REVISED DRAINAGE REPORT
INDEPENDENT SPENT FUEL STORAGE INSTALLATION
DOMINION NUCLEAR CONNECTICUT
MILLSTONE POWER STATION
WATERFORD, CONNECTICUT

PREPARED FOR:
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

PREPARED BY:

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, Massachusetts 02062

April 2012
File No. 01.0171138.00

GZA
GeoEnvironmental, Inc.

Engineers and Scientists

April 12, 2012
File No. 01.171138.00

Dominion Nuclear Connecticut
Rope Ferry Road
Waterford, Connecticut 06385

Attention: J. David Dakers, P.E.

Re: Revised Drainage Report and Drawings
Independent Spent Fuel Storage Installation
Millstone Power Station
Waterford, Connecticut

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Dear Mr. Dakers:

As per Purchase Order No. 70237837 dated December 8, 2011, GZA GeoEnvironmental, Inc. (GZA) is pleased to provide the enclosed revised Draft Drainage Report and Drawings for the above-referenced project. This report includes an evaluation of the hydrology of pre-construction and post-construction site conditions. The report discusses GZA's approach to the full build-out site drainage and presents drainage details. Modifications to the drainage system to accommodate full ISFSI build-out include construction of new catch basins and pipes to covey runoff from the site to the existing drainage network. Recommendations for Best Management Practices, consistent with Connecticut Guidelines for Soil Erosion and Sediment Control, are also presented.

Revised Site Plans detailing the existing conditions, the proposed grading and drainage, and the proposed erosion and sediment control measures are also enclosed.

We understand that the supplemental construction of the ISFSI will require a permit application under the Department of Environmental Protection (DEP) General Storm Water Management Program, including preparation of a Soil Erosion and Sediment Control plan and details, and Stormwater Pollution Control Plan (SWCP). This report will be provided under separate cover shortly. Finally, GZA is evaluating our Environmental Report, originally prepared in 2003, to confirm that the site modifications do not affect the conclusions therein. The revised report, or a letter confirming that no changes are necessary in our opinion, will follow under separate cover shortly.

Please contact David Leone at (781) 278-5788 if you have any questions. We appreciate the opportunity to assist you with this project.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

David M. Leone, P.E.
Sr. Project Manager

Daniel C. Stapleton, P.E.
Consultant / Reviewer

Peter H. Baril, P.E.
Principal

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EXECUTIVE SUMMARY

In 2003, GZA GeoEnvironmental, Inc. (GZA) conducted hydrologic and hydraulic analyses, and drainage design, for Dominion Nuclear Connecticut, Inc.'s (DNC's) construction and operation of an Independent Spent Fuel Storage Installation (ISFSI) at the Millstone Power Station (Millstone), located in the Town of Waterford, New London County, Connecticut. The ISFSI is located in the southerly portion of the 520-acre Millstone property, in an area that was previously developed as a parking lot (See Locus Plan – Figure 1). The ISFSI project was planned for construction in phases. The first phase (Phase I), which included the construction of a pad for 19 horizontal storage modules (HSMs) and the installation of a trench drain within the concrete aprons located west of the HSMs, was completed in 2004. Much of the site work required for full build-out was performed during the initial phase. The ISFSI is designed to support a total of 135 HSMS at full build-out.

Please note that for the purposes of this report, "pre-construction" indicates the site conditions prior to the construction of the Phase I ISFSI, "existing conditions" refer to the Phase I ISFSI construction and "proposed conditions" refers to the full ISFSI build out conditions.

