Change in Southern Louisiana*, <http://biotech.law.lsu.edu/katrina/govdocs/faults.pdf>. The attached affidavit by Mark Quarles discusses this serious issue in more detail. Exhibit A.

Sites that are not near active faults are more protective of the environment than the proposed site. Conservation must deny Helis’s permit application because it does not present an alternative site that is not near an active geologic fault.

3. *Sites Which Are Not Sited in Wetlands Offer More Protection to the Environment Than the Proposed Site*

The Helis plan to locate its well in a wetland is contrary to the American Petroleum Institute recommendation that wells not be placed in wetlands and environmentally sensitive areas (API HF1). Wetlands are useful for natural water quality improvement, flood protection,

shoreline erosion control, opportunities for recreation, and aesthetic appreciation. See Quarles Affidavit, Exhibit A.

Additionally, according to the Lake Pontchartrain Basin Foundation: “Clean-up in wetlands often results in severe damage to wetlands where in direct contact with crude oil or refined product. *Wetlands are considered the most sensitive habitat to crude oil in general.* Helis’ first well would irrevocably damage wetlands at the well site and pose a threat to any nearby wetlands.” Exhibit J, LPBF.

Sites that are not located in wetlands are more protective of the environment than the proposed site. Consequently, Conservation should not permit Helis to construct its proposed oil and gas well because it is in a wetland.

4. *Sites Which Are Not in a Residentially Zoned Area Offer More Protection to the Environment Than the Proposed Site.*

St. Tammany Parish has the authority to “zone and control land uses in its territory.” See affidavit of Stephen Villavaso, attached as Exhibit G. In its Master Plan and Unified Development Code, St. Tammany zoned the area where Helis wishes to drill as A-3, Suburban District. An A-3, Suburban district “is residential in nature and is intended to provide single family residential development in areas convenient to commercial and employment centers.” Exhibit G. A-3 zones do not permit oil and gas drilling. And, in fact, oil and gas drilling “would be in conflict with the current residential development standards in this zoning district and the general area” Id. Best practices in land planning and zoning require protecting residents from the detrimental effects of incompatible land uses. Helis’s proposed oil and gas operation, as an intense industrial land use, conflicts with the zoning classification of the site and is not compatible with St. Tammany Parish’s Master Plan. Id. Consequently, Conservation should not issue Helis a well drilling permit.

5. *Sites Which Are Not Near Scenic Streams Offer More Protection to the Environment Than the Proposed Site.*

At least three Scenic Streams are located in the vicinity of Helis’s project. The Abita River, Bayou Cane, and Bayou Lacombe are all Scenic Rivers, protected under the Louisiana Scenic Rivers Act. La. R.S. § 56:1847(55),(47),(48). Helis’s proposed site is with the Bayou Cane and Bayou Lacombe watersheds.

The Scenic Rivers Act designates and protects water bodies in order to “preserv[e], protect[], develop[], reclaim[] and enhanc[e] wilderness qualities, scenic beauties, and ecological regime[s].” Id. at § 1841. Bayou Cane and Bayou Lacombe’s proximity to the site raises the potential for spills and runoff to degrade their water quality. In particular, any ponds or pits on site may spill into these streams. This possibility increases in the case of heavy rain events, and a levee with a ditch as proposed by Helis will not be sufficient to prevent runoff from storm and heavy rain events, including hurricanes, from driving the contaminated runoff into these streams. Conservation has not evaluated this risk, nor has Helis addressed it. In turn, Conservation must deny Helis’s well drilling permit application.

6. *Sites Which Are Not Near Habitat Suitable for Endangered and Threatened Species in the Area Offer More Protection to the Environment.*

In prior comment letters, we have notified the agencies, including the DNR and the Corps, about the need to incorporate analysis of impacts to species that are protected as threatened or endangered under the Endangered Species Act, 16 U.S.C. 1531-1544 (ESA) within St. Tammany Parish, and in particular, this first proposed site in the parish for horizontal fracturing. Many impacts of the proposed drilling project conducted by Helis threaten classified endangered species, which have not been adequately analyzed in any prior environmental review to date. Consequently, there is a serious lack of information and understanding about the proposed drilling project's impacts on the present threatened, endangered, and sensitive species in the area at issue- including the Mississippi Gopher Frog and the Red Cockaded Woodpecker.

Due to the alarming trend toward species extinction "as a consequence of economic growth and development untempered by adequate concern and conservation," Congress enacted the Endangered Species Act, 16 U.S.C. § 1531, et. seq., (ESA) to conserve endangered and threatened species and the ecosystems on which they depend. 16 U.S.C. § 1531(a), (b). A species is listed as "endangered" if it is "in danger of extinction throughout all or a significant portion of its range." 16 U.S.C. § 1532(6). Listing triggers statutory protections for the species. See, e.g., 16 U.S.C. §, 1538(a) (setting forth prohibited acts, such as "taking" (§ 1532(19)) listed animals).

Helis's current permit application arbitrarily narrows the impact to the first of what would be many future impacts. However, DNR must assess the cumulative impacts the project will have on the threatened and endangered species in the area. The Lake Pontchartrain Basin Foundation noted that:

Based on the likely well spacing and their proposed 960-acre unit size to the state Department of Conservation, the total Tuscaloosa Marine Shale project on their lease alone could include 284 additional lateral wellbores with approximately 71 surface locations. If each well had the same wetland impact, 710 acres would be lost. But the total area potentially drilled to the Tuscaloosa Marine shale within St. Tammany parish is approximately 450,000 acres, which is a six-fold increase in wells and impacts if the play were fully developed in St. Tammany Parish. Nearly 2,000 lateral wells could be drilled in St. Tammany Parish. The impact would not just be to wetlands but possibly to riparian and pine savannah habitats. This would impact rare, threatened or endangered species. The table below (Figure 8) shows the status of some species in St. Tammany Parish that would likely be impacted.¹

¹ <http://www.saveourlake.org/PDF-documents/Press%20Releases/LPBF%20Preliminary%20Assessment%20of%20Hydraulic%20Fracturing%20in%20TMS%20in%20St%20Tammany%20205%2028%202014%20F%20WOBB.pdf>, published May 25, 2014 (retrieved October 20, 2014).

Virtually all developed hydraulic fracturing plays across the country have resulted in cumulatively significant impacts. St. Tammany Parish is home to eight different listed endangered or threatened species of plants and animals, including: the red-cockaded woodpecker (*Picoides borealis*), the Louisiana quillwort (*Isoetes louisianensis*), the ring map turtle (*Graptemys oculifera*), the gopher tortoise (*Gopherus polyphemus*), the gulf sturgeon (*Acipenser oxyrinchus desotoi*), the Alabama heelsplitter (*Potamilus inflatus*) and the West Indian Manatee (*Trichechus manatus*).² Numerous species designated as threatened or endangered under the Endangered Species Act, 16 U.S.C. §§ 1531 et seq., are known to occur in the area of Helis's proposed project. The United States Fish & Wildlife Service (FWS) has stated: "The proposed project is located in an area that may be inhabited by the red-cockaded woodpecker (RCW, *Picoides borealis*), federally listed as an endangered species." See attached Exhibit H. Further, FWS also stated that "[t]he proposed project occurs within an area containing soils which are suitable for the threatened gopher tortoise (*Gopherus polyphemus*)." Id. Additionally, just east of the site lies 1,544 acres of critical habitat for the dusky gopher frog. See attached Exhibit I (map excerpt from critical habitat designation).

In its slide presentation, Helis dismissed without consideration the issue of the nearby critical habitat for the dusky gopher frog, stating that its entire population lives in 3 ponds in Mississippi. November 12, 2014, Helis Slide Presentation at Slide E2-21. However, Helis ignored the reason FWS declared critical habitat just east of the site. In its final rule designating the critical habitat, FWS explained that even though no gopher frogs have been discovered in the area, that "this unit is essential for the conservation of the species because it provides important breeding sites for recovery. It includes habitat for population expansion outside of the core population areas in Mississippi, a necessary component of recovery efforts for the dusky gopher frog." Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Dusky Gopher Frog (Previously Mississippi Gopher Frog), 77 Fed. Reg. 35,118 (June 12, 2012) (to be codified at 50 C.F.R. Part 17).

