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Kentucky Environmental Quality Commission
Annual Meeting June 5-6, 2014
Louisville Zoo
1100 Trevilian Way
Louisville, KY 40213

EQC Commissioners present:

Steve Coleman
Ron Brunty
Tom Herman
Martha Tarrant
Scott Smith

Staff present:

Arnita Gadson, Executive Director
Janet Pinkston, Executive Assistant

Speakers:

Brandon Nuttall, Geologist, Kentucky Geological Survey
Tim Hubbard, Assistant Director, Division of Waste Management
Steve Remen, Executive Vice President, groSolar
Ryan Marlborough, Business Development, groSolar
Andrew Melnykovich, Director of Communications, Public Service Commission
Lee Ann Devine, Chief, U.S. Army Corps of Engineers South Regulatory Branch

Guests:

Tim Joice, Kentucky Waterways Alliance
Jerry Hardt, Kentuckians for the Commonwealth

Vice Chair Steve Coleman

Meeting called to order at 9:20 a.m. Introductions were made. Executive Director Gadson outlined items in packet.

Minutes to be approved.



Tom Herman made a motion to approve minutes of March 2014, motion was seconded by Martha Tarrant and unanimously approved.

Mark Grisham is leaving the state for a new job. Confirmation will be made. Please submit names of potential new commissioners. Terms are 4 years long. The Chairmanship is vacant at this time.

EQC has been involved with Lee's Lane Landfill, Black Leaf neighborhood and Bluegrass Pipeline, this is vital. This occurred when the Commission was in danger of being defunded.

EQC historically was involved with regulation development and educational outreach. The commission is a conduit for the public to address their issues.

Coleman: That's what impressed me about our pipeline work. People were upset. The company took smart move and brought troops to present facts to the Environmental Quality Commission. We can argue whether the facts were correct or not but they saw EQC as a legitimate forum in the state.

Figure out where our new niche is. Demonstrate our worth. Address monetary loss, environmental degradation.

We would be wise to put a capsule on the end of this and take a position. If we wish to recommend an oversight siting committee; we should take a stance to present the information to the General Assembly as our recommendation. Legislators will see that's the purpose EQC serves--to gather people from industry and then make an EQC recommendation.

We must be rational and science-based with valid information, not sound bites on insurance, safety, clean-up. Focus on an end product and make position known.

Smith: Must take into consideration the impact of what we're doing. Not clear on FERC's role, standards for interstate lines. We don't want Kentucky construction not to fit all involved i.e. Tennessee. What's the role of FERC on interstate pipeline? What's the role of the Public Service Commission in intrastate pipeline that comes from Ohio River to airport with jet fuel? Is that theirs?

Must understand relationships. What agencies are responsible for and what's missing. EQC need not be an expert.

Coleman: To me it seems the missing link in Kentucky. Ohio offers an example. How that siting committee is composed and their mission and expertise. As a recommendation to Secretary and Governor, Kentucky should consider something of this nature that would review projects of this magnitude to help alleviate appropriate standards. It should have soil scientists, geologists, whatever-- a body that can address a complex project. The pipeline will be back. The PSC siting board should be bigger with water and air. There is a new task force on oil and gas to study supply lines, well construction, fracking, new technology, regulatory role and permitting structure. There is discussion between oil and gas and PSC about who governs what lines. In Ohio review, they said any pipe 19 inches or more in width and 500 feet long comes in our jurisdiction period no matter what it carries.

How do they interact? The review committee is made up of all various groups of product delivered--oil, gas, electricity. Others involved with conservation, reclamation purposes.

You may have seen recently in Mason and Fleming counties, officials are discussing wind turbines. They put in local ordinances because there is nothing at the state level; local officials told the vendors "we are not interested." It seems like a siting committee could also cover siting of wind turbines or any kind of energy transmission or generation--a review committee could permit that process in the state of Kentucky.

Ohio has had a siting board for pipelines for 40 years and we may want to recommend the same as it seems there is less confrontation between landowners and companies. Tom FitzGerald, KRC, stated the Cabinet was given authority to do so, but has not exercised the authority.

Ohio already has standards on construction, reclamation, location and standards by companies must comply.

Smith. If we pursue, need to understand governmental agency's giving a review of the location of utilities in a broad sense. The Right-of-way is one of the main concerns.

Tarrant: It's very piecemeal now as far as different agencies that have oversight. Nothing ties them together, I like the idea of a comprehensive approach.

Coleman: I would think it would be positive for industry because they are not dealing with individual governmental entities.



Be aware that Secretary of Energy Len Peters has set up a work group to review oil and gas extraction in Kentucky. Fracking will be one of the topics. He asked me to represent EQC, hope to wrap up by fall so recommendations will be ready by the next legislative session. Laws are archaic relevant to some of the new technology. if you have comments on oil and gas production, Steve Hohmann of Dept. of Natural Resources is the chair.

Brunty: Will there be public forums throughout the state?

Coleman: It's internal, but will accept comments.

Smith: A lot of it is to review current regulatory structure for changes.

Brandon Nuttal, Kentucky Geological Survey

Nuttall: Kentucky most needs a publicly accessible verification of how oil and gas wells are constructed. There are various methods.

Fracture stimulation is injecting high-pressure fluids underground to break underground rock. That allows better connection between well bore and reservoir to natural fractures there, and creates surface area for shales—this is important to be able to produce natural gas, and potential liquids, but pathways must be created for oil to be produced.

Permeability is about flow. Water goes through beach sand, but shales resist fluid a billion times more resistance to fluid going through the rock.

Energized liquids are used most, even diesel. Carbon dioxide is a cryogenic frack but it is so expensive that no one uses it.

Hydraulic fracking uses water. In practice, you add chemicals for control. Most fracks are 95% water, but then chemicals are added to keep wells going for years. Chemicals are added to prevent rust, water is to move sand so fracks don't close.

Air is mostly nitrogen. What chemicals are used is proprietary. Per the Department of Transportation, all chemicals must be label it in case there is an emergency. This information can be found on FracFocus.org put out by the Groundwater Protection Council and the Interstate Oil & Gas Compact Commission.