The ISFSI project involves the following principal elements:

1. Development of the approximately 2-acre ISFSI site. The ISFSI site consists of a level, graded surface (at approximately Elevation 21) covered with concrete pads (to support the HSMs), concrete aprons and asphalt (at the north-western portion of the site);

2. Construction of a haul path (paved road) between the ISFSI site and the Millstone Unit 2 Auxiliary Building (completed as part of the Phase I work);

3. Abandonment of certain existing drainage structures and construction of new drainage and other utilities (completed as part of the Phase I work);

4. Removal and transportation of excess soil (generated from the ISFSI site grading construction) to an approximately 5-acre Soil Placement Area, located in a central portion of Millstone property that was previously used by Amtrak for railroad construction staging (completed as part of the Phase I work); and

5. Realignment of existing Security Protected Area (PA) fence to encompass the ISFSI site, haul path, and an approximately 4-acre Equipment Laydown Area (located immediately west of the ISFSI site) (completed as part of the Phase I work).

Subsequent to the completion of Phase I, GZA understands that the opposing slope condition, created by the grading and drainage design to convey runoff to the Phase I trench drain, resulted in a hindrance to loading the HSMs. As such DNC is requesting a revision to the design of the full build-out portion of the ISFSI to eliminate these restrictive hauling conditions. GZA understands that the existing grading and drainage for the Phase I ISFSI area, including the existing trench drain, need not be modified since the majority of the Phase I HSMs have already been loaded. DNC also plans to expand the entire western portion of the ISFSI site by approximately 0.23 acres during the full build-out to allow for easier access by the HSM transporter/ hauler.

Based on these proposed changes, GZA has conducted a revised hydrologic and hydraulic analysis, and drainage design. This Drainage Report presents the basis and results of these analyses, and also presents recommendations for sediment and erosion control during the final (full-build-out) ISFSI construction phase. Details of the existing and proposed site features, drainage improvements and sediment and erosion controls for construction, are presented separately on the *Revised Site Plans*[1].

Based on the existing site grades, drainage patterns and drainage structures, the ISFSI site is located within a contributory drainage area that is approximately 23 acres in size. This drainage area, prior to construction of the Phase I ISFSI, was comprised of developed upland and filled areas, some wooded low-lying areas, a pond and a former parking lot. The Phase I ISFSI now occupies a portion of this area (~2 acres). Surface runoff within the contributory drainage area flows in a general northwest to southeast direction.

The pre-construction drainage characteristics further subdivide this area into four sub-areas (referenced in the report as Sub-Areas 1 through 4). The locations of the pre-construction drainage sub-areas are indicated on Figure 2. Sub-Area 1 is a small (approximately 3 acre) low-lying area with no defined outlet, which provides temporary ponding and storage of stormwater. Sub-Area 2 is a larger (approximately 11 acre) area consisting of wetland areas and a small pond and associated upland areas. Sub-Area 3 consists principally of the ISFSI site and Equipment Laydown Area and is about 8 acres in size. Runoff from the 30-inch diameter trunkline discharges at the existing permitted outlet located east of the ISFSI site (No. DSN 011). Sub-Area 4 is located at the southeast corner of Sub-Area 3 and is about 2 acres in size.

The full build-out construction of the ISFSI will not significantly change the existing or pre-construction drainage patterns. Runoff characteristics will remain nearly identical to pre-construction and Phase I ISFSI conditions, in terms of infiltration potential as well as magnitude, timing, and volume of runoff. The drainage improvements constructed in 2004 separate the conveyance of stormwater into two trunklines. These are detailed on the

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[1] Revisions to original design, Millstone Power Station, Independent Spent Fuel Storage Installation (ISFSI), Dominion Nuclear Connecticut, Waterford, CT. April 2012

Revised Site Plans. One trunkline (30-inch diameter RCP) conveys stormwater from Sub-Areas 1 and 2, which encompass approximately 14 acres and are located upgradient of the ISFSI site. Catch basins within Sub-Area 3 but outside the Equipment Laydown Area and the ISFSI site are also connected to the 30-inch trunkline. This trunkline was constructed along the existing Access Road and discharges at the existing outlet location (No. DSN 011). Stormwater is collected within the Phase I ISFSI site using an approximately 210 feet long trench drain located west of the HSMs and catch basins constructed during Phase I in 2004. Within the Equipment Laydown Area, stormwater is collected using catch basins and drainage swales. Once collected, the stormwater is conveyed via the second trunkline along the southern and eastern portions of the ISFSI site and also discharges to the common manhole (no.4) and from there is conveyed to the existing outlet location. The outlet discharges stormwater to an existing drainage swale, which in turn discharges to an existing freshwater pond located about 250 feet east of the ISFSI site. This approach diverts stormwater emanating from the upgradient portions of the drainage area away from the close proximity of the ISFSI. It also minimizes the potential for transient flooding (i.e. surcharging), within the ISFSI site during storm events exceeding the 25-year design storm.

