FAST FRIENDS: WVDEP & FOC LAUNCH PARTNERSHIP PROJECT  

Owen Mulkeen

On April 1 of this year, Friends of the Cheat executed an exciting new partnership with the West Virginia Department of Environmental Protection (WVDEP); the Office of Special Reclamation (OSR), a division of Land Restoration, has granted FOC a two-year agreement to monitor and adjust water treatment facilities in the Cheat River Basin. The project dedicates a team of technicians solely to water quality monitoring. FOC has hired four new employees, doubling the former staff, to take on this large job. Project Manager Owen Mulkeen sheds light on the undertaking:

This summer I came on board as Project Manager, in which capacity I will oversee the project and work with the team of technicians—Chris Bern, Jeremy Sidebottom, and Garrett Thompson—to maintain compliant discharges at OSR sites. Together we bring a tremendous amount of motivation and experience to the project: Chris, an expert carpenter, has a background in natural resources; Jeremy has studied natural resources, wildlife technology, and ethnobotany, and worked as an interpretive naturalist; Garrett has a background in sustainable development, environmental studies, and geology; and I bring specific water treatment experience to FOC from my time at OSR as an environmental technician. I am a native of greater Morgantown, Chris and Jeremy are natives of the Tunnelton area, and Garrett migrated from Virginia to call the Cheat home; we are all personally moved and motivated by the threats to water-quality—and thus quality of life—in our backyard. Our team is out in the field physically turning the knobs that treat AMD pollution. Meanwhile, back at the office, the new contingent of FOC staff has been dubbed “The Left Side,” as three quarters of us are left-handed, and our office lives on the left side of FOC’s space. Like our brethren on the right side, the “left side” is full of outdoor-rec junkies who spare no chance to boat, fish, swim, bike, and hike in the local area. Be on the lookout for us as we all continue to explore the basin’s waterways and forests.

To better understand the government branch that FOC is working with, a little history lesson is in order. The State of West Virginia mandates OSR to protect public health, safety, and property by reclaiming and treating water on all bond forfeited coal mining permits. Money secured from forfeited bond collections, civil penalties, and the Special Reclamation Tax on mined coal together fund OSR’s efforts and, by extension, the partnership with FOC. FOC will work closely with the OSR office in Phillips, as it is responsible for permits in the north-central portion of West Virginia.

The formation of this new partnership was catalyzed by the 2010 ruling in a lawsuit filed by environmental groups stipulating that WVDEP must apply for National Pollution Discharge Elimination System (NPDES) permits on all of the water treatment sites it owns and operates. A NPDES permit is required of any individual, company, or governmental body discharging wastewater into a navigable waterway; this permit system was set forth by the Clean Water Act of 1972. The recent legal change tasked OSR with the significant work of producing compliant discharges from its treatment facilities. From redesigning and maintaining existing treatment facilities to building brand new facilities, the office must work full force to meet compliance schedule dates. As OSR’s workload increased, they sought a partner to manage compliance these newly permitted sites. FOC was the perfect organization to take on this vital work. With our strong reputation as an adept and

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INTO THE CANYON
NEWSLETTER OF FRIENDS OF THE CHEAT

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For the period August 1, 2013 to November 15, 2013

Stream Steward Eloise M. Milne

Canyon Contributors Anonymous

Narrows Navigators Bliss Bliss Bliss, Kroger, Larry & Mary Pethick, Preston Memorial Hospital

Confluence Crew Alyeska, Inc, Peter Daly, Keith & Kelly Heasley, Dan Henninger, David & Tonya Herron, Dale and Carolyn McVicker, Fred Wright


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- Student & Senior $20
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Complete form below, include check payable to Friends of the Cheat, & snail mail it to at
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FIELD NOTES: WATERSHED BASED PLANNING  Kevin Ryan

The US Environmental Protection Agency (EPA) requires that strategic plans to address water quality impairments be developed before funds allocated by the Federal Clean Water Act can be used for restoration projects. These plans provide a framework for choosing restoration projects, and are referred to as watershed plans, or “Watershed Based Plans”. Plans must address nine key elements which include the identification of pollution sources, a description of management measures (treatment options), and an estimation of available financial assistance.

In 2005, Friends of the Cheat, with help from environmental consultants, Downstream Strategies, submitted a watershed based plan for the lower Cheat watershed to the WV DEP and US EPA. The original plan summarized all known nonpoint source pollution sources within ten selected tributaries in the lower Cheat watershed and outlined treatment cost estimates. The plan allowed FOC to receive funding to implement 15 acid mine drainage treatment systems to date.

