



WATER RESOURCES/NATURAL RESOURCES SERVICES

The need for water resources and natural resources services has increased significantly in the past few years as a result of new environmental regulations, the desire to protect and preserve existing natural resources and a recent shift to a sustainable, low impact development (LID) process. Hagerty Environmental, LLC's professional engineers, professional geologists and environmental scientists provide a wide range of water resources and natural resources services to meet the needs of our clients in this dynamic and often cumbersome regulatory climate. These services consist of the following:

Water Resources Services

Water resources include surface water impoundments (e.g., ponds, lakes, reservoirs), water conveyance features (e.g., streams, waterways, rivers, canals) and contributing watersheds. Our engineers, hydrology/hydraulic professionals and geologists provide professional services in the following areas of competency:

- Watershed Evaluations and Flood Studies
- Stormwater Management Testing and BMP Design
- Erosion and Sediment Control Plan Preparation
- Pond/Lake Design and Management
- Dam Design, Evaluation and Inspection
- Stream Channel Evaluation and Restoration
- State and Federal Permit Preparation



Inspection of a dam's primary outlet structure. Degradation of the CMP resulted in an emergency drawdown order from PADEP and the repair/reconstruction of the dam. Hagerty provided design and construction management services for this project

FACT: There are over 75,000 permitted dams in the US, creating impoundments for various purposes, including recreation (31%), farming/fire (17%), flood control (15%), irrigation (14%), water supply (10%), mining (8%), power generation (3%) and navigation/other (2%).



Hagerty provides stormwater management testing and design services, such as stormwater infiltration testing (shown above), in support of a Low Impact Development (LID) process. Subsequent services include subsurface infiltration BMP design

For watershed evaluations, Hagerty Environmental, LLC uses the most up to date modeling software, including the US Army Corps of Engineers' Hydrologic Engineering Center - Hydrologic Modeling Software (HEC-HMS), US Environmental Protection Agency's Stormwater Management Software (SWMM) and commercially-available software packages for rainfall-runoff simulations. Flood studies, sediment transport and waterway evaluations are conducted using software such as USACE's River Analysis System (HEC-RAS).



Five (5) acre waterfowl habitat pond being constructed in Northern Delaware. Hagerty provided design and construction oversight services for this project

(Over for Natural Resources Services)



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Natural Resources Services

Our natural resources services are concentrated mainly in the areas of natural and constructed wetlands, ecosystems and groundwater. Our services are conducted by engineers, biologists and environmental scientists and include the specific service areas:

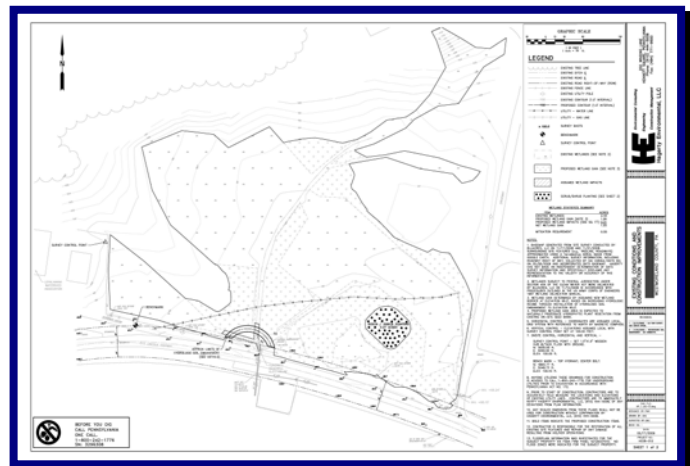
- Jurisdictional Wetland Delineation
- Wetland Functionality/Quality Assessment
- Wetland Mitigation, Restoration and Monitoring
- Treatment Wetland Evaluation, Design and Implementation
- Groundwater Investigation, Evaluation and Recharge/Remediation Design
- Ecosystem Assessment and Evaluation
- Environmental Impact Studies
- State and Federal Permit Preparation



Mitigation wetland undergoing re-vegetation with herbaceous wetland plugs. Hagerty provided re-vegetation and long-term monitoring services for this project



A 12 acre natural wetland in Northeastern Pennsylvania that was diminishing in size and quality due to a loss of hydrology. Hagerty provided surveying and engineering design services including the design of a water control structure to retain water, regain the overall wetland quality and enhance aesthetic



Wetland mitigation design showing the proposed water control feature, wetland delineation limits and replanting scheme

Identification and protection of natural resources has increasingly become a project driver for regulatory approval and compliance. As the sensitivity of these environmental factors becomes more pervasive in construction, development and remediation projects, so does the need for accurate and technically sound natural resource identification and evaluation services.

Contact us at info@hagertyenvironmental.com with any questions regarding our water resources or natural resources services



Subsurface infiltration system for stormwater management and groundwater recharge. System was tested and designed by Hagerty