Comments on Delaware River Basin Commission (DRBC)
DRAFT Natural Gas Development Regulations

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EXECUTIVE SUMMARY

The Delaware River Basin Commission Draft Natural Gas Development Regulations (December 9, 2010) fail to meet the stated purpose of the regulations, that is, the establishment of "standards, requirements, conditions and restrictions to prevent, reduce, or mitigate depletion and degradation of surface and groundwater resources and to promote sound practices of watershed management including control of runoff and erosion" (7.1(a)). The draft regulations specifically fall short in that they provide the appearance of comprehensive and more stringent regulations while failing to provide for any mechanism or process to assure that the recommended measures are adequately implemented, or that the measures as defined are, in fact, sufficient to meet the stated goals for protection of water quality. The regulations specifically fail to provide adequate protection of water resources from impacts related to erosion, stormwater, and protection of in-stream water quality.

The draft regulations separately define regulatory requirements for Water Supply, Well Pads, and Wastewater, and it would initially appear that these requirements add an additional level of resource protection (in addition to state requirements). For example:

- **Water Sources**: Requirements are proposed for stream baseflow protection and water quality (as related to water withdrawals), where there is a lack of such regulations at the state level.
- **Well Pads**: Requirements for siting restrictions and setbacks (related to well pads) are proposed, and some are more stringent than current state requirements in Pennsylvania.

Additional requirements such as these do in fact represent an improvement upon current state requirements. However, by relying on the agencies of New York and Pennsylvania in lieu of separately administering natural gas and exploratory well construction and operation standards, the DRBC fails to provide a process for implementation of the draft requirements to provide meaningful

resource protection. Pennsylvania standards fail to provide any reasonable level of regulation and review related to issues of stormwater management and erosion control (see attached report). New York's existing requirement are largely undefined pending the June 2011 Revised Draft SGEIS.

Secondly, the reliance on a process of Approval by Rule (APR) for projects meeting certain conditions allows for "self-regulation" when it cannot be supported that Natural Gas Development has less impact on surface water quality than other industries and activities subject to individual permits or regulatory review, and that an APR process is sufficient. The APR is intended to allow for an expedited review process (less than 30 days as opposed to a usual six to nine month review process). It is not clear that this expedited process will allow for sufficient technical review, or for review and comment by the public. Examples of natural gas development activities that can apply for an APR include well pad construction. Projects may seek an APR if the project sponsors' lease holdings are less than 3,200 acres in the Delaware Basin and fewer than five (5) well pads will be constructed, as well as several other requirements (i.e., outside of National Park and Delaware Water Gap National Recreation areas; outside of drainage areas to NYC's reservoirs, etc.). This means that many well pad installations within the Basin will receive little review and oversight from DRBC, and will essentially be "self-regulating" under the DRBC regulations and existing state requirements. Similarly, many sources of water can be approved for natural gas use through an APR, including previously approved water withdrawals or wastewater. Previous approvals likely did not consider the consumptive nature of water use for natural gas development.

Even if a well pad must seek approval through a Natural Gas Development Plan docket or Well Pad docket, it is unclear that the docket application requirements will provide sufficient protection or how compliance will be assured. For example, Natural Gas Development Plans (for holdings over 3,200 acres) require mapping of important natural features at the 7.5 minute USGS quadrangle scale of 1-inch = 2,000 feet. At this scale, a five-acre well pad site would measure

approximately 0.25 inches square (Figure 1). This is hardly detailed mapping that can reflect important natural conditions and features, or the potential impacts of proposed activities.