It is a voluntary site, reporting is not required except, 13 states have made reporting mandatory. No Kentucky sites are cited on the website. Reporting is not

mandatory here and Kentucky fracks are almost exclusively nitrogen fracks--95 percent. KRS 353 governs this.

Spill prevention control and counter measures: berms and lined pits etc. required per federal law. Typically, water contamination is from a flaw in well construction. In the film "Gasland," a guy lit tap water from the sink. Earlier, filmmaker made a complaint to the Colorado state government and they determined it was not gas from the shales where they were fracking, but was biogenic. State also determined his well was not constructed properly to isolate his water supply from the dissolved natural gas from some of the other reservoirs so that allowed the gas in.

It is possible that a fracture will go out of the zone you intend. The usual thing is to encounter an old well bore. There is a plugging fund in Kentucky; if you find old wells, state has funding to properly abandon the wells.

Does fracture cause induced seismicity or earthquake?

Fracking will cause earthquakes but it is not likely that it will be felt.

Most times where earthquakes are felt, the problem is associated with disposal wells.

The United States Geological Survey (USGS) and National Research Council has done studies and concluded that injection is safe, and regulated properly to protect freshwater. Durham England University Energy Institute looked at earthquakes involving human activity going back to 1929 to identify causes of man-made induced seismicity. There were research wells, salt mining, waste disposal, geothermal, oil and gas fields, mining and reservoir impoundments such as with Aswan Dam on the Nile River. When the Nile was impounded, it created several large earthquakes.

The Study concluded that fracking can re-activate faults, a well-known problem, but these vulnerable places can be readily detected. Fracking will induce earthquakes in the future, but the technique is not key to causing earthquakes that are big enough to be felt

Therefore, vendors need to:

- Find faults and fractures in the site characterization phase of permitting
- Improve monitoring
- Know rates of what's going in at the surface
- Improve guidelines and best management practices

- Alternate the schedule of injection

With careful design and monitoring, risks can be minimized.

What's happening in Kentucky? It's been happening a long time.

Most recent activity are pure hydraulic fracks—Berea, Lawrence and Greenup, Breckinridge County and New Albany shales--very interesting results there. We have 10,000+ wells fracked in Kentucky since 1980 and most are shale gas wells in Eastern Kentucky. There are 1,600 permitted horizontal wells and 1,500 drilled. Almost all since 2006, 42 horizontal wells were drilled, that is more than all previous years combined.

Kentucky is producing just under 3 million barrels of oil per year, most coming from Eastern Kentucky. The main producing counties are Union, Henderson, Lee and Lawrence.

The Oil and Gas division is our frontline enforcer of regulations and it's underfunded and understaffed for inspections. Kentucky has a very good public records system. Kentucky Geological Survey has data on wells and our interactive maps.

In parts of Eastern Kentucky--Letcher, Pike Harlan and Floyd counties, are thousands of wells. The current spacing regulation is 1,000 feet between wells to protect rights and owners.

These thousands of wells have been producing for between 30 to 80 years--all were explosive or nitrogen fracked. When horizontal wells came along, vendors started laying horizontal laterals between all these old wells. .

EQC: Does EPA still have the Underground Injection Control (UIC) program?

Nuttall: EPA Region 4 still is in charge of UIC Underground Injection Control program. Kentucky has submitted an application for primacy. EPA has not acted on it.

EQC: The reason it's important for us to get a handle on this is that the well concept on fracking for oil and gas will be dwarfed, due to the Administration's idea of carbon capture sequestration. The way to sequestration will be through injection wells. Much research has occurred on where it be put, and how effective it can be in Kentucky.

More discussion is needed. We have pulled together industry and environmental groups to pass legislation on rules. What are rules on injection of carbon dioxide underground in Kentucky? If some of our coal plants are not converted to gas, it is

potentially a way for use. This work group's rule will be instrumental in how that gets done.

Issues of wells and their use will be useful as background for the oil and gas industry and on the sequestration front. This can be used as a building block. Kentucky will produce gas and may see some power plants switch to sequestering carbon dioxide. What does it mean?

As a commission, we need points of reference, ways to get information on these issues. People will want the information.

Nuttall: The oil and gas industry pays severance taxes exactly like coal industry does. I would think there would be a mechanism to allocate some of the severance tax money paid on oil and natural gas to funding an enforcement program. Half goes back to counties and the other half to general fund--trying to recall. The \$25 to 50 million range is not big enough to make up shortfalls in decline of coal revenue, but enough to give some to divisions.

What about reclamation?

Plugging is done under KRS 343 and involves removing every bit of steel and equipment from the bore. Cement plugs are set at specific depths. Inspectors will know the water zones.

EQC: Do you feel bonding fees are enough to protect against bad actors? If there are 50 wells and only \$50,000 bond, plugging and reclamation will cost more than that. The big companies with hundreds of wells will have no problem.

EQC: The cost of getting into the business today eliminates wildcatters. On UIC, we go in and watch them. Most fraud perpetuated today is financial in nature. If a hole is punched in coal, gas is found. When pipes are not installed properly in a coal seam, those gases escape and contaminate.

Nuttall: In many cases, the coal itself is the aquifer where good fresh water is. The coal bed methane, must ventilate, it will dissolve in the water.

EQC: People think drilling is shallow, think everything on top of each other. There are issues with concrete in Eastern Kentucky--ingredients and integrity. It all gets back to enforcement. There is now a perception that nobody is watching over vendors who are in and out in 5 days, infrastructure is left behind. The Division of Water says they have no money for litigation.

Nuttall: The division of Oil and Gas has no enforcement power, all they can do is forfeit someone's bond to operate.

Tim Joice: A USGS study revealed in the last six months in Oklahoma, many underground injection wells caused earthquake of 5.0?

Nuttall: They knew about the faults when they were injecting them. We must be careful about site characterization.

