Marcellus & Dirt and Gravel Roads

Depending on who you ask (and how much property they own), the Marcellus gas play is either the best or worst thing to happen in Pennsylvania in a long time. Regardless of your position, the Marcellus Gas Play will have a large and long-lasting impact on a large array of issues for much of Northern and Western Pennsylvania.

What about the impact that all the heavy hauling is having on the states rural infrastructure? Here are some things that the Program and Center are working on:

The Center’s Marcellus Efforts

The Center for Dirt and Gravel Roads has been in touch with, and presented to, multiple gas companies working in Pennsylvania. The Center is currently working to develop a one-day “Road Builder’s Workshop” for gas companies and contracted crews. This class will be modeled off the Program’s ESM training, with additional emphasis placed on base composition and road surface necessary for heavy hauling. The Center is also preparing to convene a roundtable on road sub-base design with representatives from gas companies, quarries, and more.

The Program’s Marcellus Strategy

“Marcellus and the D&G Program”
Video and phone conference call – Friday July 23rd -10am

Program-related issues in Marcellus impacted Counties. More details will come via e-mail and our website. Anyone is welcome to join in, although the focus will be on developing strategies that Marcellus-impacted Districts can use for D&G Program Implementation. Some potential issues are:

- Should a District fund a project where hauling is expected?
- Should Program funds be used on a road that has already been impacted by hauling?
- How can we insure completed projects are restored to D&G standards after hauling?
- How does a district incorporate this into its system for ranking applications?
- What Program policies or guidance are necessary?
The Center’s Other Activities

While education and outreach for the Dirt and Gravel Road Maintenance Program continues to be at the core of the Center’s mission, we like to keep you updated on some of the other outreach and research activities here at the Center:

**ARRA Stimulus Projects:** The Center is just wrapping up its involvement in two stimulus projects. The first project is in Shohola Township, Pike County. In addition to extensive drainage work, it involves using a “Soil Nail Launcher” to stabilize the edge of a roadway that was continually sliding into the Delaware River. The second project involves 9 roads in 7 townships in Erie County. This project also involved extensive drainage work, along with the use of a “Full Depth Reclamation” process that is designed to stabilize the road.

**Allegheny National Forest Gas Access Road Sediment Study:** The Center has teamed up with the Allegheny National Forest and the National Energy Transportation Lab (part of US Department of Energy) in a effort to quantify sediment production from shallow oil well access roads. The study will use an improved version of the Center’s Rainfall Simulator to quantify sediment runoff from roads with various surfaces, configurations, and slopes. The study is being completed in conjunction with a study from Clarion University that is comparing stream quality differences in two virtually identical watersheds, one of which has many access roads, and one of which has almost none. The bulk of the testing will be done this summer and results can be expected by the end of the year.

**US Forest Service “Environmentally Sensitive Maintenance” Field Guide:** The Program’s ESM practices will soon be available to a much broader audience. The Center has been working with the USFS San Dimas Technology and Development Center on a “glove-box field guide”. The 8.5” x 5.5” laminated document is being written primarily by the Center and highlights many of the Environmentally Sensitive Road Maintenance Practices that the Dirt and Gravel Road Program has advocated over the years. USFS will be supplementing the guide with some additional practices used in the western states. When completed at the end of 2010, the guide will be made available to Forest Service Districts and other low-volume road maintenance professionals throughout the country.

**Trail Mix:** The Center has just completed the implementation of its first “Environmentally Sensitive Trail” just over the hill in Stone Valley, Huntingdon County. The trail was designed to minimize concentrated drainage and erosion to reduce both sediment runoff and maintenance costs associated with the trail. In addition, it marks the first time that the Center’s newly redesigned “Trail Mix”, an unbound surface aggregate for trails, has been used in the field.

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**Questions From the Field**

**Q** Is reclaiming a “tar and chip” road back to “unpaved” an eligible project expense for the D&G Program?

**A** It can be, at least partially. By itself, the reclamation of a broken-down paved road is not an eligible Dirt and Gravel Road Project. However, the reclamation of part of a road can be part of a larger Dirt and Gravel Road Project. For example, just reclaiming 3 miles of road is not an acceptable use of Program funds. However, if a section of the road is part of a “holistic” Dirt and Gravel Road Project involving drainage etc., then the cost of reclaiming that section of road can be funded by the Program.

