

5 INVENTORY OF POTENTIAL SOURCES OF GROUNDWATER CONTAMINATION

An essential element of wellhead protection is an inventory of all potential sources of ground water contamination (potential contaminant sources) in and around delineated wellhead protection areas. The purpose of the inventory is to identify past, present, and proposed activities that may pose a threat to the water bearing zone (aquifer) utilized by the well, spring or wellfield.

The list of potential contaminant sources derived from the inventory should be an accurate reflection of the actual risks posed to the drinking water supply. Depth of the well, its construction, the geology of the area, and the aquifer characteristics are all factors that influence what constitutes a “potential contaminant source”. For example, a properly constructed deep well drawing from a confined aquifer will probably not be significantly at risk from septic systems. However, an improperly abandoned well, which provides a conduit for contamination transport, does pose a risk to this system’s source water.

Primary responsibility for the inventory rests with the public water system / purveyor. The limited abilities of non-governmental purveyors to conduct an effective inventory points out the need to form a local wellhead protection committee to coordinate inventory and other implementation efforts. Partial inventories may have already been conducted for other purposes, such as ground water management plans or watershed protection plans, and could be re-used by purveyors.

An inventory is a required component of a local wellhead protection program. Documentation must be provided in the wellhead protection plan on how the inventory was conducted and what follow up work has and will be done by the public water system to contact both the identified potential contaminant sources as well as the Navajo Nation, federal or state agency having jurisdiction over each potential contaminant source. An initial inventory should be completed within one year following wellhead protection area delineation. An initial inventory should include, at a minimum, all potential sources of contamination within Zone 1 (the 1 year time of travel), and high risk potential contaminant sources within Zone 3 (the 10 year times of travel). The inventory must be updated every two years, at a minimum. In settings experiencing significant growth or changes in land use, the inventory should be updated on a more frequent basis.

Conducting an Inventory

The NNEPA PWSSP has developed a comprehensive list of potential contaminant sources, also known as Form 2 - Potential Sources of Contamination (PSOC) checklist (Appendix F of *Vulnerability Assessment Form - Primary Appendix H*). This list

classifies different types of potential contaminant sources into five major categories. These categories are based on the general nature of contaminants that could be released into the ground water.

When inventorying, it is important to note that one facility may have several different potential contaminant sources. For example, a gasoline service station may have an underground storage tank, a shallow drain, or dry well and an onsite septic system.

There are a variety of techniques used to identify contaminant sources, either independently or in conjunction with other approaches. Common techniques utilize existing data, surveys, and field studies.

Existing Data

It is important to include past land uses in the inventory since, for example, leaking underground storage tanks may be found at the site of an abandoned gas station. Information regarding past land uses can be obtained from such sources as old aerial photographs, historical maps, and interviews with long term community residents.

Sources of information for current land uses include:

- ▶ recent aerial photographs,
- ▶ telephone directories,
- ▶ Navajo Nation business regulatory leases, and
- ▶ construction permits.

The various NNEPA departmental programs maintain a variety of informational data bases to track permitted activities or facilities, environmentally sensitive areas, or solid/hazardous waste inventories within the Navajo Nation. These data bases range from computerized systems to file drawers.

It is important to remember that even if information from data bases is readily available, the listings will only identify facilities that are required to file information under existing regulations. Other inventory approaches must be used to identify unpermitted facilities or unknown activities / producers of sources of potential contaminants.

Surveys

Once data for wellhead protection areas has been researched and recorded, data gaps can be identified. The need for gathering additional information and/or verifying recorded data can be assessed. The most comprehensive method of obtaining additional information is generally by a survey. Type of surveys include:

- ▶ mail questionnaires,
- ▶ telephone surveys,
- ▶ windshield surveys,

- ▶ door-to-door surveys, and
- ▶ personal interview.

Field Searches

Inventories for potential contaminant sources often include field searches of some or all of the area being inventoried. Field searches allow inventory workers to look at the survey area themselves, without relying on landowners to identify and provide information about sources. Field searches are conducted much like door-to-door surveys and required the same amount of planning but often required more time to complete. Field searches consist of an extensive foot survey of an area, and are often used when a particular situation calls for a detailed inspection of land uses.