A British study compared 2 things. It looked at the range in magnitude of all various types of induced seismic events. They found events directly related to hydraulic fracking but all were less than 4.0. There are 79 events in the U.S., U.K. and Canada. If less than 3 on Richter scale, it won't be felt. It was 5.2 in Southern Illinois. It was felt, but no damage. Tilt meters can be placed out West in flat lands. On a giant frack job tilt can be measured in thousands of an inch.

Worldwide, there are big events from impoundments i.e. creating dams and big events depleting oil and gas reservoirs. We don't have the same kind of reservoirs for that. We see waste disposal creates many more events with much higher effect. It's like a battery, storing energy, must manage injection very carefully.

Jerry Hardt: When do you anticipate development and drilling in Berea and New Albany shales?

Nuttall: If production and price holds up, yes. In Berea shale, they recently started permitting wells in Carter County, that's next. Companies are moving there. Lawrence and Greenup county with Carter in middle. In New Albany, the resource is there but infrastructure is not. You don't have gathering lines, processing and compression that you have in Eastern KY. Drilling there will be a matter of, being able to afford to build 10 miles of gathering line to connect to existing facilities?

Tim Hubbard, Assistant Director, Division of Waste Management

Both Black Leaf and Lee's Lane are high priority for DVM. We have expended a huge amount of money and personnel on these projects, for good reason.

The Black Leaf property on Dixie Highway, Wilson Ave., St. Louis Ave. area of Louisville-- tracts of land of 29 acres. Pesticides were manufactured on its eastern side and most contamination there. Site also was a cooperage making whiskey barrels. Pesticides manufactured there for 40 years from 1920 to 1959, they made a Black Leaf brand pesticide for tobacco. Louisville Industrial Park purchased it in

2001 but is not in use. CSX railroad is close by. Mill Creek power plant within a few miles—so there are many industrial operations around.

We and EPA looked at site in early 1990s, but no samples collected at that time. We conducted re-review and found need for sampling due to 50 years of industrial activity. We worked with EPA in 2010 to collect samples onsite and found 4 or 5 different pesticides—DDE, DDT, Dieldrin elevated levels on site, plus lead, arsenic and PAHs, which are coal tar derivatives.

We collaborated with EPA to sample 76 residential yards on Wilson and St. Louis avenues to north and northwest. Similar results to industrial site, the PAHs could have come from coal burned at the homes—10 properties exceeded EPA levels, the other 66 exceeded state levels.

Maps show concentrations of the various chemicals in the footprint.

After we got data on concentrations and collaboration with EPA, we decided to take action to clean up the chemicals. Had a public meeting, then attempted to access 76 properties. We ended up with access to 68 properties total. Arnita helped with community relations in this regard, going door-to-door even on weekends to help prompt access to several residents who were reluctant to grant access to property.

Clean-up began Aug. 19, 2013. A gadfly tried to convince people that state or EPA would buy people out but that is not true. We were only able to address property directly adjacent to Black Leaf. Others were concerned about storm water contamination so EPA built fences and basins for sediment which they will maintain for a short time. We hope responsible parties will assume that responsibility.

Much time was spent on clean-up, and do not want them and do not want re-contamination. Our scope was to clean up down to one foot in the yard and then sod or seed it. EPA and state government clean-ups were identical using same vendor--CMC of Nicholasville. EPA sampled the air to determine that dust is not an issue, we used a sprinkler system. We provided free vouchers for produce because gardens were disrupted. Division of Forestry made recommendations on trees; we could not follow all specs due to tight spaces.

Hubbard: Heavy equipment, bulldozers and Bobcats used, but there was a lot of hand digging due to tight squeeze. In some cases, we had to dismantle decks and

give homeowner replacement cost. Logistics were tough due to the number of property owners. We had a good vendor, they cleaned up lead in Alabama in a similar case and have experience and equipment. Job was finished in January, 2014.

EPA cleaned 10 properties and disposed of 1,670 tons of soil to landfill costing \$425,000; state government disposed of 7,300 tons of soil at cost of \$1.6 million. Monies come from Hazardous Waste Management Fund. The total cost for EPA and Ky. Department of Environmental Protection is \$2.025 million. Polluters pay into the fund and we use it to clean abandoned sites and fund environmental response team in times of emergency. It comes up for re-authorization in two years.

Responsible parties include Exxon Mobile, Occidental Chemical, (Maxus is the company representing them) Greif Brothers, Diageo and Louisville Industrial Park, LLC is current owner. We met with them last fall, and they agreed to characterize the Black Leaf property. We expect to approve such a plan soon.

Residents want Black Leaf buildings down, especially those that are structurally unsound.

EQC: Is hazardous waste fund adequate for the needs?

Hubbard: Seen assessments drop to \$1.4 million, people are more aware of household hazardous waste. Industry receives exemptions if they burn energy off site. Truthfully, people are recycling more. Fund serves good purpose in sites like Black Leaf and we will seek reimbursement from responsible parties

EQC: This is a great success story.

Hubbard: Lee's Lane Landfill has a long history of 40 years of accepting industrial waste. It is 112 acres, a sand quarry before that, located next to a neighborhood called Riverside Gardens. It accepted waste from Rubbertown. It received attention due to methane leaks causing flash fires in water heaters of homes. Cane Run power plant is a neighbor.

Site has history of trespassing--all-terrain vehicle riders drive there. Not an ideal location for a Superfund site. If there is a risk to human health, it needs to be addressed, one small portion of it is capped. When fires occurred, 7 homes evacuated and purchased by the city. Several hundred drums located along rivers

were emptied and reburied on the site. State government installed the current gas collection system and EPA has installed air monitoring stations since. Other clean-up activities were in late 1980s and agreements were reached in 1991 among EPA and state. For 29 years, MSD (Metropolitan Sewer District) was responsible. At this point MSD feels they are finished with their commitment. EPA has not made a ruling on that.

EQC: Those PRP agreements were some of the first of their kind, the language is not nearly as strong as it would be today.

