KM Responses to BSEACD Questions

Pre-construction

1. **Will a surface geophysical survey be done in conjunction with the karst survey?**
Permian Highway Pipeline (PHP) has teamed up with regional karst experts at Cambrian Environmental in Austin to perform a geological assessment and karst surveys for this project. In addition, void mitigation and response protocols have been incorporated into the PHP construction plan in order to reduce the potential for impacts to karst resources. These surveys and plans are described in response #3 below.

   a. **Has KM estimated the number of karst features?**
   PHP has conducted a karst terrain feature survey. See response #3 below.

   b. **How many have been estimated?**
   PHP has conducted a karst terrain feature survey. See response #3 below.

2. **When will KM share the findings from its karst experts with the public and government agencies/GCDs?**
PHP will provide the necessary information to state and federal agencies as required per our project permits.

3. **How will KM eliminate potential impacts to karst features?**
PHP has teamed up with regional karst experts at Cambrian Environmental in Austin to perform a geological assessment and karst surveys for this project. To reduce the potential for impacts to karst resources, void mitigation and response protocols have been incorporated into the PHP construction plan.

   These surveys and plans are described below:

   - **Karst Terrain Feature Survey** – The most effective avoidance and minimization practice for projects developed in karst terrain is having the proposed route thoroughly studied on the ground by qualified karst geoscientists so that direct impacts to identified karst features can be avoided. Karst feature surveys conducted for the PHP project were conducted by field staff utilizing the best practice of identification based on Texas Commission of Environmental Quality (TCEQ)-0585 - Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones. Field staff surveyed areas where there are surface expressions of potentially sensitive karst features, identified features, and collected feature data. The karst experts evaluated this data and determined where geophysical imaging was necessary to augment the investigation. PHP realigned the route to avoid significant sensitive karst features.

   - **Void Mitigation Protocols** - Pre-construction surveys help avoid and minimize impacts to known karst features. We expect that voids will be encountered that were not detected during the pre-construction survey. When karst voids are encountered during trench excavation the void spaces are expected to range widely in both size and hydrologic function. As with other projects constructed in this terrain, PHP will incorporate a void mitigation protocol. Specially trained inspectors will be checking for voids and report to a team of geoscientists versed in void mitigation procedures. These geoscientists will then implement mitigation procedures, including site-specific best management practices (BMPs), to minimize the introduction of sediment and

maximize preservation void features' aquifer functions. This void mitigation plan is based on the standards in the Texas Commission on Environmental Quality (TCEQ) Edwards Aquifer rules (Title 30 Texas Administrative Code Chapter 213) and the associated BMP manual: TCEQ Publication RG-348 - Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices.

- **General Karst BMP Plan** – Incorporating lessons learned from both local and national linear project examples, as well as advice from karst experts and our environmental team, PHP has developed a set of BMPs tailored to the central Texas karst. Among other things, these measures address sediment control, safe materials handling, and protective measures for specific identified karst features.

4. **Will KM develop a void mitigation plan?**
Yes. See response in question #3 above regarding PHP's void mitigation plan.

5. **Will KM enter into an agreement with GCD's, counties and cities to formally document with these entities the prohibition of liquid products in the pipeline and agree to certain construction and operations methods that protect the aquifer and water supply?**
PHP is designed to transport natural gas, and only natural gas, through its pipeline. This project is backed by several long-term, binding transportation contracts with customers to move natural gas from the Permian basin to the Texas Gulf Coast.

PHP is open to entering into an agreement with groundwater conservation districts, counties and cities to provide additional formal documentation that this pipeline will transport only natural gas. This would be consistent with our easement agreement language with landowners which commits the use of the pipeline to natural gas only.

6. **If KM does not plan to conduct karst surveys, can GCD staff access ROW to perform surveys?**
PHP has conducted karst surveys.

<u>Construction</u>
7. **What are the specific sedimentation controls?**
(See below)
   a. **How do they differ in Texas, compared to Pennsylvania, which also has karst aquifers?**
   PHP will follow the U.S. Army Corp of Engineers Permit 12 for the State of Texas. In addition, the regional karst experts at Cambrian Environmental in Austin will provide a mitigation procedure that will address sedimentation controls around known or unanticipated voids. PHP's karst best management practices (BMPs) also address sediment control, among other protective measures.

8. **When karst features are encountered during construction, will GCDs be allowed access to significant features that are found?**
See the response to question #3 above.

9. **Who will inspect erosion controls and how often?**
We will have a team of inspectors present on the right-of-way. The inspection team will inspect erosion control daily in active construction areas, as well as after large rain events in areas without active construction.

a. **What is the size of the disturbed area before it is revegetated? Typically, how long does the soil remain exposed from the start of disturbance to revegetation?**
For this project, we are seeking a 50-foot easement. During construction, we plan to use up to an additional 75-feet of temporary workspace. We will begin the restoration process of these areas immediately after the pipeline is installed.

10. **As an example, the Mopac project is two miles long and has encountered over 40 voids during excavation. These voids slow down project construction as it takes time to evaluate the void to determine proper mitigation.**
    a. **How will KM respond to unknown voids found during construction?**
    See the response to question #3 above.

    b. **How will KM share the voids, as they're found, with GCDs and cities and counties?**
    Kinder Morgan can share information about significant karst features. Access to individual features may be considered on a case-by-case basis at the time of discovery and will be dependent on the ability to safely access the site during construction activities.

11. **What is KM's spill response plan during and after construction?**
PHP will transport natural gas, which is lighter than air (meaning it rises) and does not sink into the ground or water table. In the extremely unlikely event of a leak, the gas will not remain in the ground or impact the aquifer.