Conservation cannot approve Helis's proposed permit application because the site location would disrupt the habitat of St. Tammany Parish's endangered and threatened species.

B. The Potential and Real Adverse Environmental Impacts of the Helis Project Have Not Been Avoided to the Maximum Extent Practicable.

Even if Conservation determines, after thorough and reasoned analysis supported by actual evidence, that there are no alternative sites for Helis's project that offer more protection to the environment than the proposed site, Conservation must ensure that Helis's proposal avoids all potential and real adverse impacts to the maximum extent practicable. At the November 12, 2014, hearing, Helis offered to implement some measures and practices that would decrease only some of the environmental risks of its project. In other areas it offered nothing beyond the nearly nonexistent regulatory requirements. For those areas in which Helis offered to do more than the below bare minimum set by the regulations, Conservation must include these measures as

² "Species by County Report, County: St. Tammany, LA," Environmental Conservation Online System, U.S. Fish and Wildlife Service, available at: http://www.fws.gov/lafayette/pdf/LA_T&E_Species_List.pdf.

conditions to its permit. Without permit conditions, Helis's purported safeguards are simply unenforceable assurances set into a slide show for public consumption.

1. The Helis Project Presents a Very Real Threat That the Southern Hills Aquifer, a Sole Source Aquifer, Will Become Contaminated by Drilling and Fracking Operations.

As stated earlier, well failures in general are common in the oil and gas industry, and fracking is no exception. Even companies with good compliance histories experience well failure. Therefore, as stated earlier, a sole source drinking water aquifer poses too high a risk, even with the most protective measures meeting the highest standards.

However, Helis's proposal fails to meet the highest standards. While Helis has stated to DNR that it will set the surface casing at 4,000 feet, that requirement has not been put in a legally enforceable document. Conservation must include this as a requirement of the permit. (The Office of Conservation has *not* announced plans to include a surface casing requirement beyond that required by the Louisiana regulations. Louisiana Statewide Order 29-B sets the requirement for the minimum depth of the surface casing based on the total depth of the well.) Furthermore, cement casing failure is just one source of contamination that could affect the Southern Hills Aquifer.

For instance, the Lake Pontchartrain Basin Foundation (LPBF) has presented other possibilities of risks to the aquifer from fracking. See LPBF, *Environmental Concerns and Potential Direct or Indirect Impacts to St. Tammany Parish due to Development of Hydraulic Fracturing Industry to Extract Crude Oil from the Tuscaloosa Marine Shale – Preliminary Assessment* (May 25, 2014), <http://www.saveourlake.org/PDF-documents/Press%20Releases/LPBF%20Preliminary%20Assessment%20of%20Hydraulic%20Fracturing%20in%20TMS%20in%20St%20Tammany%20%205%2028%202014%20F%20W%20OBB.pdf>. Exhibit J. The report states that

[t]he use of the freshwater aquifer in St. Tammany Parish has *already significantly lowered the pressure of the aquifer*. When fluid pressure is reduced within a rock formation, especially unconsolidated aquifers, they are likely to compress or collapse . . . Collapse of the aquifer could crack the concrete and damage the pipe. The pipe is already subject to corrosion so it becomes even less of a barrier over time. The cracking of the concrete and damage to the casing pipe could overtime compromise the seals. Deeper high pressure fluids could eventually seep upward through the well bore and into the aquifer. *Even very small amounts of salt water make a fresh aquifer unusable for a municipal potable water supply*. The chance of this scenario may be small, but every additional well may equate to loss of the water supply to local communities. *In general, remediation of contaminated aquifers is difficult or impossible*. Alternative water supplies may need to be found and that could be prohibitively expensive to sustain local communities. *Loss of water supply could jeopardize*

the very existence of the community. The bottom line is that the casing failure scenario is a low risk, but a very high consequence.³

Id.

Additionally, the Lake Pontchartrain Basin Foundation points out that fracking wells raise “the risk of unforeseen issues to arise immediately or years to decades into the future.” *Id.*

Finally, as discussed below, to the extent that Helis’s proposal merely follows the requirements of Conservation’s regulations at Statewide Order 29-B, these regulations do not meet industry standards or best practices. As a result, they are inadequate to ensure that the risks of the Helis project have been avoided to the maximum extent practicable.

In addition to potential contamination of the aquifer from casing failure, other sources of contamination including from pits (most of which in Louisiana do not require a liner. *See* discussion *infra* and Quarles Affidavit, Exhibit A.

As Mark Quarles explains, “Waste storage in pits while a well site is active and the allowance for contaminated wastes to remain at well sites after closure – especially wherever wells are constructed over former wetlands and adjacent to wetlands – represents a threat to the water quality of the wetlands because of the toxicity and mobility of fracturing chemicals, the toxicity and mobility of exploration and production wastes, and the shallow groundwater conditions that are present.” Exhibit A.

Furthermore, aquifer layers mix, so contamination of one layer of the aquifer can lead to contamination of a higher layer. As Mark Quarles states in his affidavit: “Aquifer layers can mix and consolidate due to clayey soil confining layers that may or may not be continuous, by leakage through confining layers, or when heavy pumping of one unit extends beyond a confining layer. Deeper confined aquifers can mix with shallow aquifers above. Contamination found in one layer of the aquifer can migrate into and contaminate other sub-aquifers.” *See* Quarles affidavit (Exhibit A) for a more detailed discussion.

2. The Potential Impact of Helis’s Drilling and Fracturing Operations Contaminating Nearby Surface Waters Has Not Been Avoided As Much as Possible.

Helis’s project is proposed for a wetland. As a result, any spills or leaks from surface operations will almost surely contaminate surface waters. Helis has informally proposed to construct a dike around the perimeter of the well pad, a drainage ditch, and a rainwater holding pond (*see* Helis slide E2-18), but a dike, ditch and holding pond are unlikely to be sufficient when a heavy rainwater or stormwater event like a tropical storm or hurricane occurs. In filings before the Corps, Helis also said that it would not have waste pits on site, but that representation was limited to Phase I of its project, which just involves the vertical, exploratory well. Helis likely will construct a waste pond for Phase II, as it indicated to the Corps in the plat included in

³ Attached as Exhibit J.

its initial application. The presence of a waste pond for holding toxic chemical-laden produced water and/or flowback water poses significant potential for not just surface runoff from the pond in heavy rain events, but also from seepage or leakage from the bottom of the pond/pit. As discussed by Mark Quarles, Louisiana regulations do not require a liner for any pit other than the produced water pit, and because this facility is in a wetland, the contents of an unlined pit will surely leak into the water table, which may mean the toxic chemicals therein will reach a nearby stream which is hydrologically connected.

Further, even as to the produced water ponds and pits which Louisiana regulations require to be lined, the liner required is extremely thin, much thinner than that required for a municipal solid waste landfill. See Quarles Affidavit Exhibit A.

Neither Conservation nor Helis have discussed what safeguards they will require for the hydraulic fracturing phase of Helis's operation to prevent the highly contaminated water in the pits and ponds from reaching surface water. For shale fracking operations in particular, research is showing that a particular problem in the flowback water is naturally occurring radioactive material, or NORM. NORM in shale fracking flowback water can be present in significantly higher amounts than in flowback water from traditional sandstone drilling. NORM present in storage ponds and pits, even rainwater holding ponds, can present a significant hazard to nearby waters and from spills during transport for eventual disposal. Conservation and Helis must address the NORM problem.

3. Helis Has Not Adequately Addressed How It Will Minimize Air Pollution.

Air pollutants that are harmful to human health are produced during all stages of fracking development. These stages include: preparing the site, drilling the vertical well, driving trucks (which deliver water, chemicals, etc. and remove waste), separating and treatment operations, operating compressors, flaring, escaping ("fugitive") emissions, and operations involving "blowdown and venting." See *Health Impact Assessment of Shale Gas Extraction*, Institute of Medicine of the National Academies (2013), prepublication copy available <http://www.ohioeha.org/media/7254/Health-Impact-Assessment-of-Shale-Gas-Extraction.pdf>.