Hubbard: It's cash out settlement--it's something we would not sign onto now because it puts us on the hook and we don't have the funding. We hope responsible parties will step up. EPA deleted the site from the National Priorities List in 1996. State government was concerned at the time. EPA has done a 5-year review. Trespassers were cited. ATV trail with flags exist there, an elaborate system. On a landfill, you must keep a cap on the waste--otherwise drums could be exposed. People look for scrap metal. There is a walking trail there even though it's fenced. Warning signs disappear.

EQC: Hunting also occurs there.

Hubbard: The original gas collection system was designed with a flare, but a flare was never installed. Therefore, it was not operated as it should have been. We discussed with Arnita and former neighbor named John House back in 2011 and collected soil samples in 28 locations in April 2013. Found samples above-industrial levels in three locations. We found need for additional groundwater data as the wells were in poor shape due to silt. We put in 5 nested wells this year. EPA did soil gas survey and found 7 volatile organics above risk levels - benzene, butadiene, vinyl chloride, etc. so EPA will do additional soil gas surveys among neighbors in Riverside Gardens to determine ongoing exposure.

Arnita and others propose a cap on the site and are discussing potential reuses. We look forward to taking property and make something good out of it in a way that will still be protective. We want to get it cleaned up and made safe.

Gadson: The owner wants to get rid of it to anyone who will take it. There are liens, this is a challenge for potential buyer.

Hubbard: Many people think an old site like this should be fenced off and access denied. But there are things you can do, repurposing is done all over the country.

Gadson: Once we receive geological test to see what that site can hold, i.e. a parking lot, there is a ferry vendor who would take customers to Horseshoe Casino. Casino wants to know what they would have to do on the Indiana side.

EQC: I've been out there when there were 20 or 30 dirt bikes and 4-wheelers there. Anything done? A liability issue, hunters with access. At one time, police refused to answer calls there.

Hubbard: To keep them off, we'd consider anything.

Hubbard: There are hundreds of responsible parties. On conference calls, they cordially listened. EPA has since sent letters to them. EPA will next set guidelines for tasks for them--soil gas surveys etc. that expand on our work. In the past, attorneys structured contracts to reduce the their liability.

Gadson: City would be excited if someone else took the lead. I recommended that the city take ownership through the Land Bank which would eliminate the liens. But they feel it makes them totally liable--it would give them an incentive to work with EPA and state government?

EQC: How many similar landfills do we have out there that could be impacting adjacent neighborhoods?

Hubbard: Over 600 landfills predate 1992. They are technically solid waste and never met 1992 regulations regarding liners so they had to close. Many were owned and operated by cities and counties. We have a program to close them and do groundwater monitoring regarding leachate. So far, none affecting homes, but maybe we have just been lucky.

Lee's Lane Landfill predates CERCLA and RCRA laws.

Steve Remen, Executive Vice President, groSolar

Placing a solar installation on a landfill is very common in the Northeast. We will provide overview of economic benefits of repurposing brownfields with a solar installation and our business specializes in this niche. Due to a tenure of 15 years, we are a senior citizen in the field and do projects across the U.S. Our goal is to reuse parcels that are fallow.

In New York and throughout New England, solar is seeing incredible growth because of tax benefits from the federal government. A city government or non-

profit cannot take advantage of the tax benefit, but we have parties who want the benefits and provide tax equity; they contribute to the project in order to get the benefit. Therefore, the projects are set up with third-party owners. We provide a total solution i.e. site feasibility, design and construction and built with no capital cost.

Examples:

- Solar on top of wastewater treatment plant in Camden, N.J.
- Solar on top of petrochemical in Indiana in an urban industrial area
- Solar on top of Amish farm field in Pennsylvania whose owner will return to farming one day.

Project can have permanent structures or non-permanent. At Clean Harbors Landfill in N.J., nothing penetrates soil on this capped landfill. It is a beneficial use of land that has no other development potential. We maintain all and capture the landfill's gas.

Ryan Marlborough, Business Development, groSolar

Our proposal for Lee's Lane: We would use half of its 112 acres depending on topography. EPA thinks it would be a good site for solar and we agree. Design considerations: load bearing, settling, system built in sections, storm water management, gas collection and ventilation.

There are 600 landfills in Kentucky and none with solar installations at this time.

EQC: Megawatts of production—output not consistent with size of project?

Remen: Rule of thumb on solar production is 5 acres per megawatt.

EQC: What is the business model? Locate site, get investors, and pick up tax credits. Do you own the production of the energy?

Remen: We started business with construction. When tax benefits evolved, we got involved in financing. We look at potential of ownership. We make money on design, construction, operation and maintenance of the structure. We hope settling has already occurred and therefore target older properties. We don't penetrate the cap but use a ballast block. Geotechnical analysis determines if cap is stable and can bear the load. There is no permanent impact on cap. Solar does not impact groundwater.

The benefits are that it generates clean energy from fallow land, provides local jobs, sustainability and you can add to curriculum at local school.

We'd have to sell power to local utility or it will have to be used onsite. Some states encourage net metering but that doesn't exist here. Municipalities cannot amortize the tax benefits.

EQC: KU and LGE--their incentives for buy back are not good compared to elsewhere in the U.S. Does that affect viability?

Remen: Yes, we would ask LGE to be involved, to turn liability into a benefit. They would have to be part and parcel to make it viable. We have not done calculation due to the fact that Lee's Lane is not totally capped. We must know geotech status there before we can calculate cost. Economies of scale, we'd like to maximize size. We can be competitive with current price of power.

LGE is building a large natural gas combined cycle facility and we can compete with that type of technology and cost. We produce power when sun's out and that is when it is most expensive during peak periods.

Factors here/Kentucky Market Overview:

1. Net metering limited to 30kW here
2. We need 10 megawatt potential to occupy 50 acres.

LGE building 640 megawatt, so this is small by comparison. The facility would be fenced and we monitor it remotely.

Next steps:

1. Schedule meeting with Louisville Gas & Electric to discuss project and power purchase opportunity
2. Following meeting with LG&E, groSolar will conduct further site analysis, pricin
3. g

EQC: What is the minimum size or scale needed?