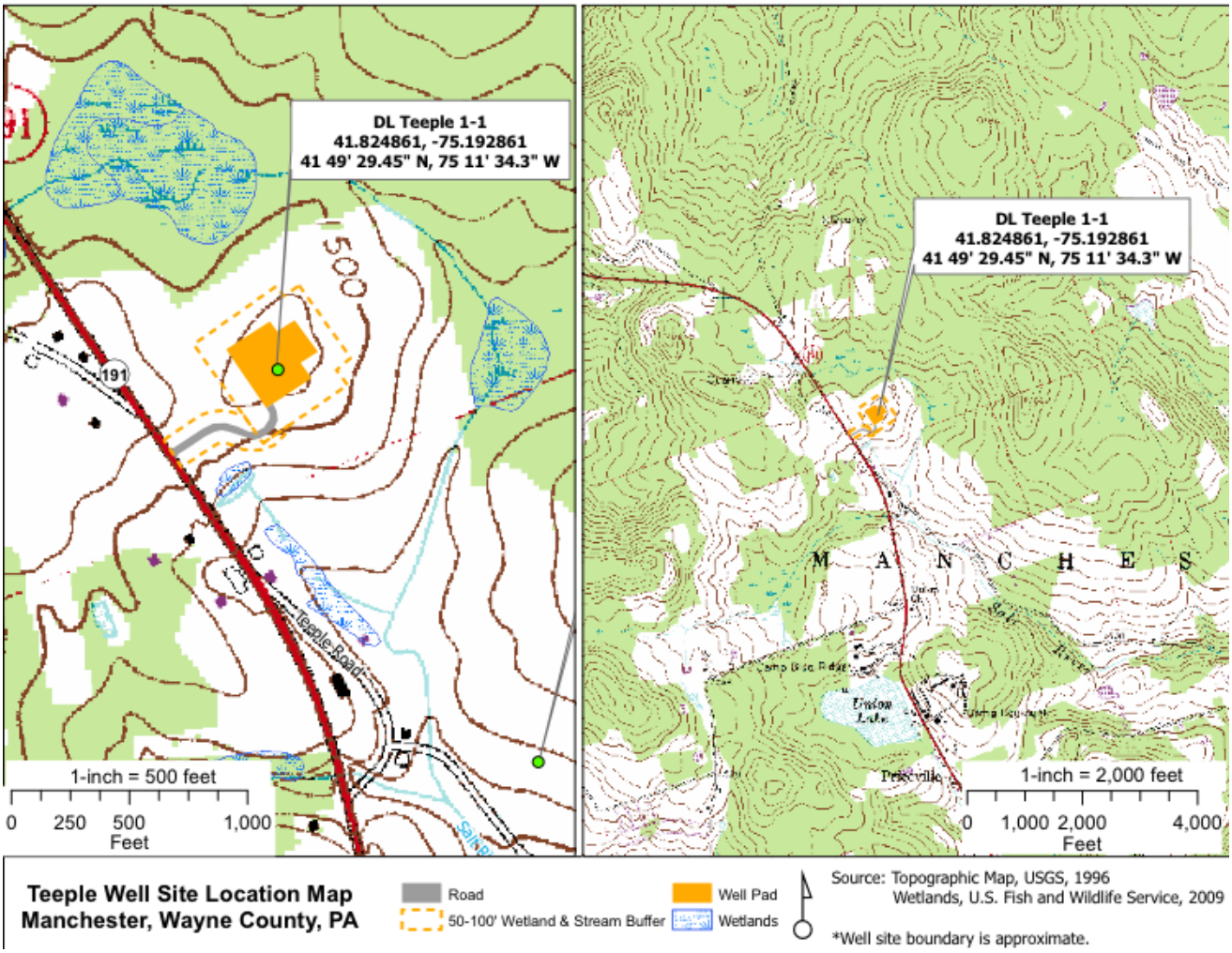

Figure 1. DL Teeple 1-1 Well Site Location Map in Altering Scales; 1"=500' and 1"=2,000' Respectively

Thirdly, the DRBC draft regulations do not allow sufficient public access to data and information, given that facility records are to be kept at the project site and only made available at the request of the Commission or Executive Director (7.3(j)). It is crucial that all natural gas operations in the Basin function

transparently. There is no process provided for potentially impacted parties to obtain and review information. Public notification of the proposed well is limited, and interested parties have no mechanism for review or access to detailed information.

These shortcomings in the draft DRBC regulations, as well as numerous other shortcomings related to inadequate definitions, poorly defined restoration requirements, limited requirements for financial assurance, and other issues means that the draft DRBC regulations fall far short of protecting the water resources of the Basin, as stated in the first paragraph of the draft regulations as their purpose.

