WETLANDS:

Marcellus drillers feel heat as EPA mulls expanded Clean Water Act oversight

Annie Snider, E&E reporter

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First of two stories on wetlands in Marcellus Shale states.

JANE LEW, W.Va. -- Wetlands were early casualties of the Marcellus Shale boom.

Beginning in 2007, oil and gas drillers in West Virginia built well pads, roads, compressor stations and pipelines through streams and wetlands at nearly 50 sites without Clean Water Act permits, according to a *Greenwire* review of U.S. EPA compliance orders for drilling in the state.

As the drilling spread, concerns about potential wetland violations were eclipsed by questions from regulators and the public about the drilling technique -- hydraulic fracturing, or fracking -- and its possible impact on drinking water quality and public health.

But wetland issues re-emerged in December when a Chesapeake Energy Corp. subsidiary agreed to pay nearly $10 million to settle a Clean Water Act violation linked to fracking operations. The tab includes a $3.2 million civil fine -- one of the largest levied for damaging wetlands without permits (***E&ENews PM***, Dec. 19, 2013).

That big penalty, combined with several years of concerted educational efforts, has driven companies into a permitting process they should have been going through in the first place, regulators say.

But now a pending regulatory change expected to extend protections for waters and wetlands stands to redraw the map for oil and gas activities in the region, according to industry staff, consultants and other stakeholders.

The rule shift, they say, could alter the economics of gas drilling.

"I'm kind of looking into the crystal ball and seeing a train wreck," said Brent Fewell, a former EPA deputy assistant administrator and now senior vice president at water services firm United Water. "When EPA does promulgate this rule and expand jurisdiction to headwaters, it's going to have a huge impact. Given the push for fracking, industry and regulators really have not been prepared for this."

The Obama administration's proposal, aimed at ending years of confusion over two muddled Supreme Court decisions, is expected to expand the number of streams, creeks, bogs and marshes that get Clean Water Act protections. The law's Section 404 is aimed at protecting areas deemed critical to cleansing stormwater, providing drainage during intense storms and offering wildlife habitat (***Greenwire***, Feb. 7, 2011).

The new rule stands to have significant implications for a number of industries, notably mining, farming and homebuilding. But the effects for the oil and gas industry haven't been a major point of discussion among policymakers or industry executives who are focused on production.

In Marcellus states -- West Virginia, Pennsylvania and Ohio -- which have relatively wet landscapes, the rule could force oil and gas companies through lengthier permit processes, spur delays at overburdened and underfunded regulatory offices, and increase the amount of wetland restorations that companies must fund in exchange for permits.

"I think industry's been asleep on this," said Marc Seelinger, who owns the Raleigh, N.C.-based Swamp School LLC, which trains wetlands scientists.

"This isn't on anybody's radar. The implications are huge, but no one's paying attention."

'You're really hemmed in'

Christy Mower's paying attention. As a biologist and ecologist working for Consol Energy Inc., she has long tracked wetlands regulations that affect Appalachian coal mining. Now, with her company shifting toward natural gas development, she is closely watching implications for that industry, as well.

Consol biologist Christy Mower shows an ephemeral stream channel on a potential natural gas development site. Photo by Annie Snider.

Mower and her colleague, engineer John Sampson, took *Greenwire* on a tour of a potential drill sites in the this central West Virginia town of 400 people to show how they think the pending regulation could affect the industry's operations.

Consol acquired the Jane Lew site in a recent deal with Dominion Transmission Inc. On the day of the December visit, Sampson had been working on the site for 22 days since Consol got the initial sign-off from the farmer that owns the property.

Mower and Sampson said that their company takes environmental requirements seriously. Chief among those is the mandate to avoid and minimize impacts to wetlands, streams and marshes that fall under federal jurisdiction.

But if more soggy areas fall into that category, Mower said avoiding them will be well-nigh impossible.

With landowners already signed on for two neighboring well pads, Sampson had a diamond-shaped area -- about 2,200 feet at its widest and 4,000 feet long -- to find a place for the well pad at this site.

That may sound like a lot of room for a 486-by-250-foot pad, they said, but the constraints quickly add up.

The site is a former strip mine with a plateau carved out of a small mountain. On two sides are steep hills.

"You're really hemmed in here," Sampson said.