Remen: We try to provide power at a price that is competitive. In order to get there, we must have at least 5 acres but bigger is better.

EQC: What you would install today would be laughable in 5 years due to fast improvements in solar. Do your agreements anticipate replacement of panels for more power generation?

Remen: Solar is undergoing steady efficiency improvements. Owner must decide whether to replace panels, but once it's up and running, just let it generate power.

EQC: About the lease, how long does the agreement run?

Remen: 20 to 25 years with option to extend.

Gadson: What can you do for the city, rates are good for 100 years?

Remen: We are the only technology in which I can sell power today at 6 cents per kilowatt and price will remain stable. That's a huge advantage particularly in an environment where coal plants are pressured to close. Also, the owner of the landfill gets a lease payment--recurring revenue.

EQC: Reclaiming landfills, what about coal mines of hundreds of acres?

Marlborough: A study said if you used one fifth of the abandoned mine lands you could power all of Kentucky's energy needs.

EQC: Due to mountaintop removal, it is flat now in many counties. Hal Rogers has created a development zone and that may mean additional tax credit. It's an ideal time. Does power generated go back to the entity?

Andrew Melnykovich, Director of Communications, Public Service Commission

Like all regulatory agencies, PSC is a creature of statute. We can only do what legislature allows and no more. We cannot go beyond regarding solar development. To change parameters that are an impediment to solar development will likely involve changing legislation at the state level. Except for municipalities and TVA cooperatives, retail electric service is under the jurisdiction of PSC.

PSC was created in 1934 with jurisdiction over municipalities, and then taken away 2 years later in 1936. We have had no jurisdiction over TVA coops since a court case in 1980s.

Jurisdiction means how rates and service are regulated--how much paid per kilowatt hour and broadly interpreted, terms of service means safety. Since 1972 in Kentucky, retail electric suppliers have had exclusive rights to provide service within certified territories. They are legislated monopolies within their territories. Kentucky currently has no rules that apply to solar power because all fuels compete on a level playing field under Kentucky law.

If a utility wants to acquire generating capacity either through purchase, lease, or construction, in order to buy power under contract they must come to PSC to get a Certificate of Public Convenience and Necessity and must demonstrate that their power generating capacity acquisition is the least cost reasonable option available to them.

Solar power must compete on cost basis against natural gas, coal and all else in marketplace.

The only exception so far has been biomass--allowing Kentucky Power to purchase power from a proposed plant in Perry County took an act of the legislature. It was a specific act to apply to that facility.

Utilities are required to offer net metering to customers--the system capacity maximum is 30 kilowatts, which is a residential rooftop array. The excess power is carried forward to the next billing cycle; homeowners cannot generate cash doing it. If you sell the property or shut down solar array, any accumulated credits vaporize.

It is strictly net metering. When generating power, it runs backwards, when buying power it runs forward. At the end of the billing period, it's forward or backward from where it started.

We have small generator qualifying facility rules which are the same as the Federal Energy Regulatory Commission rules. These apply to co-generators and small power facilities.

Co-generators operate with an industrial facility that produces a waste stream. Upper capacity limit is 80 megawatts and 75% must come from renewables--biomass or waste.

We have 2 co-generating facilities in Kentucky. They are paper mills that generate something called black liquor, which is a water-based product with organics. If selling it back to the utility, they are allowed utility interconnection up to a point. Any expense beyond that is borne by the co-generator.

If the utility buys that power, they are subject to the same least cost test as anyone else. The rules apply to wholesale power producers--if just selling onto the grid instead of selling to a utility.

If just selling into a regional transmission grid, you are not regulated by the PSC. But if they are going to build a facility greater than 10 megawatts, it must get



permission from the Kentucky State Board on Electric Transmission Siting. It looks at factors not in the environmental permitting process, like visual impact, noise, etc.

When the law passed in 2004, it was anticipated it would be coal burning at that time. The law was recently amended to make sure it applies to large-scale wind development, aggregate capacity of wind. Co-generation (combined heat and power facilities or industrial) facilities under 150 megawatts are exempted from the statute also.

Energy Secretary Len Peters asked for advisory legal opinion 2 years ago, scenarios with solar:

Scenario #1

Developer comes and leases solar arrays to residential and commercial customers. Lease rate based on capacity of array rather than the amount of power it generates. It contemplates interconnection to the distribution system and net metering by the customer directly or through equipment vendor.

Regulatory implications: It's not a violation of service territory rights. They are not a utility subject to PSC regulation although if it became a large phenomenon, it might raise questions. It's a fuzzy area. It is not entitled to net metering per statute. However the utility would have the option if they wanted, to rewrite its tariff, come to the PSC for approval of same if it found this would accomplish its net metering goals. A Developer is not qualified for net metering as it would have to be to the customers' benefit.

Scenario #2

Developer erects solar arrays on customer's property, customer then buys power from the developer and customer plans to buy the solar equipment. Since the developer is selling power at retail, they are in violation of the territorial act, future purchase plans notwithstanding.

For systems under 30kw, the customer is ineligible for net metering due to ownership--a gray area. The developer would be unlikely to qualify for net metering. If the system is above 30kw, the developer could then qualify for interconnection but then you are falling under small generator provisions and must deal with that.

Scenario #3

Developer constructs a large centralized solar array with intent to provide electricity to multiple customers, who can buy panels, kilowatt capacity or electricity by kilowatt hour.

Regulatory implications are that the purchase of panels would not violate exclusive territory rights because it would be similar to the lease in Scenario #1 where customer owns or leases panel so he is not operating as a utility. However, if you purchase capacity or quantities of electricity then you are in violation of the territorial act.

Sale of panels would not trigger PSC jurisdiction, but the sale of capacity or electricity on a metered rate would trigger PSC jurisdiction under current law. The utility would not be obligated to provide net metering to customers purchasing the panels because it's not on their premises.

There are permutations, but it's restrictive now.