Remember, Program fund expenditures must be tied to reducing sediment to streams. Reclamation can be part of a successful project, but because of the Program’s “local control” mantra, it is up to individual Districts to determine its applicability to individual projects. Center and Program staff are available to assist on a case-by-case basis if needed.

*Have a question? Submit it to smb201@psu.edu*

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*Trail mix is placed and compacted over a French Mattress at Shaver’s Creek Environmental Center.*

-Steve Blaser, CDGRS
Dirt and Gravel Road Program District Allocations

The State Conservation Commission allocates funding each year to Conservation Districts involved in the Dirt and Gravel Road Maintenance Program. Beginning with next year’s FY 2011-12 allocations, a newly revised allocation formula will be used. The new formula reflects the changes that have occurred within the Program over the last decade since the original allocation formula was developed. Conservation District allocations WILL CHANGE starting next year pending SCC approval. Details of the allocation changes are not finalized yet. More information will be presented at the next few SCC meetings in 2010.

New DGRoads is Released

Conservation Districts use a customized GIS program named “DGRoads” to track location, work, and spending for over 17,000 pollution sites statewide. The new DGRoads Version 5 was released online to Conservation Districts in April of 2010. Preliminary feedback has been positive, and no major bugs have been reported. Any District who has not installed it is encouraged do so by visiting the Center’s website www.dirtandgravelroads.org. The Center will hold training(s) for Districts that will go through the entire DGRoads program in detail. The number and timing of trainings is to be determined based on District Feedback.

2010 Maintenance Workshop: September 28-29th, Erie, PA

The Center’s annual Road Maintenance Workshop is held at locations across Pennsylvania and attracts around 150 participants each year. This year’s two day event will be held September 28-29, 2010 at the Bayfront Convention Center in Erie, PA. The workshop is designed for Conservation Districts and Municipalities who are involved in the Dirt and Gravel Road Maintenance Program, but has been gaining attendance from a wide range of low-volume road maintenance professionals over the years. The workshop will feature concurrent classroom sessions along with field trips to completed and active project sites. The agenda and registration materials should be available by the end of this summer. More details can be found on the Center’s website at www.dirtandgravelroads.org under “Education”, “Workshop”. Remember that attendance at the workshop counts as an ESM training re-certification for anyone who has already attended the ESM training.

Bureau of Forestry’s Dirt and Gravel Program Update

The Bureau of Forestry continues to administer its portion of the Dirt and Gravel Road Maintenance Program on projects throughout the State. The Center is involved in two large-scale demonstration projects with the Bureau of Forestry in 2010. The first project in the Tiadaghton District involves drainage improvements and the use of Soil Nail Launcher technology to reinforce a failing road slope. The second project involves the relocation of a road in the Gallitzin District. Look for a more in-depth update of the Bureau of Forestry’s Dirt and Gravel Road Program in the next newsletter.

-Steve Bloser, CDGRS
The two-day ESM training covers many aspects of road maintenance and focuses on practices to reduce maintenance costs and environmental impact from unpaved roads.

Have questions or want to schedule an ESM training? Want to receive future newsletters?

Contact Kathy Moir at:
1-866-No-To-Mud (1-866-668-6683)
dirtandgravel@psu.edu
www.dirtandgravelroads.org
NEWSLETTER INSERT

Marcellus Perspective

Unconventional Road Maintenance for and Unconventional Gas Play

Center staff Member Tim Ziegler has been actively leading the Center’s Marcellus efforts and relations over the past two years. Tim also serves on Centre County’s Marcellus Shale Task Force. Tim’s experience with the Dirt and Gravel Road Program and interactions with Marcellus players give him a unique perspective on the situation.

The staff at the Center for Dirt and Gravel Roads includes a materials scientist, an engineer, a geologist, a pollution control systems specialist, people with agriculture and construction backgrounds, and folks with years of practical road maintenance knowledge and experience. None of us is an “expert” on any of the vast subjects and issues pertaining to the Marcellus Shale development. However, after numerous interactions with municipalities, industry representatives, conservation districts and the general public in the last two years, and especially this past spring, it has become apparent that the Center’s long standing message of the need for proactive pre-haul road maintenance and upgrades is the key to easing many of the road related problems associated with this boom industry.

