

**U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
NEW YORK CONSERVATION PRACTICE GUIDELINE**

SPRING DEVELOPMENT

(No.)

CODE 574

REFERENCES

National Handbook of Conservation Practices-574, Spring Development

Commonly Associated Practices or Processes

The following conservation practices are commonly used in conjunction with this practice to address natural resource concerns and opportunities in New York. This does not imply that any or all of the listed practices must be included or that others may not be included in a conservation management system (CMS). Consult Section III of the Field Office Technical Guide for assistance in developing CMS.

To determine whether a National or New York Conservation Standard applies to this and any other associated practices, check the following website: www.ny.nrcs.usda.gov. Click on the Technical Resources button, and look in the left-hand column for "eFOTG" on the next screen. Next, click on the "eFOTG" link, and look for the Conservation Standards in Section IV.

Table A: Commonly Associated Practice Standards or Processes

Number	Name	Job/Engineering Sheets
342	Critical Area Planting	
382	Fence	
472	Use Exclusion	
516	Pipeline	
528	Prescribed Grazing System	
561	Heavy Use Area Protection	
606	Subsurface Drainage	NY-ENG-606
614	Watering Facility	

OTHER REFERENCES

NRCS Engineering Field Handbook, Chapters: 3-Hydraulics, 12-Springs and Wells, 14-Drainage, 17-Construction and Construction Materials

USDA-SCS Drainage Guide for New York State, September 1987

eFOTG, Statement of Work, 574 http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=NY

NYS Department of Environmental Conservation, Wetland Regulations

<http://www.dec.state.ny.us/website/regs/index.html>

Procedures for NRCS-Assisted Programs, Compliance with NEPA, General Manual 190, Part 410, Sub part A http://policy.nrcs.usda.gov/scripts/lpsiis.dll/GM/GM_190_410_a.htm

USDA-NRCS, Wetland Technical Assistance Policy, General Manual 190, Parts 410.26 and 610.97

http://policy.nrcs.usda.gov/scripts/lpsiis.dll/GM/GM_190_410.htm

http://policy.nrcs.usda.gov/scripts/lpsiis.dll/H/H_190_610_F_97.htm

NYS Health Department, regulations regarding criteria of water sources for human consumption

<http://www.health.state.ny.us/>

Conservation practice guidelines are reviewed periodically, and updated if needed. To obtain the most current version of this practice guideline, contact the Natural Resource Conservation Service.

**NRCS-NHCP
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USDA-NRCS Cultural Resources Handbook
 NRCS National Environmental Compliance Handbook
http://policy.nrcs.usda.gov/scripts/lpsiiis.dll/H/H_190_610_Content.htm
 USGS maps on groundwater or aquifers <http://www.usgs.gov>
 Occupational Safety and Hazard Act (OSHA) part 1926 and N.Y.S.Industrial Code 23
 Pump manufacturers' product information and specifications.

CULTURAL RESOURCES

Cultural resource reviews will be conducted for all ground disturbing practices, components, or other activities, as per the State Level Agreement between NRCS and the New York State Historic Preservation Officer.

PERMITS AND NOTIFICATIONS

All permits, easements, and rights-of-way are the responsibility of the landowner. **Dig Safely NY** (formerly the Underground Facilities Protection Organization, or UFPO) and non-member local utilities will be contacted according to the time required before construction to mark all applicable facilities in the construction area. This is the responsibility of the excavator.

Identification and the location of all other underground or overhead facilities is the responsibility of the landowner.