The development and production of natural gas wells is associated with criteria air pollutants that have been identified by the EPA. These include nitrogen oxides and volatile organic compounds (VOCs). Id. VOCs are especially problematic because they react to form ozone. In addition to criteria air pollutants, fracking operations also emit hazardous air pollutants, e.g., diesel-powered engines release diesel particulate matter. Id. Additionally, extraction of natural gas releases greenhouse gases (like methane). Id.

Connecting air pollution directly from fracking to poor health outcomes is difficult given that most studies making this connection require a few years to complete and fracking is relatively new. UMD SPH, *Potential Public Health Impacts of Natural Gas Development and Production in the Marcellus Shale in Western Maryland*. However, peer-reviewed journals are publishing results and have associated air pollution connected to fracking with "increased risk of sub-chronic health effects, adverse birth outcomes including congenital ear defects and neural tube defects, as well as higher prevalence of symptoms such as throat and nasal irritation, sinus

problems, eye burning, severe headaches, persistent cough, skin rashes and frequent nose bleeds among respondents living within 1500 feet of UNGDP facilities compared to those who lived > 1500 feet.” *See e.g.*, UMD SPH, Potential Public Health Impacts of Natural Gas Development and Production in the Marcellus Shale in Western Maryland.

Furthermore, “[w]hile no information is available on the concentration profile of air pollutants as a function of distance from the well pads and compression stations, increasing body of literature on traffic related air pollution show that the concentrations of traffic related air pollutants reach to background level beyond 500-1000m (1640-3280 feet) distance from the roads.” *Id.*

One expert stresses that in addition to being concerned about *local* exposure to air pollutants, one must consider *field* exposure: “As well pads become concentrated in a small area, the emissions from the individual activities of each are integrated and can alter air quality.” The National Academies, Health Impact Assessment of Shale Gas Extraction. Field exposure will be a concern if Helis drills more than one well and/or if Helis (or other oil companies) drills additional wells in and around St. Tammany Parish.

Another study surveys air pollution results from fracking projects around the nation:

The state of Texas reports benzene concentrations in air in the Barnett shale area that sometimes exceed acute toxicity standards, and although the concentrations observed in the Marcellus shale area in Pennsylvania are lower (with only 2,349 wells drilled at the time these air contaminants were reported, out of an expected total of 100,000), they are high enough to pose a risk of cancer from chronic exposure. Emissions from drills, compressors, trucks and other machinery can lead to very high levels of ground-level ozone, as documented in parts of Colorado that had not experienced severed air pollution before shale gas development. *Should fracking stop?*, Ingraffea, A. & Howarth, R.W., Nature, September 2011, available at <http://www.nature.com/nature/journal/v477/n7364/full/477271a.html>.

Helis has not mentioned any plans to control air pollution or to minimize the risks associated with air pollution exposure for any of the residents living and working near the well site or for the many students at the nearby Lakeshore High School. Nor has Helis committed in a legally enforceable document to installing air monitoring stations.

4. *Helis Has Not Adequately Addressed How It Will Minimize Truck Traffic From All Phases of Its Operation.*

Helis has not released any information relating to the amount of truck traffic that can be expected for the entire project, including fracturing operations. As the Lake Pontchartrain Basin Foundation Report points out: “Since there are no railroads near the proposed lease area, produced crude would likely be trucked. In addition to wear and tear on the roadways . . . , their use in transportation increases the likelihood of spills due to accidents. *Vehicular transport is*

considered one of the riskiest modes of transportation for hazardous materials such as crude oil, and the rate of accidents is increasing.” Attached Exhibit J (emphasis added).

At the November 12, 2014, hearing, Helis consultants stated that the initial exploratory well will require approximately 800,000 gallons of water. Helis has not released information relating to how this water will be brought to the exploratory well or where it will come from. Helis consultants refused to answer questions at the hearing about exactly where the pond is that it claims it will get its water for the vertical and fracking phases of its operations.

The second phase of the project could require up to 13 million gallons of water and tens of thousands of gallons of fracturing fluids. *See e.g.* EPA, *Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources: Progress Report*, Dec. 2012, <http://www2.epa.gov/sites/production/files/documents/hf-report20121214.pdf>. Helis has not released any information about the number of trucks that will be traveling along St. Tammany’s roads, nor have they released any information about ways in which Helis intends to reduce air pollution from truck operation (e.g., use of hybrid trucks, etc.).

5. *Helis Has Not Adequately Addressed How It Will Minimize Noise Pollution.*

During drilling and fracking operations, noise pollution is produced during the clearing of the land, by drilling construction and operations, and by trucks (on-road and off-road), generators, and pumps. If the permit is granted, this noise could occur for hours on end and for several years.

To assess potential health impacts from natural gas drilling in Colorado along the Battlement Mesa, the Colorado School of Public Health conducted a Health Impact Analysis. The Colorado School of Public Health found that the following sources would be significant sources of noise: heavy truck traffic, diesel engines (which are used during drilling and hydraulic fracturing), construction equipment, and drill rig brakes. <http://www.garfield-county.com/public-health/documents/1%20%20%20Complete%20HIA%20without%20Appendix%20D.pdf>.

One study states that “long-term exposure to environmental noise has been associated with a myriad of health outcomes, including stress and annoyance, sleep disturbances, hypertension, and cardiovascular disease.” UMD SPH, *Potential Public Health Impacts of Natural Gas Development and Production in the Marcellus Shale in Western Maryland*. Another study notes that noise pollution “can induce hearing impairment, hypertension and ischemic heart disease, annoyance, sleep disturbance, and *decreased school performance*.” Passchier-Vermeer & Passchier, *Noise Exposure and Public Health*. Furthermore, “[c]hildren, elderly, chronically ill, and hearing impaired individuals have been found to be more susceptible to environmental noise.” *See* UMD SPH, *Potential Public Health Impacts of Natural Gas Development and Production in the Marcellus Shale in Western Maryland*. The possibility of decreased school performance and the fact that children are more susceptible to adverse effects from noise pollution are especially concerning given the proximity of Helis’s site to Lakeshore High School.

The University of Maryland School of Public Health conducted a study about the potential effects on public health from unconventional natural gas development and production (UNGDP, or fracking) and concluded that “there is a Moderately High Likelihood that UNGDP related changes in noise exposure will have negative impacts on public health” in the counties where fracking could take place. University of Maryland School of Public Health, Potential Public Health Impacts of Natural Gas Development and Production in the Marcellus Shale in Western Maryland. The study’s authors based their conclusions on their own monitoring results from a site in West Virginia and on other noise monitoring studies.

While Helis has stated—though not in a legally enforceable document—that it will place a sound barrier near the site, Helis has not mentioned whether it will minimize noise from the site during nighttime hours. (In fact, it’s very possible that drilling could continue 24 hours a day, 7 days a week). Limiting noisy operations at night is important for multiple reasons: noise disrupts sleep and “[a]dverse health effects from noise are dependent on the duration of exposure and the intensity of the noise” University of Maryland School of Public Health, Potential Public Health Impacts of Natural Gas Development and Production in the Marcellus Shale in Western Maryland.

Helis has not stated whether it will use diesel engines (which produce more noise) or electric engines (which produce less noise). Other than constructing a sound barrier, Helis has not mentioned any other noise abatement strategies. Potential strategies that Helis could adopt include, but are not limited to: noise blankets for diesel engines, electric grid power for drilling, and use of noise suppression equipment if well head compression is used. Colorado School of Public Health.

6. Helis’s Refusal to Identify the Chemicals In Its Fracking Fluids Before Drilling Fails to Minimize the Negative Impacts of the Use of These Chemicals.