It is essential that the draft regulations set forth adequate protection standards not only on an individual well and well pad basis, but also on a basis that considers the cumulative impacts of gas development facilities throughout the Basin. That is, the impacts of individual facilities on headwaters, wetlands, and waters of the Basin must be adequately addressed, but at the same time, the cumulative impacts of multiple well pads, access roads, water withdrawals, etc. must also be considered. The regulations must be well defined and administered in a manner that recognizes the importance of the Delaware River basin as both a natural resource and the drinking water source for 15 million people.

DETAILED DISCUSSION

The following sections provide comment on the draft regulations by Section. There is cross-reference between sections as appropriate.

Section 7.2 Definitions

While some definitions (as defined in Section 7.2) are well defined, such as the definition for Water Body, a number of definitions are unclear or can be interpreted in a manner that is not protective of the water resources. Ambiguous

definitions leave room for a range of interpretations. Additionally, a specific definition may be adequate, but the mapping or other regulatory requirements associated with the definition fail to provide sufficient information based upon the definition. Specific examples include the following definitions:

- ***Disturbed area*:** The DRBC definition of disturbed area is "devoid of trees greater than 5 meters in height and substantially devoid of woody vegetation". Under this definition, are areas of pasture, meadow or fields considered disturbed? Are only forested areas (greater than 3 acres) considered undisturbed? How are existing and built conditions taken into account for stormwater management and erosion control? Detailed stormwater calculations (for Pennsylvania well pads greater than 5 acres) show that the gas industry assumes that areas disturbed by well pad activity, but seeded in a seed mix that includes some brush species, are "better" than existing woods (and correspondingly generate less runoff). Under this definition for disturbed areas, it is unclear that there will be any change in this practice: disturbed well pad sites will still be represented as "better" than woods or pasture.
- ***Final site restoration*:** Defined as restoring a disturbed site "as nearly as practicable to its condition prior to the commencement of gas regulations". Does this include restoration of topography, land cover, soil conditions, soil compaction, etc.? What parameters define restorations, and what mechanisms exist within the DRBC regulations or state requirements to achieve this restoration?
- ***Forested Site*:** Defined as requiring removal of 3 acres or more of tree canopy. Does this refer to three acres of contiguous tree canopy, or three acres of cumulative tree canopy removal? Is this per pad site or based on holdings? If less than 3 acres is removed but is part of a larger contiguous tree canopy, is that considered forest? Is three acres the appropriate threshold? Are there any considerations for maintaining larger forest areas as intact (and reducing fragmentation) or are all areas considered equal? Is there any consideration for forest quality such as maturity and

mix of species, vegetative community, or conditions of forest floor and soil mantle? Removal of forest increases stormwater runoff, increases erosion, diminishes forest soil quality and contributes to the decline of adjacent forest areas.

- ***Water Body*:** While the definition for Water Body is comprehensive, the requirement for mapping at the scale of the 7.5 minute USGS topographical quadrangle (when mapping is required, which is limited) will result in numerous water bodies failing to be identified or adequately protected. Intermittent water features are not likely to be shown on a 7.5 minute quad, nor will ditches, small channels, or headwater springs and seeps.

Section 7.3 Administration

These ambiguities in definition continue throughout the draft regulations. Section 7.3(k)(1) discusses financial assurance "for **restoration of land disturbances**…." as required by Section 7.5(h)(1)(vi). However, Section 7.5(h)(1)(vi) simply states to restore land disturbances "according to host state requirements". Pennsylvania requirements are nominal (i.e., seeding with a seed mix that includes brush), with no mechanism for inspection or enforcement. New York has no specific requirements at the moment.