However, significant events have occurred since 2005 that affect current restoration strategies. These include WV’s updated list of impaired streams and Total Maximum Daily Loads (TMDLs), the completion of the 2010 census, the results of relevant court decisions such as WV Highlands Conservancy and WV Rivers Coalition vs. Randy Huffman known as the ‘The Keeley Decision’, and recent academic research from ecologists working in the Cheat watershed.

Furthermore, the watershed planning process suggests periodic review of progress and the development of more detailed plans for priority streams, called subwatershed plans. In 2013, almost a decade after the first plan was published, it was clear that the development of subwatershed plans was needed for FOC and its partners to strategically improve water quality with increasingly limited resources.

SOLID WASTE FROM DEEP SHALE GAS EXTRACTION: THE RADIOACTIVE ELEPHANT IN THE ROOM  Amanda Pitzer

In 2011, the Big Sandy watershed was threatened by a proposed “oil field waste landfill.” This facility was the brainchild of a Canadian company looking to serve the rapidly growing gas industry with a 250 acre facility designed specifically for waste streams produced by unconventional natural gas exploration and production. The company courted the Preston County Solid Waste Authority (SWA) for a Certificate of Site Approval and in July 2011 the Preston County SWA voted to not amend their 2009 Siting Plan and to not issue a Certificate of Site Approval. To date, a permit for this facility has not been submitted to the West Virginia Department of Environmental Protection (WVDEP).

So, where is this waste going? The 2011 Horizontal Well Control Act requires waste from unconventional natural gas exploration and production to be put in landfills: “with respect to disposal of cuttings at the well site, all drill cuttings and associated drilling mud generated from horizontal well sites shall be disposed of in an approved solid waste facility.” Currently, solid waste produced by unconventional natural gas exploration and production—for the sake of brevity, fracking—is being disposed of in at least nine municipal West Virginia landfills. WVDEP has coined this waste “special waste,” a subset of solid waste. Other special wastes include petroleum-contaminated soil, asbestos wastes, and sewage sludge. Although this is an improvement from having hundreds of buried storage pits scattered across the state, this practice brings significant concerns. (Note: Storage pits can still be buried on site with landowner permission and clearance from the Cabinet Secretary of the WVDEP). The problems and concerns surrounding this waste divide into three fields: Quality—What is it?; Quantity—How much of it?; and Procedural—What are the rules and are they being followed?

Quality—What is it?

The majority of these solids can be grouped into two categories: drill mud and drill cuttings. Drill mud is a manmade substance used to lubricate the head of the drill. Certain geological formations are harder to drill than others, and shale gas-producing layers, including the Marcellus and Utica formations, are very dense and therefore difficult to drill. The WD-40 of the gas industry, drill muds are made up of a base fluid (water, mineral oil, or a synthetic oil-based compound); weighting agents (most frequently barite, which contains barium); a clay; and a stabilizing organic material such as lignosulfonate or lignite. Besides these components, which are present in the mud to begin with, the fluid [mud] also picks up other constituents that were originally associated with the geology itself. Since the mud flows through the well and comes into contact with the shale and other geological formations, material can dissolve or absorb into the mud fluid and get transported to the surface. Marcellus shale naturally contains salts, metals, and naturally-occurring radioactive materials (NORMs).
A longtime resident of Preston County and advocate for the water-quality issues underpinning sustainable agriculture and local food security, Susan participates in Friends of the Cheat’s restoration efforts as a CAPABLE stream-monitoring volunteer. This fall, Susan has also been donating her time and considerable talents in organizing a Watershed-Foodshed fundraising dinner to benefit the CAPABLE volunteer program and draw attention to the connection between food-source and water-quality concerns.

Q: Who or what do you cite as your biggest influences?
A: PASA, certainly, where I’ve heard The Big Picture speakers, like Vandana Shiva on GMOs, Charles Eisenstein on economic de-growth, and William McDonough on design that accounts for “love for all the beings.” Wendell Berry moves me in his hold on the land and it on him. Rachel Carson, who was dying of cancer and testifying in Congress about DDT, while being defiled by producers of that poison. Closer to home, I greatly admire FOC’s Amanda Pitzer and Downstream Strategies’ Evan Hansen, both on the front lines, every day. It takes a deep well of commitment to go forward like they do, seeing manipulation of laws and words, watching defunding of programs and then witnessing the very real effects degrading the world around us. People like Amanda and Evan are our local heroes and I sleep better for their efforts. Last but not least, I am greatly influenced by my daily walks to our back pond, through the woods, where renewal seeps into my bones by osmosis.

