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DETERMINING

NON-POTENTIAL DRINKING WATER SOURCE AREAS
(Based on Definition found in 310 CMR 40.0006)

POLICY: WSC-97-701

This policy offers guidance for identifying Non-Potential Drinking Water Source Areas (310 CMR 40.0006).

4/30/97
Date

Signature on original
Sarah Weinstein
Acting Deputy
Assistant Commissioner
Bureau of Waste Site Cleanup

Determining
Non-Potential Drinking Water Source Areas

1.0 Purpose:

This policy provides guidance on how to apply the definition of NPDWSAs within Potentially Productive Aquifers (PPAs). NPDWSAs include land that has been developed for specific urbanized uses and/or is so densely populated that installation of a new public water supply there is highly unlikely. NPDWSAs are not considered to be potential drinking water source areas. Therefore, groundwater cleanups in these areas do not need to meet Massachusetts Drinking Water Standards (provided other GW-1 criteria defining Current or Potential Drinking Water Source Areas do not apply).

This policy also explains the components (i.e., land use definitions, 100 acre rule, and population density) found in the definition of *Non-Potential Drinking Water Source Areas* (NPDWSAs).

2.0 Applicability:

This policy applies to land overlying any Potentially Productive Aquifer or "PPA"(as defined by the MCP) or portion thereof provided the area meets the criteria found in the definition of NPDWSA.

Please note: The NPDWSA criteria and this policy **are not** applicable within a Current or Potential Drinking Water Source Area as defined in the MCP (310 CMR 40.0006).

3.0 Criteria:

The following sections provide additional information on NPDWSA criteria found in the MCP. While DEP, in conjunction with MassGIS, has developed guidance maps identifying NPDWSAs, the reader should be aware that the criteria in the MCP and site specific information, are the basis for determining NPDWSAs. More on the NPDWSA guidance maps is contained in section 5.0 of this document.

3.1 NPDWSA MCP Criteria:

To be considered a NPDWSA, the land above the PPA must have:

- Land Uses which are urbanized (i.e., industrial, commercial, dense residential, transportation development and/or urban open lands) as of January 1, 1996;

and/or

- Population Density (based on the most recent US Census information) equal to or greater than 4,400 people per square mile.

The area meeting these criteria must encompass 100 acres or more.

3.1a Land Use Criteria:

The definition of NPDWSA includes 5 main categories of land use. These categories correspond to the categories of land uses used by MassGIS. These categories group related land uses under each main heading. For example, Urban Open Lands include: a) various types of open lands awaiting development within otherwise urban centers, b) open public or quasi-public land such as green spaces within otherwise developed areas (e.g., The Boston Common and Public Garden), and c) cemeteries. These different uses cannot be separated from each other or the main heading of Urban Open Lands because they have all been melded together under one mapping code during the generation of the GIS land use categories.

The Geographic Information Systems land use abbreviations are indicated in parentheses after each of the headings.

MCP NPDWSA Land Use Categories:

Industrial lands (UI)

- Land used for heavy industry, such as facilities for the manufacture, storage and assembly of raw or partially processed products such as machinery, metals, chemicals, petroleum, or electrical power. Such industries often have large smokestacks and large storage areas. Warehouses and transportation facilities for bulk products and an open and interrupted street pattern characterize this type of land use. Large industrial parks are an example of this type of development. (UI)
- Land used for light industry, such as facilities for the manufacture or assembly of smaller, partially processed products. Many modern light industries are well landscaped and are indistinguishable from commercial activity on aerial photographs. (UL)

Commercial lands (UC)

- Land predominantly used for distribution, or merchandising goods and services. Uses include stores, hotels, offices, parking garages, and smaller warehouses which are usually set close to streets in a close pattern. Trees may be rare in downtown commercial areas. City people not living in residential areas may likely live here. (UC)
- Land along highways outside of urban centers used for merchandising goods and services. Gas stations, motels, restaurants, drive-in movie theaters and stores located in strips along major routes of travel make up this type. Route 6 on Cape Cod is an example of this type of development. (UH)
- Shopping centers outside of the urban center which are surrounded by large parking lots and may have some landscaping and trees as part of the complex. Theaters are often located in shopping centers to take advantage of the parking. Large isolated malls located throughout the Commonwealth are examples of this type of development. (US)

Dense, residential lands (URD)