Numerous studies, and expert Mark Quarles, support the proposition that hydraulic fracturing operations “inject toxic chemicals at harmful concentrations into the subsurface.” Quarles Affidavit Exhibit A.

The majority of the chemicals that are in the hydraulic fracturing fluids *are not* routinely tested for in public or domestic drinking water well sampling programs.

Of further concern, “water treatment plants generally have no ability to remove those chemicals before distribution into the system.” Exhibit A, Quarles Affidavit. According to one study, “In New York and Pennsylvania, some of the [flowback] waste is treated in municipal sewage plants that weren’t designed to handle these toxic and radioactive wastes. Subsequently, there has been contamination of tributaries of the Ohio River with barium, strontium and bromides from municipal wastewater treatment plants receiving fracking wastes. This contamination apparently led to the formation of dangerous brominated hydrocarbons in municipal drinking-water supplies that relied on these surface waters, owing to interaction of the contaminants with organic matter during the chlorination process.” Ingraffea, A. & Howarth,

R.W., Nature, September 2011, available at
<http://www.nature.com/nature/journal/v477/n7364/full/477271a.html>.

According to information that was provided to the U.S. House of Representatives' Committee on Energy and Commerce and published in a report written by the U.S. Environmental Protection Agency, chemicals that are suspected carcinogens, regulated by the Safe Drinking Water Act, or identified as Hazardous Air Pollutants in the Clean Air Act are used in 652 different hydraulic fracturing products. Quarles Slide Presentation, Slide 12, Table 11. Additionally, the chemicals that are used most frequently in more than 2,500 hydraulic fracturing products include: methanol, isopropanol, 2-Butoxyethanol, and ethylene glycol. These constituents are *not* tested for in public water systems.

Additionally, fracking fluids often include petroleum distillates; these distillates are used as "friction reducers. Quarles Affidavit Exhibit A. The U.S. EPA "concluded that even in minute concentrations (for example, 0.4 to 1% mixtures of hydrocarbon to water) of typical diesel fuel-containing fluids, the concentration of benzene (a carcinogen) exceeded EPA's safe drinking water standard 9 to 880 times at the point of injection into the formation. EPA, Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs. These petroleum hydrocarbon constituents (e.g., benzene) are especially concerning because even when present in harmful concentrations, they "cannot be smelled, tasted, or observed."

Groundwater aquifers that are used for public water supplies in Louisiana (of which the Southern Hills aquifer is one) are not routinely tested for constituents that are most commonly present in hydraulic fracturing fluids. By law, public water systems that draw from groundwater are only required to sample the raw supply well once every three years for: volatile organic compounds (e.g., benzene), inorganic constituents such as metals and nutrients, and radionuclides. Quarles Affidavit Exhibit A.

Expert Mark Quarles states: "Given the infrequent, every 3 years testing requirement for groundwater supplies for public water systems and the fact that the analytical testing program does not include all contaminants associated with fracturing fluids, untreated, contaminated aquifer water could be distributed into a distribution system without any knowledge of its presence prior to human consumption." *Id.*

Though Helis represented at the hearing that it would eventually fully disclose all the chemicals in its fracking fluid—although not in a legally enforceable document—it will not disclose the chemicals in its fracturing fluids until *after* it starts drilling. Mark Quarles points out that this plan "does not allow any private well owner to test their well prior to drilling and fracturing, because Helis does not plan to disclose what chemicals it injected until after the fracturing is complete." *Id.*

Furthermore, Helis has not committed to using what the industry considers green completion. This means it would commit to the use of fluids that the industry considers less toxic (<http://www.bloomberg.com/news/2012-10-02/chesapeake-testing-green-fracking-fluids-in-u-s-shale-wells.html>).

**7. *Helis Has Not Minimized Other Impacts of Its Project
On the Surrounding Community and Their Quality of Life.***

As stated earlier, this portion of St. Tammany Parish is suburban residential; it is not industrial. Lakeshore High School is just over a mile away from the drill pad, and right across the street from the access road that all workers will enter and exit the area from. There are numerous other broader impacts of a heavy industrial project like Helis's than the environmental and health impacts discussed. Helis has not discussed any of these, nor has Conservation analyzed them. As merely one example of the broader, yet very real negative impacts such an operation can have, these types of operations bring in an influx of workers whose off-the-clock activities are not compatible with suburban family life. Man camps and their often-associated activities, some of which are illegal, could very well be located in the middle of St. Tammany Parish suburbia and near Lakeshore High School. This is yet another example of why zoning laws must be followed, and respected by Conservation.

**C. *Conservation and Its Current Regulatory Scheme
Are Insufficient to Avoid the Potential and Real
Adverse Impacts of this Project to the Maximum Extent Practicable.***

**1. *The STRONGER Report Establishes That Conservation's Drilling
Regulations Are Inadequate to Protect Against the Negative Impacts of
Fracking.***

A non-profit, multi-stakeholder organization which includes industry representatives, the State Review of Oil and Gas Environmental Regulations (STRONGER) Hydraulic Fracturing Workgroup conducted a review of the Louisiana Office of Conservation's oil and gas regulatory program in 2010 and 2011. (According to the STRONGER report, Conservation volunteered to have its regulations reviewed.) As a result of the review, STRONGER released a report identifying numerous weaknesses in the Louisiana regulations. Until Conservation strengthens these regulations, it should not issue a fracking permit to operations like Helis's that present so many irrevocable risks to the environment.

Among the findings of the STRONGER report on Louisiana's drilling regulations' deficiencies are the following:

a. The minimum depth required for surface casing is insufficient. In its report STRONGER "recommends that, in order to protect groundwater, the Office of Conservations should consider the depth of the USDW and the depths of any saline or productive zones, in addition to the total depth of the well, in setting surface casing requirements."

b. "There are no specific standards or requirements for cement used in well construction." The STRONGER review team issued the following recommendation, "the Office of Conservation [should] develop cement standards to meet anticipated pressures and protect other resources and the environment."

As Mark Quarles writes in his affidavit, standards for cementing casings are important “to protect against anticipated pressures, to protect aquifers, and to protect the environment. Cement is a critical component of a well construction plan to ensure mechanical integrity over the life of a well and to protect the environment.” Quarles Affidavit Exhibit A.

c. Spill Prevention and Control Plans are not required to be developed and implemented until after the well becomes operational. According to STRONGER: “DEQ regulations (LAC 33:IX. Subpart 1, Chapter 9) require the development and implementation of a Spill Prevention and Control Plan (SPCC). The regulations require the operator to prepare the plan within 180 days after the facility becomes operational and to be fully implemented within one year after the facility begins operation. Consequently there is a gap in time between the drilling and hydraulic fracturing of a well and the time that the Spill Prevention and Control Plan is required.”

STRONGER issued the following recommendation “the State of Louisiana [should] develop contingency planning and spill risk management procedures for hydraulic fracturing which meet the requirements of Section 4.2.1 of the STRONGER guidelines.”

Mark Quarles explains that the regulation should be altered to “require that the SPCC Plan shall be prepared and approved prior to constructing the well pad and supporting structures (e.g. roads) and prior to drilling the well.” Quarles Affidavit Exhibit A.

d. Insufficient training for field staff. STRONGER also recommended that DNR field staff “should receive more structured training to stay current with new and developing hydraulic fracturing technology.”

Additionally, STRONGER has made recommendations for well site pits, which Statewide Order 29-B does not address. For instance, STRONGER recommends that workover and reserve pits which will contain oil-based drilling fluids be lined. STRONGER also recommends that “a review or study should be made to determine if an aquifer is present and determine measures to protect that aquifer.” 2014 STRONGER Guidelines at 5.5.3(b). Additionally, STRONGER recommends that pit construction standards vary depending on the following factors: “the wastes [the pits] receive; the length of time they are used; and site-specific hydrologic, geologic, and hydrogeologic conditions.”

Statewide Order 29-B, in contrast, allows five types of pits yet only *one* pit must have a liner. Therefore, flowback liquids, workover liquids, drilling muds, and stimulation fluids can be stored in pits with no liner.

