UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

OSWER-9200.0-66

MEMORANDUM

SUBJECT: Transmittal of Amendments to Superfund Hazard Ranking System Guidance Incorporating Native American Traditional Lifeways

FROM: James E. Woolford, Director
Office of Superfund Remediation and Technology Innovation

TO: Superfund National Policy Managers, Regions 1 - 10

Purpose

The attached document amends the November 1992 Hazard Ranking System (HRS) Guidance Manual (EPA 540-R-92-026, November 1992) by adding examples, consistent with the HRS, on ways Native American lifeways can be considered under the HRS; it does not otherwise supersede or change the guidance. This will help the Superfund program to better recognize and account for Native American traditional lifeways in the National Priorities List (NPL) process.

Background

In 1998 the Assistant Administrator of EPA's Office of Solid Waste and Emergency Response (OSWER) agreed to examine technical scoring guidance for the HRS, a mathematical model used to determine site eligibility for the NPL. This examination would identify ways in which the HRS Guidance could better take into account Native American cultural practices (traditional lifeways). The Office of Inspector General, in a 2004 evaluation report on the Superfund Tribal Program, also recommended HRS and risk assessment guidance more appropriately consider tribal cultural practices.

Implementation

When the HRS Guidance Manual was first developed over a decade ago, the preparers did not explicitly consider using Native American cultural examples. However, there are a number of ways in which EPA's HRS Guidance can appropriately consider traditional lifeways. Amendments to the 1992 HRS Guidance Manual follow as an attachment. In these amendments we present examples, consistent with the HRS, of some of the ways site assessors can consider Native American traditional lifeways when developing HRS scores.

Encourage Active Tribal Involvement

Regional Superfund staff should follow the consultation procedures presented in "Consulting with Indian Tribal Governments at Superfund Sites: a Beginner's Booklet" (http://www.epa.gov/superfund/partners/oerr/stsi.htm), OSWER 9200.3-42, November 2006. Staff should make other personnel working in site assessment aware of the guidance as well. Further, EPA Regional assessment personnel should involve interested tribes in assessment and potential listing activities, since tribes can be a valuable source of information. As the consultation booklet says: "EPA is better able to fulfill its responsibility to 'protect human health and the environment' if the Agency utilizes the tribal consultation process by taking advantage of the insight and knowledge tribal governments can provide."

Limitations of this Guidance

Several tribes have provided feedback on several concerns that unfortunately cannot be addressed in these amendments.

- **Tribal Populations -** Small and/or rural tribal populations believe they are at a disadvantage in the HRS formula provided at 40 CFR 60, Appendix A. They believe that risks posed to an entire reservation or tribe, regardless of number, should have greater weight than what the current HRS provides. Addressing this concern would require a regulatory change to the HRS, which is beyond the scope of this guidance.

- **Potential scoring misperception –** There was a perception that sites with higher HRS scores are always riskier and will be cleaned up sooner than sites with lower scores. This is not true. The HRS is not a risk assessment and a site's HRS score does not determine risk. Moreover, the HRS score does not determine site priority for EPA. It is usually only used to document the eligibility of a site for inclusion on the NPL.

Conclusion

EPA should consider, to the extent allowed under the HRS, Native American traditional lifeways when assessing a site for listing. Further, Native Americans should be aware that there are many other options that may be available to address environmental problems. Other programs within OSWER, such as Superfund removal, brownfields cleanup, solid waste, underground storage tanks or oil spill prevention and cleanup, may be appropriate mechanisms for reducing the human health and ecological risks on tribal lands. Similarly, programs under other Federal agencies, such as those of trustee agencies, may be able to perform response activities.

Contact

For additional information or questions concerning this guidance amendment, please contact me or have your staff contact Robert Myers, the Superfund Headquarters Tribal Coordinator, at (703) 603-8851.

Attachments

cc: OSRTI Managers
Susan Bodine, OSWER
Barry Breen, OSWER
Scott Sherman, OSWER
Ed Chu, Land Revitalization Staff
Debbie Deitrich, OEM
David Lloyd, OBCR
Matt Hale, OSW
Cliff Rothenstein, OUST
Mary-Kay Lynch, OGC
Susan Bromm, OSRE
David Kling, FFEO
Marsha Minter, IPCO
Gail Cooper, FFRRO
Joanne Marinelli, Superfund Lead Region Coordinator, US EPA Region 3
NARPM Co-Chairs
OSRTI Documents Coordinator

HRS Guidance Amendments

Native American Advice on Sensitive Environments [1]

The HRS Guidance Manual explains the categories used for identifying contaminated sensitive environments in the surface water, soil, and air pathways.

The guidance indicates that Natural Resource Trustees should determine whether a potentially sensitive area meets the definition of the following two categories:

- *Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time.*
- *Spawning areas critical for maintenance of fish/shellfish species within river, lake, or coastal tidal waters.*

Tribes are identified in the HRS Guidance as Natural Resource Trustees.[2] Thus, for these sensitive environments, no changes to the HRS Guidance are necessary, but the Office of Superfund Remediation and Technology Innovation (OSRTI) would like to remind site assessors that Native American tribes are trustees for resources on or related to tribal lands or for resources for which they may have treaty rights.[3]

Example: Salmon are a significant part of some tribes' traditional lifeways. If a tribe is the Natural Resource Trustee for a salmon spawning area, a designated tribal fish and wildlife official could make the determination whether the area meets the definition of a "spawning area critical for maintenance of fish/shellfish species within rivers, lakes, or coastal tidal waters."[4]

For other sensitive environment categories, the HRS Guidance asks the site assessor to consult with various governmental agencies to make the determination. These categories are:

- *Habitat known to be used by federal designated or proposed endangered or threatened species.*
- *Particular areas, relatively small in size, important to maintenance of unique biotic communities.*
- *Terrestrial areas utilized for breeding by large or dense aggregations of animals.*

For these, the guidance does not include the example of consulting with tribal agencies or officials. However, the guidance does say to consult with appropriate federal, state, county, or

[1] HRS Tables 4-23 and 5-5, HRS Sections 4.1.4.3.1 for surface water, 5.1.3.5 for soil and 6.3.4 for air
[2] Guidance Manual Highlight A-5
[3] Guidance Manual Highlight A-5, footnote c
[4] Guidance Manual Highlight A-7

local representatives of agencies,[5] and tribal officials could also be knowledgeable and appropriate representatives. We are amending the guidance to explicitly include tribal officials as contacts for identifying these sensitive environments.

