

To PUC Members
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Docket HP22-002
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I am a married 72-year-old retiree. My wife and I are writing to you regarding the impact of the Navigator Carbon Dioxide pipeline (Iowa = HLP-2021-0003 and SD HP22-002) as it pertains to areas with significant rural residential growth potential in the next 20 years, specifically southeast of Sioux Falls. Thank you for this freedom to express our opinions and concerns. We would also like to share a suggestion we believe could potentially increase the safety of the pipeline project while also potentially saving approximately \$3 million for Navigator if the project is approved. The following is my understanding to the best of my ability. If I make any error or perhaps offend unintentionally, I apologize in advance and am very open to correction. Over the past 20 years there has been significant number of rural residential Developments that have sprung up along the Sioux River corridor southeast of Sioux Falls. Based on that growth trend one would expect that it will continue over the next 20 years. Unfortunately, in Navigator's current route, the last 5.7 miles crossing into Iowa from South Dakota (South of Sioux Falls) will end up right in the middle of a new rural residential growth area along this river corridor. This raises several concerns.

Safety/Liability/Accountability/Transparency:

This high-pressure liquid Carbon Dioxide (CO₂) pipeline project will fail at some point just like the recent failure of the Keystone pipeline in Kansas. That is a statistical reality. Oil and natural gas pipelines have been around for many years, yet they still fail despite huge advancements in technology. The Keystone oil spill is bad, but what if it had been a CO₂ liquid high pressure pipeline that burst? Unfortunately, we have an example of one that did less than two years ago. The incident occurred August 2021 in Satartia Mississippi (population around 50). Based on articles I read, the Satartia disaster was caused by a landslide which severed a pipe located on a high bluff about ½ mile from the town of Satartia. The CO₂ gushed out in a white cold cloud and proceeded to roll down into the valley where the town was located, eventually flooding the town with CO₂. Some residents trying to escape the CO₂ cloud were overcome by lack of oxygen. They walked around aimlessly, disoriented, and confused. Others passed out in their cars or laid on the ground from oxygen deprivation. Because emergency vehicles could not run in the CO₂ cloud, rescue workers had to travel on foot which limited the number of oxygen tanks they could carry to help those who were passed out. One of the articles indicated 300 people were harmed and 45 people were hospitalized due to near suffocation. Some of the individuals have on-going health problems due to near suffocation. Yet, had the pipeline burst at night when people were sleeping many would likely have died. Like a natural gas line, a CO₂ pipeline explodes and creates a crater -- not due to flammable gas but due to extremely high pressure. A rupture of a natural gas pipeline is only potentially lethal within the proximity of the explosion. However, a CO₂ pipeline could potentially kill at the rupture site and also be lethal within at least ½ mile along the ground (likely farther) in any direction as was the case with Satartia. There were also reports of wildlife such as deer that succumbed to the gas along the path. This fact would also imply that livestock (and pets) could also die if engulfed by a CO₂ cloud. Many articles about this event are available on the internet. I would encourage everyone to read them.

My understanding is a pipeline carrying liquid CO₂ will quickly change (burst) into CO₂ gas when a pipeline ruptures. It appears that CO₂ gas could be considered more dangerous due to its impact to a larger area because it does not disperse by rising upward and quickly into the air. Instead, CO₂ gas settles near the ground in low lying areas. Or it will flow on a flat area as a white cloud in any direction, as if it were water. This is due to the fact CO₂ is heavier than normal air. In either case, it will engulf any living organism in its path potentially suffocating

them. CO2 gas is also more dangerous than natural gas from a rescue standpoint because any vehicle with diesel or gas engines (i.e., ambulances, firetrucks, cars, etc.) cannot run in a CO2 cloud. This is because CO2 displaces oxygen which is required for combustion engines. Also, emergency responders cannot rescue people unless they have special breathing apparatus, requiring them to carry oxygen tanks for themselves and victims when entering the CO2 area. The current Navigator route's proximity to the southeast Sioux Falls expansion and Sioux River Corridor development puts many at risk. The magnitude of the damage and liability caused by a ruptured pipeline will increase dramatically in the coming years, particularly along Navigator's 5.7-mile route as it crosses into Iowa as it fills in with family homes.