Section 7.3(k)(17)(ii) allows for release from Financial Assurance when restoration is complete, and states "successful restoration of well sites and access roads may only be considered complete after observations over two growing seasons indicate **no significant impact on hydrologic resources**". But what defines "significant hydrologic impact"? Is an increase in stormwater runoff volume with stream morphology changes "significant", and at what threshold is an increase "significant"? Who conducts the referenced observations to determine this? Are the "observations" conducted by the project sponsor, and what constitutes observation? Are observations simply visual assessments by the project sponsor? Are observations sufficient to

assure that baseflow conditions have been maintained, especially in headwaters and wetlands? Again, without metrics and performance standards, the definition of "significant impact on hydrologic resources" does not provide for industry regulation. If all observations and reporting are conducted by the project sponsor with undefined requirements and standards, compliance is self-monitored and subjective.

Equally importantly in regards to Financial Assurance, there is no mechanism to determine if the required amount of $125,000 is sufficient to address "impacts" when what constitutes an impact is undefined. There are likely to be costs associated with technical observations and monitoring if these are in fact required, and such costs can quickly exceed $125,000.

It is worrying to note that the draft regulations expend more detail describing how and when the $125,000 financial assurance can by reduced (by 75%), than in defining what "no significant impact to hydrologic resources" means. The draft regulations provide a process for reducing the financial assurance by 75% when only one year has elapsed since hydraulic fracturing is completed (Section 7.3(k)(15). Specifically, the financial assurance can be reduced if, after one year to the best of the project sponsor's knowledge "no harm to water resources has occurred or been alleged".

Similarly, Section 7.3(m)(2) discusses **reporting violations** and requires project sponsors to notify the Executive Director of data or information that indicates that the "project significantly affects or interferes with any designated uses of ground or surface water". But specifically:

- What is meant by "significantly affects or interferes"? This is not defined.
- What are the parameters and thresholds that determine interference, and at what point is interference considered "significant"? Does this refer to water quality, and what parameters in groundwater or surface water? Does this refer to a reduction in groundwater well yields or

stream base flow? How will changes be measured and monitored? Is an increase in runoff volume and downstream flooding considered interference with designated uses? Special protection waters should not be diminished in any way. Is a certain level of diminishment acceptable before it is considered interference?

- What process exists to notify property owners in the event of a reporting incident?
- The DRBC regulations do not outline a timeframe that the sponsors must abide by.
- Are there no reporting requirements for increases that are not large enough to "significantly interfere" with uses?

The result of such ambiguities and lack of performance standards is that the draft regulations create the appearance of requirements for restoration and reporting violations, without actually defining, imposing or enforcing restoration or meaningful reporting. Without defined metrics for performance and a process for monitoring and verifying compliance, such draft regulations are meaningless and create an impression of regulation where none exists. At a minimum, defined criteria must be established for:

- Restoration and what parameters adequately represent restoration.
- What constitutes "significant impacts on hydrologic resources", and what are the project sponsors responsibilities and liabilities when significant impacts occur.
- What constitutes an "observation", and an associated schedule and reporting requirements for observations. .

<u>Public Notice and Access to Information (Sections 7.3(i) and (j))</u>

The DRBC requirements for Public Notice to property owners are extremely limited (i.e. adjacent property owners and property owners within 2,000 feet of a well pad), meaning that many property owners who are downstream

from a facility and may be affected by stormwater impacts, water quality impacts, alterations in flow, or erosion will not be aware of these potential impacts until after something occurs. It is not uncommon for sponsors to drill horizontally up to, and exceeding, 5,000' from the well pad. Perhaps more disturbing is that parties that are interested in obtaining information do not have a process to do so. Records required as a condition of approval are kept by the project sponsor, and not available for review at the DRBC. There is no process or ability for interested parties to obtain information. The public is unable to access information on activities that may affect their water resources.

Section 7.4 Water Sources

The DRBC Draft regulations allow for use of a number of water sources. Imports of water or wastewater from outside the Basin require a docket, and are not eligible for an APR, but most other potential water sources are eligible for an APR. As discussed earlier, the APR provides for an expedited review process (less than 30 days versus six to nine months), and it is unclear how this expedited review will provide sufficient oversight or allow for public access to information. Water Sources eligible for APR include:

- Exports of non-domestic wastewater from natural gas activities.
- Previously approved water sources (Groundwater and surface water withdrawals; treated wastewater, cooling water).
- Recovered flowback and production water.
- New water sources if located within an approved NGDP.