Example: A tribal fish and wildlife official might identify an area of traditional medicinal plant growth as a "unique, rare, or otherwise ecologically valuable biotic area."[6]

See guidance amendments in Appendix 1.

Native American Resource Usage [7]

The HRS guidance resources factor discussion clarifies the possible loss of resource use resulting from site-related contamination in the ground water, surface water, soil, and air pathways. The HRS identifies the uses, including crop irrigation, watering of commercial livestock, ingredients for commercial food preparation, commercial aquaculture (or agriculture or silviculture), and supply for a major or designated recreational area. The uses vary depending on the pathway. The HRS Guidance Manual defines these terms more specifically and provides illustrations.[8] Many of the resources listed are commercial resources, but some Native American communities use a barter system in which food or other products are traded rather than purchased. Although such a system is outside the mainstream U.S. currency economy, it is consistent with the examples provided in the HRS Guidance Manual to consider products widely traded or distributed similarly as products widely sold. The tribal system merely removes the extra step of currency exchange. Including the tribal system also is consistent with the standard definition of commercial as "engaged in or related to commerce", and commerce as the "exchange or buying and selling of commodities."[9] The guidance is changed to apply tribal trading to all of the commercial resource categories.

Native American recreation resource use areas (such as canoeing for surface water and community gathering areas such as sweat lodges for ground water and pow wow grounds for the air pathway) are appropriate examples of major recreational areas and they are consistent with the guidance definitions of major or designated recreation area for ground water,[10] surface water,[11] and air.[12] The guidance is amended to include these examples.

The guidance applicable to the surface water pathway includes a list of sources of information on possible surface water uses, and includes local chambers of commerce, state or regional parks and recreation departments and state water supply offices.[13] We are amending the guidance to

[5] Guidance Manual, p. A-27–29
[6] Guidance Manual p. A-28
[7] HRS sections 3.3.3, 4.1.2.3.3, 5.1.3.4, 6.3.3
[8] Guidance Manual p. 193 for ground water, p. 289 for surface water, p. 371 for soil, and p. 421 for air
[9] Webster's Ninth New Collegiate Dictionary, 1985
[10] Guidance Manual p. 193
[11] Guidance Manual p. 289
[12] Guidance Manual p. 421
[13] Guidance Manual p. 290

add Native American officials as a source in determining resource uses. Finally, site assessors are reminded they should also use the checklist for resources,[14] provided in the original guidance, in identifying potential Native American resources.

See guidance amendments in Appendix 2.

Native American Workers[15]

The HRS ground water migration pathway discusses how to evaluate the population factor. The population factor includes residents, students, and workers who regularly use the water, but excludes transient populations such as customers and travelers passing through the area. Similar population considerations of workers occur for the surface water and air pathways. The soil pathway has additional constraints; workers must be working on a property with observed contamination and in a workplace area within 200 feet of that contamination.

The HRS Guidance generally defines workers as permanent employees (part-time or full-time) of a facility or business.[16] Clearly, Native American or other outdoor artisans or craft people can be considered workers in calculating the target population, provided they meet all other appropriate HRS target criteria. Although we might typically think of workers as located in office buildings or manufacturing facilities, this is not necessarily true of Native American or other outdoor artisan workers. Workers include those working outdoors, as well as indoors. Workplace areas (unique to the soil pathway) include areas outdoors, as well as indoors.[17]

The guidance is amended to include this change in all four pathways.

See guidance amendments in Appendix 3.

Native American Seasonal Populations[18]

As mentioned under workers above, the HRS specifies that "Population" for the ground water, surface water, and air pathways includes resident, worker, or student populations. The HRS Guidance clarifies this by saying workers and students can be part-time, and seasonal populations (such as at a resort area) are included.[19] Clearly, a seasonal tribal camp or work area population could be considered a seasonal population.

The guidance is amended to add this tribal example in the surface water, ground water, and air pathways.

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[14] Guidance Manual Highlight 8-45
[15] HRS sections 3.3.2, 4.1.2.3.2, 5.1.3, and 6.3.2
[16] Guidance Manual p. 165 for ground water, p. 266 for surface water, p. 371 for soil, and p. 412 for air
[17] Guidance Manual p. 371 for soil
[18] HRS sections 3.3.2, 4.1.2.3.2, and 6.3.2
[19] Guidance Manual p. 163-165 for ground water, p. 265-266 for surface water, and p. 412 for air

See guidance amendments in Appendix 4.

Attractiveness/Accessibility of Native American Recreational Use Areas[20]

The HRS provides, for the soil pathway only, assigning a value for attractiveness/accessibility to areas of observed contamination. The HRS Guidance Manual[21] adds examples, such as open fields where people play frisbee or non-maintained baseball fields, under the areas regularly used for public recreation.

Evaluations of the attractiveness/accessibility of an area of observed contamination for the soil exposure pathway should take into account Native American recreational areas, such as traditional hunting or community gathering areas such as camping or pow wow grounds. Pow wow grounds, regularly used in late summer and fall and containing bleachers and coverings for the performers, would fit under "designated recreational areas",[22] and the attached amendments add the pow wow grounds example to the guidance. The appropriate categories for other tribal recreational areas would depend on the specific usage of those areas. It is necessary to document why each assigned value was selected. As mentioned in other sections, tribal officials may be helpful in identifying such areas, which could be unique to the tribe.

See guidance amendments in Appendix 5.

Notice: This document provides guidance to EPA personnel regarding ways to consider Native American traditional lifeways when scoring sites under the HRS. This document does not create any legally binding requirements, but rather suggests an approach that may be used, as appropriate, given the site-specific circumstances. This document does not substitute for EPA's statutes and regulations, and interested parties are free to raise questions and objections about the appropriateness of applying the approach presented in this guidance to a particular situation. EPA may change this guidance in the future.

[20] HRS section 5.2.1.1 and Table 5-6
[21] Guidance Manual p. 390 and Highlight 9-21
[22] Guidance Manual Highlight 9-21

(3) Determine which of the areas meet the definitions of a partially developed coastal barrier or an undeveloped coastal barrier (as specified in Section A.2):

- The entire coastal barrier is undeveloped if it contains (on average) fewer than one man-made structure per 5 acres of fastland area.
- A portion of the coastal barrier is undeveloped if it has at least 1/4-mile of undeveloped shoreline on the shoreward side of the coastal barrier and the undeveloped area extends through the fastland from the beach to the associated landward aquatic habitat.
- A coastal barrier is partially developed if it contains (on average) one or more manmade structures per 5 acres of fastland, but no more than 50 percent of the fastland area is covered by one or more man-made structures per 5 acres of fastland area. A coastal barrier that is more than 50 percent developed is not eligible for evaluation as a partially developed coastal barrier.