Questions: Are County emergency vehicles and employees equipped with breathing equipment to work in a CO2 cloud? Will there even be volunteers willing to enter such a dangerous area with heavy equipment on their backs? Will counties and their taxpayers bear this financial burden?

The failed Satartia pipeline is still owned and operated by the largest producer of CO2 in the world, Denbury INC., headquartered in Mississippi. Denbury INC. extracts CO2 from a dormant volcano 2,500 feet under Jackson Dome near Jackson Mississippi which is also near Satartia. It primarily uses CO2 in their pipelines for enhanced oil recovery. This involves injecting the liquified CO2 gas into underground rock formations to collect more oil. We are told that the CO2 from the Navigator pipeline will be piped up to North Dakota and be injected a mile below ground where over time it will mineralize.

Questions: Why not use the carbon dioxide like Denbury INC. to extract the oil in North Dakota as it is displaced by the carbon dioxide pumped into the ground? Is it because Tax Credits designed to reduce CO2 do not qualify if used to harvest oil which eventually offsets the purpose of the pipeline due to the release of CO2 when burned? If, however, that is what is being planned then that should be made known in all carbon company presentations (transparency). Citizens should know the full impact of the pipeline and all the implications of its installation. We would assume the PUC must surely agree. If harvesting oil is not what is being planned it would also be beneficial to mention it in the presentations. This quickly clears up any thought that its absence may be intentional which opens the door to other concerns.

We own crop land both in Sioux and Lyon County in Iowa, and as such, have an interest in a strong ethanol industry and also own Rural residential lots on the pipeline route. We are greatly concerned about the pressure being put on landowners to sign easements while many safety questions still remain. I am quite certain this is due to completion date targets on a project plan. **We will not feel comfortable with the pipeline until solid evidence confirms the adopted standards that are specific to CO2 gas unique characteristics are incorporated in the design. We need facts not opinions which are really easy to give if you're not directly impacted. For example, are the pipes specifically designed for CO2 gas versus repurposed natural gas lines? If so, were tests done and are there reports available by independent organizations (not by stakeholders) validating that the standards for the pipe are adequate? Have procedures and controls been approved by governing agencies, if so, where are their findings? Are there actual existing CO2 pipeline routes using these special designed CO2 pipes and if so, how have they performed? Where are the pressure pumps going to be located, what is their safety record? We would assume all this and much, much more would be defined before rolling it out in such a massive scale.** Our concern is that, if the project obtains approval prior to all these issues being addressed, they will not be addressed. And if so, we may live to regret the CO2 pipeline due to the dangerous threat to human and animal life. Satartia is an example of what could happen. Everyone had better be comfortable when weighting the risks to families against their personal ethical standards and willing both financially and morally to face a similar event as Satartia if this project is approved. Pray for the best but plan for the worst.

Question: I understand the pressure of meeting project deadlines. We are hopeful that safety will NOT be placed on the sideline in order to get as many landowners signed up as fast as possible. What is the rush?? Is this being driven by PUC rules?? Why not have all issues addressed and designs tested with actual prototypes in operation? Other roll-out strategies could be utilized. For example, approve a route that is closest to its final destination and allow it to run for 2 years to identify any issues. After 2 years evaluate if those issues have been resolved. At the point of resolution, approve another section using the same process. After 5 years, expand the pipeline to its full potential. A phased rollout seems to be a sound, rational approach to me. Legislation could be approved that accommodates this approach to maintain tax credits since it appears both Republican and Democrat representatives approve this project. There is plenty of time to 'make money' but there is no amount of time that can bring back loved ones who could die from exposure to CO2 gas. If that happens the public will demand that decision makers who were aware of the risk to be held accountable, that is a reality. As the old saying goes, "once you are aware, you are responsible and accountable". This applies primarily to leaders, but in a democracy, it applies anyone reading this document.

