

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

SINKHOLE AND SINKHOLE AREA TREATMENT

(Ft.)
Code 527



DEFINITION

The treatment of sinkholes and/or sinkhole areas to reduce contamination of groundwater resources, and/or improve farm safety.

PURPOSES

- To improve water quality.
- To improve farm safety.

CONDITIONS WHERE PRACTICE APPLIES

On any land surface or existing practice where the soils and geologic conditions have led to the development of sinkholes.

CRITERIA

General Criteria Applicable To All Purposes

The installation and operation of sinkhole treatment(s) will comply with all Federal, state, tribal and local laws, rules, and regulations.

Impact to cultural resources, wetlands and Federal and state protected species shall be evaluated and avoided or minimized to the

extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part 401, Title 190 Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), national Food Security Act Manual (NFSAM), and the National Environmental compliance Handbook (NECH).

Conduct a geologic investigation of the potential impact of the treatment on ground water, surface water, and the karst features by a qualified geologist.

Remove and dispose trash and other material from the sinkhole in an environmentally sound manner.

Divert excess surface water caused by construction activities from the sinkhole area in accordance with the Florida NRCS conservation practice standard Diversion, Code 362.

Develop nutrient and pest management plans for the drainage area of the sinkhole controlled by the landowner.

Vegetative Treatment. All sinkholes treated will have a minimum of 25 feet wide vegetated buffer measured from the rim of the sinkhole. If needed, the buffer area shall be extended to control concentrated flow channels entering the sinkhole. Guidance for vegetative buffers for the treatment of sinkhole areas is addressed in Florida NRCS conservation practice standards Riparian Forest Buffer, Code 391, Riparian Herbaceous Cover, Code 390, and Filter Strip, Code 393. Establish and maintain the width of the vegetated buffer in accordance with the type of buffer chosen. Fence the sinkhole and surrounding buffer. Fence shall meet the

requirement of Florida NRCS conservation practice standard Fence, Code 382.

Exclude livestock from the vegetative buffer except where applicable for maintenance purposes.

Do not apply nutrients, herbicides, pesticides, and animal waste within an established buffer. Use only mechanical treatments for weed control.

Use appropriate erosion and sediment control measures to reduce the amount of sediment entering sinkhole openings during the establishment of the vegetative buffer.

Surface Water Control. Changes to the volume of surface water that enters a sinkhole may disturb the underground hydrology. To the extent possible, maintain the surface water flow at historic (or predevelopment) volumes.

Pre-existing concentrated flow channels will be stabilized but should not otherwise be altered. If a plug or inverted filter is used, the area to be protected will be characterized by a qualified geologist. Disperse concentrated flow caused by the construction activities with a suitable spreading structure.

Sinkhole Treatment/Closing. Adequate protection of most sinkhole and sinkhole areas can be achieved by the use of vegetative buffers and livestock exclusion. However, if an open sinkhole is a safety hazard, it may be treated with a rock filter, gabions, or other methods approved by the State Conservation Engineer.

Do not fill sinkholes that open into caves under any circumstances. Gated openings may be used for safety reasons.

CONSIDERATIONS

Consider using this practice in conjunction with conservation cropping systems, pest and nutrient management, and practices that control sheet, rill and gully erosion.

Current and planned land use should be considered. In particular, structures, septic fields, wells, feedlots, ponds, and animal waste storage systems should not be located over a sinkhole site or within the impact area.

For a sinkhole receiving contaminated overland flow, every effort should be made to first treat

the source of the contamination. Although it is important to maintain the hydrology of the karst system, it may be more beneficial to the ground water quality to divert the contaminated water away from the sinkhole. In some cases, it may be necessary to completely plug a sinkhole with sealing materials rather than treat it with a filter. Acceptable sealing materials are provided in ASTM D 5299, Part 6.4. An example of this would be a sinkhole in a feedlot or a site that is difficult to protect by any other method.

The sinkhole treatment should not result in excessive surface water ponding or high soil moisture conditions over an extended period of time.

Treatment of one sinkhole may have an effect on other sinkholes or solution features in the vicinity.

The use of a conservation easement for the buffer and sinkhole should be considered.

PLANS AND SPECIFICATIONS

Prepare the plans and specifications for Sinkhole and Sinkhole Area Treatment in accordance with this standard and describe the requirements for applying the practice to achieve its intended purpose.

As a minimum, the plans and specifications shall include:

- Plan view showing sinkhole and sinkhole area. Include topographic information and photographs.
- The geologic investigation will include a study of potential impacts on the Karst resource.
- Delineate the drainage area of sinkhole on a topographic map.
- Planned treatment measures.
- Availability of safe outlet for surface water, if applicable.
- Removal and disposal of trash, if applicable.
- Special safety requirements.
- Environmental assessment, if applicable.

OPERATION AND MAINTENANCE

Provide an operation and maintenance (O&M) plan with specific instructions for maintaining the sinkhole and sinkhole area treatment, including reference to periodic inspections and the prompt repair and/or replacement of damaged components.

REFERENCES

ASTM D 5299, Part 6.4
Florida NRCS Conservation Practice Standards
 Diversion, Code 362
 Critical Area Planting, Code 342
 Fence, Code 382

Filter Strip, Code 393
Mulching, Code 484
Riparian Forest Buffer, Code 391
Riparian Herbaceous Cover, Code 390
General Manual
 Title 420-Part 401
 Title 450-Part 401
 Title 190-Parts 410.22 and 410.26
National Cultural Resources Procedures
 Handbook
National Environmental Compliance Handbook
National Food Security Act Manual
National Planning Procedures Handbook Florida
 Supplements to Parts 600.1 and 600.6