WATERSHED = FOODSHE
Benefit Dinner at Madeleine’s | December 5 at 6pm
Featuring food grown in the Preston County watershed by farmers depending on its healthy land and water. Funds will support the CAPABLE monitoring program, a citizen-scientist initiative equipping volunteers with monitoring tools and technical support to collect water quality data throughout the lower Cheat. To learn more, visit:
www.cheat.org/our-work/mapping-monitoring-program/capable-monitors/
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FOC decided to tackle two of the more challenging subwatersheds in the lower Cheat first: Muddy Creek and Pringle Run. Downstream Strategies of Morgantown will be preparing the updated plans.

After years of implementing passive treatment systems, FOC has recently installed its first active treatment system in the headwaters of Pringle Run. The project doses acid mine drainage with calcium oxide in order to quickly increase the pH of the water and remove pollutants like metals by keeping them in settling ponds.

A different version of active treatment has been employed successfully in the Three Fork Creek watershed in the Tygart drainage just over the ridge from the Pringle Run headwaters. Multiple dosing units were installed by WV DEP's Office of Abandoned Mine Lands to treat water because acid mine drainage was too numerous and too severe to treat passively, and because available space for treatment structures was limited. Fish surveys before and after the dosing started showed an increase of fish populations from a single fish in 2010 to 1,605 in 2012.

Friends of the Cheat is doing a lot of great work in the watershed. No doubt about it. But there is a critical need we are not currently able to fulfill with our existing programming and staff: meaningful environmental education. Some education proponents would surmise that we are treating the symptom—acid mine drainage—and not the illness—poor environmental literacy. Each time I stop at the Pringle Run take-out along the Narrows to pick up Busch Light cans, plastic water bottles, and bait containers I beat my head against the wall trying to understand how someone who visits the river for enjoyment would choose to leave their trash behind. It boils down to stewardship, which is an attitude catalyzed by a variety of experiences, a crucial one being substantive environmental education.

Before joining the FOC team, I was a teacher. But before that I was a daughter and a student. I recall my dad constructing primitive litter grabbers, a dowel rod with a nail on the end, for Earth Day when I was only nine years old. I remember how excited I was to go pick up our very first recycling bins at the landfill. In middle school I dissected frogs and a cat for the science fair. When the chance to monitor streams through my high school's partnership with Allegheny College presented itself in ninth grade, I was one of the first to sign up. Five years later, I was a freshman at Allegheny taking high school groups to the same streams where I collected my first water pennies and stoneflies. These experiences came full circle in 2007 when I was hired by Friends of Deckers Creek to lead their first summer camp, All Hands On Deckers. As the position evolved, the setting and students changed. From the curious and committed members of their Youth Advisory Board to the polite cadets at the Mountaineer Challenge Academy, students were always eager to talk water, pollution, fish, and bugs (especially bugs). I have many wonderful teaching experiences—there's space enough here to mention but a few: I've stood on top of the Continental Divide and spit into the Chesapeake Bay and then the other way to the Mississippi; I've witnessed a heated youth-designed and youth-facilitated mock mountaintop removal public hearing with state-level leaders; and I've cried with a 14-year-old because we couldn't understand how humans could be so short-sighted and destructive.

Friends of the Cheat must continually assess how well we are serving the needs of our community. Quality programming and activities for youth across the watershed are lacking. We are dreaming up big plans for the Festival site's Doug Ferris Outdoor Classroom, including ways we can implement infrastructure to allow for youth summer camps and adult workshops. And as we enter our twentieth year of existence and approach the thirtieth anniversary of the flood of 1985, FOC is seeking to collect creative input and engage stakeholders (that means you!) about how we

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WISH LIST

Mine Rail
Framing Services
Good Fill for Fest Site

Desk and Floor Lamps
Office Furnishings
Volunteers to fold and stuff
FOC mailings
The exact nature and concentration of constituents will depend on local geological conditions and the length of the well. Drill cuttings are chunks of earth removed from the wellbore by the drill. Think about drilling a hole into a piece of wood—the little wood chips that flake out from the drill bit represent the drill cuttings. Miles of earth must be removed for a well to be fracked, and the deepest rock contains NORMs. The drill mud and cuttings come to the surface and are transferred into large bins or dumpsters on the well pad; other solids could include slops and flowback pit precipitate. Well pad workers labor in dangerous proximity of these materials. Landfills in neighboring states have been turning away loads of the radioactive solids.