At a recent Navigator informational meeting a question was asked, "How many people are in favor of the pipeline?" In a room of maybe 75 participants, we saw about 6 hands go up. Then the question was asked, "How many people want to live by the pipeline?" Interestingly, I did not see any hands go up. Even in this informal small poll the answer was clear. If there are two identical building lots or houses for sale, potential buyers would pick the one without a pipeline.

To compete, the owner of the property with a pipeline would have to drop his price to attract a buyer. As a result, he will eventually find someone who will buy it even if the lot or home is within 10 feet of a pipeline but at a much lower sale price. Clearly, the value of the current homes and potential future homes (which will be built) near the 5.7- mile route will be negatively impacted. The current and future density of this area surrounding this section of the route would certainly qualify as an area of high population consequence.

We also own a number of small exclusive Agriculture Transition A2 zoned Lots for single family dwellings. One of the lots we own is on the current Navigator pipeline route. It consists of 100% old growth forest of Burr oak, maple, ash, and cedar on 13 acres bordering the Sioux River and overlooking its flood plain. Navigator plans to bore under both the river and lot due to the 150-foot change of topography from the river to the top of the lot and another 100 feet to the top of the bluff. Navigator management has been very accommodating to try to help minimize the damage to the valuation of our lot if the project is approved, and that is very much appreciated but there still remains impact just from the potential risk of a ruptured pipeline. An actual rupture of the pipeline in this area (as it did Satartia) would also resulting in CO2 flowing downward along the river and into the 177-acre flood plain. Given the topography, nobody whether human or animal will escape the cloud. The high bluffs surrounding the flood plain will prevent escape by hikers, boaters, hunters or families living in that area.

Suggestion to mitigate some of the above risk and/or negative impact of the pipeline mentioned above, simply put:

"Avoid and minimize High Consequence Areas (populations, environmental)"

This is Navigator's first Design and Safety principle as explained to us by the Navigator presenter at the meeting we attended. She indicated that population considerations include current and future growth expectations. Yet, it appears that the 5.7-mile route they propose which crosses into Iowa does NOT follow this principle. In this section of the route there are already 34 existing homes within ½ mile of the pipeline (Distance similar to Satartia from their pipeline). There are also at least 11 existing single family zoned lots with building elibilities some within ¼ mile. We suspect that Navigator route designers were not aware of the actual historical growth along this corridor, nor the obvious logical expected growth and development of this area in coming years. On that basis we believe that had they known, they would not have chosen this route and quite logically chosen the route we are proposing.

Conclusion:

In this document we are providing evidence in order to alert Navigator (and PUC) that the 5.7 mile stretch of the current Navigator pipeline route described above does not appear to currently comply with their stated principles. This would put them in high liability/financial risk in the future which should be a concern for Navigator management and investors. We are also providing a suggestion on how Navigator could still comply with their stated safety principles reducing liability exposure while potentially saving up to 3 million dollars at the same time. We realize there may be some issues we are not aware of that could deteriorate the full savings. Yet, even if it were a “break even” situation (or even a loss situation), by preventing a future disaster (incurring a huge liability) it would be a win for trust in Navigator’s integrity to safety, faith in the PUC’s obligation to the protection of citizens and environment, while still achieving the desired outcome for the project and still delivering it on time.

The two States through which the 5.7 mile leg of the route crosses, have different rules. It is my understanding that Iowa PUC rules would prevent Navigator from considering our suggestion given it is more than a ½ mile change outside the current proposed route. Apparently, Iowa PUC rules would require them to restart the pipeline application process over from the beginning requiring public meetings etc., delaying the project. However, I was told by Navigator this is not a requirement of the South Dakota PUC, so Navigator could change the route in SD unhindered.