For these various sources, it is unclear how the performance requirements imposed by the draft regulations will be evaluated and enforced, especially if regulated under an APR. For example:

For previously approved sources (Groundwater and surface water withdrawals; treated wastewater, cooling water, (Section 7.4.d)) that are eligible for APR:

- The draft regulations allow for an increase in individual well allocation (but not total allocation) if it will not adversely affect other wells or surface flows. But how will this be determined? The draft regulations do not impose additional requirements for a hydrogeologic report, so can it be assumed that such a report already exists for individual wells, and that this data will be referenced in determining the allowable increase from an individual well? Will data be reviewed by the DRBC? Will data be available for public access? Who determines what the allowable increase from an individual well should be?
- The draft regulations recognize that natural gas water use is one hundred percent consumptive, and the regulations require that this consumptive use not adversely affect streamflow at a withdrawal location, or from a location where wastewater is normally discharged. But again, how is this determined, and how will the determination be reviewed by the DRBC? At what location does the Q7-10 and pass by flow requirements apply? Does it apply to wetlands, intermittent streams, and other headwaters, especially if an individual well withdrawal is increased? Who determines the Q7-10 and pass by flow requirements for these water bodies – is the value calculated by the applicant and reviewed by the DRBC? How is it considered in the increased withdrawal from an individual well? This requirement has no meaning if parameters are not defined.
- The consumptive use of water for hydraulic fracturing is, in large part, qualitatively different than "conventional" consumptive use. It is estimated by agencies and the industry that on average about 15% of the fluids injected into the well bore to hydraulically fracture a shale well is returned to the surface. The approximate 85% left in the ground is not only consumed but is lost to the hydrologic cycle, much of it forever sequestered in deep formations and intermingled with resident marine waters. This complete removal of fresh water from natural hydrologic processes represents an additional impact because this water will not be naturally recycled back into our environment, compounding the environmental effects of this fresh water depletion both in the Watershed

and to the larger environment. How will DRBC evaluate this added impact for water sources, both in the APR process and for new water withdrawals that require docket approvals?

- In the permitting of approved water sources, did the DRBC previously make the assumption that a portion of the water use would be consumptive, and if so, does this assumption represent the anticipated needs for natural gas facilities? If not, how will the cumulative impacts of multiple natural gas facilities and their consumptive water needs be fully addressed, even if the water sources are previously approved? In other words, have the full watershed impacts of consumptive use been considered for previous existing approvals?
- The draft regulations indicate that withdrawals must be metered (continuous recording), transferred directly to trucks, and records held at the site. Quarterly reports, including the amount of withdrawal and destination, must be given to the Commission at request of the Commission. Is there a process for public access to this information? Does the Commission have a plan to collect and evaluate the withdrawals and their destinations? Will this information be available quickly in the event of a pollution event or water emergency or advisory, a drought or other emergency to assure the other water needs are adequately met, or are decisions left to the water seller and the gas well user?
- An Invasive Species Control Plan (for already approved sources) is only required at request of the Commission. However, it is unclear how the Commission will have information related to the intended water destination (how will the Commission know where water is going before a transfer process begins?). How will the Commission determine if an ISCP is needed?
- Facilities that discharge wastewater or non-contact cooling water can apply under an APR to become a source of water for natural gas projects. The facilities must demonstrate that the "loss" of the discharge will not adversely affect up or downstream users, groundwater levels, or streamflows, but again, "adversely affect" is not clearly defined. It is not

clear what effects or parameters are to be evaluated by either the applicant (under the APR) or the Commission to determine "adverse effects", nor is it clear how an effect is determined to be adverse. Is a downstream mixing zone analysis or flow analysis required? Will the cumulative impacts of discharge reduction be considered by DRBC? Again, what is the process for determination?