What if developer constructs combined heat and power system at an industrial facility to sell it both power and thermal heat? There is no ruling on whether retail power to a single customer constitutes a violation of territorial act. Staff legal opinion would likely be that it would be a violation.

We have no renewable standards portfolio or any kind of renewable requirement in Kentucky. It's still the least cost rule that applies to virtually every piece of power generated in the state.

A case is pending before us now--LGE and KU want to build a second combined cycle gas facility in Muhlenberg County next to the coal-fired Green River plant that is scheduled to shut down.

In conjunction with that, they have applied to build a 20 megawatt solar facility. This is new. First time we have been asked to consider whether or not a solar facility of that size built by a utility will meet the least cost test. The only other renewable case like that we've had was a number of years ago, both Kentucky Power Company and LGE/KU wanted to buy wind under contract.

Kentucky Power was going to purchase from West Virginia and LGE and KU were going to purchase from Indiana. Kentucky Power was denied on 2-1 vote on the basis that it did not qualify under the least cost standard.

So LGE/KU withdrew their application. That has been the only time in which a major renewable project was subjected to the least cost test by the commission other than the biomass plant which had the legislative exemption.

EQC: PSC looks to General Assembly for the authority to do something different than what they are doing now?

Melnykovych: That's right. The argument raised in the wind power case was: If you look at life cycle costs, wind power looks competitive 20 years out. Without crystal ball, it's hard to know whether the argument will be correct. What happens in Washington may change least cost analysis. Some will play out in the regulatory arena but you are right, it will take legislation or a federal mandate to states.

Gadson: So PSC never takes the lead?

Melnykovych: We discuss things with the legislature but don't go public with it. Our role is not to advocate policy. Demand side management does not allow PSC to require utilities to engage in demand side management. It must be at the initiation of the utility.

In all our cases in the last three years, we encourage utilities to do more demand side management. Read between the lines to know our position. We are not a policy making body like the Cabinet.

EQC: Created by legislature, that's how you must carry it out.

Melnykovych: When legislature asks questions, we answer. We are a quasi-judicial agency. All proceedings take place under oath. When a judge dislikes a law, law doesn't change but opinion can reveal thoughts about legislation. PSC has stated that some laws need to change to provide for better regulation but it's up to the legislature.

EQC: Even if 2 commissioners want to do something different, that session of the legislature can change it anyway.

Melnykovych: Commissioners are appointed by Governor and confirmed by the Senate. All we do, because we are a quasi-judicial agency, must withstand legal review, must be OK in court. Sometimes we win at the appellate level, sometimes not. We're in court now on biomass and that may not be the end of it.

Two other matters:



1) PSC has nothing to do with natural gas liquids (NGL). Safety is under regulation of Pipeline Hazardous Materials Safety Administration (PHMSA) in federal government. No pre-approval is required from FERC for siting NGL pipelines unless they are converting an interstate natural gas transmission line to carry NGLs.

2)

FERC must approve, because it is taking natural gas capacity out of the system. There is no state siting requirement at present but any bill would have mirrored the process of siting carbon dioxide pipelines.

Currently, NGL pipelines have no legal status in Kentucky. They are certainly not utilities, therefore do not enjoy right of eminent domain. That matter will be litigated.

3) What if FCC decides that broadband is a common carrier?

4)

There is a discussion of net neutrality in D.C. now. The answer is it depends on how FCC words the decision. In any case, retail service in Kentucky will remain deregulated as it has been since 2004 after legislature removed broadband from PSC jurisdiction. If FCC pursues, it would affect interconnectivity between providers. It would operate at the wholesale level, not retail.

EQC: PSC governs intrastate pipelines? Some jurisdiction?

Melnykovych: We do over intrastate natural gas transmission. That's all. We regulate rates, service and safety of those. We used to regulate intrastate liquid pipelines for safety only, but relinquished to PHMSA because there were only 2 in the state and it was not worth the expense of an inspector.

Gadson: The only way to get solar is that LGE must ask for it?

Melnykovych: The law would contemplate a number of avenues. Vendor could offer to build it and sell it to the grid. In that case, through PSC, other than siting aspect, via siting board. The siting board has 7 seven members, 3 members of PSC, Secretary of Energy Cabinet or designee, Secretary of Economic Development Cabinet, or designee, and 2 ad hoc members appointed for a specific case from the county in which the facility is located.

If a vendor said it would build a 25 megawatt solar array on Lee's Lane landfill and sell it to the grid, there would be 2 members from Jefferson County to serve on the siting board to serve for that case only, plus the 5 permanent members. If met

all criteria, siting board could grant the certificate then the issue becomes: Can you get an interconnection agreement with the service transmission provider, i.e. LGE, who serves that area?

To come in as an independent power producer, would need agreement from LGE to transmit and make it viable. If LGE agreed to buy power from it, they need permission from PSC to purchase it.

Under either scenario, buying power or building facility, must meet the least cost test.

Two things can happen to allow solar to be more competitive:

- Change legislation to require renewable portfolio standard or give price break to solar
- Price of renewables comes down to match coal or natural gas
-

EQC: LGE would have to determine if it is interested in being a player. It's a Rubic's Cube—look at statues, try to align, figure out with PSC and others what will work, what has been missed. It's easier to get one project approved. Many utilities try to do interesting things i.e. East Kentucky Power subsidiary, on energy efficiency and demand side management. It's interesting to see how they think and how to bring before PSC.

Melnykovych: PSC encourages demand side management proposals and has encouraged them. LGE is very aggressive on this, shaving 10s of megawatts of load off with some programs. Small projects don't move the needle on rates so they get approved. Look at East Kentucky Power's landfill gas projects, where they are pulling off fuel. You only need a diesel generator on a pad to burn the landfill gas, so cheap power gets approved. Legislatively, there are many ways to skin a cat—took 3 tries to get biomass through. Discussion of renewable portfolio in Kentucky hasn't gotten very far.

EQC: It was very time consuming and painful on biomass plant group. End users are saying--no matter what anyone says, this impacts my rates.