Based on the information above it would be pretty much common sense that moving the route is the right thing to do. Fortunately, the Iowa PUC have also taken into account situations like this and allow for a request for a waiver of rules. I have discussed this with Navigator management and am hopeful they will do the right thing and request waivers that would mitigate delays so they could proceed with this change in Iowa. Question for SD PUC, what is required of Navigator to modify their existing route?

Current Navigator Proposed Route

Navigator’s current east/west route in South Dakota runs parallel to SD 276 from Interstate 29 eastward about 5 miles then turns north about ½ mile west of SD County Road 135 which is within a couple of miles of the Sioux River. It continues northward along the Sioux River Corridor through the prime future Sioux Falls metro development area impacting both the SD and IA sides of the Sioux River.

We are suggesting they change the route (Proposed Alternative Route) to avoid the Sioux River Corridor described above. **The Proposed Alternative Route potentially saves up to three million dollars based on Keystone XL estimated pipeline cost per mile as a comparison (source from WIKI Global Energy Monitor).**

Proposed Alternative Route

Instead of turning north crossing SD 276 approximately ½ mile west of SD County Road 135, Navigator should continue the pipeline eastwardly 2 additional miles and then turn northward at an approximate 45-degree angle to cross the Sioux River into Iowa.

After crossing the Sioux River, the Proposed Alternative Route would continue northeast through the east edge of the Hidden Bridge Park and Peterson Prairie Wildlife Park. Hidden Bridge Park is a preserve and Peterson Prairie Park is basically a grassland. No buildings or residences exist on either of these parks. The Proposed Alternative Route could then continue northward in the middle of two sections in Lyon County which have no existing county gravel road between them (east side of Peterson Prairie Wildlife Park going north). Since existing farms and new building eligibilities are generally near county roads, the pipeline (over the next 20 years) would be nearly one mile on either side from existing farms or potential future development stimulated by proximity to Sioux Falls. The Proposed Alternative Route could then reconnect with the current Navigator route continuing northward.

In summary, we believe the Proposed Alternative Route should be attractive to Navigator management, the PUC, and the many property owners having lots or homes in this Sioux River corridor. Benefits include:

1. Shortening the pipeline. The Proposed Alternative Route is 5.2 miles long while the current Navigator route is 5.7 miles. The Proposed Alternative Route would eliminate nearly 1/2 mile of steel pipeline and installation labor. My understanding is the cost of installing the Keystone XL pipeline was estimated at approximately \$3.7 million per kilometer or equivalent of about \$6 million per mile (information obtained from WIKI Global Energy Monitor). It is likely a high-pressure hazardous CO2 pipeline of this nature would cost even more. In either case, \$3 million (\$6 million x 50%) could potentially be saved with the Proposed Alternative Route.
2. Avoiding high concentration population areas of both current and future development over the next 20 years. This is congruent with Navigator's criteria for designing a route as explained by their representative during the presentation at the meeting. The current route is simply too close to Sioux Falls metro area, especially the Sioux River corridor. The Proposed Alternate Route will reduce liability exposure when the pipeline breaks. Not that I am for passing the safety risk downstream, but the immediate concentration and future growth pattern of population should be the primary factor in the route selected exactly as Navigators principles state. Those living downstream would be affected regardless which route is taken.
3. Requiring only three bends in the pipeline verses the seven bends required in the current Navigator route. Fewer bends are needed in the Proposed Alternate Route since it traverses fewer farms and acreages that require more twists and turns. Fewer bends are beneficial in decreasing the friction caused by pushing the liquid through the pipeline. Less friction means fewer pump stations would be needed to push the liquid through the pipeline - another cost savings.
4. Reducing the amount of cropland impacted by approximately 1.5 miles. One half mile is preserved by the pipeline length reduction. The other mile is preserved by instead using Hidden Bridge Park and Peterson Prairie Park grasslands.
5. Reducing the cost of easements. This is partially due to the shorter route. Plus, we assume Lyon County would not require payment on any easement for crossing the Hidden Bridge and Peterson Prairie Park since the CO2 project and the grassland park are both promoted for the benefit of the public.
6. Causing less environmental impact. The Proposed Alternative Route does not cross large heavily old growth treed areas thus saving the rare old growth canopies. Governor Kim Reynolds signed the 2018 Iowa Tree Canopy Cover Proclamation protecting such areas. We believe the PUC members support this directive. It also does not cross a flood plain where many wild ducks and geese nest each year.
7. Protecting current and future property valuations. The Proposed Alternative Route will mitigate the decrease in property values that would occur with Navigator's current route plan. Additionally, it protects potential future growth along the Sioux River corridor. These changes will be considered positive for the citizens and elected officials representing them.
8. Avoiding the flood plain. The Sioux River floods nearly every year either due to snow melt or large rainfall. Pipelines under flood plains require special design and installation with additional costs. The Proposed Alternative Route would eliminate this expense.
9. Avoiding the need to traverse huge changes in elevation resulting from the bluffs along the river. The current Navigator route requires a 250-foot change in elevation. Avoiding this