Modifying Inventory Approaches to Address Local Settings

Few public water supplies or communities need to conduct mail, phone, door-to-door surveys, and field searches, as this would gather a large amount of repetitive information at a high cost. Which methods are used will depend upon the situation of the community conducting the inventory. If resources are not available for some of the more labor intensive methods, various means may be used to reduce the efforts without losing their value. The use of volunteer organizations, or the Navajo Nation Chapter Representative, should always be considered when resources are limited. Ideally, each community should strive to conduct the most complete inventory possible given their situation and the resources available to them.

It is important to remember that the information gathered from the inventory needs to be updated regularly, perhaps more frequently than the two year minimum requirement. The intervals necessary between updates will vary with each municipality; rate of growth will be a big factor in making this determination. It may be possible to update the inventory automatically, i.e. when a new business opens in a wellhead protection area, it could be immediately entered into the database.

Prioritizing Inventory Efforts

Method(s) of inventorying within the wellhead protection area, and the outreach to both identified potential contaminant sources and agencies with jurisdiction over them, need to be included within the public water system's wellhead protection plan. NNEPA PWSSP recognizes that conducting a comprehensive inventory for all potential sources of ground water contamination within a large wellhead protection area will require time. Inventory efforts should be prioritized using two criteria. The first is working out from the wellhead. The most intensive efforts should be initially focused within Zone 1, the one year time of travel area. Then the inventory area should be expanded outwards to include Zone 2 and Zone 3.

The second prioritizing criteria is to initially focus on high and medium risk facilities and activities within the entire wellhead protection area. While what constitutes a high potential risk source will vary from location to location, there are certain types of operations that pose a potential threat in almost all settings. Improperly abandoned wells, underground storage tanks, dry cleaning operations, and abandoned mine lands, for example, all have a high potential for seriously impacting ground water quality. Because the total number of high and medium risk operations is typically low, detecting and contacting them should not be a labor intensive task.

An inadequate inventory or outreach effort will result in NNEPA PWSSP not approving the vulnerability assessment and / or wellhead protection document.

Prioritizing Inventory Findings

Information gathered through the inventory process can be used to help establish action priorities within the wellhead protection area. Risks posed to the wellhead protection area can be evaluated and management efforts can be directed towards high priority sources. When assessing the relative risks posed by a variety of potential contaminant sources, the type of material / activity, quantity, and method of storage and handling should all be taken into account.

A relative risk assessment will aid the purveyor / community in:

- ▶ determining a risk “score” for each potential source,
- ▶ ranking each source according to the level of risk associated with it; and
- ▶ determining the relative level of threat that a given source poses (high, medium, or low).

This approach allows a initial screening of potential contamination sources on the basis of relative risk, without complicated risk assessments. It may not, however, be an adequate substitute for site specific, detailed risk assessments. Using this technique, the local chapter community can develop an initial priority list for focusing implementation efforts without allocating substantial amount of funds. This process can be used either for potential contaminant sources within a single wellhead protection area, or over a larger geographic area for multiple wellhead protection areas.

Documenting Inventory Efforts

The following must be included in the wellhead protection program document:

1. A list of all potential and known sources of ground water contamination (past and present) within the wellhead protection area boundaries that may pose a threat to the water bearing zone (aquifer) utilized by the well, spring, or wellfield. The

inventory findings should be prioritized and grouped by time of travel zones. This list is required by the wellhead protection regulations to be updated at least every two years.

2. Documentation that the purveyor has notified the correct regulatory agencies and the local Navajo Nation Chapter governments of the location of potential and known sources of ground water contamination within the wellhead protection area boundaries. An notification letter should be included, along with a list of all entities notified.
3. Documentation that all owners / operators of known and potential sources of ground water contamination have been notified of their location within the wellhead protection area boundaries. An notification letter should be included, along with a list of all entities notified.

Highly vulnerable systems with 1,000 or more connections should also include:

1. Current land use designation of the wellhead protection area(s),
2. A priority ranking of potential contaminant sources (high, medium, and low).