Melnykovych: The question is how much discretion does PSC have? Did PSC abuse its authority in permitting the facility given what the price will be? It will set a precedent.

EQC: It may go all the way to the Supreme Court. Can we not argue that the local economy benefits? All the timber operators tanked and the quality of timber now in

Eastern Kentucky is low. Hardwoods are not there on yield of woody mass, excited biomass.

Melnykovych: That will be a key issue in the court case--an issue raised in challenging the decision. Opponents brought in an economic expert who said that the economic benefits to timber industry are outweighed by resulting rate hike. It's an 80 megawatt facility and the project rate impact is a 5 to 6 percent rate.

Kentucky Power just bought half of a coal-fired power plant in West Virginia to replace the plant shutting down in Lawrence County. The rate impact of the purchase is about twice as much, though it's a 550 megawatt purpose. The crux of the argument: How did PSC apply least cost standard?

Melnykovych: We're in court on both situations—biomass purchase and coal-fired plant.

EQC: Is wind power under the siting board?

Melnykovych: Yes, the siting board law was just modified to look at aggregate capacity of wind.

EQC: About Bluegrass Pipeline--other states are experiencing this explosion in Natural Gas Liquids and they have siting boards. How do you see that going here?

Melnykovych: We don't know; legislature did not wish to tackle. There is nothing in statutes now to address NGL lines under any way, shape or form. We have no jurisdiction over them so they fall under local planning and zoning. Siting board statute originally designed to apply only to electric generating facilities and electric transmission lines that were independent power producers. When the law passed in 2004, there were 5 or 6 applications made to the siting board—all for coal-based facilities of one kind or the other.

Two were to use coal wastes or process plant sludges i.e. dig it out of a lagoon to reburn. Some were merchant power coal plants. One was to convert garbage from New York City to syngas to burn in Clark County and that was converted to a project to convert coal into syngas.

Siting board approved all but the syngas project. Not one was built other than one due to a fluke in the law, 75 percent owned by LGE and being built for the utility--25 percent owned by Indiana and Illinois municipal power agencies, and since they

own it and it's selling to cities out of state, it fell under siting board law. As a fluke, we had to approve that 25 percent of a plant that LGE was going to build anyway.

History of these projects - not successful to this point, all coal-based to this point. The law revised to include "electric generating facilities" no matter what you were using as a fuel.

A law later amended to give the siting board jurisdiction over CO2 pipelines to try to make it possible if someone wanted to build a carbon capture facility at a coal plant that was going to capture CO2 to move it to an oil field for enhanced oil recovery, there would be a process in place to get that pipeline sited. It was revised again for a windpower issue to respond to a Mason County matter of 2 vendors coming in with no clear process to site the facility.

It raises the issue of even if you have siting board approval, you do not have the right of eminent domain to get to the grid.

Lee Anne Devine, Chief, U.S. Army Corps of Engineers South Regulatory Branch

Devine: We cover 2 opposite ends of the world: Our missions are to try to protect our waters for children and protect development for the purpose of commerce and jobs and to be fair and balanced in our decisions.

Lake Cumberland is ruled by Nashville but we do the rest of state. We have authority under 2 sections of federal law. The first is Section 10 of Rivers and Harbors Act of 1899. It gave the Corps the authority to regulate waters. The second is Section 404 of the Clean Water Act of 1972.

We regulate any structure or work that takes place in, under or over a navigable water. We maintain navigation on Kentucky's many navigable rivers, i.e. Kentucky River, Ohio River, Green River. These are used in commerce. We protect the commerce clause of the Constitution. Daniel Boone on a boat is the image and some rivers we don't think are navigable really are.

Section 404 is to regulate the discharge of dredge or fill material in the waters of the United States, including wetlands. We regulate placement of material, into waters, not removal. Material is anything that changes the bottom geometry of a water—rock, sand, soil, dams, berms, concrete, culverts, rip-rap, sewer lines.

Waters of the United States are defined as:

- Traditional navigable water
- Interstate waters and interstate wetlands
- Other waters including intrastate, non-navigable waters with interstate/foreign commerce connections
- Impoundments of waters otherwise defined as waters of the U.S.—a lake
- Tributaries of the above
- Territorial seas
- Adjacent wetlands

Farmers get special treatment when it comes to farm ponds etc. If just a bowl filled with water, it's not waters of the United States. It's isolated water.

If you must dam a creek to make the pond, it's waters of the U.S.

Kentucky has more linear streams than any other state except Alaska due to mountain streams, etc. There must be a commerce connection in order to take in these waters.

Macro invertebrates are creatures that shred up leaves, that goes to the next tributary, and fish eat that and go to next water down to Gulf of Mexico. It's the circle of life. You can't fill up all those ephemeral streams and maintain good water quality downstream, according to science.

Limits of jurisdiction:

- Non-tidal streams—determine Ordinary High Water Mark
- Wetlands—determine jurisdiction and boundary using Corps of Engineers 1987 Wetland Delineation Manual and Regional supplements
-

Criteria are:

- Hydric soils
- Hydrology
- Wetland vegetation
-

In any tributary or stream you can see an ordinary high water (OHW) elevation. Below that is what we regulate. Above it is beyond our jurisdiction. When you see shelving that is the marker line. You need a permit to place fill material below it.

EQC: Who regulates floodplain?

Devine: In Jefferson County, it's MSD. If you have wetlands in the floodplain, we regulate those. We have a 1987 manual regarding criteria. Is it an isolated wetland

or part of tributary system? If talking about farming and the Food Security Act, it's complicated. New rules are out.

1. Perennial streams has water all year round i.e. big rivers such as Ohio River
2. Intermittent streams flow certain times of year and have a groundwater connect
3. Ephemeral streams pop up after a storm and the water flows only for a short time
- 4.

To avoid and minimize impacts to waters of the U.S. We require the least environmentally damaging possible solution; this may require moving a building, parking lot, etc.