- "Garden" apartments which are usually located outside the "core" city, are set back from the street, have some "grounds" and may have attached recreational facilities such as swimming pools and tennis courts. (UA)
- Attached town or row houses or apartment buildings close to streets having a close pattern. They are for the most part three or more stories in height. Some goods or services may be sold here, but the area is predominantly used for high density residences. (UT)
- Land used for high density homes which are spaced closely, set back from the street, and usually arranged in orderly patterns on lots less than 1/4 acre in size. Nearly all the street frontage for these building lots is in the vicinity of 50 feet. Examples are residential neighborhoods in older urban areas, cottages near the ocean, or mobile home parks. (URH)

Transportation lands (UT)

- Airports with paved landing strips, hangers, parking area and related facilities. Small airfields without paved landing strips, hangers or other specialized facilities are excluded from NPDWSAs. (UTA)
- Docks, warehouses and related land-based storage facilities for water transportation and commercial fishing. (UTW)
- Railyards, terminal freight and storage facilities, and rail stations for passengers. Railway tracks are excluded from the definition but often cross urbanized land that is included in a NPDWSA [see Example 4.5]. (UTR)
- Terminal freight and storage facilities for passengers (e.g., bus terminals) and truck freight (including liquid storage facilities). Transportation facilities which are part of an industrial complex are categorized as "industrial". (UTT)
- Divided highways with 200 feet or more of right-of-way width. (HW)

Urban open lands (UO)

- Open undeveloped land which is lying idle in the midst of urban areas. This type includes land which was cleared for urban development that was not constructed as of 1/1/96. (UO)
- Public or quasi-public land with "grounds" and green space which contains facilities to serve large numbers of people. Examples are: schools, colleges, churches, hospitals, prisons, etc. (UP)
- Cemeteries. (†)

PLEASE NOTE: *It is important to note that the definition requires actual development and is not based on municipal zoning bylaws.*

3.1b Population Density Criterion:

In addition to applying the above land use criteria, a PPA can also be categorized as an NPDWSA by applying the Population Density criteria found in the definition. Portions of PPA that underlie

block groups (as defined by the U.S. Census Bureau) identified by the most recent U.S. Census as having a population density equal to or greater than 4,400 persons per square mile also meet the NPDWSA criteria. While the population density criteria may be applied on its own or in conjunction with the land use criteria, census block groups with density equal to or greater than 4,400 persons per square mile very closely track the development patterns of the high density residential category listed above.

3.1c 100 Acre Rule:

Land overlying a PPA that meets either or both of the land use or population density criteria must also encompass an area of at least 100 acres in size to be considered a NPDWSA [see Examples 4.1 & 4.2 below].

The 100 acre area may include areas that do not meet the land use or population density criteria, **provided** that the land which does not meet either of these criteria is:

- a. less than 100 acres in size; and
- b. completely surrounded by areas that do meet one or more of the MCP criteria.

In some cases a PPA may underlie only a portion of a large urbanized area. In these cases, the urbanized land over the PPA can be categorized as NPDWSA even if this area is smaller than 100 acres as long as the whole urbanized area exceeds 100 acres in size [see Example 4.6 later in this document].

3.2 Exclusions from NPDWSA MCP Criteria:

In the MassGIS data-base, landfills and sewage lagoons are grouped under a main land use heading of *Waste Disposal*. *Waste Disposal* is **not** included in the NPDWSA definition. However, because of the *100 acre rule*, landfills and sewage lagoons that are less than 100 acres in size **and** are surrounded by other land uses that meet one or more of the NPDWSA criteria **will automatically be included in the exemption from meeting GW-1 standards**. Likewise, a few single family homes on lots larger than 1/4 acre in the midst of more dense contiguous development would be included in the NPDWSA provided they were surrounded by 100 acres or more of land meeting one or more of the NPDWSA criteria [see Example 4.3 below].

Utility rights-of-way and train tracks are not included in any of the 5 main categories of land uses defining NPDWSAs. However, utility rights-of-way and train tracks often cross over or through urbanized lands of 100 acres or more. In these instances, the rights-of-way and train tracks should be included into the areas designated as NPDWSA [see Example 4.5]. This does not hold true for areas outside of developed lands that do not meet any of the 5 main categories of land uses.