mitigates the potential issue of landslides due to erosion which was experienced in Sartia Mississippi. Also, additional cost savings would occur by reducing the need for boring.

We believe this alternative is a win-win for nearly everyone, and a tie score for the rest. We also realize that both the current Navigator route and Proposed Alternate Route cross state lines, and thus, involves the PUCs of both states. We also know that each state has its specific rules/process/authority as it relates to pipe line approvals. Likewise, Navigator is primarily responsible and accountable in the determination of routes. However, it is our expectation as citizens and land owners that both PUCs of each state will work with Navigator (i.e., provide rule exceptions) to ensure the route maximizes safety by, "Avoiding and minimizing High Consequence Areas (population, environmental)" regardless of what state (or investors) they represent.

Thank you for reading and considering our input.

Two Images:

These images provide a high-level (first image) and close-up view showing the relative distance between Sioux Falls and the Sioux River corridor and details of that area. Highlighting in yellow shading the areas of rural residential development south along the Sioux River Corridor over the past 15- 20 years. Rural residential developments located farther south along the river (Lake Alvin area) have grown the fastest because prices for lots have skyrocketed for those in and nearer to Sioux Falls. Even lot prices located on the lower portion of the exhibit areas are reaching \$150,000 per acre. As lot prices continue to rise in these established developments, Developers/home builders/buyers will migrate farther south to the area highlighted in a green border (go to second image).

Within this green bordered area, the yellow house icons represent a high number of current existing homes. However, in the next 20 years it is reasonable to assume this section will be developed similar to those along the corridor above it. Thus, the pipeline is already and in the future be well within a densely populated rural residential area of 100's of family homes.

The following is the legend:

1. Highlighted areas in yellow are actual housing developments with many homes.
2. The red line represents Navigator's current route.
3. The yellow line is the Proposed Alternative Route.
4. The solid blue area is the flood plain that is covered by water nearly every spring and occasionally with heavy rains. During those periods, it literally turns into a lake.
5. The area bordered in green is currently a high-density area. Gaps between homes in the interior of the section will likely be filled in over the next 20 years as prices skyrocket in the upper developments.
6. Each yellow house icon represents an actual family home in existence today.
7. Each green house represents building eligibilities.
8. The smaller bordered areas on the north and east side of the flood plain (bordered in black, orange, and purple) represent actual zoned lots in Ag2 district. Those eligibilities positioned for future development. All lots have old growth forests. The Navigator current route (red line) goes through the left edge of my lot 6 having a building eligibility (orange bordered area north of flood plain).
9. The area bordered in blue represents the two parks.