In addition to naturally-occurring radionuclides (radon, radium 223, and radium 226), this waste may contain BTEX (benzene, toluene, ethylbenzene and xylenes), barium, chlorides, and other proprietary chemicals/compounds found in fracking fluids and waste. Many of these contaminants—identified by the Environmental Protection Agency as carcinogens—are known to be hazardous to human health, and are consequently also deadly to wildlife.

It is unclear if this waste has undergone a complete characterization, which would involve a third party laboratory analyzing samples to determine the concentrations of constituents in the waste and submitting a Waste Characterization Form to the WVDENR. This form includes a question about radioactivity, and the possible responses are simply “yes” or “no.” State law prohibits the disposal of radioactive materials in municipal solid waste landfills. However, West Virginia landfills currently accepting this Special Waste are not required to use sensitive radioactivity detectors to test the waste before it is landfilled. No actual measurements have been made.

When water comes into contact with and percolates through the waste, leachate is produced. Municipal landfills discharge treated leachate in streams and rivers and are required to monitor its contents. Fracking waste can contain a variety of water pollutants, and current landfill water discharge permits do not include discharge limits for all of these pollutants. In 2010, WVDENR issued a memo to the Meadowfill landfill requiring them to test leachate twice a month for over 40 parameters including chloride, benzene, total recoverable selenium and arsenic, hexavalent chromium, gross alpha and beta radiation, total radium 226 and 228, and dichlorobenzenes, to name a few.

Quantity—How much of it?

The amount of solid waste generated by each fracking well varies depending on how deep the vertical shaft is, how many horizontal legs the well has, and how far those horizontal legs extend. Pennsylvania has been tracking tonnages of fracking waste for several years, and between July and December of 2010 (a very busy drilling year in PA) over 198,000 tons of fracking waste was reported to the PADEP. Several of the waste reports show over 15,000 tons from a single well. For comparison purposes, this computes to an average of 33,000 tons per month. The total monthly capacity of the seven West Virginia landfills accepting this waste as of 2011 is 134,780 tons—33,000 tons is over 25% of the total monthly capacity of these facilities. In July of 2013, the Wetzel County landfill took over 25,000 tons of fracking waste, despite being a Class B facility permitted to accept only 9,999 tons of waste per month. In short, this is a huge amount of waste. If the practice continues, these landfills will fill up at a much faster rate than originally anticipated.

Procedural—What are the rules and are they being followed?

West Virginia has pretty good laws regulating the management of solid waste thanks to the so-called Garbage Wars of the 1980s and 90s. At that time the “Garbage Crazies” were furious that vast quantities of out-of-state garbage were being trucked to West Virginia and for-profit super-dumps were being proposed all over the state. This issue united concerned citizens and legislators and new West Virginia solid waste laws were born. The core achievement of the regulation was putting the landfill siting and sizing process into the hands of local citizens through the creation of the Solid Waste Authorities (SWA), required voter referendums, and locally approved tonnage caps. SWAs create Siting Plans which define where landfills can be constructed. In West Virginia, municipal landfills are classified by the amount of tonnage they are permitted to accept each month. Class A landfills are the largest, accepting up to 30,000 tons of waste per month. Class B landfills are the state’s most common and can accept up to 9,999 tons of waste per month. If a facility wishes to expand its tonnage caps, it must gain approval from the local SWA. If a facility wishes to expand to a Class A landfill, affected citizens also have input via referendum vote. Beyond landfill siting and sizing, SWAs have little authority. But the power they do have is crucial. Their siting and sizing decisions are based on the following criteria: effect on economic development; transportation network; impact on property values; groundwater and surface water protection including “taking into consideration wetlands, any surface water, groundwater quality, perennial streams, floodplains, and public or private water supply wells”; geologic and hydrologic conditions; impact on existing aesthetic or environmental conditions; boundaries of any public parks; effect on historical and cultural resources; proximity to airports; present or potential land use for residential, commercial, recreational, environmental, conservation or industrial purposes; and effect on public health, welfare, and convenience.