4.0 Examples:

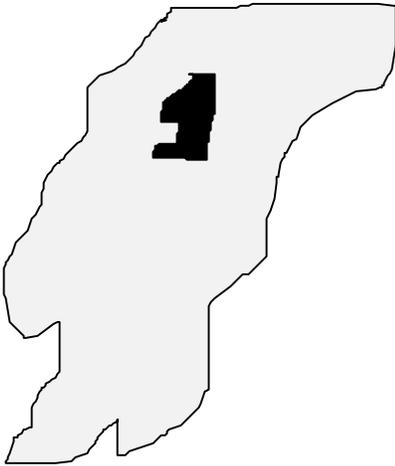
The following are examples of scenarios that commonly exist in the field and the corresponding appropriate application of the NPDWSA definition:

Legend:

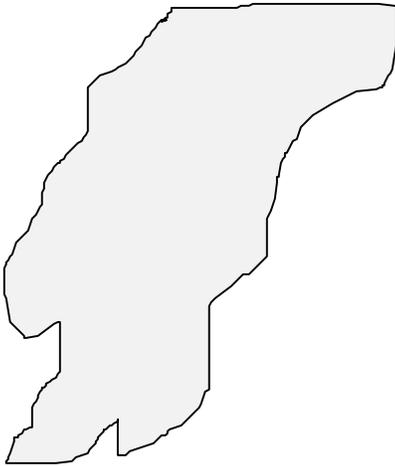
-  Potentially Productive Aquifer
-  "Urbanized Area"
-  Non-Potential Drinking Water Source Area

Example 4.1:

Field Scenario → Explanation → Proper application of NPDWSA



In this scenario, 75 acres of commercial development is located in the middle of a PPA. The MCP definition requires that the urbanized area must be at least 100 acres in size in order to be categorized as a NPDWSA. Therefore, in this instance, the 75 acres of commercial development can not be categorized as a NPDWSA.

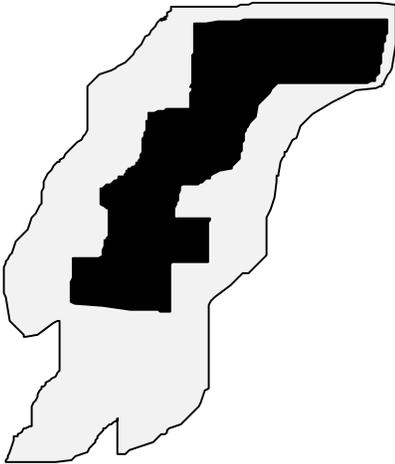


Example 4.2:

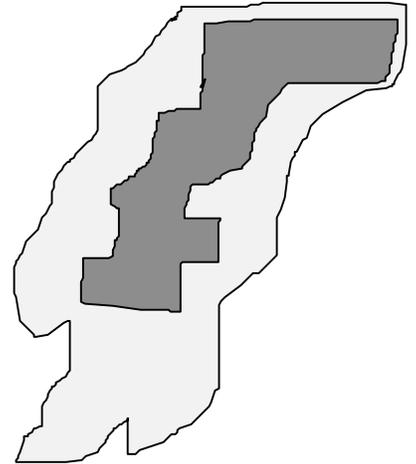
Field Scenario

Explanation

Proper application
of NPDWSA



In this scenario, 135+ acres of industrial and commercial developed land is located within a PPA. The MCP definition requires that the urbanized area must be at least 100 acres in size in order to be categorized as a NPDWSA. Therefore, in this instance, the 135+ acres of industrial and commercial development can be categorized as a NPDWSA.

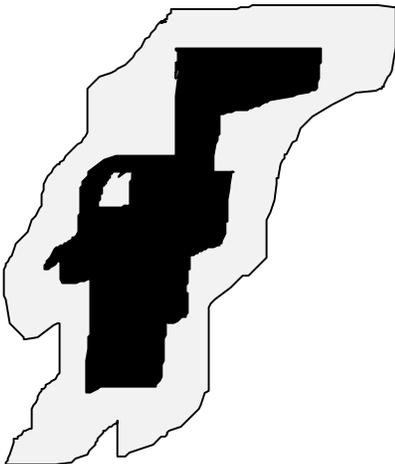


Example 4.3:

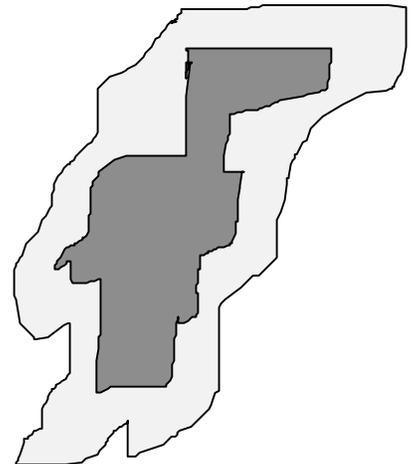
Field Scenario

Explanation

Proper application
of NPDWSA



In this scenario, at least 175 acres of residential development of lots less than 1/4 acres is located within a PPA. Within the residential development, there is a woodland that is approximately 24 acres. Although woodlands are not included in the NPDWSA definition, this woodland is less than 100 acres and completely surrounded by other land uses that meet the definition. Therefore, in this instance, the woodland should be included in the NPDWSA categorization.