Pit standards are important because, as Mark Quarles points out: “Waste storage in pits while a well site is active and the allowance for contaminated wastes to remain at well sites after closure – especially wherever wells are constructed over former wetlands and adjacent to wetlands – represents a threat to the water quality of the wetlands because of the toxicity and mobility of fracturing chemicals, the toxicity and mobility of exploration and production wastes, and the shallow groundwater conditions that are present.” Quarles Affidavit Exhibit A.

2. *The Louisiana Regulations (Statewide Order No. 29-B) Fail to Protect Human Health and the Environment Because They Do Not Meet Industry-Established Standards Nor Do They Satisfy U.S. EPA Recommendations for Hydraulic Fracturing Operations.*

Conservation has indicated that the only legal requirements it will require Helis to meet before granting it a drilling permit are those requirements in its regulations. However, as discussed in detail in attached affidavit by Mark Quarles, not only are Conservation's regulations deficient in the ways identified in the STRONGER report, they also fail to meet standards set out by the Environmental Protection Agency (EPA) and the industry's best practices standards. Exhibit A.

Among other recommendations established by the EPA, minimum criteria for well siting require that the following be pre-identified: exploratory wells, abandoned wells (both plugged and unplugged wells), oil and gas production wells, underground waste injection wells, and faults. February 2011, Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources, U.S. EPA, EPA/600/D-11/001/February 2011/www.epa.gov/research. The issue of faults is a particularly concerning one, as available evidence indicates that a fault runs through the exact area where Helis proposes to drill. However, disturbingly, after careful review of the documents Helis submitted to Conservation, Mark Quarles came to the following conclusion, "There is no indication that Helis has evaluated the occurrence of faults." Quarles Affidavit Exhibit A.

The American Petroleum Institute (API) has likewise issued recommendations for industry best practices, many of which Statewide Order 29-B does not meet. For example, Statewide Order 29-B does not require drillers to meet API recommendations for testing cement. The API standard is that "compressive strength testing of the cement associated with surface casing grout should be determined" (Quarles Affidavit) and "a cement integrity test be completed prior to drilling the intermediate casing." Quarles Affidavit. Cement is used to "fill any voids between the pipe and side of the drill hole." (Exhibit J). Cement is used to protect the aquifer and, as such, it is particularly important that Louisiana's regulations on cement should require drillers to meet minimum API standards. The cement is also important because, according to Mark Quarles, "Methane can contaminate groundwater supplies and create explosive hazards on the surface if the concrete seal is not adequate over the life of the well."

Statewide Order 29-B also does not meet the API standard for production casing, which recommends that prior to beginning hydraulic fracturing operations "the production casing should be pressure tested" and a test to evaluate the cement integrity should also be run" API. As Mark Quarles explains, "[f]ormation pressure tests consistent with API standards should be required of the production casing because *they are needed to determine if the seal is adequate to prevent leakage.*" According to Mark Quarles, "repeated mechanical integrity tests should be required for the life of the well – yet none are required by Statewide Order 29-B. Further, Helis' plan presented at the public hearing did not include any cement testing of any casing for the life of the well."

Furthermore, “Statewide Order 29-B does not require any mechanical integrity tests of the annular space outside of the surface casing or intermediate casing to demonstrate that an adequate seal exists – instead only relying on internal casing pressure tests. The API recommends that formation pressure tests be performed for each casing string prior to advancing the next string. Formation pressure tests consistent with API should be required of the surface casing and intermediate casing because they are needed to determine if the seal is adequate to prevent leakage.” Quarles Affidavit.

Lastly, in order to comply with API standards, the regulations should require that the surface casing extend beyond the deepest known aquifer (API HF1).

D. Conservation cannot issue Helis’ permit (nor any future permits) to drill for minerals until its operations are in full compliance with the Louisiana Constitution.

Conservation’s current practices do not comply with mandated constitutional requirements under the Louisiana Constitution of 1974. As mentioned previously, article IX, section 1 of the Constitution states that “the natural resources of the state, including air and water, and the healthful, scenic, historic, and esthetic quality of the environment shall be protected, conserved, and replenished insofar as possible and consistent with the health, safety, and welfare of the people.” La. Const. art. 9, § 1. In turn, regulatory decisions that impact Louisiana’s environment must not violate the public trust doctrine. See In the Matter of Dravo Basic Materials Co., Inc., 604 So.2d at 634. Consequently, before an agency or official grants approval for a proposed action that affects the environment, the agency must “determine that adverse environmental impacts have been minimized or avoided as much as possible consistently with the public welfare.” Save Ourselves Inc., 452 So.2d at 1157. Conservation, however, is currently unable to comply with its constitutional mandate to protect the state’s natural resources and the welfare of its people.

The Louisiana Legislative Auditor (LLA) conducted an audit of the Department of Natural Resources’ Office of Conservation’s regulations of oil and gas wells in 2014. According to the final report, “[t]he primary purpose of this audit was to evaluate whether the Office of Conservation (OC) effectively regulated oil and gas wells” See Regulation of Oil and Gas Wells and Management of Orphaned Wells: Office of Conservation – Department of Natural Resources at 2 (May 28, 2014), available at [http://app.lla.state.la.us/PublicReports.nsf/0/D6A0EBE279B83B9F86257CE700506EAD/\\$FILE/000010BC.pdf](http://app.lla.state.la.us/PublicReports.nsf/0/D6A0EBE279B83B9F86257CE700506EAD/$FILE/000010BC.pdf) (hereinafter “LLA”). The auditor wrote in the final report that effective regulations are important not just to “ensur[e] ensuring that wells are operating in compliance with regulations and that environmental and public safety risks, such as contamination of ground and surface water, are identified and addressed.” *Id.* at 1. Furthermore, according to the report, “[e]ffective regulation is also important in preventing operators from abandoning their wells.” *Id.*

Overall, the LLA concluded that “the OC has not always effectively regulated oil and gas wells to ensure operators comply with regulations.” (LLA, pg. 2). Below are the auditor’s conclusions, which demonstrate that the OC does not effectively regulate existing wells.

- DNR Does Not Require Financial Security From All Operators, As Many Other States Do.

Operator-provided financial security provides funds for the state that can be used if an operator abandons a well (LLA, pg. 3). The OC does not require all operators to require financial security on their wells, and the amount of funds that is required is too low to pay the costs of plugging an abandoned well. According to the LLA report, “25% of all current oil and gas wells are required to be covered by financial security and 55% of orphaned wells that were subject to financial security requirements were exempt from financial security.” *Id.* at 3. The auditor concluded that, “[n]ot requiring sufficient financial security amounts *provide an incentive for operators to abandon their wells* since forfeiting the financial security may be more economical than paying plugging costs.” *Id.*

The Auditor notes that OC told the Auditor that some operators could not afford the financial security and still be profitable. In response the Auditor notes: “if operators cannot afford to pay financial security, then they likely will not be able to pay to plug the well *and perhaps should not receive a permit* to operate a well as they are demonstrating that they cannot comply with the established regulations.” *Id.* at 6.

- DNR Does Not Inspect Wells.

OC well inspections identify which wells are out of compliance or may have stopped producing (LLA, pg. 3). The DNR Commissioner requires that wells be inspected once every three years. According to the LLA report between fiscal years 2008 to 2013, “OC did not conduct routine inspections in accordance with timeframes established by the Commissioner of at least 26,828 (53%) of 50,960 oil and gas.” *Id.* at 3. Furthermore, 25% (12,702) of all oil and gas wells *were not inspected at all.*” *Id.*

According to the LLA, OC does not report its inspection data “in a format that can be easily quantified,” so “OC also cannot identify the number or type of violations cited on inspections.” *Id.* .

The LLA report hypothesizes that OC did not meet its inspection goals because “OC has not effectively managed the inspection process or monitored districts to ensure they are meeting these goals.” The LLA notes: “Although OC has given districts the responsibility to inspect wells, it has not developed formal inspection procedures for districts that would help ensure inspections are conducted consistently and scheduled appropriately.” *Id.* at 10.