(4) Evaluate each of the qualifying areas as an undeveloped or partially developed coastal barrier. If the same coastal barrier has portions that qualify as both undeveloped and partially developed, evaluate either the undeveloped or partially developed portions, but not both (i.e., do not score the same coastal barrier as both undeveloped and partially developed).

COASTAL BARRIER – UNDEVELOPED

See subsection above, Coastal Barrier — Partially Developed.

HABITAT KNOWN TO BE USED BY A FEDERAL DESIGNATED OR PROPOSED ENDANGERED OR THREATENED SPECIES

(1) Determine whether any of the species (as defined in Section A.1) are known to be present in and using suitable habitat within the TDLs ~~(or areas of observed contamination)~~ for the site. Contact a representative of an appropriate Federal, state, county, or local agency (e.g., USFWS, NMFS, state fish and game ~~department, state Natural Heritage program~~) or a recognized expert to help determine if suitable habitat for any of the species exists within the TDLs or areas of contamination and if the habitat is currently occupied and used by the species. It may be difficult to obtain information beyond the known presence of a species within a given area, distance ring, or surface water body. If it is not possible to document the presence of one or more of the species within the TDLs (or areas of contamination), stop; otherwise, proceed to Step (2).

(2) Document all habitat known to be used by each eligible species within the TDL. Appropriate documentation includes (but is not limited to):

- A written or documented oral statement from a representative of the appropriate Federal, state, or local agency (or from a recognized expert) that establishes the presence of the species within the TDLs or area of observed contamination; or
- Any other evidence that documents the recent presence of the species in suitable habitat within the TDLs or areas of observed contamination (e.g., within a 5-year period prior to HRS package preparation).

Ensure that a habitat identified as used by a Federal designated or proposed endangered or threatened species (or a portion thereof) is not listed as a critical habitat for that species as defined in Section A.2. If an area is a critical habitat for a Federal designated species, the area qualifies as a separate sensitive environment for HRS scoring and should be evaluated for that species based solely on that classification.

...Federal, state, tribal, county, or local agency...

HABITAT KNOWN TO BE USED BY A SPECIES UNDER REVIEW AS TO ITS FEDERAL ENDANGERED OR THREATENED STATUS

See subsection above, Habitat Known to be Used by a Federal Designated or Proposed Endangered or Threatened Species.

HABITAT KNOWN TO BE USED BY A STATE DESIGNATED ENDANGERED OR THREATENED SPECIES

See subsection above, Habitat Known to be Used by a Federal Designated or Proposed Endangered or Threatened Species.

MIGRATORY PATHWAYS AND FEEDING AREAS CRITICAL FOR MAINTENANCE OF ANADROMOUS FISH SPECIES WITHIN RIVER REACHES OR AREAS IN LAKES OR COASTAL TIDAL WATERS IN WHICH THE FISH SPEND EXTENDED PERIODS OF TIME

(1) Contact one or more of the following, provide them with the definitional criteria for these sensitive environment categories (i.e., as stated in HRS Table 4-23), and ask them to determine whether any surface water bodies within the TDLs meet one or all of the definitional criteria:

- Representatives of agencies designated as CERCLA natural resource trustees (see ***Highlight A-5***);
- Representatives of state or local agencies that have statutory responsibility for or involvement in management of the area or types of species of concern (e.g., state fish and game departments), even if these agencies are not designated CERCLA natural resource trustees; and/or
- Recognized experts familiar with the area or types of species of concern.

(2) Request written documentation (on appropriate letterhead) that the area of concern is a critical spawning area and some information about the species and habitat(s) of concern (e.g., some explanation as to why the habitat is critical). The documentation should be legally defensible for CERCLA damage assessment purposes. Examples of suitable evidence are provided in ***Highlights A-6*** and ***A-7***). If these individuals do not identify any qualifying areas, stop; otherwise, proceed to Step (3).

(3) Evaluate each qualifying area identified as a critical spawning area, migratory pathway, or feeding area.

PARTICULAR AREAS, RELATIVELY SMALL IN SIZE, IMPORTANT TO MAINTENANCE OF UNIQUE BIOTIC COMMUNITIES

(1) Contact representatives from State Natural Heritage Programs, state natural resources agencies, and recognized experts to determine if any unique, rare, or otherwise ecologically valuable biotic areas (e.g., old growth areas, pine barrens, bogs) are located within the TDLs (or areas of observed contamination) for the site. If there are no such areas within the TDLs of the site, stop; otherwise, proceed to Step (2).

(2) Determine if each area in question meets the definitional criteria as specified in Section A.2. Four types of areas generally will meet the following definitional criteria for this sensitive environment (note that other areas that do not meet these criteria may be eligible):

- Areas with a high proportion of species with highly restrictive habitat requirements due to unusual natural biotic and/or abiotic conditions;

...state or tribal natural resources agencies...

- Isolated areas that may or may not have an unusual community structure per se, but are particularly important to the continued existence of their biotic communities because of their geographic isolation;

- Areas with a high proportion of locally endemic species because of a relatively long period of geographic isolation and/or are exceptional examples of "climax" communities because of minimal human disturbance; or

- Areas that are vital to a species for maintenance of a community.

SPAWNING AREAS CRITICAL FOR THE MAINTENANCE OF FISH/SHELLFISH SPECIES WITHIN RIVER, LAKE, OR COASTAL TIDAL WATERS

See subsection above, Migratory Pathways and Feeding Areas Critical for Maintenance of Anadromous Fish Species Within River Reaches or Areas in Lakes or Coastal Tidal Waters in which the Fish spend Extended Periods of Time.

TERRESTRIAL AREAS USED FOR BREEDING BY LARGE OR DENSE AGGREGATIONS OF ANIMALS

(1) Contact state fish and game officials, USFWS officials, or recognized experts to determine whether ~~any terrestrial species that normally~~ breed in large or dense aggregations have been observed or are expected to be present within the air and surface water pathway TDLs or areas of observed contamination of the site. If no such species have been observed or are expected to be present within the TDL or area of observed contamination, stop; otherwise, proceed to Step (2).