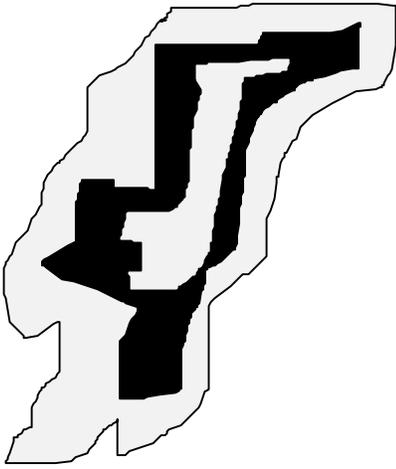


Example 4.4:

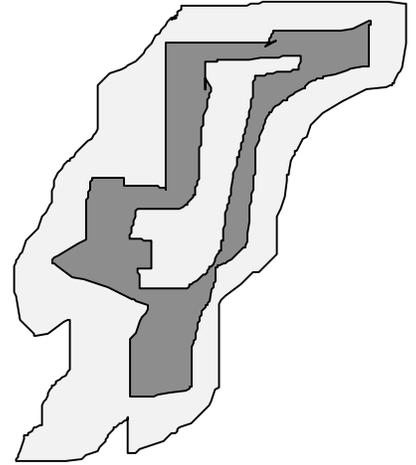
Field Scenario

Explanation

Proper application
of NPDWSA



In this scenario, the land use meeting the NPDWSA definition is greater than 100 ac. but contains within its borders an area that does not meet the land use or population density criteria of the definition which is greater than 100 ac. In this instance, the non-urbanized area **can not** be included in the NPDWSA categorization.

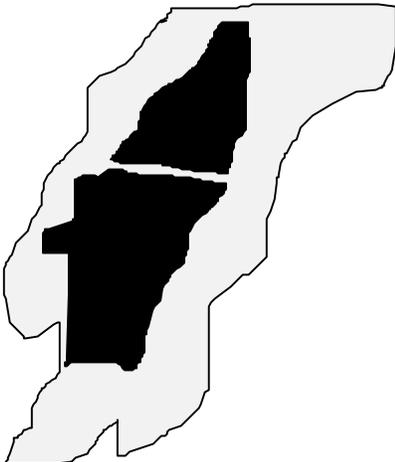


Example 4.5:

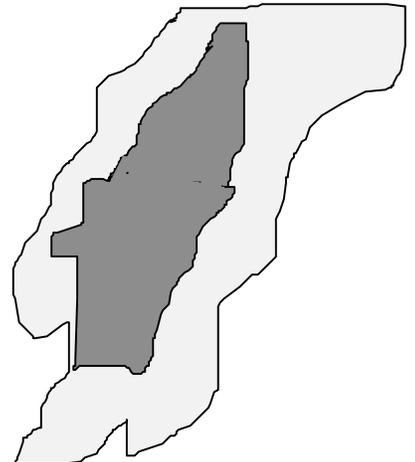
Field Scenario

Explanation

Proper application
of NPDWSA



In this scenario, the land use meeting the NPDWSA definition is greater than 100 ac. but is split by a utility right-of way (or it could be a train track for the purpose of this example) which does not meet the land use criteria. Since this right of way crosses otherwise urbanized land, it should be included in the NPDWSA categorization.



Example 4.6:

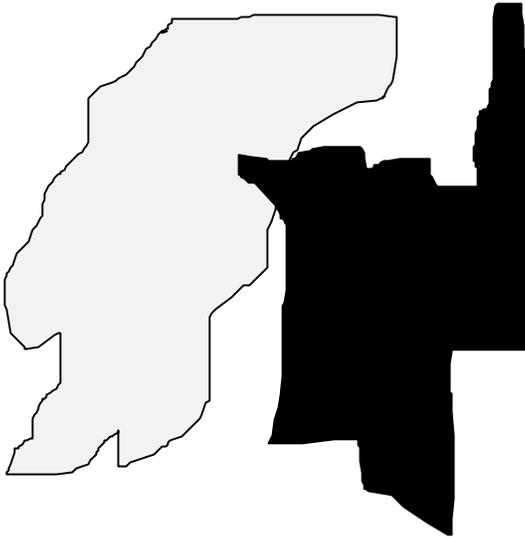
Field Scenario



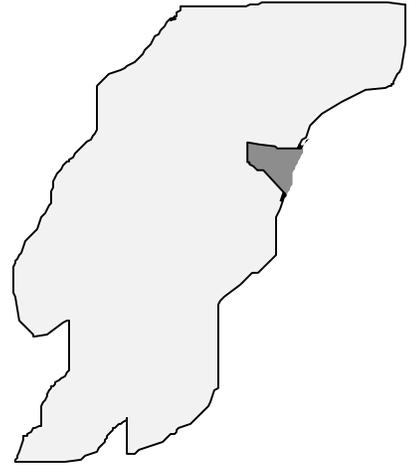
Explanation



Proper application
of NPDWSA



In this scenario, the industrially developed land is 110 acres but is located mostly outside of the limits of a PPA. However, a small portion of the urbanized area lies over the PPA. Since NPDWSAs only apply to areas within a PPA, only that portion within the PPA borders may be categorized as NPDWSA.



Example 4.7:

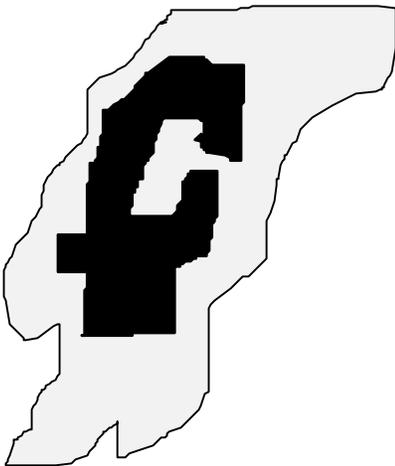
Field Scenario



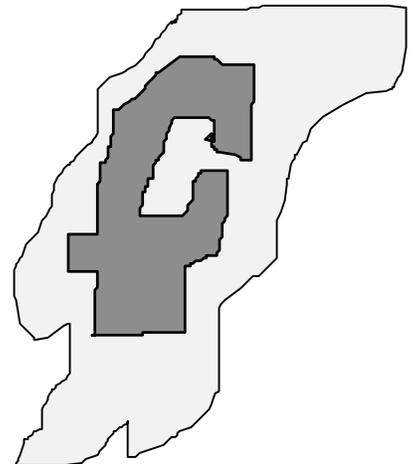
Explanation



Proper application
of NPDWSA



In this scenario, the urbanized land is 100 acres and therefore can be categorized as NPDWSA. The NPDWSA partially envelops 80 acres of land developed with single family homes on 3/4 acre lots, which cannot be considered to be “urbanized”. Because this area is not **completely surrounded** by the area of NPDWSA, it can not be incorporated into the NPDWSA.



5.0 Guidance Maps:

As noted in section 3.0, BWSC Resource Maps available from MassGIS include a map overlay showing NPDWSAs based on statewide land use information and U.S. Census data. **These maps are only to be used as guides. Actual site specific information obtained from visiting the site should be the basis for determining if the area actually meets the NPDWSA definition.**

The NPDWSA overlay is included on the BWSC Resource Maps. The overlay is a composite of the MassGIS land use data-base (created from the interpretation of 1985 and 1990 aerial photographs) and the U.S. Census Bureau. The user should be aware that due to tree canopy coverage when the aerial photographs were taken, the guidance maps may contain some errors made in interpreting the existing land uses on the ground.

The Department wishes to have the most accurate information available depicted on the BWSC Resource Maps. In the event that site specific information disagrees with the NPDWSA mapped overlay (i.e., the subject area is mapped as PPA but meets the NPDWSA criteria **OR** the subject area is mapped as NPDWSA but does not meet the NPDWSA criteria and should be mapped as PPA), DEP would like to know about it. Please submit: a) written documentation explaining how and why the area is mapped incorrectly (with clear reference to the MCP criteria), and b) a copy of the BWSC Priority Resource map with the area of concern clearly delineated to:

BWSC Policy Branch, 1 Winter Street, Boston, MA, 02108.

The information will be reviewed and the maps updated if necessary. BWSC staff will contact the person requesting the change if additional information is required to make a determination.

For more information:

(Note: This section revised 5/10/2000)

The MCP is available at the State House Bookstore in Boston and the Western Office of the Secretary of State in Springfield. To order, please call either 617-727-2834 in Boston or 413-784-1378 in Springfield for exact prices and postage charges.

Electronic copies of the MCP, this document, and many other DEP publications are available on the World Wide Web at <http://mass.gov/dep>.

Copies of the Bureau of Waste Site Cleanup Resource Maps, which contain the guidance overlay illustrating Non-Potential Drinking Water Source Areas can be purchased from MassGIS at 20 Somerset Street, Boston, MA 02108. If you have questions regarding the guidance maps or other MassGIS programs please call (617)727-5227 ext. 323.