Kinder Morgan has a set of best management practices (BMPs) for the construction of the pipeline which includes, among other topics, safety measures to prevent spills, such as spills from construction equipment fuels, oils, and grease along the pipeline right-of-way. Kinder Morgan's spill prevention measures will meet or exceed state and federal environmental protection requirements.

12. **Will the pipeline be double-walled?**
The pipeline is single-walled steel.

13. **Does KM plan to drill cathodic protection wells along the pipeline? If so, what are the specifications (depth, casing, material, spacing, etc.)?**
Yes, Kinder Morgan will utilize cathodic protection along PHP in order to prevent corrosion for the long-term safe operation of the pipeline. The cathodic protection system will be designed based on an initial cathodic protection survey which will be conducted after the pipeline is in service.

Other
14. **Will there be an opportunity for GCDs to use wells for data collection (geophysical logs, downhole camera survey, etc.)?**
Kinder Morgan will provide the necessary information to state and federal agencies as required per our project permits.

15. **Will background water-quality sampling of wells be conducted?**
Kinder Morgan will work with individual landowners to respond to their questions and concerns about their wells.

16. **What is the chemical composition of the natural gas to be transported?**

PHP has a gas quality specification that every customer must meet in order to deliver gas to the pipeline.

    a. **What toxic constituents will be present and what is their typical concentration in the gas to be transported?**
The natural gas present in PHP meets the required gas quality specifications and is treated prior to entering the pipeline. The quality of the natural gas in PHP is similar to the quality of the gas delivered to individual homes and businesses.

17. **What liquids might be in the pipeline and how much could be released if a leak or spill occurs?**
PHP is designed to transport natural gas, and only natural gas, through its pipeline. This Project is backed by several long-term, binding transportation contracts with key customers looking to move natural gas from the Permian Basin to the Texas Gulf Coast.

PHP's gas quality specifications require the cricondentherm dew point temperature of the gas stream to be normally less than 20 deg. F, but in no event more than 40 deg. F, and in either of those circumstances, PHP does not expect condensate to form in this pipeline.

18. **What is the estimated volume of condensate that can be found in the pipeline or compressor stations at any one time?**
PHP's gas quality specifications require the cricondentherm dew point temperature of the gas stream to be normally less than 20 deg F, but in no event more than 40 deg F, and in either of those circumstances, PHP does not expect condensate to form in this pipeline.

    a. **If a compressor station fails to remove the liquids, what is the volume of liquid in the pipeline.**
PHP does not expect condensate to form in this pipeline.

    b. **What is the volume of condensate that could escape from the pipe?**
PHP does not expect condensate to form in this pipeline.

19. **Will KM notify GCDs and cities/counties if pipeline switches from transporting natural gas to crude or other liquids?**
PHP is designed to transport natural gas, and only natural gas, through its pipeline. PHP is backed by several long-term, binding transportation contracts with customers to move natural gas from the Permian basin to the Texas Gulf Coast.

The current form of easement agreement that PHP signs with landowners contains language that provides PHP will be dedicated to natural gas only. Future right of way documents will include this commitment. Additionally, landowners that have already signed easements with PHP can request an amendment to insert this language.

20. **What resources will be in place to respond in the event of a leak/contamination?**
PHP will transport natural gas, which is lighter than air (meaning it rises) and does not sink into the ground or water table. In the extremely unlikely event of a leak, the gas will not remain on the ground or impact the aquifer.

a. **In the event of drinking water contamination, what actions will be taken to protect water users?**
See answer above.

b. **Will KM conduct ongoing sampling of Trinity Aquifer wells for possible pipeline contaminants?**
See answer above.

21. **How will KM inspect the pipeline and how often?**
Just like Kinder Morgan's existing pipeline systems, PHP will be monitored, 24 hours a day, seven days a week and 365 days a year using a Supervisory Control and Data Acquisition (SCADA) computer system.

These specialized communication systems allow us to monitor and control equipment on the gas pipelines we operate. SCADA systems transmit operating status, flow volumes, and pressure/ temperature information including safety alarms from compressor stations, measurement stations, key pipeline valves and other equipment to centralized, manned control facilities. Kinder Morgan uses state-of-the-art communication systems that include cellular, satellite, microwave, radio and traditional telephone lines to reliably transmit this information to and from the control center, and provide real-time monitoring and control of the pipeline. When operating conditions approach preset conditions, an alarm alerts the operator on duty, and the condition is investigated and corrected.

We employ internal inspections using sophisticated, computerized inline inspection equipment (aka "smart pigs"), close interval surveys and cathodic protection to protect pipelines from external corrosion.

 "Smart pigs" are inserted into the pipeline at a valve. They then are pushed along by the products through the pipe measuring and recording irregularities that may represent or presage corrosion, cracks, laminations, deformations or other defects that could turn into problems. There are three basic types of smart pigs. One uses mechanical arms or other electro-mechanical means to measure the bore of the pipe. These geometry tools can identify a variety of deformations and can sense changes in girth welds and wall thickness. Two other types utilize ultrasonic testing, either via compression waves or shear waves, and magnetic flux leakage (MFL) with the magnetic field oriented either axially or circumferentially.

For new pipeline systems, and occasionally on existing lines, we also use hydrostatic pressure testing to perform strength and leak tests. This process is performed before putting the pipeline into service, or after taking an existing pipeline out of service, filling it with water, raising the internal pressure of the pipe to a designated level well above its allowed "in-service pressure," and holding the pipe at or above that level for a prescribed period of time.

a. **How will KM test the pipeline and how often?**
See answer above.