The pair think that most of the wetlands that would be affected by the project are likely to be deemed "isolated" by the Army Corps of Engineers, which administers Clean Water Act permits. That would mean the wetlands aren't connected to downstream waterways; thus, they can be destroyed without the requirement to create new habitat or clean up degraded marshes to offset the damage.

But stream impacts may be trickier, Mower and Sampson said.

Walking to the edge of the field where they plan to place the well pad, Mower caught hold of a piece of blue and white tape tied to a tree branch that was fluttering in the breeze. The tape marks an ephemeral stream segment that flows down the hillside, then disappears when it hits the flat area, likely dipping to become subsurface flow.

Across the field, when the flat area hits the other edge of the hill, another piece of tape marks where the stream segment picks up again.

"These kinds of channels are my biggest question," Mower said. Ephemeral stream segments like these are common in West Virginia with its steep terrain and history of human disturbances to the landscape.

Today, the two segments would be regulated, meaning that their length counts toward the cumulative 300-foot cap that you're allowed to fill while still qualifying for a nationwide permit.

But language in a leaked draft of the proposed rule has Mower worried that the area between the two segments, which has no surface flow but is likely connected by groundwater, could come under jurisdiction.

The leaked document labels as jurisdictional all tributaries, regardless of the frequency or size of flow, and includes a definition of the term that industry groups argue is overly broad and could encompass areas like the connection here as well as an array of ditches. Environmentalists, however, are skeptical that the definition would cause major changes, since agencies say that the definition is the same one that has long been used (***Greenwire***, Nov. 13, 2013).

"Avoid and minimize impacts, that's how we operate, and [the new rule] would make that extremely difficult," Mower said. "If

this connecting area counted, it would be like 400 feet of stream impacts just here."

What type of permit is needed is a major issue for oil and gas companies that thrive on speed.

Nationwide permits are usually issued within a few months, while an individual permit, allowing larger impacts, can take a year or more and often requires much more complex and expensive forms of mitigation.

The difference between the two permit types can be make or break, Mower and Sampson said.

Mower worries that the new regulation could bump more projects into the individual permit category. And those permits could take longer, she fears, as more applications pile up at regulatory offices that haven't seen budget or staff increases even as their workloads have risen.

"This is where the rule could really have an impact," she said. "If they start to have jurisdiction over these [additional] waters, it's probably going to make a difference in the type of permit we need, and on the gas side, we really don't have time to wait, because there's a drill rig waiting on a site and ready to move."

Moreover, Mower argued that many of the water resources at stake in the new regulation -- geographically isolated wetlands and streams that usually only flow during rainfall events -- are of limited ecological benefit.

"We are also unclear on how the rule is really increasing environmental protection," she said. "We have to keep in mind that we are talking about isolated wetlands and streams that have limited functions, sometimes only functioning during rainfall events. From what we understand, these are not endangered habitats."

But environmentalists adamantly disagree on this point.

"Just because a water body has invasives ... you don't write that water body off," Jan Goldman-Carter, wetland specialist for the National Wildlife Federation, said in an interview last year. "If you take a complex of isolated wetlands that have invasives in them and you drain them all to a tributary system, that is going to have downstream impacts, invasives or no invasives, and so it's relevant."

'Let's go through the process'

What broader jurisdiction would mean for oil and gas companies depends on where you are.

At some sites, it would probably just mean higher costs and slower permitting speeds, Mower and Sampson predict. In others, they say, it could make sites unworkable.

"If I look at the pads we have in existence, I would say one-third of them wouldn't exist if I had to mitigate for [all of the] streams," Sampson said, referring to his work in West Virginia.

Already, he said, one out of every 25 or 30 sites where he gets to this point actually comes to fruition.

"I have a small pool to choose from in the first place, and this really narrows that," he said. "There is nothing abstract about this at all; this is going to hurt."

Mower and Consol engineer John Sampson survey a site where their company hopes to build a road, well pad and other infrastructure to tap Marcellus Shale gas. Photo by Annie Snider.

Much will depend on what state the drilling site is in. In the wake of the confusing Supreme Court decisions, many states stepped in with their own laws regulating activities in the waters in question -- isolated wetlands and intermittent and ephemeral streams.

In Pennsylvania, for instance, the state claims jurisdiction over those waters. Applicants there can file for a joint permit that covers both state and federal requirements.