New water sources require a Docket, unless the source is located within the boundaries of a NGDP (Natural Gas Development Plan) and the water will be used within the boundaries of the NGDP. In that case, the new water source may be approved by APR. A NGDP covers all lands in a project sponsor's lease holdings, and while NGDPs are required for holdings in excess of 3,200 acres (although there are exemptions for that requirement), there is no upward limit of area covered under a NGDP. Theoretically, a new water source could be located a considerable distance from its use area and be within a NGDP.

For new water sources:

- If the source is located within Special Protection Waters, a Non-Point Source Pollution Control (NPSPC) Plan is required. Such a plan does <u>not</u> appear to be required in other waters, so addressing issues of erosion & sediment control, as well as stormwater impacts from new water sources, will be left to the states for regulation unless located in Special Protection Waters.
- A NPSPC Plan must meet the more stringent requirements of either the Commission or state, however, it is not clear how this is determined. As described in detail in Attachment 1, approval by Pennsylvania does <u>not</u> assure that erosion & sediment control or stormwater management are adequately addressed for resource protection. Pennsylvania only requires that stormwater be addressed for sites over 5 acres, and further waives the submission of any plans or stormwater calculations if the

applicant indicates that, 1) original contours will be maintained or replicated, and 2) stormwater BMPs are employed to address the 2-year volume increase. Pennsylvania's requirements are not adequate to protect Special Protection Waters or other waters. If an Erosion & Sediment control plan is not required in Pennsylvania for sites less than 5 acres, will a New Source in Special Protection Waters be required to prepare a NPSPC Plan? This is not clear.

To adequately address non-point source pollution in Basin waters, the Commission should require that all new water sources prepare and submit a NPSPC Plan and erosion and sediment control plan for all locations, in conformance with the Commission's Water Quality Regulations for a NPSPC Plan. NPSPC Plans should be reviewed by the Commission, and available to the public.

Additionally, the same concerns that were cited for existing water sources also apply to new water sources, as related to metering, invasive species control, and most importantly, the cumulative impacts of multiple withdrawals, and the meeting of pass-by flow requirements. It is unclear what level of review will be applied by DRBC, or how determination will be made to rely on a more stringent pass-by flow requirement determined by the state agency.

For new groundwater sources, a Hydrogeologic Report is required as well as a map that identifies nearby wells. But no mapping is required for nearby water features, such as headwaters streams and wetlands, and no required scale is indicated for the well mapping. It is unclear how the Commission will determine that the new withdrawal will not impact nearby perennial streams or sensitive hydrologic features, since "nearby" is not defined.

Finally, Section 7.4.i indicates that a Hydrogeologic report must be submitted for new water sources, but does not indicate that it must be reviewed and approved before proceeding, especially if approved by APR. Section 7.4.ii

indicates that if the monitoring data or other information indicate that the withdrawal "significantly affects or interferes with any designated uses of ground or surface water", or if a complaint is received, that the sponsor must "investigate such complaints" and notify the DRBC. It is unclear whether or not the sponsor should immediately discontinue the withdrawal, or what the timeframe and process are to investigate complaints and to determine if surface or groundwaters have been "substantially adversely affected". Rather, an investigation report or mitigation plan is to be prepared "as soon as practicable" or within a timeframe directed by the Director. This essentially puts the burden on those adversely affected to report problems to the project sponsor, with an unknown timeframe for response and mitigation. It is unclear how adverse affects on headwaters and wetlands will be determined unless specifically identified by the project sponsor.

Section 7.5 Well Pads

The Well Pad requirements are an improvement to state requirements in that the siting restrictions and setbacks are more restrictive and better defined than the state requirements (for Pennsylvania). Specifically, well pads cannot be located in a Flood Hazard Area, and no variance can be granted for a well pad construction within the floodway. However, it appears that variances can be requested for all other siting issues (i.e., construction on slopes greater than 20%, or construction of a well pad within a critical habitat). To request a variance, the project sponsor must only demonstrate that compliance will cause an undue burden (what does this mean?), and demonstrate that the requested siting is equally protective. If "equally protective" is the same as meeting state requirements for issues related to erosion & sediment control, spill control, water resource protection, etc., then the additional siting requirements imposed by the Commission have little value, as the state requirements in Pennsylvania are not adequate (Attachment 1) and state requirements in New York are still undefined. Further, it is still unclear how the mapping and submission requirements imposed by the Commission (at a scale of 1:2000) will provide for a sufficient level of review to protect the resource, as discussed later in this section, and spacing

requirements are based on the state requirements, not the Commission's. For the siting requirements to have meaning, variances should not be permitted, most especially as related to critical habitats for threatened or endangered species.

Well pads can receive DRBC approval under a:

1. **Natural Gas Development Plan Docket**: a Natural Gas Development Plan (NGDP), as described earlier, is required for all leaseholds with over 3,200 acres in the Basin or more than five well pads.

   A project sponsor may request to divide their basin-wide leaseholdings into separate leasehold units (7.5.c.1). It is unclear if this means that a separate NGDP will be required for each portion of the divided leasehold, and if each subdivided portion may submit five well pad applications before NGDP approval. There is no limit indicated for how many separate leaseholds the project sponsor's holdings can be divided into, or any indication of the smallest allowable area (i.e., can a leasehold be divided into areas much smaller than 3,200 acres, or must each subdivided lease holding be at least 3,200 acres)? Is each subdivided leasehold then allowed five well pad applications, while the NGDP is under review? This is not clear.

   There also does not appear to be any limit or restriction to the number of well pads that can apply for dockets under an approved NGDP (Section 7.5.f). In other words, once a NGDP is approved, is there any limit on well pad approvals, or any basis defined for considering limits on the number of well pads allowed? It is unclear how the Well Pad Application Requirements (discussed later) adequately address the impacts of the pad construction, but more importantly, it is unclear how the NGDP will provide for review and adequate resource protection regarding the cumulative impacts of many wells, or how the Commission will consider these cumulative impacts.

2. **Well Pad Docket:** A well pad may also be approved under a Docket, and must submit mapping information that is essentially the same as the mapping information provided in a NGDP, as well as a Natural Diversity Index Assessment (NDIA). Meeting state requirements for an NDIA meets the Commission requirements.
3. **Well Pad APR:** A project sponsor can apply for a well pad APR if it has an approved NGDP, or if it meets specific siting requirements. These requirements are improvements over state well pad requirements, i.e., the well pad cannot be located on slopes greater than 15%, it cannot be located within the New York City Reservoir drainage basins, and the well pad cannot be located on a forested site (although the forested site definition is weak and unclear as discussed earlier). It is unclear how these "more stringent" requirements will apply to APRs for wells under an approved NGDP, presumably the Commission will rely on the NGDP mapping to make these determinations for compliance. The required scale of mapping (at a 7.5 minute quad scale of 1:2000) is insufficient to provide adequate mapping information to determine project compliance.

Natural Gas Development Plan Requirements Section 7.5.c.3 defines the content requirements of the NGDP. The same mapping requirements are required for Well Pad Dockets or ABR. Essentially, the mapping must indicate leaseholds intended for development (within 5 year increments), and map geography, property and mineral rights, roads and rights-of-way, wellhead protection areas, hydrologic features, soils, slopes, critical habitats, natural heritage sites, and forested landscapes. This level of mapping requirements represents a significant improvement over the current level of information required at the state level in Pennsylvania.

However, as discussed previously, at a scale of 1 inch = 2000 feet, it is difficult to determine many of these features adequately, or to map the information in a meaningful way. For example, USGS 7.5 minute quadrangles typically provide

contours at 20-foot intervals. A 15% slope would translate into 0.067 inches between contours, and a 20% slope is 0.05 inches between contours. These small distances are difficult to distinguish or accurately map, and many small areas of steep slopes that could be impacted by well pad construction are likely to not be represented. Similarly, headwaters, wetlands, and springs are unlikely to be represented accurately on a 7.5 minute quadrangle. To accurately locate and identify all natural features, mapping for the well pad area should be site specific and developed at a scale that adequately provides information, such as 1 inch = 200 feet or less. This is common practice for other development projects, and well pad mapping should not be allowed to rely solely on existing 7.5 minute quadrangle information.

Requirements for Well Pads Section 7.5.h defines the requirements for Well Pads, including water source requirements, wastewater requirements, non-point source pollution control plan requirements, mitigation-remediation-restoration requirements, and additional requirements for High-volume hydraulically fractured wells.

With regards to <u>water sources</u>, the requirements fall short of providing for adequate resource protection as discussed previously in detail (regarding Section 7.4). One item worth noting is that for the purposes of payment, the holder of a well pad approval is required to pay the Commission's water supply charge for consumptive use by assuming that "**100% of the water used by a natural gas extraction and development project is considered to be consumptive for the purpose of calculating the water supply charge**". If the Commission is regarding water use as 100% consumptive for the purposes of fee collection, than this water must also be considered 100% consumptive for the purpose of water withdrawal or transfer (as discussed previously) and it is essential that the Commission consider the cumulative impacts of this water loss on a watershed basis, as well as the local impacts on headwaters and wetlands.

With regards to wastewater, the draft regulations require that the well pad sponsors submit quarterly reports to the Commission indicating monthly and daily total water volumes of flowback and production water collected and transported off-site, and the results of any water samples. These reports should also include the destination for disposal or reuse of transported waters, and provide a process for public access to this information.

Well pads are only required to prepare a Non-Point Source Pollution Control Plan only if the well pad is located in the portion of the Basin classified as Special Protection Waters. A Plan is not required for all other waters, and as previously discussed (regarding water sources) the existing regulations in Pennsylvania are not adequate to protect the resource in either Special Protection or other waters. Most importantly, the Commission will rely solely on the state requirements for erosion & sediment control and stormwater management for all well pads approved by APR for exploratory or low volume purposes. Therefore, it can be anticipated that most well pads will seek compliance under the inadequate state regulations, even in Special Protection Waters.

Similarly, for mitigation, remediation, and restoration, the draft regulations accept the host state requirements as adequate for closing and restoration of a well pad site. As discussed in Attachment 1, Pennsylvania's requirements are minimal and consist primarily of seeding the site with a seed mixture that contains some seed material for "brush" species. The Commission should develop its own requirements for site restoration, and a plan to achieve the restoration should be included as part of the well pad application and approval process for all well pads. This restoration should include a process for demonstration of compliance within a set time period. Financial assurance (as addressed in Section 7.3.k.15) should be maintained until adequate site restoration has been demonstrated (and not simply for one year where "no harm" has occurred).

Also, as previously discussed, the definition of an "adversely affected" well or surface water users (as a result of releases) is not well defined and open to

interpretation. Specific parameters related to water quality and quantity should be defined by the Commission for guidance regarding "adverse effects" to provide a benchmark. The report of an investigation or mitigation plan should be prepared by an independent qualified professional as directed by the Commission, with professional fees for the professional paid through the Commission to assure an independent and unbiased review. This is standard practices for other construction projects and installations, and would assure that professional recommendations are unbiased.

With regards to groundwater and surface water monitoring (both pre-alteration and post construction) for high-volume hydraulically fractured wells, there does not appear to be any basis for limiting sampling to groundwater wells within 1,000 feet of the pad, especially since horizontal drilling may extend many thousands of feet from the pad. At a minimum, the monitoring should extend 1,000 feet down gradient of the extent of horizontal drilling and fracturing. Results of sampling should be available to all owners of sampled wells, regardless of whether or not the samples exceed primary or secondary maximum contaminant levels, and the results of sampling should be available for public access and review.

For the pre-alteration monitoring of surface waters, samples should be collected prior to the construction of the well pad to assure adequate representation of pre-alteration. The draft regulations do not indicate whether "pre-alteration" refers to before well pad construction or before fracturing. Since many exploratory wells may be converted to high volume hydraulically fractured wells, and since the construction of all well pads can adversely affect surface water quality, this requirement should be clarified to apply to all well pads, with pre-alteration defined as pre-construction. Again, all sampling results should be available for public access.

Similarly, all reports related to volumes of water use, wastewater disposal amounts and locations, and chemical additives and amounts should be accessible to the public.