If there is a finding of no regulatory impact, then you don't have to pursue an environmental impact statement (EIS). We hardly ever do an EIS, roughly 2 in my 22 years.

EQC: Would Bluegrass Pipeline have prompted an EIS?

Devine: Probably not due to the fact that what they were doing would have been a temporary impact to waters/crossings, not permanent. It takes 120 days for a non-controversial project to be permitted but most applications are incomplete. Our jurisdiction is the footprint of crossings not all the upland stuff. On NGL pipelines, FERC is out of it because it is not an energy project. It falls into a black hole, no one is regulating the whole thing. They intended to bore under a lot of creeks in order to avoid discharge.

Our form is the ENG Form 4345. We serve large contractors and Mom and Pop with small projects. An engineer is not obligatory.

Corps has 3 kinds of permitting procedures:

1. Individual Permits—IPs. These are big impact projects i.e. coal mining. We make sure it is the least environmentally damaging alternative (LEDPA). A public notice goes out to notify federal and state agencies and the neighbors so they can comment within 30 days. Environmental Assessment required.
2. Letters of Permission—LOPs

Letters of permission (LOP) are an abbreviated version of the process. It's common for the Department of Transportation to use. People who wish to put a boat dock on the Ohio River use it too, for example. There are 3 kinds of letters:

- Section 10 Activities

- Transportation LOP for roads
- Mitigation LOP

3. General Permits:

- Regional General Permits (RGPs)
- Nationwide Permits (NWPs)

General Permits—expires in 5 years

Regional permits, are issued by a District for specific activity in a particular region or area that would result in a minimal impact to the aquatic environment (e.g. RGP in Indiana; boat docks all navigable waters)

Nationwide Permits—50

Permit issued for certain specified activities nationwide that would have minimal impact on the aquatic environment—current ones expire 3/18/17. They are good anywhere in the U.S. For subdivisions, coal mining, road crossings, maintenance of structures, riverbank stabilization. If you can follow specs of a nationwide permit, then can go ahead with your project but it must be of minimal impact at the moment, and cumulatively, on the aquatic environment. We don't have time to inspect all small projects but all who write to us get their contract returned. We must follow other federal laws like Section 7 of Endangered Species Act to protect bats and Buffalo Clover, mussels. Also Section 106 of the National Historic Preservation Act which protects many buildings over 50 years old and archeological sites.

There are choices in our decision making:

- Authorize as proposed
- Deny as proposed, not in the public interest
- Issue with Special Conditions to ensure in the public interest

Special Conditions:

- Mitigation to offset adverse impacts to the aquatic environment
- Limit tree clearing
- Hours of operation (can limit to daylight)
- Comply with MOA

In lieu fee, it equals money for streams. If filling in a perennial stream, they can purchase credits from Fish & Wildlife in state government to build a stream elsewhere--improves lands for all.

- Mitigation bank
- In Lieu Fee
- On-Site mitigation
- Off-Site mitigation

The cost of a permit is \$100.00 but getting studies done, etc. can be costly. There is an appeal process, but appeals are rare.

Non-compliance:

When there is non-compliance with a permit, we send a letter regarding corrective actions, cease operations. We can delay processing new applications until the problem is resolved. No further release of credits (mitigation sites). The last step is to involve the Department of Justice, but that's rare.

Enforcement:

What happens when work is performed prior to authorization?

- Cease and Desist (C&D)
- Voluntary Restoration—remove structures or vessels, remove dredged/fill material
- ATF permit with tolling agreement
- Flagrant and/or repeat violator—U.S. EPA possible penalties

Website:

www.lrl.usace.army.mil

Gadson: What kind of permit would we need for ferry parking lot on Lee's Land landfill to serve casino across the river?

Devine: For a dock

If discharging material into the Ohio River, will need a 404 permit. If we're looking at uplands, are there any streams or wetlands up there? They would have to apply for an individual permit to protect navigation

The Corps is very involved with Green River and de-commissioning structures there, great partners. There is a new rule with NRCS

EQC discussion

Following are the “things to do list” resulting from discussion on Friday the 6th. This included the input from discussion on Thursday.

- Recommend an official oversight committee or give teeth to one that is present to help alleviate discrepancies, or, structure an oversight board to develop standards for projects such as the Bluegrass Pipeline. (Using the Ohio standards and efforts as a template). Fitzgerald stated in the public meeting, the state already has this power. I will revisit the meeting minutes and talk to Tom.
- To follow up with DOF to find out the legal weakness and/or need, to give substance for forward movement on legalizing the timber theft resolution
- Work with LRC/Secretary to update and revise EQC mandate and statute to help put us in a better position when funding comes around again
- Bring together the Louisville delegation on solar support to provide legislative support for change, projects such as the Lees Lane Landfill. It appears from the presentation by Andy, we need permission from someone to move forward on allowing the site to be used as a solar panel project. I talked with groSolar after the meeting asking if they had experienced this block before and they informed me they only have to work in partnership with the Utility to make this happen. Next step set up the meeting.
- Have an EJ conference – this was discussed at last annual meeting, however with cuts looming everywhere from both federal and state, it was never pushed very hard Steve Holhmann and Bruce Scott have expressed their support. We would be working with EPA Region 4.
- To become more inclusive in the Land, Air and Water publication other than announcing Earth Day winners (We were told they don’t want things like EJ or anything that would “show” give a negative slant toward the cabinet.
- More discussion on Climate Change, and legislation to open Kentucky’s Alternative Energy Sources for power generations
- Biennial Report catch-up
- Continue EQC publication update
- Continue Black Leaf work
- Continue Lees Lane work
- Think about Nominations for Chair.

At 11:45 a.m. Ron Brunty made a motion to adjourn the meeting and Tom Herman seconded and the motion was approved unanimously.

THESE ACTIONS, ALONG WITH THE AGENDA ITEMS, MAKE UP THE OFFICIAL MINUTES, WHICH ARE ON FILE IN THE OFFICE OF THE SECRETARY

Signed by:

Mark Grisham, Chairman

Date:
