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Proposal
for
Revision to the Action Memorandum
for the
Skyline Water System

April 18, 2002

Introduction

The U.S. Environmental Protection Agency (EPA) issued a final Action Memorandum on May 19, 2000 regarding a replacement water supply for the Skyline water system near Moses Lake, Washington. The Action Memorandum called for installation of a new groundwater well to replace the Skyline system's two contaminated wells. These wells are contaminated with trichloroethylene (TCE), a solvent routinely used in metal degreasing operations.

A new groundwater well was installed to replace the Skyline system wells per the terms of the Action Memorandum; however, groundwater samples collected from the new well revealed TCE contamination. The new well has never been used as a water supply, and it cannot be used in the future without treatment.

The Action Memorandum contemplated contingency options in the case of the new well being contaminated. However, as the formulation of options in this proposal is different than the options described in the Action Memorandum, a revision to the original Action Memorandum is appropriate.

This proposal summarizes the work that is required to provide Skyline with a replacement water supply. The decision described in this proposal is intended to provide sufficient detail for public notice and comment. The original Action Memorandum will be revised after EPA has received public comment regarding this proposal, has prepared written responses to all comments, and has modified this proposal, as appropriate.

Proposal

The proposal EPA is presenting herein is intended to replace the Skyline water system supply as expeditiously as possible. The proposal reflects a tiered decision process, which includes three potential technology options: another new groundwater well, treatment of the existing contaminated groundwater, or a pipeline connecting to the Moses Lake municipal water supply.

The three technology options described in this proposal are very similar in terms of their costs to implement (between $300,000 and $450,000), their technical complexity, and in terms of the time required for construction. However, they are not similar in terms of anticipated community support or EPA's preferences for implementation. In previous community meetings and in written comments, Skyline water system users have expressed their preferences for a new well, and they have vigorously opposed being connected via pipeline to the Moses Lake municipal water supply. Based on these community preferences, and on an analysis of relative costs and technical factors, EPA has determined that the three technology options presented in this tiered proposal should be prioritized as follows:

1. Another new groundwater well;
2. Treatment of existing contaminated groundwater; or a
3. Pipeline connecting to the Moses Lake municipal water supply.

If this proposal is finalized, after proper public notice and comment, EPA will implement option #1, if possible to do so within the range of estimated costs and technical factors described in this proposal. If EPA determines it is not possible to implement option #1 above, then EPA will attempt to implement option #2, and so on for option #3. This tiered approach is necessary because there are both technical and non-technical factors that may affect whether the options are feasible as described herein. EPA is confidant that all three options are feasible, but is presenting the proposal in this manner in order to account for a variety of variables that are not yet resolved.

Each of these three options, and the variables related to each one, are described in more detail below. During the public meeting on April 30th, 2002, and in the final revision to the Action Memorandum, EPA will briefly summarize all other options considered but not selected for this proposal.

New Groundwater Well

The objective for installation of a new groundwater well is more precisely stated as "installation of a new well to obtain groundwater from the Gingko basalt flow located near the base of the Wanapum Formation." It is also more accurate to state that a "new well" is not the specific objective, because it may be possible to obtain groundwater from the Gingko basalt flow by deepening the well that had been installed under the terms of the Action Memorandum.

However, it will be necessary to first determine whether there is sufficient groundwater volume and quality located in the Gingko basalt flow prior to installing a new well. This will require an investigation of the Gingko basalt flow, including deepening the existing replacement well and conducting pump tests, packer tests, and groundwater chemical analyses. This investigation will cost less than $100,000, can be implemented in a relatively short period of time, and will be used as the basis for determining whether the Gingko basalt flow can provide the needed groundwater for Skyline.

If EPA determines the Gingko basalt flow can provide Skyline with a sufficient volume of uncontaminated groundwater, it will then be necessary to determine what the most cost-effective manner would be for installing another well. This may involve deepening and modifying the existing well or installing an entirely new well nearby. EPA will use the information and experience from the Gingko basalt flow investigation to make this determination, if required.

If EPA determines the Gingko basalt flow can not provide a sufficient volume of uncontaminated groundwater for Skyline, or if EPA determines a new well would not be feasible due to technical, cost, or legal factors, then EPA would close this option and move on to the treatment option below.

There are some risks associated with this option. The most important risk is the possibility that TCE-contaminated groundwater could eventually contaminate any new well in the Gingko basalt flow over time. This could occur even if initial tests demonstrate that the Gingko basalt flow is uncontaminated. This is because continual pumping from the Gingko basalt flow could draw TCE down into the Gingko flow from the upper basalt formations. EPA will not install a new well if it believes there is more than a very small chance this will occur, but nonetheless this risk is real and must be considered by the community. If any new well in the Gingko basalt flow does become contaminated over time, EPA would then support the option to connect Skyline via pipeline to the Moses Lake municipal water supply.

A final risk associated with a new well is that groundwater volumes may not exist for the purposes of supporting any future upgrade to Skyline's fire protection systems. Such an upgrade is not within the scope of this proposal, but it may nonetheless be a subject the public may choose to comment about.