INVENTORY AND EVALUATION

1. Determine landowner's objectives for development of the spring as a water source for livestock, crop production, pesticide/herbicide mixing, farmstead or household use, etc.
2. Assess the land uses upslope of the spring or seeps as contributing potential contaminants to the proposed water source/spring. Consider protection of the spring from contaminants. Fence to exclude livestock, vehicle traffic and unauthorized personnel and also for safety reasons.
3. Consider the potential for negative effects on rare and declining habitats such as calcareous fens.
4. Evaluate the soils and topography for the feasibility for developing the spring, gravity flow vs. pump system. Avoid spring development in areas prone to flooding.
5. Prior to any soils investigation, all surface layer material possibly containing any organic pollutants shall be removed to prevent contamination of subsurface resources.
6. Dig test holes up hill from the seep to find a point where the imperious layer (bedrock, clay soil, etc.) below the water bearing layer is about 3 feet below the ground surface. Water flows on top of this layer in sand or gravel towards the surface seep.
7. Collect water samples to have the proposed water source/supply tested by an approved testing facility for the intended use. When water is planned for human consumption, NYS Department of Health regulations shall apply.
8. Water quantity will determine if development will meet the landowner's requirements. When possible, determine the spring's flow (gallons per minute-gpm) to assist with the site evaluation and meeting the landowner's needs. Utilize a pail of known volume, record the time it takes to fill and calculate the results in gallons per minute. Visual observations of flow quantities and duration over time by the landowner may assist with the evaluation.
9. Make provisions for diverting surface water away from the spring with a diversion or grading and shaping. Avoid excavating too deep or too near the site in order not to disrupt the spring source.

10. The spring and appurtenances shall be protected to allow use without continual maintenance. Consider year round use and the need for special considerations in winter to prevent freezing conditions. Sufficient, constant flows should prevent freezing in lines. Using a smaller trough or tank during winter will reduce the amount of heat loss from incoming water and minimize ice build up. Insulation around the trough, a partial lid or adding a heater will also prevent freezing conditions.
11. The use of explosives for development of the spring is **not recommended**. Blasting may shatter and dislocate rock that would affect the spring's flow.
12. Spring developments shall be planned, designed and constructed in compliance with Federal, State and Local laws and regulations.

DESIGN

1. Develop a site survey and soil investigation based on the complexity of the site. A topographic map should be prepared for more complex sites and where several practices may be necessary to address the identified problems.
2. Utilize soils, geology, topographic data and other information collected during the I&E to develop the site design.
3. Determine the layout and configuration of the spring development and its associated components. Factors may include the type of traffic (vehicular, animal, or human), the travel patterns, and intensity of usage. Safety and accessibility considerations shall be incorporated into the design.
4. Determine the type of collection system to be used for the site. EFH, Chapter 12, pgs. 12-13 thru 17 has several figures that convey the various collection systems.
 - 4.1 A well defined spring site with ample flow may only require the installation of a spring box or sump set at an elevation that would not restrict the present flow in order to collect and disseminate the water supply. Do not allow water to pond over the spring openings, since ponding may reduce spring flow, alter flow paths of water and/or introduce contaminants into the system.
 - 4.2 For perched or contact springs, collection trenches shall be used to intercept and divert flows to a collection box. Collection trenches shall be excavated so that they extend into the impervious layer.
 - 4.3 Spring boxes shall be made of durable material, have an impervious floor and tight access cover.
 - 4.4 Provide a drain in the spring box to assist with maintenance issues.
5. Determine the type of outlet (gravity or pump) needed for delivery of water from the collection system to the intended use site. Install all pipes below frost line.
6. For pipeline, determine the pipe length, number and type of fittings, friction losses, and required flow to calculate the size of pipe. Refer to the Spring Development and Pipeline practice standards for recommended pipe sizes and recommended grades. Provide extra protection for pipe when placing in rocky areas and when crossing roadways and areas of concentrated use by vehicles or livestock. All materials used in the system shall be rated for the intended use.
7. For pump sizing, determine the pipe size and length, number, size and type of fittings, any friction losses, static head, total dynamic head, pump cycle, and required flow to calculate the size of the pump. For a specific pump product, refer to manufacturers' information and specifications.