Additional catch basins are proposed to be installed within the ISFSI site for the full build-out condition. The proposed catch basins will be connected to the existing drainage network at the ISFSI site via 12-inch and 21-inch diameter reinforced concrete pipes.

Peak rates of runoff, under the design storm condition for the proposed changes are not expected to be significantly different from existing condition (Phase I construction). Phase I development of the ISFSI site is estimated to have increased peak rates of runoff, under the design storm condition by approximately 5 percent or less. This increase is not appreciable, as it will not materially increase water surface profiles or flooding potential to the existing freshwater pond (which will receive the runoff).

The drainage system incorporates structural Best Management Practices (BMPs), consistent with Connecticut guidelines[2], Structural Best Management Practices, including, but not limited to deep sump catch basins with hooded outlet pipes, a velocity dissipater (rip-rap swale) at the outlet and grassed swales. Standard erosion and sedimentation controls measures will be incorporated during the final phase of construction.

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[2] These include: 1) the "2002 Connecticut Guidelines for Soil and Erosion and Sediment Control"; and 2) the "Connecticut Stormwater Quality Manual", 2004. Both these documents were prepared by the Connecticut Department of Environmental Protection.

1.0 INTRODUCTION

GZA GeoEnvironmental, Inc. (GZA) conducted hydrologic and hydraulic analyses, and drainage design, for Dominion Nuclear Connecticut, Inc.'s (DNC's) construction and operation of an Independent Spent Fuel Storage Installation (ISFSI) at the Millstone Power Station (Millstone) in 2003. The ISFSI project was planned for construction in phases. Most of the site work required for full build-out was performed during the first phase (Phase I) constructed in 2004.

Phase I included the construction of a pad for 19 horizontal storage modules (HSMs), and included the installation of a trench drain within the concrete aprons located west of the HSMs. GZA understands that the opposing slope condition created by the grading and drainage design to convey runoff to the trench drain is a hindrance to loading the HSMs. DNC requested a revision to the design of the full build-out portion of the ISFSI to eliminate these restrictive hauling conditions. The ISFSI is designed to support a total of 135 HSMS at full build-out. GZA understands that the existing grading and drainage for the Phase I ISFSI area, including the existing trench drain, need not be modified since the majority of the Phase I HSMs have already been loaded. DNC also plans to expand the entire western portion of the ISFSI site by approximately 0.23 acres during the full build-out to allow for easier access by the HSM transporter. This additional area will be lined with asphalt.

GZA GeoEnvironmental, Inc. (GZA) has revised the hydrologic and hydraulic analyses, and drainage design, to include the proposed changes to the original design for the construction and operation of the ISFSI. The objectives of the drainage study were to:

1. Describe the pre-construction and existing site conditions, including drainage areas and patterns, and the runoff potential and hydraulic capacity of existing storm water collection systems in comparison to the proposed conditions; and

2. Revise the storm water drainage design for the full build-out condition.

This Drainage Report presents the basis and results of these analyses, and recommendations for sediment and erosion control during the final construction phase. Details of the existing and proposed site features, drainage improvements and erosion and sediment controls for construction, are presented separately on the *Revised Site Plans*.

Upon completion of construction, the ISFSI site and related drainage improvements will be incorporated into Millstone's existing "*General Permit for the Discharge of Stormwater Associated with Industrial Activities*".

This report is subject to the limitations listed in **Appendix A**.