- DNR Has No Written Formal Enforcement Procedures.

According to the LLA, “OC has not developed an effective enforcement process that sufficiently and consistently addresses noncompliance and deters operators from committing subsequent violations.” *Id.* at 3. In fact, the LLA writes, “*OC has not developed formal procedures in policy or in rule that outline the enforcement process.* Formalizing this process would help ensure that noncompliance is sufficiently, consistently, and appropriately addressed.” *Id.* at 11 (emphasis added). The LLA points out that “[p]roviding specific criteria on what

violations would result in compliance orders would help districts cite violations consistently for all operators.” *Id.* at 12.

- DNR Does Not Enforce Violations.

The LLA’s report cites the following regarding OC enforcement:

- Of the failures documented during routine inspections conducted from fiscal year 2008 through fiscal year 2013, 15% of the well operators (1,179 of 7,665) “did not receive a compliance order to correct the violation.” *Id.* at 3. DNR has no criteria for when compliance order should be issued;
- During the same period, OC did not re-inspect 16% (1,116 of 6,827) of wells that had received compliance order. *Id.* at 3. Re-inspections allow OC to determine whether wells complied with the compliance orders and corrected the violations. *Id.* at 12. Furthermore, of the re-inspections that did take place, 41% (2,326) were conducted after the agency-imposed date for compliance had passed *Id.* at 13. Lastly, according to the LLA, “OC has not developed any procedures for re-inspection . . . [W]ithout standardized procedures that outline criteria for re-inspections, OC cannot ensure that they are done appropriately and consistently among the districts.” *Id.* at 13.
- OC did not penalize well operators who, upon re-inspection, were found not to have complied with their compliance orders. Fifty-five percent of wells (507 of 918) were not issued a penalty. *Id.* at 4. In fact, rather than penalizing well operators, OC gave the operators an extension to comply.
- OC does not impose civil penalties when it has the authority to do so. The auditor, “identified approximately \$471,200 in penalties that could have been assessed by 589 operators who did not submit required well tests during fiscal years 2011 through 2012.” *Id.* at 4. (By comparison, on average OC issued \$150,468 in penalties annually beginning in fiscal year 2008.) *Id.*
- The LLA also concludes that “OC’s enforcement actions may not be deterring noncompliance.” *Id.* The LLA notes that “of the 1,027 operators with at least one failed inspection from fiscal years 2008 through 2013, 649 (63%) failed multiple inspections. The 10 operators with the most failed inspections had between 97 and 255 each over the six years we reviewed.” *Id.*

- DNR Has Not Consistently Ensured that Inactive Wells Were Plugged, Which Louisiana Regulations Require.

Louisiana regulations require that wells that operators plug wells within 90 days after it has been determined that the wells have no future utility. The LLA found that from 2008-2013 operators self-reported that 747 wells had no future utility. Of these 747, 64.5% (482) the operator failed to properly plug the well. *Id.* at 19.

- DNR Has Not Instituted a Process to Identify Orphaned Wells.

The auditor states: “[b]ecause OC has not always identified and effectively regulated inactive wells, the current orphaned well population may grow in the future.” As of July 2013,

there were 2,846 known orphaned wells in Louisiana. However, because OC has not always identified and effectively regulated inactive wells, the current orphaned well population may grow. For example, because OC does not have an effective process to identify inactive wells, many of these unidentified inactive wells may already be abandoned by their operators, but have not yet been orphaned. In addition, since OC does not have sufficient regulations over inactive wells, which have a high risk of becoming orphaned, many of these wells may also become orphaned. As of June 30, 2013, there were 12,181 oil and gas wells in an inactive status (both future and no future utility status), which represents 21% of the total oil and gas well population. Of these, 8,528 wells have been classified as having future utility for greater than three years and 887 wells have been in no future utility status for longer than 180 days. Both of these populations of wells (9,415 in total) can be considered at risk of being orphaned.” *Id.* at 23.

In light of such evidence presented by the Auditor’s Office, DNR cannot justify under its public trust duties the issuance of any additional well drilling permits at this time. Current regulations of the oil and gas industry in Louisiana are in place to protect the welfare of Louisiana citizens and our environment – a value so engrained in Louisiana culture that it is codified in the state’s constitution. So long as DNR remains unable to effectively enforce current regulations of the oil and gas industry, the approval of Helis’ (or any additional) well drilling permit application would violate the Louisiana Constitution.

E. Conservation Must Consider and Address the Cumulative, Indirect, and Secondary Impacts of Helis’s Proposed Project and Likely Future Projects.

Though Helis’s current September 10, 2014, drilling permit application suggests that it is only for a straight well (which it later describes as a vertical well), Helis represents that all that will be required for it to conduct horizontal fracturing operations out of this same well is for it to amend its permit (“Helis understands that drilling the horizontal lateral will require it to amend its permit prior to conducting such operations.”). If this is true, then the current application is the only opportunity that commenters will have to address the impacts of the full scale of operations Helis intends to conduct. Conservation, then, must now address all the impacts of Helis’s proposed project. This includes all the cumulative, indirect and secondary impacts of the current proposal; as well as the horizontal fracturing aspect of the current well, and the future dozens if not hundreds of wells that Helis and other operators (include operators to whom it sells its leases) will frack in this suburban area.

According to a report written by the Lake Pontchartrain Basin Foundation, “Based on the likely well spacing and their [Helis’s] proposed 960-acre unit size to the state Department of Conservation, the total Tuscaloosa Marine Shale project on their lease alone could include 284 additional lateral wellbores with approximately 71 surface locations . . . Nearly 2000 lateral wells could be drilled in St. Tammany Parish.” Exhibit J.

Conservation must address these potentially massive impacts individually and as a whole and cumulatively. The whole area must be viewed as an interrelated ecological unit in order to adequately assess the true cumulative impacts of Helis’ project..

It is not hyperbole to suggest that these and future drilling operations will change the face of St. Tammany Parish, and the chances of accident or well failure increase with each new well. Further, not only the direct impacts of the project must be considered, but also secondary impacts that result from the project.

Without doubt, this project will also increase the region's greenhouse gas emissions and impact the overall health of the region's watershed. For instance, the company reports that its proposed well will require 800,000 gallons of water daily, and that it will source this water from "private ponds." However, the public has no information about the nature of these "private ponds." Are they connected to streams and additional wetlands? Are they filled and maintained from groundwater wells? How many trucks will be needed to transport this quantity of water? What will be the impact of moving this quantity of water on the climate and community?

As stated by the LPBF 2014 report, "[a]s for the groundwater, any withdrawal would impact the only aquifer and sole potable water source for the parish . . . Although Helis has stated they will not use groundwater for their first well, this is not a binding arrangement. Helis has not indicated what the water source for future wells might be. Without safeguards in place, Helis or its competitors may look to surface water and groundwater for the water needed for their operations. Also, if Helis sells their interest as they did in North Dakota, the next operator may choose differently. *Safeguards need to be in place to protect the over production of the aquifer for such an industrial use.*" Exhibit J.

The LPBF report further discussed the cumulative impacts if Helis uses surface water: "[i]f surface water was to be used in fracking, the streams could become shallower and even slower moving, thus causing dissolved oxygen levels to drop in the warmer months. St. Tammany Parish is sensitive to the dissolved oxygen levels in the streams – LPBF measures 32 'hotspots' on parish streams for dissolved oxygen. St. Tammany has actually considered inducing flows into some streams to help with oxygen levels. One of these streams, Ponchitolawa Creek, has its headwaters in the Helis lease area. In addition, all streams in the lease area are subject to increased water quality regulations under the Clean Water Act through the TMDL and MS4 programs." Exhibit J.

Additional information and clarity about this project's cumulative, indirect and secondary impacts on the region's carbon footprint and watershed. No final agency decision should be rendered until this information is disclosed to the public, so that it can provide meaningful comments about the nature of Helis' project. Without it, the public notice remains deficient and any final agency action on Helis' permit application would undoubtedly violate Louisiana law.