(2) Determine if each area in question meets the definitional criteria specified in Section A.2 and if such breeding occurs within that area. Support documentation may include defining the breeding habitat requirements of the species of concern and demonstrating that the species typically nests or breeds in large colonies or dense aggregations. Additional pathway-specific criteria include:

- In the surface water pathway, eligible areas are limited to terrestrial areas that are used for breeding by terrestrial vertebrate species with aquatic or semi-aquatic foraging habits (i.e., birds, mammals, or reptiles that consume fish or other aquatic organisms that inhabit or might inhabit the surface water bodies within the TDL). Such species generally correspond to those defined in Section A.2 as "terrestrial vertebrates with semi-aquatic habits".

- In the soil exposure pathway, eligible areas are limited to terrestrial areas that are at least partially in the area of observed contamination and are used for breeding by terrestrial vertebrate species.

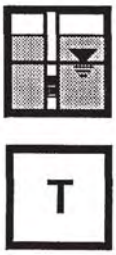
- In the air pathway, eligible areas are limited to terrestrial areas that are at least partially within the TDL and are used for breeding by terrestrial vertebrate species.

WETLANDS

(1) Determine if there are any wetlands within the air or surface water pathway TDLs. As a starting point, use existing maps to delineate wetlands within the TDL. The preferred maps are the NWI Maps or state maps of equivalent quality. If these maps are not available, use USGS topographic maps or Soil Conservation Service (SCS) maps to initially screen wetlands locations.

...state or tribal fish and game officials...

SECTION 7.8
RESOURCES AND WELLHEAD PROTECTION AREA



This section provides guidance on scoring the resources and wellhead protection area (WPA) factors for the targets factor category of the ground water pathway. The resources factor (HRS section 3.3.3) evaluates the possible loss of ground water use value resulting from site-related contamination. It does not evaluate threats to human health that are considered in the nearest well and population factors. The wellhead protection area factor (HRS section 3.3.4) evaluates the possibility that a source or observed release lies in or near an area that a state has designated for protection under the SDWA.

RELEVANT HRS SECTIONS

Section 3.3.3	Resources
Section 3.3.4	Wellhead protection area

DEFINITIONS

Commercial Aquaculture: Cultivation of fish or shellfish to be sold for widespread distribution. Examples include a rearing pond used to raise catfish or a pond for nonfood crops such as goldfish and tropical fish.

Commercial Food Crops: Crops that are intended to be sold widely, such as in supermarkets, and locally, such as those sold at local produce stands. Crops grown for domestic consumption or for use in a single restaurant are not considered commercial food crops.

Commercial Forage Crops: Crops grown to be sold as food for livestock (it is not necessary to document that these crops were sold only for commercial livestock), and grasslands used for grazing by commercial livestock (including areas technically defined as "pasture/rangeland" by the USDA).

Ingredient In Commercial Food Preparation: Ground water used for wholesale food preparation (e.g., a manufacturer that prepares food products to be sold in supermarkets or produce stands). Food prepared in restaurants is not included in this category.

Major or Designated Water Recreation Area: A major water recreation area is an area used by a large number of people for recreational purposes (e.g., a water theme park). A designated water recreation area is an area designated and maintained by a government body (e.g., local, state, or Federal) as an area for public recreation (e.g., municipal swimming pool).

193 Section 7.8

Commercial Aquaculture: ...sold or traded for widespread distribution...

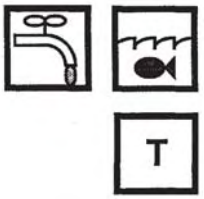
Commercial Food Crops: Crops that are intended to be sold or traded widely, such as in supermarkets, and locally, such as those sold at local produce stands or traded within a Native community....

Commercial Forage Crops: ...sold or traded as food for livestock...

Ingredient in Commercial Food Preparation: ...sold or traded in supermarkets, produce stands, or traded within a Native community..

Major or Designated Water Recreation Area: ...for recreational purposes (e.g., a water theme park or sweat lodge). ...by a government body (e.g. local, state, tribe, or Federal)...

SECTION 8.11
RESOURCES



This section provides guidance on scoring the resources factor for the targets factor category of the surface water drinking water threat. The resources factor evaluates the possible loss of surface water use resulting from site-related contamination of the surface water. The resources factor does not evaluate threats to human health, which are considered in the nearest intake and population factors, and in the human food chain threat. Unlike the ground water resources factor, the surface water resources factor does not address commercial aquaculture, which is evaluated in the human food chain threat. HRS section 4.1.2.3.3 discusses the resources factor.

DEFINITIONS

Commercial Food Crops: Crops that are intended to be sold widely, such as in supermarkets, and locally, such as those sold at local produce stands. Crops grown for domestic consumption or for use in a single restaurant are not considered commercial food crops.

Commercial Forage Crops: Crops grown to be sold as food for livestock (it is not necessary to document that these crops were sold only for commercial livestock), and grasslands used for grazing by commercial livestock (including areas technically defined as "pasture/rangeland' by the USDA).

Commercial Livestock: Livestock raised for sale to commercial wholesalers or supermarkets. Livestock raised for private or domestic use is not considered commercial livestock.

Designated for Drinking Water Use: Section 305(a) of the Clean Water Act requires states to prepare a water quality inventory that designates and classifies certain waters for drinking water use. The water can have such a classification even if it is not currently used for or is not currently suitable to be used for drinking water.

Ingredient In Commercial Food Preparation: Surface water used for wholesale food preparation (e.g., a manufacturer that prepares food products to be sold in supermarkets or produce stands). Food prepared in restaurants is not included in this category.

Major or Designated Water Recreation Area: A major water recreation area is an area used by a large number of people for recreational purposes (e.g., swimming or fishing). A designated water recreation area is an area designated and maintained by a government body (e.g. local, state, or Federal) as an area for public recreation.

SCORING THE RESOURCES FACTOR

(1) **Use the checklist In *Highlight 8-45* to determine if any surface water uses that are assigned resource points apply to the watershed**. Do not use standby intakes to evaluate the resources factor.

Commercial Food Crops: Crops that are intended to be sold or traded widely, ...and locally, such as those sold at local produce stands or traded within a Native community....

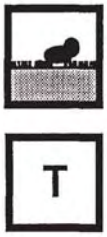
Commercial Forage Crops: ...sold or traded as food for livestock...

Commercial Livestock: ...raised for sale or trade...

Ingredient in Commercial Food Preparation: ...sold or traded in supermarkets, produce stands, or traded within a Native community..

Major or Designated Water Recreation Area: ...for recreational purposes (e.g., swimming, ~~or~~ fishing, or canoeing). ...by a government body (e.g. local, state, tribe, or Federal)...

SECTION 9.5
WORKERS AND RESOURCES



This section provides guidance for evaluating workers and scoring the resources factor for the targets factor category in the resident population threat of the soil exposure pathway. The workers factor is used to score the targets factor category of the resident population threat. The scorer must consider the number of workers who frequent workplace areas on or near the area of observed contamination. The resources factor evaluates the possible loss of resource use resulting from surficial contamination at a site. The factor evaluates the presence of commercial agriculture, commercial silviculture, commercial livestock production, and commercial livestock grazing; it does not evaluate threats to human health or sensitive environments.

RELEVANT HRS SECTION

Section 5.1.3	Targets
Section 5.1.3.3	Workers
Section 5.1.3.4	Resources
Section 5.1.3.6	Calculation of resident population targets factor category value

DEFINITIONS

Commercial Agriculture: Production of crops for sale, including crops intended for widespread distribution (e.g., supermarkets) and more limited distribution (e.g., local produce stands), and any nonfood crops such as cotton and tobacco. Commercial agriculture does not include livestock production, livestock grazing, or crops grown for household consumption (e.g., backyard garden or fruit trees).

Commercial Livestock Production or Commercial Livestock Grazing: Raising or feeding of livestock for sale.

Commercial Silviculture: Cultivation of trees for sale (e.g., Christmas tree farm, trees raised for lumber).

Worker: A person working on a property with an area of observed contamination and whose workplace area is on or within 200 feet of an area of observed contamination. Both full and part-time workers are considered.

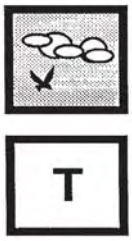
Workplace Area: Any area where workers are regularly present. Areas receiving only brief but regular use (e.g., parking areas, lunch areas) may qualify as work areas.

Commercial Agriculture: ...crops for sale or trade...(e.g., local produce stands or traded within a Native community),...

Commercial Silviculture: ...for sale or trade...

Commercial Livestock Production or Commercial Livestock Grazing: ...for sale or trade...

SECTION 10.4
RESOURCES



This section provides guidance for scoring the resources factor in the air pathway. The resources factor evaluates potential damage to recreation areas, commercial agriculture, and commercial silviculture due to site-related atmospheric contaminants. It does not evaluate threats to human health or sensitive environments.

RELEVANT HRS SECTIONS

Section 6.3	Targets
Section 6.3.3	Resources

DEFINITIONS

Commercial Agriculture: Production of crops for sale, including crops intended for widespread distribution (e.g., supermarkets) and more limited distribution (e.g., local produce stands), and any nonfood crops such as cotton and tobacco. Commercial agriculture does not include livestock production, livestock grazing, or crops grown for household consumption (e.g., backyard garden or fruit trees).

Commercial Silviculture: Cultivation of trees for sale (e.g., Christmas tree farm, trees raised for lumber).

Major or Designated Recreation Area: A major recreation area is an area used by a large number of people for recreational purposes (e.g., swimming or baseball). A designated recreation area is an area designated and maintained by a government body (e.g. local, state, Federal) as an area for public recreation.

SCORING THE RESOURCES FACTOR

(1) **Using the checklist In *Highlight 10-11,* determine if there are any commercial agricultu or silvicultural areas, or major or designated recreation areas within 1/2 mile of a sou at the site.** Use the above definitions in making this determination. ***Highlight 10-12*** lists examples of data sources for the resources factor.

(2) **If any of these areas are present within 1/2 mile of a source with an air migration containment factor value greater than 0, assign a resource factor value of 5.** If none of these areas is present within 1/2 mile of a source, or if the source has an air migration containment factor of 0, assign a resource factor value of 0.

Commercial Agriculture: ...crops for sale or trade...(e.g., local produce stands or traded within a Native community),...

Commercial Silviculture: ...for sale or trade...

Major or Designated Recreation Area: ...for recreational purposes (e.g., swimming, ~~or~~ baseball or Native American pow wows). ...by a government body (e.g. local, state, tribe, or Federal)...

The following sources of information on possible surface water uses will help in documenting resource use for a watershed:

- USGS topographic maps and land use data
- USDA county crop records and irrigated acreage data
- Field observations
- Interviews with water company officials
- Public utility trade association online services (e.g., American Water Works Association's WaterNet data base)
- Existing PA/SI reports for the site or nearby sites.
- Correspondence with nearby businesses
- Correspondence with other nearby institutions, such as farms or universities
- EPA's FRDS
- Agricultural extension agents
- Local chambers of commerce
- Federal, state, or regional parks and recreation departments
- State public water supply offices (usually found in state departments of health or environment)
- State water classification and designation maps
- Native American officials

(2) **If a resource use is documented, assign a value of 5 to the resources factor for the watershed; otherwise, assign a value of 0.**

HIGHLIGHT 8-45
CHECKLIST FOR THE RESOURCES FACTOR

For the watershed being evaluated:

(1)	Is surface water used to irrigate five or more acres of commercial food crops or commercial forage crops?	Yes	No
(2)	Is surface water used to water commercial livestock?	Yes	No
(3)	Is surface water used as an ingredient in commercial food preparation?	Yes	No
(4)	Is surface water used as, or used to supply, a major or designated water recreation area, excluding drinking water use?	Yes	No
(5)	If.surface water Is not used for drinking water within the TDL, is any portion of the surface water designated by the state for drinking water use under Section 305(a) of the Clean Water Act, as amended, or is any portion usable for drinking purposes?	Yes	No

If the answer to any of the above questions is "yes", assign a resources factor value of 5. If the answer to all questions is "no", assign a resources factor value of 0.

- Include any drinking water well with an observed release attributed to the site, regardless of its distance from the source.

- Exclude wells completed in portions of an aquifer that are beyond an aquifer discontinuity (see Section 7.1).

Target Wells for Aquifer Being Evaluated: Wells that are located within the TDL, and drawing water from the aquifer being evaluated or an overlying aquifer through which hazardous substances would migrate.

Workers: Permanent employees (part-time or full-time) of a facility or business that is served by a well located within the TDL.

EVALUATING THE GROUND WATER POPULATION FACTOR

The steps below describe an approach to estimating the population served by target wells for the aquifer being evaluated. First, contact water authorities that have wells within the TDL to determine or estimate the population served by municipal water systems. (See ***Highlight 7-32*** for data needs that the water authority may be able to fulfill.) If the water authority provides an estimate of the population served by the system, use that number for your ground water target calculations. The water authority should know if the population served includes workers and/or students in addition to residents. If the population estimate does not include workers and/or students, it may be possible to modify the following methodology. The assumptions used should be clearly presented in the documentation record.

If the water authority provides just the total number of connections, then estimate the population served by multiplying the number of connections by the county average number of persons per household. After making an initial estimate of residential population served, estimate any student and worker populations served by the municipal system, and adjust the total. Next, evaluate residential populations served by private wells within the TDL. At each stage, evaluate whether documenting additional population will be important to the site score.

Depending on site circumstances, the scorer may conduct these steps in a different order. For example, if many people within the TDL use private wells or if private wells are subject to actual contamination, it may be more efficient to consider residential populations served by private wells before considering student or worker populations served by municipal connections.

(1) **Draw target distance categories.** Draw concentric rings with radii 1/4, 1/2, 1, 2, 3, and 4 miles on a topographic map from the edges of the source. If there is an aquifer discontinuity, exclude any areas beyond the discontinuity. Remember that any well with a documented observed release attributable to the site is evaluated regardless of its distance from sources.

(2) **Identity all municipal systems with target wells for the aquifer being evaluated.** Repeat Steps (3) through (5) for each system if more than one municipal system has wells within the TDL. If no municipal system has a well within the TDL, proceed to Step (7).

(3) **Identify all system water supply units In the aquifer being evaluated or an overlying aquifer.** These units may include drinking water wells and standby wells. If the municipal system is a blended system, identify all wells inside and outside the TDL. Also identify all surface water intakes and standby intakes contributing to a blended system.

(4) **Evaluate the population served by the municipal water system, assuming all service connections are residential.** Because connections to schools or businesses generally serve more individuals than those in a typical household, this assumption may result in a lower estimate of the target population. If this assumption yields a high score, however, time consuming inquiries to document student or worker populations may be avoided.

Workers: ... 'Workers' include those working outdoors, as well as indoors.

Workers: ... 'Workers' include those working outdoors, as well as indoors.

Workers: Permanent employees (part-time or full-time) of a facility or business that is served by an intake within the TDL.

EVALUATING THE DRINKING WATER POPULATION FACTOR

The steps below describe an approach for estimating the population served by surface water intakes located within the TDL. First, estimate the population served by municipal water systems with intakes within the TDL. Contact municipal water authorities to obtain estimates of populations served. The water authority should know whether the population served includes workers and students in addition to residents. If the population estimate does not include workers and/or students, modify the methodology presented below as necessary.***Highlight 8-33*** summarizes the information needed to obtain drinking water population estimates.

HIGHLIGHT 8-33
DATA NEEDS FOR DRINKING WATER THREAT POPULATION

Obtain from Local, Municipal, or Other Water Authorities:

- Identification of all municipal surface water intakes located within the TDLs for surface water bodies in the watershed being evaluated;
- Number of persons saved or service connections for each intake that is not part of a blended system; and
- For intakes that are part of a blended system:
  - — Total population served or number of service connections;
  - — Total number of wells and intakes in the system (including those outside the TDL);
  - — Whether any wells or intakes are standby;
  - — Whether any well or intakes provides more than 40 percent of the system's water; and
  - — Average annual pumpage or capacity for each intake and well (only needed if one intake or well provides more than 40 percent of the system's water).

Obtain from Local, Municipal, or Other Water Authorities, or Local Health Agencies:

- Identification of private intakes located within the TDL; and
- Identification of schools and large businesses possibly served by intakes located within the TDL.

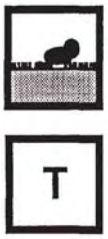
Obtain from U.S. Bureau of Census Reports (or more recent source if appropriate):

- Average number of persons per residence for each county served by a system with intake located within the TDL.

Obtain from Business and Schools:

- Information on how they obtain water; and
- Number of workers and/or students.

SECTION 9.5
WORKERS AND RESOURCES



This section provides guidance for evaluating workers and scoring the resources factor for the targets factor category in the resident population threat of the soil exposure pathway. The workers factor is used to score the targets factor category of the resident population threat. The scorer must consider the number of workers who frequent workplace areas on or near the area of observed contamination. The resources factor evaluates the possible loss of resource use resulting from surficial contamination at a site. The factor evaluates the presence of commercial agriculture, commercial silviculture, commercial livestock production, and commercial livestock grazing; it does not evaluate threats to human health or sensitive environments.

RELEVANT HRS SECTION

Section 5.1.3	Targets
Section 5.1.3.3	Workers
Section 5.1.3.4	Resources
Section 5.1.3.6	Calculation of resident population targets factor category value

DEFINITIONS

Commercial Agriculture: Production of crops for sale, including crops intended for widespread distribution (e.g., supermarkets) and more limited distribution (e.g., local produce stands), and any nonfood crops such as cotton and tobacco. Commercial agriculture does not include livestock production, livestock grazing, or crops grown for household consumption (e.g., backyard garden or fruit trees).

Commercial Livestock Production or Commercial Livestock Grazing: Raising or feeding of livestock for sale.

Commercial Silviculture: Cultivation of trees for sale (e.g., Christmas tree farm, trees raised for lumber).

Worker: A person working on a property with an area of observed contamination and whose workplace area is on or within 200 feet of an area of observed contamination. Both full and part-time workers are considered.

Workplace Area: Any area where workers are regularly present. Areas receiving only brief but regular use (e.g., parking areas, lunch areas) may qualify as work areas.

Worker: ...'Workers' include those working outdoors, as well as indoors.

Workplace Area: ... 'Workplace areas' include those outdoors, as well as indoors.

Nearest Individual: Factor evaluated based on the presence of actual contamination or, for potential contamination, the shortest distance from any source at the site to any residence or regularly occupied building or area.

Population for the Air Migration Pathway: Number of residents, students, and workers regularly present within the TDL. This population does not include transient populations, such as hotel and restaurant patrons, but may include seasonal populations (e.g., a resort area).

Students: Full- or part-time attendees of an educational institution or day care facility located within the TDL.

Target Distance Limit for the Air Migration Pathway: Distance over which population and other targets are evaluated. The TDL generally is a 4-mile radius from the sources at the site. However, if a sampling point meeting the criteria for an observed release is located beyond the 4-mile radius, that point defines the outer boundary of the TDL. For example, if an observed release is established 6 miles from the source, the TDL is 6 miles.

Workers: Permanent employees (part-time or full-time) of a facility or business that is located within the TDL.

DETERMINING LEVEL OF ACTUAL CONTAMINATION

In order to evaluate level of actual contamination, an observed release should first be established (see Section 10.1 for establishing observed releases in the air pathway). If an observed release to air is established in or beyond a distance category, actual contamination is also established for that distance category and the level of contamination for the observed release location needs to be determined. The steps below explain how to determine if a location is evaluated as Level I or Level II.

(1) **Determine whether an observed release can be established for any hazardous substance detected in air samples or based on direct observation.** See Section 10.1 for information on establishing an observed release.

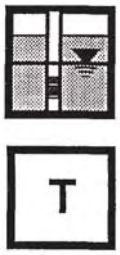
- If an observed release is established only by direct observation, Level I cannot be established and all locations for the direction observation are Level II. Continue with the guidance in the next subsection, Evaluating Sites with Actual Contamination.
- If an observed release is established based on chemical analysis, continue to Step (2).
- If no observed release can be established, evaluate the entire population within the 4-mile TDL for potential contamination.

(2) **For each sample location, compare the concentration of each hazardous substance that meets the observed release criteria to its applicable benchmark(s).** When comparing sampling results to benchmarks, concentrations from longer collection times may be compared to shorter time-frame benchmarks, but concentrations from shorter collection times may not be compared to longer time-frame benchmarks. Sample concentrations tend to decrease as sampling time increases (e.g., 8-hour concentrations generally are lower than 3-hour concentrations). Applicable benchmarks (available in SCDM) for hazardous substances include:

- NAAQS;
- NESHAPs;
- Screening concentrations for cancer, which correspond to the 10^{-6} individual cancer risk for inhalation exposure; and

Workers: ... 'Workers' include those working outdoors, as well as indoors.

SECTION 7.5
POPULATION AND NEAREST WELL FACTORS



The population factor in the ground water pathway evaluates the number of residents, students, and workers served by ground water wells (in the aquifer being evaluated and appropriate overlying aquifers) located within the TDL. The nearest well factor evaluates the threat to the maximally exposed individual and takes into account whether that individual is subject to actual or potential contamination. This section explains how to estimate the population (i.e., residents, students, and workers) that regularly uses ground water from wells within the TDL, how to score the ground water population factor, and how to score the nearest well factor.

The ground water population includes the people served by wells located within the TDL, not the residents living within the TDL (see ***Highlight 7-31***). People living within the TDL may obtain drinking water from wells outside the TDL or from surface water sources, and people living outside the TDL may obtain drinking water from wells located within the TDL.

RELEVANT HRS SECTIONS

Section 3.0.1	General considerations
Section 3.0.1.1	Target distance limit
Section 3.3.1	Nearest well
Section 3.3.2	Population

DEFINITIONS

Nearest Well Factor: Factor for evaluating the maximally exposed well. This factor is based on the presence of actual contamination or, for aquifers where no drinking water well is subject to actual contamination, the presence of karst and distance to nearest drinking water well.

Population for the Ground Water Pathway: Number of residents, students, and workers regularly served by wells that are located within the TDL for the aquifer being evaluated (and appropriate overlying aquifers). This population does not include transient populations, such as hotel and restaurant patrons, but may include seasonal populations (e.g., a resort area).

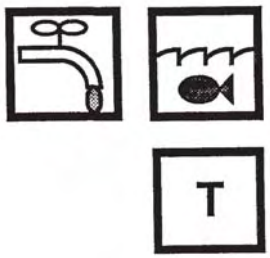
Students: Full- or part-time attendees of an educational institution or day care that is served by a well located within the TDL.

Target Distance Categories: Concentric rings (not necessarily circular) with radii 1/4, 1/2, 1, 2, 3, and 4 miles from the sources at the site. These distance categories are used to group the wells subject to potential contamination for distance weighting.

Target Distance Limit for the Ground Water Migration Pathway: The distance over which targets are evaluated. The TDL is generally a 4-mile radius from sources at the site, except:

Population for the Ground Water Pathway: ... but may include seasonal populations (e.g., a resort area or seasonal tribal camp or work area population).

SECTION 8.8
POPULATION AND NEAREST INTAKE FACTORS



The population factor in the drinking water threat evaluates the number of residents, students, and workers regularly served by surface water intakes within the TDL for the watershed being evaluated. This evaluation is essentially the same as that for the ground water pathway, except that surface water intakes are considered instead of drinking water wells. This section also briefly discusses the nearest intake factor.

RELEVANT HRS SECTIONS

Section 4.1.1.2	Target distance limit
Section 4.1.2.3.1	Nearest intake
Section 4.1.2.3.2	Population

DEFINITIONS

Dilution Weight: A unitless parameter that adjusts the assigned point value for certain targets subject to potential contamination as a function of the flow or depth of the water body at the target.

Nearest Intake Factor: Factor for evaluating the maximally exposed intake. This factor is based on the presence of actual contamination or, for watersheds where no intake is subject to actual contamination, the flow or depth of the water body at the intake nearest to the PPE within the TDL.

Population for the Drinking Water Threat: Number of residents, students, and workers regularly served by surface water intakes that are located within the TDL for the surface water bodies evaluated for a given watershed. This population does not include transient populations, such as hotel and restaurant patrons, but may include seasonal populations (e.g., a resort area).

Students: Full- or part-time attendees of an educational institution or day care facility that is served by an intake located within the TDL.

Target Distance Limit (TDIL) for the Surface Water Migration Pathway: Distance over which the in-water segment of the hazardous substance migration path is evaluated. The TDL extends **15 m**iles from the PPE in the direction of flow (or radially in lakes, oceans, or coastal tidal waters) or to the most distant sample point establishing an observed release, whichever is greater. In tidally influenced surface water bodies, an upstream TDL is also determined. For some sites (e.g., sites with multiple PPEs), an overall target distance of greater than 15 miles may result.

Population for the Drinking Water Threat: ... but may include seasonal populations (e.g., a resort area or seasonal tribal camp or work area population).

Population for the Air Migration Pathway: ... but may include seasonal populations (e.g., a resort area or seasonal tribal camp or work area population).

Nearest Individual: Factor evaluated based on the presence of actual contamination or, for potential contamination, the shortest distance from any source at the site to any residence or regularly occupied building or area.

Population for the Air Migration Pathway: Number of residents, students, and workers regularly present within the TDL. This population does not include transient populations, such as hotel and restaurant patrons, but may include seasonal populations (e.g., a resort area).

Students: Full- or part-time attendees of an educational institution or day care facility located within the TDL.

Target Distance Limit for the Air Migration Pathway: Distance over which population and other targets are evaluated. The TDL generally is a 4-mile radius from the sources at the site. However, if a sampling point meeting the criteria for an observed release is located beyond the 4-mile radius, that point defines the outer boundary of the TDL. For example, if an observed release is established 6 miles from the source, the TDL is 6 miles.

Workers: Permanent employees (part-time or full-time) of a facility or business that is located within the TDL.

DETERMINING LEVEL OF ACTUAL CONTAMINATION

In order to evaluate level of actual contamination, an observed release should first be established (see Section 10.1 for establishing observed releases in the air pathway). If an observed release to air is established in or beyond a distance category, actual contamination is also established for that distance category and the level of contamination for the observed release location needs to be determined. The steps below explain how to determine if a location is evaluated as Level I or Level II.

(1) **Determine whether an observed release can be established for any hazardous substance detected in air samples or based on direct observation.** See Section 10.1 for information on establishing an observed release.

- If an observed release is established only by direct observation, Level I cannot be established and all locations for the direction observation are Level II. Continue with the guidance in the next subsection, Evaluating Sites with Actual Contamination.
- If an observed release is established based on chemical analysis, continue to Step (2).
- If no observed release can be established, evaluate the entire population within the 4-mile TDL for potential contamination.

(2) **For each sample location, compare the concentration of each hazardous substance that meets the observed release criteria to its applicable benchmark(s).** When comparing sampling results to benchmarks, concentrations from longer collection times may be compared to shorter time-frame benchmarks, but concentrations from shorter collection times may not be compared to longer time-frame benchmarks. Sample concentrations tend to decrease as sampling time increases (e.g., 8-hour concentrations generally are lower than 3-hour concentrations). Applicable benchmarks (available in SCDM) for hazardous substances include:

- NAAQS;
- NESHAPs;
- Screening concentrations for cancer, which correspond to the 10^{-6} individual cancer risk for inhalation exposure; and

SCORING THE LIKELIHOOD OF EXPOSURE FACTOR CATEGORY

To score the likelihood of exposure factor category for the nearby population threat, determine the attractiveness/accessibility factor value and the area of contamination factor value for the areas of observed contamination as follows.

(1) **Assign the attractiveness/accessibility factor value.** Assign each area of observed contamination a value for attractiveness/accessibility, excluding any area of observed contamination on a residential property. If an area falls into two or more categories, use the higher score. Select the highest value assigned to the areas evaluated and use it as the attractiveness/accessibility factor value for the site. If the attractiveness/accessibility factor value for a site is 0, the nearby population threat score will be 0.

Highlight 9-21, which is based on HRS Table 5-6, provides attractiveness/accessibility factor values along with examples of the types of areas that would receive a given value. Public recreation use can be activities such as walking, sports, fishing, air shows, and hayrides, and can occur on public or private lands. The examples presented in***Highlight 9-21*** are not exhaustive. Select the best-fitting category and document why it was selected.

(2) **Determine the area of contamination factor value.** The area of contamination factor value is based on the total area of all areas of observed contamination at the site with an attractiveness/accessibility factor value greater than 0. To determine the area of contamination factor value:

- Identify all areas of observed contamination with an attractiveness/accessibility value greater than 0.
- Determine their total area.
- Assign the approximate area of contamination factor value using HRS Table 5-7.

Section 9.1 provides instruction on identifying areas of observed contamination.

(3) **Determine the likelihood of exposure factor category value.** The likelihood of exposure factor category value is based on the values assigned to the attractiveness/accessibility and area of contamination factors. Use HRS Table 5-8 to assign this value. The maximum value is 500.

SCORING WASTE CHARACTERISTICS FACTOR CATEGORY

The waste characteristics factor category for the nearby population threat is scored as it is scored for the resident population threat, except that the nearby threat considers only those areas of observed contamination that have an attractiveness/accessibility factor value greater than 0. The waste characteristic factor category value for the nearby population threat, therefore, will be equal to or less than that for the resident population threat. Section 9.2 provides guidance on scoring the waste characteristics factor.

SCORING TARGETS FACTOR CATEGORY

The targets factor category value for the nearby population threat is based on two factors: nearby individual and population within a one-mile travel distance from the site. Sum these two factor values for the targets factor category value.

Highlight 9-21, ... Public recreation use can be activities such as ..., Native American pow wows, ...

HIGHLIGHT 9-21
EXAMPLES OF ATTRACTIVENESS/ACCESSIBILITY VALUES

Area of Observed Contamination	Assigned Value
Designated recreational areas Includes areas designed specifically to encourage recreational use. • Playground • Golf course (public or private) • Baseball field with backstop and maintained basepaths or infield • Areas with Improvements aimed at enabling people to view scenic attractions	100
Areas regularly used for public recreation Includes areas used regularly for public recreation but not designated for such use. • Open fields where people play frisbee • Fields where people play baseball (provided that they are not maintained for such use)	75
Accessible and unique recreational areas • Vacant lot in an urban area • Shoreline of stream in an urban area	75
Moderately accessible areas with some public recreation use Includes areas used for recreation with some improvements that increase accessibility even if these improvements are not made specifically for the areas In question. • Undeveloped land along corridors to a recreational area where there are not thousands of acres of similarly undeveloped land (e.g., areas adjacent to a road or trail leading to a public lake or river) • Shoreline of public lakes or rivers that can be reached via moderately improved roads (e.g., gravel or dirt)	50
Slightly accessible areas with some public recreation use Includes areas used for public recreation but with few improvements that increase accessibility to the areas. It can also include areas that have nothing unique about them relative to their surroundings. • Shorelines of relatively remote public lakes (e.g., lakes that cannot be reached by automobile) • Undeveloped land along corridors to a recreational area where there are thousands of other acres of similarly undeveloped land along the corridor	25
Accessible areas with no public recreation use • Unfenced industrial or commercial site (guarded or not) with no vacant lots, sand piles, or other recreational attractions • Abandoned lagoons or other surface impoundments in an industrial area	10
Areas surrounded by maintained fence or combination of maintained fence and natural barriers • Fenced, unguarded industrial or commercial sites	5
Areas physically inaccessible to public, with no evidence of public recreation use Includes areas where (1) steps have been taken to absolutely preclude public access to the areas or (2) natural conditions make access physically impossible. • Area off-limits to unauthorized personnel at guarded and fenced military base or industrial complexes.	0

Designated recreational areas...

- Community gathering areas, such as Native American pow wow grounds