2.0 PROJECT DESCRIPTION

Millstone is located in the Town of Waterford, New London County, Connecticut. The ISFSI site is a dry fuel storage facility that provides interim storage for spent nuclear fuel. It is composed of individual concrete and steel containment units (Horizontal Storage Modules [HSMs]) housed on concrete storage pads with concrete apron areas for haul vehicle access. The project, partially constructed in 2004, involves the following principal elements:

1. Development of the approximately 2-acre ISFSI site. The ISFSI site will consist of a level, graded surface (at approximately Elevation 21) covered with concrete pads (to support the HSMs), concrete aprons and asphalt (partially completed as part of the Phase I work).

2. Construction of a haul path (paved road) between the ISFSI site and the Millstone Unit 2 Auxiliary Building (completed as part of the Phase I work).

3. Abandonment of certain existing drainage structures and construction of new drainage and other utilities (partially completed as part of the Phase I work).

4. Removal and transportation of excess soil (generated from the ISFSI site grading construction) to an approximately 5-acre Soil Placement Area, located in a central portion of Millstone property that was previously used by Amtrak for railroad construction staging (completed as part of the Phase I work).

5. Realignment of existing Security Protected Area (PA) fence to encompass the ISFSI site, haul path, and an approximately 4-acre Equipment Laydown Area (located immediately west of the ISFSI site) (completed as part of the Phase I work).

The first Phase ("Phase I") of the ISFSI Project was constructed in 2004. During the Phase I (partial build-out), a pad for 19 HSMs was constructed. Most of the site work required for full build-out was performed during the first phase (Phase I). When at full build-out, the ISFSI will support a total of 135 HSMs.

2.1 SITE DESCRIPTION

All construction components of the project, including the ISFSI site, the haul path, the Equipment Laydown Area and the Soil Placement Area are located on upland portions of the Millstone property that have been previously disturbed, filled, and developed. The ISFSI area, haul path and Equipment Laydown Area are all contiguous, whereas the Soil Placement Area is located in the central portion of the Millstone property, north of the Amtrak railroad line.

The ISFSI site is approximately 92,000 square feet (approximately 2 acres) in size. The area is abutted to the east by an existing asphalt-paved access road. The grade at the ISFSI site is approximately Elevation 21 (NGVD 29).

The Equipment Laydown Area is about 157,350 square feet (approximately 4 acres) in size and is located immediately west of the ISFSI site. This area, which was previously developed as an asphalt and gravel paved parking lot, was not substantially changed by the development with the exception of minor grading and drainage improvements. Existing grades within the Equipment Laydown Area range from about Elevation 32 to about Elevation 22 and slope to the east-southeast.

The Soil Placement Area, which was used in the past for equipment laydown by Amtrak and the plant, consists of a gravel and dirt surface. The area is abutted to the south by Amtrak train rails, to the west by the asphalt-paved Millstone access road and to the north by an existing ball field. The area for excess soil placement is approximately 5-acres in size.

2.2 CONSTRUCTION

The ISFSI pad and approach apron, constructed during Phase I to support the 19 Phase I HSMs, covers an area of approximately 12,000 square feet (approximately 0.3 acre). Most of the site work required for full build-out was performed during Phase I, in order to minimize the extent of construction required in the future. The portion of the ISFSI site not covered with concrete pads or aprons during Phase I was graded and covered with a gravel surface.

The Phase I construction generally included the following:

1. Site preparation, including stripping of existing topsoil and pavement within the ISFSI area;
2. Removal and/or abandonment of existing drainage utilities;
3. Re-grading within the limits of the site;
4. Over-excavation and replacement of soil beneath the concrete pads to improve the soil dynamic properties (and resultant seismic response);
5. Construction of a concrete retaining wall at the northeast corner of the ISFSI site. The wall is approximately 350 feet in length and range in height from about 1 foot to 6 feet;
6. Construction of approximately 12,000 square feet of concrete pad and apron;
7. Construction of new drainage structures;
8. Construction of approximately 500 feet of asphalt-paved roadway, for the new haul path; and
9. Construction of new protected area security fencing.