Procedure & Quality

Certain wastes—construction and demolition waste, and designated Special Wastes including petroleum-contaminated soils, asbestos, and tires—require special landfill features like clay liners, underdrains, and leachate capture systems. These controls are engineered to prevent pollution based on a certain waste’s potential for pollution, an assessment informed by the waste characterization process. As of 2011, the WVDENR could not or would not voluntarily share with FOC any completed Waste Characterization Forms for fracking waste. WVDENR informed FOC that the Waste Characterization Form is submitted by companies delivering waste to the landfill accepting the waste.

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This form is "generally required" for every 300-500 tons of Special Waste. Until the contents and implications of frack- ing waste are understood, we can only hope that the controls utilized in regular municipal landfills are protective of worker health, water quality, and community safety. If the waste is found to be significantly radioactive, our communities will be polluted for hundreds of years to come.

Procedure & Quantity

West Virginia's solid waste laws were designed to put decision-making power into the hands of local citizens and the current Act has worked well. Landfills are planned, designed, and permitted to anticipate West Virginia's waste disposal needs based on projected waste streams. The approval of the current practice of disposing of waste in municipal landfills did not involve the input—or even notification—of local SWAs. Landfills are exceeding their tonnage caps without going through the approval process set forth in state law.

In 2013, West Virginia University's Water Research Institute completed a study mandated by the state legislature on several aspects of the fracking process, including researching radioactivity levels in fracking wastes. The study found that drill cuttings from the vertical section of the drilling did not show excessive radioactivity. However, they did not have access to any samples from the horizontal leg of the wells. Flowback fluids were also tested for radioactivity and results exceeded Safe Drinking Water Act standards with respect to alpha radiation and radium (226 and 228).

The bottom line is that there is still a lot unknown about solid waste from fracking operations. Not only may we be stuck with toxic pollution from this waste for a very long time, but there is going to be a whole hell of a lot of it, and radioactivity is cumulative. Unfortunately, the extraction of gas from the Marcellus and Utica shales is not slowing down to allow for thorough research and decision making. In the meantime, several groups, including the Association of West Virginia Solid Waste Authorities and West Virginia Environmental Council, are looking into these concerns. It is likely that this issue will not be buried—no landfill pun intended—anytime soon.

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and impactful watershed organization and a location central to a large volume of OSR treatment sites, FOC was well positioned to secure the partnership.

System adjustments to active treatment sites constitute the principal work of the project. At these active sites, water is treated by the introduction of chemicals, notably liquid sodium hydroxide (NaOH) and varying types of lime (pulverized, hydrated, pebble). These chemicals boost the low pH of AMD and, from that reaction, the metals (aluminum, iron, and magnesium) present in the water precipitate out, meaning that they physically fall out of the water. After catching these metals in a series of ponds on the site, the water discharged—known as effluent—must be compliant with NPDES standards set forth by the CWA. It will be the technicians' job to actively change the amount of chemical that is added to the treatment process to ensure the maintenance of proper pH levels. The amount of chemical is proportional to the rate of water flowing through the system. Flow rates are subject to change from day to day, depending on rain events, and from season to season. FOC's technicians will develop intimate knowledge of the hydrology at each of their sites and be able to adjust their treatment in advance of precipitation to maintain compliant discharges. In addition to system adjustments, technicians will undertake the monthly sampling required under a NPDES permit. These samples will be analyzed for the system's effectiveness, as measured by the effluent's compliance with Clean Water Act standards. This is a critical job that must take place year-round in varying weather conditions. Rain or shine—or blizzard—our guys work alone in the field to get these systems operational. Even in Preston County's punishing winters we'll be out there playing our important role in keeping the Cheat River clean.

As this project continues, be on the lookout for the new FOC staff. With big smiles on our faces, we'll be making our rounds in FOC-logo-emblazoned vehicles, working to keep the Cheat River clean so that everyone can continue to work and play in and around this remarkable natural resource. Stay tuned for more developments, as the partnership is expected to grow to include more treatment sites—and maybe more FOC staff!
MAKE A DONATION TO FRIENDS OF THE CHEAT IN THE NAME OF THE HARD-TO-BUY-FOR RIVER LOVER ON YOUR HOLIDAY LIST!

FOC will send them a hand-written thank you acknowledging the donation & the donor (you), and an 8x10" color print of this photo of the Cheat River Canyon taken by award-winning Preston County photographer, Kathy Jenkins. For delivery by 12/25 FOC must receive donations by 12/18.

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