No one argues that the task of maintaining PA’s aging and ailing network of roads is a huge financial and logistical challenge, and is, quite frankly, impossible in today’s economic environment. We have more miles of public road to tend here in the commonwealth than any other state in the nation. We have more annual freeze-thaw cycles than our sister states, and we have more structurally deficient and functionally obsolete bridges than anywhere else. Most of our rural municipal roads lack sufficient base composition and are little more than paved or gravel surfaced cow paths. This past spring thaw clearly showed that our back roads, as well as many of our state highways, are not able to support the magnitude of heavy hauling associated with deep shale gas development. This was most apparent in the counties along the northern tier. While some of the most dramatic road failures were witnessed on low volume township roads, leaving impassible sections with 4’ deep ruts and non-functional drainage, even state arterial routes were damaged to the point of requiring temporary traffic control in order to allow vehicles to safely pass.

Up to now, the industry has taken a “break it down and fix it approach” in dealing with the public roads they rely on to move their rigs, water and materials. This approach appears reasonable when dealing with hard-topped asphalt roads, where it would not be economically prudent to tear up a costly hard surface to stabilize spot sections of roadway. It is an effective way for the drillers to identify weak portions of road where they should focus their money and efforts in order to beef-up the road in preparation for future truck traffic. To date, drillers may also have been hesitant to invest much up-front capital to improve road infrastructure until they had a better estimate of the gas reserves below. Initially, this all makes sense when you consider the rapid growth of the industry in the state, as well as the cost of road maintenance and construction. However, it is the Center’s contention, as well as a growing number of other individuals and organizations, that the situation is quite different with unpaved roads and the industry itself has spent, and continues to spend, considerably more money repairing and patching these roads than it would cost them to properly prepare them prior to the heavy construction phase. The lack of a permanent hard surface makes unpaved roads prime candidates to employ preemptive road maintenance and upgrades.

Photo courtesy: Bruce Snyder, Range Resources

Results of drilling traffic on a public unpaved road during PA’s Spring thaw in 2010.
Pre-haul road upgrades are likely to achieve a host of other positive consequences in addition to the very real potential for long term cost savings. These include, but are not limited to, environmental stewardship/compliance, enhanced community safety, better public relations, and economic growth beyond the gas industry. By addressing road base stability and problematic drainage issues prior to subjecting the road to hundreds or thousands of very heavy trucks, catastrophic road failures will be less likely. Tons of tailgated stone required to prolong a passable road will be minimized. Sediment release to surrounding surface waters will be reduced. Fewer hazardous road conditions will exist, and emergency vehicles will be able to access homes and businesses. Additionally, less local residents will be troubled or inconvenienced by poor road conditions or impassable roads, leading to better relations between industry and local citizens. We also need to keep in mind that while the gas industry will supply a much needed economic boost to much of PA, many unpaved public roads in the Marcellus region share watersheds with the highest quality streams in the Commonwealth. Local communities throughout the region are home to businesses based on tourism and outdoor recreation. The local roads in the area should be maintained in order to protect these valuable resources and serve the customers of this revenue generating business sector as well.

The two-day Environmentally Sensitive Road Maintenance (ESM) training delivered throughout the state by Center staff makes a clear distinction between traditional road maintenance practices and ESM road maintenance practices. Traditional maintenance being those procedures that have historically been done during the maintenance of our roads that have long been accepted as the way we do things. Examples of traditional maintenance practices relative to the issue of oil and gas development include: the preconceived notion that if there is a road - then the road must have parallel ditches on both sides, the ditches should be very deep to handle large flow volumes and keep water off of the road surface, ditch outlets should be located at the low points of the road, and excessively long ditch runs are acceptable in order to direct the flow to these low points. Unfortunately, the road work being done thus far by the gas companies, or their contractors, have adhered to these traditional practices, and unfortunately these practices are an about face from the ESM principles of the successful Dirt and Gravel Roads Program. The principles promoted by the Program include avoiding concentrated drainage, minimizing flow volumes and reducing the effects of concentrated flow, to reduce erosion and the time and money spent on road maintenance.