During the Phase I construction, the formerly existing drainage structures within the proposed ISFSI site were removed. The existing drainage structures located within the Equipment Laydown Area were abandoned in-place. We understand that the principal components of the drainage improvements constructed during Phase I included:

1. A new trunkline along the existing Access Road, which conveys stormwater from approximately 14 acres of the contributory drainage area located upgradient of the ISFSI site. Catch basins were constructed along this trunkline to intercept flows at various points.

2. An approximately 210 feet long trench drain within the concrete aprons located west of the HSMs constructed during Phase I

3. Two new catch basins (CB#3 and CB#4) within the Equipment Laydown Area and two new catch basins (CB#7 and CB#8) within the ISFSI site. A temporary catch basin (CB#9A) was also constructed within the ISFSI site to help drain the site. This catch basin will be removed during subsequent phases of construction.

4. The trench drain and catch basins discharge to a second trunkline which extends along the southern and eastern portions of the ISFSI site.

5. Drainage Manholes to connect the catch basins to the trunk lines and at various sections of the trunklines.

6. The trunklines join at a manhole located east of the ISFSI site. A 30-inch diameter RCP conveys the water from this manhole to an outlet located at an existing permitted outlet (current outlet designation No. DSN 011).

7. Lowering of the permitted outlet invert by about 2 feet, from approximately Elevation 13 to Elevation 11.

Earthwork for the Phase I construction included excavation to achieve proposed grades, re-grading, over-excavation of some existing material considered unsuitable for foundation support, replacement with a stable backfill material or concrete, and import of clean structural fill. Excess or natural unsuitable material generated during construction was placed in the designated Soil Placement Area. Topsoil, excavated soil and boulders were relocated to the Soil Placement Area.

Approximately 550 cubic yards of clean structural fill and 600 cubic yards of gravel/crushed stone (for a total amount of 1,150 cubic yards) was imported during Phase I to provide a sound base for the pad, apron and new haul path. Construction of the Phase I pads and aprons required placement of approximately 1,500 cubic yards of reinforced, structural concrete.

As noted above, earthwork included excavation to achieve the proposed site grades, as well as over-excavation and replacement of soil beneath the pads to improve seismic response. The soil beneath the pads was over-excavated to bedrock and replaced with low strength, non-structural concrete or stable backfill material.

Construction activities for the next (and final) project phase would include:

1. Additional excavation of soil for construction of additional concrete pads and aprons;
2. Modification of some of the drainage structures constructed during Phase I;
3. Addition of 15-ft of bottom width along the entire western portion of the ISFSI apron to allow for easier access by the HSM transporter;
4. Construction of the additional concrete pads and aprons; and
5. Delivery and assembly of the HSMs.

The personnel fence along the western portion of the site will have to be moved approximately 15 feet west to accommodate the additional 15-ft of bottom width.

Full build-out would generate about 7,000 cubic yards of additional excess material that would be relocated to the Soil Placement Area. An additional, approximately 5,000 cubic yards of concrete would also be required to achieve full build-out.

Soil generated during construction and brought to the Soil Placement Area will be placed in controlled lifts that match the existing ground contours. The area will be loamed and hydro seeded after construction.

2.3 PROPOSED DRAINAGE IMPROVEMENTS

The proposed drainage improvements are detailed on the revised site plans titled "Revisions to Original Design, Independent Spent Fuel Storage Installation (ISFSI). Dominion Nuclear Connecticut Inc., Waterford, Connecticut" and dated March 2012.

Proposed Drainage Improvements which is the focus of this revised drainage report include:

1. Construction of three (3) new catch basins within the ISFSI site to drain the concrete pads and aprons;
2. Replacement of one drainage manhole (DMH#5) with a fourth new catch basin;
3. Construction of one (1) drainage manhole at the northern end of the ISFSI site;
4. Reconstruction of a 128-foot long 15-inch reinforced concrete pipe (RCP) on the north-western end of the ISFSI site;
5. Replacement of a 168-foot 15-inch RCP on the south-western portion of the ISFSI site with a 168-foot long 21-inch RCP;
6. The new catch basins and drainage manhole will be connected to the drainage network at the ISFSI site using 12-inch and 21-inch diameter reinforced concrete pipes as shown on the site plans.