Another potential impact that Conservation must consider is that the chances of accident or well failure increase with each new well.

Further, Helis's proposed project will destroy wetlands that act as a buffer to reoccurring storms and localized flooding. The destruction of these wetlands will certainly contribute to the weakening of Louisiana's storm defenses. Where over three (3) acres of wetlands are involved, it is unacceptable that the applicant offers no analysis of these probable impacts.

As well, this project will likely incite additional construction, and in turn increase the region's carbon footprint and jeopardize even more wetlands unique to this region of St.

Tammany Parish. This activity, combined with similar wetland-destroying projects, could result in more flooding in surrounding communities, and the degradation water quality in Bayou Castine, Bayou Cane, surrounding wetlands, and the watershed as a whole.

Conservation must also address the potential health impacts of the proposal on the community. Increased climate changing emissions, air pollution, more trucks, deforestation, potential water pollution, and additional development can have serious direct, indirect and secondary impacts local residents' physical and mental health. The permitting processes is also putting tremendous strain on the cultural and social fabric of St. Tammany Parish, where community members are galvanizing in either support or opposition to the project.

As well, Conservation must address the secondary and cumulative impacts from spills and runoff. Given that this site is in wetlands, the impacts of spills and runoff, individually and cumulatively, have the potential to be significant.

According to the LPBF report:

[T]here has been very little improvement in oil spill clean-up. The BP spill in 2010 illustrated the ineffectiveness of spill cleanup in open-water. Clean-up in wetlands often results in severe damage to wetlands where in direct contact with crude oil or refined product. *Wetlands are considered the most sensitive habitat to crude oil in general.* Helis' first well would irrevocably damage wetlands at the well site and pose a threat to any nearby wetlands. Exhibit J.

F. Conservation Should Not Issue Helis A Well Drilling Permit Without Proof of Requisite Testing that Demonstrates No Other Alternatives Exists.

a. Helis should conduct a subsurface investigation to ascertain whether there are active faults present.

According to expert Mark Quarles, "The vertical and horizontal wells associated with the Helis plan should not be drilled until a thorough subsurface investigation is completed to deny the presence of these faults. Faults can act as conduits that allow contaminants to travel large distances vertically and horizontally." Quarles affidavit.

b. Extra protections in the well/well casing to ensure more protection for the aquifer.

Cement and or casing issues in a well can lead to aquifer contamination. Dr. Tony Ingraffea, et al., analyzed "75,505 compliance reports for 41,381 conventional and unconventional oil and gas wells in Pennsylvania drilled from January 1, 2000–December 31, 2012 . . . with the objective of determining complete and accurate statistics of casing and cement impairment. *Statewide data show a sixfold higher incidence of cement and/or casing issues for shale gas wells relative to conventional wells.*" (Exhibit E, emphasis added).

c. More protective baseline testing of the aquifer and surrounding surface waters.

Helis should be required to satisfy API minimum standards for protective baseline testing. The API standards, Water Management Associated with Hydraulic Fracturing, recommend that baseline water samples from public and private wells and nearby surface water bodies be taken and tested for constituents that indicate that fracturing and drilling operations have taken place.

The API standards state that “the actual parameters to be tested will depend somewhat on site specific geology and hydrology.” API HF2. However, the API recommends that “Testing parameters should include, *but are not limited to*, total dissolved solids (TDS), total suspended solids (TSS), chlorides, carbonates, bicarbonates, sulfate, barium, strontium, arsenic, surfactants, methane, hydrogen sulfide, naturally-occurring radioactive materials (NORMs), and benzene.” (API HF2, emphasis added).

Dr. Jeffrey K. Wickliffe, Associate Professor of Global Environmental Health Sciences in the Tulane School of Public Health and Tropical Medicine, makes the following recommendations, supported by a report from the National Institutes of Environmental Health Sciences, for how to minimize the potential health risks posed by fracking:

- “Baseline ground water quality data should be taken before any drilling operations begin and ground water quality should be monitored throughout the active lifetime of the drilling and extraction operations as well as after the drilling and extraction operations cease.” (See NIH/NIEHS report attached as Exhibit K and November 19, 2014 email from Dr. Jeffrey K. Wickliffe on file with author.)

According to expert Mark Quarles, “Helis’ conceptual sampling plan presented at the public hearing did not include any list of constituents that would be tested for any well. There is also no indication that the Office of Conservation has considered these relevant factors in their review of the application.”

Baseline testing will allow communities to know whether fracking fluids have migrated into the aquifer after drilling operations commence.

d. Baseline testing of ambient air quality for criteria pollutants and volatile organic compounds

Helis has not addressed baseline testing of ambient air quality in its application. As noted above, shale gas drilling “creates local air pollution, often at dangerous levels.” (“Should Fracking stop? Yes, it’s too high risk.”)

Dr. Jeffrey K. Wickliffe, Associate Professor of Global Environmental Health Sciences in the Tulane School of Public Health and Tropical Medicine makes the following recommendations, supported by a report from the National Institutes of Environmental Health Sciences, for how to minimize the potential health risks posed by fracking:

- “Environmental epidemiological study should be performed prior to and during active drilling and extraction to determine whether air pollution associated with hydraulic

fracturing increases the incidence of respiratory illness and/or cardiovascular disease.” (See attached NIH/NIEHS report and November 19, 2014 email from Dr. Jeffrey K. Wickliffe on file with author.)

- “Ambient and occupational air quality should be measured and monitored prior to and during active drilling and extraction operations and monitoring in adjacent areas without active drilling and extraction operations should be carried out during active drilling and extraction operations to serve as continuous baseline measurements.” (See attached NIH/NIEHS report and November 19, 2014 email from Dr. Jeffrey K. Wickliffe on file with author.)

e. Establish the health of the community.

Helis should establish the baseline health of the community before commencing fracking because health impacts have been documented by individuals living in close proximity to shale drilling, fracking and production wells.

Dr. Jeffrey K. Wickliffe, Associate Professor of Global Environmental Health Sciences in the Tulane School of Public Health and Tropical Medicine makes the following recommendations, supported by a report from the National Institutes of Environmental Health Sciences, for how to minimize the potential health risks posed by fracking:

- “Environmental epidemiological study should be performed prior to and during active drilling and extraction to determine whether any association exists between health outcomes data and water quality in private drinking wells in communities with and without hydraulic fracturing.” (See attached NIH/NIEHS report and “November 19, 2014 email from Dr. Jeffrey K. Wickliffe on file with author.)
- “Community-based participatory research principles should be embraced in designing and conducting studies on environmental and health impacts of hydraulic fracturing so that a broad range of community and stakeholder perspectives are addressed. All stakeholders (individual/community/industry/advocacy groups/decision makers) should be engaged early to foster multi-directional transparency, communication, and accountability.” *Id.*

f. More protective frequent and regular monitoring of the aquifer made a condition of the drilling permit and results made publicly available.

As noted above, Helis’ plan poses an unacceptable risk to the Southern Hills aquifer. If DNR is too grant this permit, the agency must require that frequent and regular monitoring of the aquifer be made a condition of the drilling permit. The results should be made publicly available so that the citizens of St. Tammany Parish have access to it.

g. Proper containment around open pits.

To mitigate contamination of the wetlands and aquifer Helis should be required to properly contain open pits. As Mark Quarles explains, “Waste storage in pits while a well site is active and the allowance for contaminated wastes to remain at well sites after closure – especially wherever wells are constructed over former wetlands and adjacent to wetlands – represents a

threat to the water quality of the wetlands because of the toxicity and mobility of fracturing chemicals, the toxicity and mobility of exploration and production wastes, and the shallow groundwater conditions that are present.” Quarles Affidavit.