8. Design the necessary system appurtenances that control water use, i.e. a water hydrant, tank or trough with overflow provisions or float valve, air vents to prevent air locks, etc. (Note: Practice Standard 614 -Trough or Tank has been renamed Watering Facility as referenced in 574-Spring Development.)
9. Design features to protect the spring site, i.e. diversion, fencing, vegetative treatment, etc. Refer to appropriate practice standards for assistance with these design features.
10. Compile all design information in appropriate design folder.
11. Develop construction drawings and specifications for the spring development project, locate and describe all visible public utilities near the project. Include profile showing pipeline size, material, grade, required and actual capacities, inlet and outlet locations and elevations. Show structural details of spring box outlets, inlets and flow control devices showing material, dimensions, and elevations. Standard details may be available for inclusion in the final drawings.
12. Compute material quantities, such as trenching, backfill, type and length of pipe (for each of the designed sizes) and for any other appurtenances.
13. Develop a cost estimate, an O & M Plan, and an inspection plan for the project.
14. A statement requiring the excavator to notify **Dig Safely NY** and non-member utilities for proper utility notification is **REQUIRED** on the drawing.
15. Determine your level of Job Approval Authority for the design class of this project, obtain approval from appropriate individual, if not qualified.
16. Assemble a complete final construction package.

INSTALLATION

1. Provide copies of the construction specifications and drawings to the landowner. Explain all aspects of the job before a contractor is secured. Review the O&M plan with the landowner to assure proper maintenance of the completed practice.
2. Thoroughly review the job with the landowner and contractor prior to construction. Ensure that all utilities applicable to the job site have been notified and are marked prior to construction.
3. Schedule the construction start with the landowner and contractor. Coordination of all staking and construction timing with the contractor and landowner can assure an efficient use of manpower.
4. Mark the stations with proposed cuts, set and mark offset grade stakes, if needed. Set stakes at the location of the spring box, interceptor or collection pipe or trenches, pipeline, hydrant, trough or tank, and areas requiring specific considerations to show elevations and any other critical information for proper installation.
5. Make random construction checks during implementation. The checks should include:
 - 5.1. Spring box size and material, outlet location, drain location, collection pipes or trenches, pipelines and conduit materials and sizes; and other appurtenances, as required.
 - 5.2. Ensure that adherence to the design grade, bedding/blinding, depth and cover are met.
 - 5.3. The pipeline shall be tested for 15 minutes at the working pressure prior to backfilling of the pipeline trench.
 - 5.4. Elevation and location for the top and bottom of the spring box; location, elevations and grades of the collection pipes or trenches, pipeline, outlet, drain, and associated appurtenances.

6. During the final construction check, ensure that the:
 - 6.1. Installed components are stable and free of spoil and debris.
 - 6.2. Safety and protection measures are properly installed and secured.
 - 6.3. Trenches are adequately backfilled to allow for settlement.
 - 6.4. Structures and components have adequate soil cover for frost protection.
 - 6.5. Construction spoil and debris are properly disposed of.
 - 6.6. The site receives vegetative treatment as specified in the design.

CHECK OUT

All properly planned, designed, and installed conservation practices require documentation in the appropriate case file. Documentation must be sufficient to show:

1. The design conforms to the applicable standard;
2. The prepared construction drawings, specifications, plan maps, and/or job sheets accurately reflect the design;
3. The installed practice meets the requirements of the construction drawings, specifications, and practice standard; and
4. The “As Built” condition of the practice. All drawings shall be identified “As Built” as drawn in red, and all changes shall be made in red. Practices not requiring construction drawings will have the “As Built” condition documented on plan maps, job sheets, and/or with narrative.

REPORTING

Enter all documentation on the Conservation Plan (Toolkit), contract document (Protracts) and Conservation Assistance Notes (NRCS-CPA-6/6A) or similar documentation.

Report the practice and applicable components in the NRCS progress reporting system. Be certain to report benefits for all applicable resources and resource concerns as allowed in the NRCS progress reporting system.

OPERATION AND MAINTENANCE

Facilities, structures, and practices must be operated and maintained to ensure proper function and longevity. Periodic follow-up with the landowner is essential to ensure that all operation and maintenance (O&M) requirements are understood and followed.