These are discussed in detail in Section 4.

3.0 PRE-CONSTRUCTION DRAINAGE CONDITIONS

3.1 SURFICIAL SOIL AND SUBSURFACE CONDITIONS

As noted above, all components of the project, including the ISFSI site, the haul path, the Equipment Laydown Area and the Soil Placement Area, are located on upland portions of the Millstone property that have been previously disturbed and developed. According to the Soil Conservation Service map (ref. Soil Conservation Services, Soil Survey of New London County, Connecticut), surficial soils at the ISFSI site, the Equipment Laydown Area and the Soil Laydown Area consist of Urban Land (Ub), consistent with the developed nature of the area and the presence of the shallow fill.

The geology at Millstone consists typically of glacial till overlying bedrock of the Monson Gneiss and Westerly Granite formations. At the southwestern portion of the Millstone peninsula, glacial stream deposits overlay the bedrock, and at the southern tip of the peninsula artificial fill is present. A 2002 geotechnical study of the proposed ISFSI site (ref. Geotechnical Study, Dry Storage Project, Millstone Nuclear Power Plant, by Dr. Clarence Welti, dated December 2002) indicates that bedrock is encountered at elevations ranging from about Elevation 7 to Elevation 14.5, corresponding to depths of about 6.5 feet to 28 feet below existing grade. The glacial till typically consists of a well-graded, poorly sorted sand and gravel with about 10 to 30 percent fine-grained soil (silt). One to 2 feet of sand fill is present throughout the area, above the glacial till.

3.2 DRAINAGE PATTERNS

Based on the site grades, drainage patterns and drainage structures, the ISFSI site is located within a contributory drainage area that is approximately 24 acres in size. This drainage area is comprised of developed upland areas, some wooded low-lying areas, a pond and the ISFSI site. The ISFSI site is located within an area previously developed as a parking lot, and is at the southern, downgradient portion of the drainage area. Surface runoff within the contributory drainage area flows in a general northwest to southeast direction.

The pre-construction drainage characteristics further subdivide this area into four sub-areas (referenced in the report as Sub-Areas 1 through 4). The locations of the drainage sub-areas are indicated on Figure 2. Sub-Area 1 is a small (approximately 3 acre) low-lying area with no outlet, which provides temporary ponding and storage of stormwater. Sub-Area 2 is a larger (approximately 11 acre) wetland and pond area. Sub-Area 2 has an outlet at its southern end, which connects to an existing 30-inch diameter RCP trunkline. Sub-Area 3 is about 8 acres in size and previously consisted principally of a parking lot. The ISFSI site is located in Sub-Area 3. Stormwater within Sub-Area 3 was conveyed as sheet flow to shallow concentrated flow until intercepted by one of seven catch basin structures located throughout the parking lot. Once collected in these catch basins, storm water was conveyed to the existing 30-inch diameter RCP trunkline. The 30-inch diameter trunkline discharges at the permitted outlet located east of the ISFSI site (No. DSN 011). The outlet discharges to a drainage swale, which in turn discharges to a freshwater pond located about 250 feet east of the proposed ISFSI site. Stormwater at the fourth sub-area (Sub-Area 4), which is located at the southeast corner of Sub-Area 3 and is about 2 acres in size, is conveyed via sheet run-off toward the southeast portion of the Millstone property.

As discussed in Section 2.3, the drainage improvements constructed during Phase I included the construction of a new trunkline along the Access Road to convey flow from Sub-Area 2 to the permitted outlet east of the ISFSI site. Flow intercepted by the catch basins outside the ISFSI site and the Equipment Laydown area discharge to this trunkline. Flow intercepted by catch basins within the ISFSI site and the Equipment Laydown Area discharge to a second trunkline located along the southern and eastern portions of the ISFSI Site. The two trunklines join at a common manhole located east of the ISFSI site.