We are transitioning from the exploratory phase and into the production phase here in the Marcellus Shale basin. The word on the street is that Marcellus Shale drilling will increase three to four fold by this time next year. If the trend continues as expected, and the gas companies and their contractors continue to perform the maintenance and repair work on our municipal roads, they will essentially become our township and forestry road crews in many areas. Further, if these road crews continue to employ traditional maintenance practices as seen thus far, the Dirt and Gravel Roads Program, and the waters of Pennsylvania, stand to lose significant gains made in recent decades.
Some of the “repaired” roads such as this one are the antithesis of Environmentally Sensitive Maintenance, collecting water in needless ditches and transporting it long distances to a stream.
Add to the mix that the gas companies have substantial budgets to address their needs, and in most cases have been very cooperative with the townships requests for road work, and another substantial hurdle is put in place. It is usually the case that when a Marcellus driller “repairs” a damaged road for the township, those “repairs” exceed the expectations of most townships. It is not inconceivable that the expenditures by the gas company to remediate a short section of unpaved township road would exceed the township’s annual road budget. Unfortunately, as mentioned earlier, many of the finished roads could be the poster child for the term traditional road maintenance. This puts the Dirt and Gravel Road Program and the local conservation districts at a marked disadvantage to gain buy-in for ESM practices with traditional township road crews through the lure of grant funds for local projects. A carrot with a four figure value is a hard sell against the seven course meal with a six figure value.

The Center is taking every opportunity to address and get ahead of this issue. We are talking to conservation districts to solicit ideas and concerns. We are working with industry as best we can. We are working with our contacts in Harrisburg and are speaking to various audiences all over the state. We are formulating a game plan even as the game goes on. As of right now, we can’t report that we have the magic bullet to achieve widespread adoption of Environmentally Sensitive Maintenance Practices by those who will shape our rural roads of the future. However, because we at the Center are committed to Pennsylvania and the clean streams that flow here, we will continue to promote common sense solutions to road related pollution issues and we will continue to use every outlet available to educate and advise those with the power to effectively implement those solutions.

We understand the challenge of working to change accepted behaviors. While there have been many municipal converts to ESM practices in the twelve years of the Dirt and Gravel Road Program, many more townships continue to practice traditional road maintenance. In light of this, it is not reasonable to think that wholesale buy-in of the Program’s principles could be achieved with either municipalities or gas companies. Instead, we suggest that districts and progressive municipal officials encourage the gas companies to improve the road base prior to heavy hauling, to install more ditch outlets (crosspipes and turnouts) than currently exist on the road, to locate ditch outlets away from the stream and to create wide and shallow ditches instead of narrow and deep ditches. Adherence to these concepts is particularly important when the road is in close proximity to a stream. These practices will help to minimize the cost of future road maintenance, to enhance public safety, and to maintain the health of local streams.

The Center is currently working with various entities to draft language for sample road use maintenance agreements (RUMAs) for townships to use when contracting with gas developers. The basic ESM principles included in the previous paragraph are included in those RUMAs. It is our hope that PennDOT, PSATS and DEP will adopt or encourage the use of these RUMAs and practices.
As a society, if we didn’t adopt new ways of doing things, we would not be drilling in the Marcellus Shale today. As our rural road network changes to meet the needs of this emerging giant, so should the way we maintain those roads. Once again, our rural roads will be vital to the economic development of the state and our local communities. More than ever, the way we chose to maintain these roads will be vital in determining the impact they have on the future of our local communities and on the local streams and waters of the Commonwealth. On the road we chose, we can be one step ahead or one step behind.

If you have any insight, input, or just plain good ideas, feel free to contact Tim Ziegler at the Center for Dirt and Gravel Road Studies at tmz115@psu.edu or 814-865-5891.

This road illustrates that it is possible to repair a road after heavy hauling in a more environmentally sensitive manner.

It has taken the Dirt and Gravel Road Program over a decade to get Environmentally Sensitive Road Maintenance Strategies to be accepted in much rural Pennsylvania. If we are not careful, we will quickly lose all of the progress we have achieved to date, and possibly more.

If you are a Conservation District in the Marcellus Region, don’t forget the phone and video conference call below.

“Marcellus and the D&G Program”
Video and phone conference call – Friday July 23rd -10am

More info about call on page 1 of newsletter