Treatment Of Existing Contaminated Groundwater

The option to treat contaminated groundwater will only be considered if EPA determines the option for a new well as described above is not feasible.

The objective for treatment of contaminated groundwater is more precisely stated as "treatment of TCE-contaminated groundwater pumped from both the existing new well and from Skyline #2." It is necessary to use both wells in order to obtain a sufficient water volume to serve Skyline. EPA has also determined that the most cost-effective treatment technology for this project is a low-profile air stripping system.

A low-profile air stripping system has several advantages for this application. "Low-profile" in this context means that the air stripping technology being considered for Skyline does not use large, tall air stripping columns, characteristic of large-scale air stripping systems. The TCE concentrations found in groundwater at Skyline, and the needed volume of groundwater, are both low enough to allow a low-profile system to be used.

The air stripping technology removes TCE from groundwater by running air through the contaminated groundwater. TCE is a volatile chemical that tends to transfer from contaminated water into air. This results in a lowering of TCE concentrations in groundwater. In this case, EPA believes the low-profile air stripping technology is capable of reducing TCE contamination in groundwater to levels well below the maximum contaminant level (MCL) of 5 micrograms/liter (ug/l, commonly referred to as "parts per billion").

At this point, EPA has not selected any specific low-profile air stripping technology. If this option is necessary, the U.S. Army Corps of Engineers (USACE) will seek competitive bids from several low-profile air stripping technology vendors. EPA and USACE will then choose the most cost-effective air stripping technology based on the bids received. Only vendors who can demonstrate compliance with the technical requirements of the bid specifications will be considered.

If EPA determines the low-profile air stripping technology can not provide a sufficient volume of uncontaminated groundwater to Skyline, or if EPA determines such a system would not be feasible due to technical, cost, or legal factors, then EPA would close this option and move on to the pipeline option below.

There are some risks associated with this option. The most important risk is the technical and legal particulars associated with obtaining the necessary water rights and health department clearances to operate both the new well and Skyline #2 at the same time. The water rights issue is a matter EPA is confidant can be quickly resolved, but there may be a need to chlorinate the treated water supply because any treatment technology represents a "break" in the connection between the wells and Skyline. EPA encourages the public to comment on this potential need for chlorination.

Another issue is the expense to the Skyline community of operating the treatment system. For the first 10 years, the U.S. Government will pay for maintenance labor and materials, but not for electricity to run the treatment system. The electrical cost is estimated at $6,000 per year, or an average of about $6 per month per household. After 10 years, the community will be responsible for an additional estimated $14,000 per year in operation and maintenance costs, for a total of about $20 per month per household on average. These costs are in addition to the costs of operating and maintaining the pumps in the two wells. EPA encourages comments on the operation and maintenance costs associated with low-profile air stripping water treatment.

A final risk for Skyline associated with this treatment option is that groundwater volumes will not exist for the purposes of supporting any future upgrade to Skyline's fire protection systems. Such an upgrade is not within the scope of this proposal, but it may nonetheless be a subject the public may choose to comment about.

Pipeline Connecting To Moses Lake Municipal Water Supply

The option to connect Skyline to the Moses Lake municipal water supply will only be considered if EPA determines the options for a new well, and for groundwater treatment, as described above, are not feasible.

The objective for connecting to the Moses Lake municipal water supply is to provide Skyline with clean, potable water if the other options considered herein are not feasible. EPA is aware there is significant community opposition to such a pipeline, but has determined that it may be necessary to achieve the stated objective of supplying clean, potable water.

The pipeline itself is a relatively straightforward technology and has already been the subject of significant design work conducted during previous phases of this project. The pipeline routing, rights-of-way, and other technical details had already been worked out in 2000. The rights-of-way would need to be approved again.

However, as for the other two options, there are some risks associated with the pipeline option. The most important risk relates to distribution of Moses Lake municipal water via the existing Skyline water distribution system. This system is reportedly old and leaking, which may result in excess use of the Moses Lake water supply and additional costs to Skyline residents because of this leakage. Upgrade and/or repair of the Skyline water distribution system is not within the scope of this proposal, so this risk is largely one that would be faced directly by the Skyline water users themselves. EPA and USACE would terminate the pipeline at the head of the Skyline distribution system, and the water would be metered at that point for calculation of payments owed by the water purveyor, and ultimately the community, to Moses Lake. If this option were implemented, the existing water purveyor and the Skyline water users would need to negotiate distribution options from the pipeline termination point to residents' homes.

Other risks are the technical and legal particulars associated with obtaining the necessary water rights and health department clearances. The water rights issue is a matter EPA is confident can be quickly resolved, but there may be operation and maintenance issues associated with the current water purveyor, or another purveyor, being the distributor of Moses Lake municipal water. EPA encourages comments on this distribution issue during the public comment period.

Unlike the previous two options, a potential benefit of the pipeline option is that sufficient water volumes will exist for the purposes of supporting any future upgrade to Skyline's fire protection systems. Such an upgrade is not within the scope of this proposal, but it may nonetheless be a subject the public may choose to comment about.