"The national stuff I don't think is going to cause much of an increase in Pennsylvania," said Wade Chandler, chief of the Pennsylvania regulatory office for the Army Corps' Baltimore District. All the activity "that's been going on in the state, they've

been applying to the state for all those areas," he said.

In fact, regulators say they are already doing tests to determine whether streams and wetlands that are in question meet the requirements to be called jurisdictional, and that in most cases, they do. Moreover, they say, many applicants are already assuming that all waters are jurisdictional for the sake of speed.

"They're saying, for the ease of permitting, we just want to assume that everything is jurisdictional, and let's go through the process," said Mark Taylor, chief of the energy resource branch in the Army Corps district in Huntington, W.Va., where the state does not claim authority over all of the resources thrown into question at the federal level.

But environmentalists argue that because permit applicants aren't required to go to the Army Corps for a jurisdictional determination, a lot of aquatic resources aren't being counted.

"One of our beefs with the agencies is always that they don't require applicants to have the wetlands delineated and checked through a corps [jurisdictional determination] process, and what we find, oftentimes, is when the corps looks at a project ... they'll find every time that wetlands have been undermapped," said Stephen Kunz, senior ecologist with the Media, Pa.-based consulting firm Schmid & Co. Inc., which works both for real estate developers and environmental groups opposing coal and shale activities.

In one case, Kunz said, he did wetland delineations for three Pennsylvania landowners in an area where a gas company was proposing to place a pipeline. Just in that small area, he said, he found seven times more aquatic resources than the gas company had found.

Moreover, greens say regulators, especially at the state level, often don't have sufficient support to do their jobs.

George Jugovic Jr., who served as director of the Southwest regional office for the Pennsylvania Department of Environmental Protection under former Gov. Ed Rendell (D) and is now chief counsel for the environmental group PennFuture, said that there was a time when the state's wetlands ecologists and biologists were encouraged to stay at their desks and process permit applications rather than spend time in the field.

"I'm not sure whether they're able to fully do their job in some cases without going out into the field," he said. "And some would have observed that that was because maybe those persons were viewed as sort of causing problems, acting as impediments to development."

Environmentalists also note that projects can be broken up in ways that appear to minimize their cumulative impacts. That might mean, for example, counting each of multiple stream crossings for a single pipeline separately.

Ultimately, they say, broadening which waters get Clean Water Act protections may serve to tap the brakes on Marcellus Shale development, but they don't see it being a game-changer.

"I don't think that wetlands are in the end going to prohibit a significant amount of development," Jugovic said. "It may slow it, it may moderate the pace of development, and it may increase costs to ensure that we protect the environment, but I don't see it substantially prohibiting it."

Up next: mitigation banking.

WETLANDS:

Mitigation banks see green in Marcellus drillers' permit crunch

Annie Snider, E&E reporter

Greenwire: Wednesday, February 12, 2014

*Second of two stories on wetlands in Marcellus Shale states. **Click here** to read the first story.*

PITTSBURGH -- Conor Gillespie moves streams.

These days, he has plenty of work in southwest Pennsylvania, returning creeks to their floodplains and recreating wetlands along their banks.

Scanning a denuded winter landscape of hilly farms, he pointed to a stream that had years ago been channelized and pushed to the edge of a field so it would run straight along the road. Without natural twists and turns to slow the water, the stream had cut a deep gash.

"Farmers wanted as much farmable land as possible," he said. "A stream doesn't want to do that. It gets eroded banks and becomes degraded."

Gillespie last year created a new, wandering path through the field for a stretch of the stream, complete with nooks and crannies to serve as fish habitat. It was an effort that was one part science, two parts art -- and all-around expensive.

But Gillespie's employer, Resource Environmental Solutions LLC, or RES, believes its investment in 34 restoration projects like this in Pennsylvania, as well as one in West Virginia, will bring a major payoff.

The first mitigation banking company to get approval from Pennsylvania to sell credits for restoration work, RES has its sights on big customers: oil and gas companies.

Unlike the arid Southwest, where drilling companies are most at home, the Marcellus Shale in Pennsylvania, West Virginia, Ohio and New York has abundant water. The formation underlies 681,697 acres of wetlands and 64,098 miles of streams in Pennsylvania alone, according to federal data.

Oil and gas drillers want to work in those areas. The Army Corps of Engineers, which oversees wetland permitting under Section 404 of the Clean Water Act, reports skyrocketing workloads in Marcellus areas.