**G. Conservation Must Consider and Address
the Costs and Benefits of the Proposed Project.**

According to a “Memorandum for Record” from a Geologic Review meeting that was held at the request of the Corps of Engineers, New Orleans District (CEMVN)—and which was facilitated by the Louisiana Geological Survey employee John Johnston—“Mr. Johnston analyzed the data presented by Helis at that meeting and determined (with agreement from Helis representatives) that the site had no more than a 50% chance of becoming a viable production site.” Memorandum of Record, Geological Review Meeting findings, MVN-2013-02952-ETT, August 19, 2014 (attached as Exhibit L). In addition to the CEMVN and the Louisiana Geological Survey, the following agencies were present: the Louisiana Department of Wildlife and Fisheries, the Louisiana Department of Environmental Quality, and the U.S. Environmental Protection Agency.

**II. CONSERVATION MUST DENY HELIS’S PERMIT APPLICATION BECAUSE
IT PRESENTS CONFLICTING INFORMATION ABOUT ITS OPERATIONS TO
THAT WHICH THE COMPANY PRESENTED TO THE LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY.**

Helis has presented an application that presents conflicting information to that application which it presented to the Louisiana Department of Environmental Quality (DEQ) for its water quality certification. On the first page of its application to Conservation, Helis has indicated that the well it wishes to drill for oil, and specifically does not check the box for gas. However, in the addendum that it attached to its application for a DEQ water quality certification, Helis writes that “[p]hase 1 will include the development of a drill site for the drilling of a vertical well from which . . . Helis seeks to extract oil and/or gas.” See Exhibit M.

Consequently, such a misrepresentation in these two applications to different agencies is enough to deny outright (and not allow revision) Helis’ permit application.

**III. DNR MUST DENY HELIS’S APPLICATION BECAUSE
IT VIOLATES ST. TAMMANY PARISH ZONING.**

Drilling at Helis’s proposed site violates the St. Tammany Parish Unified Development Code (“Zoning Code”). In its application for a drilling permit, Helis describes its project as a “vertical” well. Even without the fracking, “Phase II” aspect of its project, however, the project is clearly industrial.

However, the area where Helis proposes to drill is not zoned industrial – it is zoned residential. The property is in an area classified as A-3 Suburban District for residential

purposes. Exhibit G (Affidavit of Stephen Villavaso).⁴ As such, it precludes Helis's proposed activity. Section 5.08 of the Unified Development Code, Volume I, St. Tammany's zoning code provision regulating A-3(D) suburban districts, provides that "no structure or land shall be devoted to any other use other than a use permitted hereunder with the exception of uses lawfully established prior to the effective date of this ordinance or accessory uses in compliance with this section."⁵

A-3(D) Suburban Districts provided for in the Zoning Code at § 5.0802 (2010) are "intended to provide a single-family residential environment on moderate sized lots." Use of A-3(D) Suburban Districts are limited to permitted uses enumerated in section 508 of the St. Tammany Unified Development Code and uses which are similar and compatible. Installation and/or existence of drill pads, structures associated with drill pads, and/or oil and gas wells are not enumerated as permitted uses in A-3(D) districts. Nor is development of drill pads, structures associated with drill pads, and/or oil and gas wells similar to or compatible with any permitted use enumerated for A-3(D) districts. According to expert planner Stephen Villavaso, "oil and gas drilling is not a permitted land use In the A-3 zoning district and this land use is not compatible with the Intention or purpose of the district. Oil and gas drilling is an intense, industrial land use and would be in conflict with the current residential development standards in this zoning district and the general area." Affidavit at § 6. Nor has the Director of Planning acting in the capacity of Zoning Administrator of St. Tammany Parish determined that Helis's project is similar to or compatible with any permitted use enumerated in this district.

Accordingly, installation of the Drill Pad and Well would be unlawful because it would be drilled in an A-3(D) Suburban District and drilling in an A-3(D) Suburban District is prohibited by the St. Tammany Parish Unified Development Code.

Statutory law governing Conservation dictates that it deny a permit that conflicts with applicable zoning laws. La. Rev. Stat. § 33:109.1 (2014) provides that "[w]henver a parish or municipal planning commission has adopted a master plan, state agencies and departments shall consider such adopted master plan before undertaking any activity or action which would affect the adopted elements of the master plan." As testified to by Mr. Villavaso: "St. Tammany Parish has an adopted Master Plan⁶ and a Unified Development Code⁷ governing the current use and future development of property located in the Parish as a whole, and the subject property in particular." Villavaso Affidavit. Helis's argument that the St. Tammany Parish zoning code is preempted by La. R.S. § 30:28(F) ignores the fact that La. R.S. § 33:109.1 was adopted many years after La. R.S. § 30:28(F), and the legislature is presumed to be aware of all the laws when it promulgates a new law. Helis's interpretation would mean that La. R.S. § 33:109.1 was meaningless when it was passed, which contradicts proper rules for interpretation of laws so as not to be in conflict with other laws.

⁴ See also Exhibit N (May 22, 2014, email from St. Tammany Parish Planning Director to the Assistant District Attorney). Though this correspondence related to Helis's original application to the Coprs for a larger wellpad, the location of the current proposal is the same.

⁵ Exhibit O (Section 5.08 of St. Tammany Parish's Unified Development Code-Volume I [Zoning]).

⁶ See http://www.norpc.org/assets/pdf-documents/parish_studies/Vol_4_Map_Compendum.pdf. See also Exhibit 26.

⁷ See St. Tammany Parish Unified Development Code § 5.0802 (2010).

Further, the Louisiana Department of Environmental Quality interprets this statutory provision as applicable to it. See LDEQ EDMS #9318425. Mr. Villavaso agrees with the LDEQ's application of La. R.S. § 33:109.1 in this case as requiring that Helis meet the zoning requirements to be permitted by a state agency. Affidavit at paragraph 3. Mr. Villavaso is uniquely qualified to offer this opinion, as he was the legislative chair and leader of the Louisiana American Planning Association drafting committee when Act 859 of 2004 (which enacted La. R.S. § 33:109.1) was passed. Id. at page 1.

In addition to the statutory provision requiring Conservation to respect St. Tammany Parish zoning, its Constitutional duty under Article IX, section 1, as public trustee of the environment requires it to do so.

IV. HELIS COMPLIANCE HISTORY

Helis has represented on numerous occasions that it is an environmentally responsible operator. *See* John Connor slide entitled "Helis' Operational History," "Over 900 regulatory inspections, since 2006 alone. Only 11 issues, none environmental. All resolved." There are many compliance issues of which Conservation should be aware, two of which are cited here: First, The U.S. Environmental Protection Agency, Region 6, and Helis signed a Consent Agreement in 2013 due to violations EPA found during an inspection of the Willow Cove oil production facility. United States Environmental Protection Agency, Region 6, In the Matter of Helis Oil & Gas Company, LLC, Willow Cove Facility, St. Martin Parish, LA. Docket No. CWA-06-2013-4815. Exhibit Q. The Consent Agreement was entered into because "On February 27, 2013 EPA inspected the facility and found that [Helis] had failed to fully implement its SPCC plan for the facility." (*Id.* at 4.) The Consent Agreement lists 10 categories of failures on Helis' part, including that Helis's "[f]acility failed to conduct inspections and tests in accordance with written procedure, failed to keep written records and tests signed by the appropriate supervisor or inspector and failed to keep them with the SPCC plan for three years." (*Id.*) Additionally, Helis' "[f]acility failed to discuss in plan blowout prevention assembly and well control system installation before drilling below casing string and during workover operations, and failed to discuss if blowout prevention assembly and well control system was capable of controlling any well-head pressure that maybe [*sic*] encountered while on the well." (*Id.* at 5.)

Helis entered into a settlement agreement with the Wyoming Department of Environmental Quality, Air Quality Division and agreed to pay a \$1,200 fine because it was alleged in a Notice of Violation that "Helis installed and operated a 190-hp Waukesha F817G pumping unit engine without controls or a permit and failed to obtain DEQ/AQD construction permit prior to constructing the Hornbuckel 1-11H production facility (Facility) located in Converse County, Wyoming, thereby violating the Wyoming Environmental Quality Act." Settlement Agreement between DEQ/AQD and Helis Oil & Gas Company, LLC. DEQ NOV #497-12. Exhibit R.

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