The Army Corps' Baltimore District, which is responsible for the Susquehanna River watershed, a large swath of central Pennsylvania, had received 785 general permit applications from July 2011 through mid-December of last year, up from 73 applications that it received during the entire five-year period that preceded that.

Under Section 404, homebuilders, miners and other developers are supposed to avoid damaging wetlands and streams -- protected as buffers for floods, cleansers for pollutants and habitat for wildlife -- but the oil and gas industry continues to hit water with well pads, roads and pipelines.

When those impacts are more than what regulators consider minimal, a company is supposed to offset, or mitigate, the damage by creating new wetlands on-site or restoring degraded marshes and streams elsewhere.

The company can do that restoration itself, or it can buy credits from a mitigation bank like RES's that has already done the work. In some states, permittees also have the option of paying into a state fund that pays for restoration work, but Pennsylvania's program closed last year.

Elliott Bouillion, RES's Houston-based CEO, said oil and gas companies aren't interested in getting into wetland restoration.

"They have to be focused on their core competency," he said. "What they want is reliable people to help them deal with the environmental offsets. It's what we know; it's what we do."

Both oil and gas companies and mitigation banking firms hold prices close to their vests and costs vary widely by geography and resource type. A 2011 **report** from Ecosystem Marketplace, a nonprofit research group that tracks markets for ecosystem services, found that wetlands restoration credits averaged $74,535 an acre, but in areas with high land prices, hefty demand and a small supply, the cost could reach as high as $653,000 an acre. Stream credits averaged $260 a linear foot.

[+] RES's Grave Creek mitigation site, located just east of Cameron, W.Va., was developed as an offset for a construction project permit. Before, during and after shots above show how the project returned a degraded, channelized stream to a more natural, meandering path. Photo courtesy of Resource Environmental Solutions.

Now, people who follow wetlands regulations and the oil and gas industry closely say that a looming federal regulation could create a lot more demand for RES's product.

U.S. EPA and the Army Corps are expected to propose a new rule to expand the number of streams, creeks, bogs and marshes that receive Clean Water Act Protections. The regulation is aimed at clearing up a decade's worth of confusion about the reach of the law following two confused Supreme Court decisions (***E&ENews PM***, Sept. 17, 2013).

Environmentalists have lobbied hard for a rule change, arguing that wetlands and streams provide vital habitat, filter pollution and help store water during storms. Extending jurisdiction would likely make it harder for developers to obtain permits for impacts, and increase the amount of mitigation work that permittees must fund.

But Brent Fewell, who served as EPA deputy assistant administrator during the George W. Bush administration and is now a board member of the nonprofit U.S. Water Alliance, said that for expanded jurisdiction to work, industry will need some good options for complying while still doing business.

"It is going to be incredibly challenging for communities and developers to manage land unless there is greater certainty on the permitting side and alternatives to on-site mitigation," he said. "Mitigation banking is going to become increasingly important."

Complex regulatory landscape

In 2001, a panel of biologists, ecologists and other researchers did a major review of the effectiveness of the country's protections for wetlands and streams. In their National Research Council **report**, the scientists laid out major problems: The long-standing federal goal of "no net loss" of wetlands was not being met. Restoration work that was required by permits was often not being done. Even when it was, the projects frequently failed.

Regulators had long thought that it would be best to do restoration work as close as possible to where the damage it was compensating for occurred. But the National Research Council's panel said that wasn't always true.

Seven years later, the Army Corps finalized a major new regulation on mitigation that encouraged banking above other approaches. Restoration projects tend to work best when they happen on a larger scale, the thinking was, so by adding a number of disparate impacts together, banks can restore a large stretch of a stream or many acres of wetlands, creating a bigger ecological boon than small, one-off projects would.

Banks are also easier for regulators to monitor.

All things being equal, industry also tends to prefer wetland banking. Part of what a company is buying when it purchases a mitigation credit from a bank is the transfer of liability. The banker assumes responsibility for maintaining the mitigation project,

and if something goes wrong, it's the banker that is on the hook with regulators, not the permit holder.

Purchasing credits from a bank also speeds permit applications, according to analysis from the National Mitigation Banking Association. Its review of Army Corps permitting data found that applications for a nationwide permit using mitigation banking credits waited an average of 70 days, as opposed to 547 days if the application proposed that the permit holder do the mitigation project itself on another site.

But for all the excitement around mitigation banking, wetland banks are not uniformly established across the country.

"There's some areas where mitigation banking has really taken off and done really well, and then there are others where for policy or regulatory reasons or culture, they haven't," Fewell said.

Many veteran regulators are still skeptical of wetland bankers because some early "cowboys" in the field did poor work, said David Urban, director of operations for Ecosystem Investment Partners, a private equity firm that funds mitigation banks. He said the Army Corps holds great power over whether banking will be feasible in a region, for instance with decisions about the size of the service area that a mitigation bank can work within.

And with regulators from three Army Corps district offices -- in Philadelphia, Pittsburgh and Baltimore -- operating in the state, Pennsylvania poses a particular challenge for bankers.

It took RES about three years to hammer out a framework with Army Corps and state regulators for how its credits would be produced, counted, monitored and sold in Pennsylvania. Other bankers who have been working on it for years are still awaiting sign-off.

Meanwhile, the state is pondering a large shift in how it figures wetland-mitigation credits.

Nationally, the trend has been away from using ratios to calculate wetland mitigation toward methods that attempt to capture the functions that are being lost. In other words, instead of requiring the restoration of 3 wetland acres to compensate for damage to 1 acre, a functional method would require that restoration projects replicate the range of jobs that the destroyed wetland does for the environment. That shift can cause major problems for mitigation bankers who built their businesses around ratios.

"Mitigation banking is mitigation in advance," said George Kelly, director and founder of Environmental Banc & Exchange LLC. "You are making investments based on a set of standards, but if you don't have those standards in place, you run a major risk."

'Oh, I can fix that'

Karen Bennett, a lawyer at the Washington, D.C., firm Hunton & Williams LLP who has represented the coal industry on permitting issues, contends that mitigation requirements are a major missing piece in the ongoing debate about the reach of the Clean Water Act.

Right now, she said, few companies see the value in fighting regulators on jurisdictional calls about whether a tract is a protected wetland or not. Usually, she said, permit applicants accept what the Army Corps decides about whether an individual stream or wetland qualifies for protection.

But, she said, that might change if mitigation costs rise or a region doesn't have enough banks to create competition and bring costs down.

"I think the more pressure there is and the more expensive mitigation gets and the more onerous that this mitigation tail becomes, the more people are going to reconsider that they're just going to accept everything that EPA and the corps is going to say about jurisdiction," she said.

On the other hand, some in the mitigation banking industry argue that regulators will be more likely to accurately account for impacts in the permitting process if mitigation banks are in place.

Tara Allden, regulatory manager with the Raleigh, N.C.-based mitigation banking firm Restoration Systems LLC, which has been working to set up a bank in northeast Pennsylvania, said the Army Corps can be reluctant to protect a resource if industry doesn't have a structure in place for mitigation.

"If there are good mitigation options available, the Corps of Engineers is going to be more apt to require mitigation, but they

don't, in my opinion, feel they can say you have to do this if there's no available way for the permittee to meet it," she said.

But, Joy Zedler, an ecologist at the University of Wisconsin, Madison, who chaired the 2001 National Research Council panel on mitigation, said questions are being raised in the scientific community about the environmental benefits of mitigation.

Emerging science is proving some long-standing assumptions about restoration wrong, she argued.

For instance, having thick vegetation at a wetland site is considered a best management practice because it was assumed that all that vegetation would help filter nutrient pollution and provide clean water, she said. But in a project she is working on with colleagues to measure six wetland functions over a two-year period, Zedler said they found that the most dense cattail wetland that they measured was the worst at filtering pollution.

"So, there's a big question mark there as to whether or not the kinds of wetlands that we're producing, which are often nutrient-rich or loaded with cattails or other invasive species, are actually functioning to clean water, or whether they are contributing in some way to poor water quality," she said. She acknowledged, though, that some regulators put limits on the amount of invasives a restored site can have.

Mitigation banking can be a "very positive thing," Zedler said, but she stressed that it's also important to recognize the limits of our current understanding.

"It's just too tempting to assume that we can compensate fully," she said. "By setting up these various mechanisms for compensation, we actually make it easier for there to be discharges of materials into wetlands because there's always that attraction of, 'Oh, I can fix that.'"