It appears that during the design storms considered in this study (up to the 100-year storm), stormwater remains ponded within Sub-Area 1 and does not contribute to flow to the 30-inch trunkline; however, it may contribute during larger storm events.

3.3 DRAINAGE CALCULATIONS - PRE-CONSTRUCTION CONDITION

GZA estimated the volume and peak rates of runoff, emanating from the contributory drainage area, under various conditions, including the 24-hour, 2-, 10-, 25-, and 100-year storms. The design outlet point for the hydrologic analysis was the outfall (No. DSN 011).

Inflow hydrographs developed by GZA for the various frequency storms were initially generated in 2003 using the U.S. Army Corps of Engineers HEC-1 Flood Hydrograph Package computer program. Incremental rainfall input to the HEC-1 simulation model was based on the National Resource Conservation Services' (NRCS), Type III, 24-hour duration distribution pattern. Total rainfall depths for southeastern Connecticut were obtained from the State of Connecticut Drainage Manual, originally developed by Weiss (USGS, 1983). Storm hydrographs created within HEC-1, were based on NRCS Dimensionless Unit Hydrograph theory. Resultant flood hydrographs for each sub-area were combined at the design outlet point to produce composite flood hydrographs for the site, for the various storm frequencies previously noted. The runoff from the approximately 11-acre Sub-Area 2 to the pond was hydrologically routed to account for the natural storage characteristics of the pond, which attenuated the peak discharge by about 30 percent. The results of these rainfall/runoff simulations indicate that runoff from the approximately 3.0-acre Sub-Area 1 drains to an isolated low lying area just west of the Millstone access road and does not contribute surface runoff to the existing 30-inch diameter RCP trunkline during the design storms considered. Combined peak rates of runoff at the design point were 19, 33, 39, and 53 cubic feet per second (cfs) for the 2-, 10-, 25-, and 100-year storms, respectively. These inflow hydrographs have been updated as part of this revised report using the Army Corps of Engineers HEC-HMS computer program, which has superseded HEC-1. Inputs to the HEC-HMS model are identical to the inputs to the HEC-1 model. Results from the HEC-HMS model are the same as those from the HEC-1 model. The updated results for each sub-area are summarized in **Table 1**. HEC-HMS input and output summaries for the existing condition analyses are presented in **Appendix B**.

The hydraulic capacity of the existing trunk line drainage system (completed as part of Phase I construction in 2004) was also estimated by GZA using the StormCAD® engineering software package. The StormCAD® program computes the hydraulic grade line profile along a specified drainage pipeline network using standard step backwater methodology. Energy (i.e. head) losses are computed based on user-specified pipe sizes, Mannings friction "n" factors, pipe slopes and also accounts for minor (i.e., "shock") losses due to pipe size transitions, bends, and junction manhole structures. Assuming free discharge (i.e. critical depth) at the design outlet point, the full-flow capacity of the lower end of the trunk line system is approximately 50 cfs. StormCAD® results, including the layout and hydraulic profile of the existing drainage system, are presented in **Appendix C**.

4.0 PROPOSED FULL BUILD-OUT CONDITION

4.1 DESIGN OBJECTIVES AND CRITERIA

The objective of the proposed conditions hydrologic analysis was to evaluate the rainfall/runoff characteristics of the site under the proposed conditions described in earlier sections (full build-out conditions with the additional 15-ft of bottom width along the entire western apron of the ISFSI). Based on Connecticut Department of Transportation (ConnDOT)[3] and the Department of Environmental Protection (DEP)[4] design and guidance documents, and local ordinances, the hydraulic design for the structural components of the proposed drainage system was based on the 25-year storm. As discussed in Section 5.0 below, the drainage system has been designed utilizing appropriate structural Best Management Practices to improve the general storm water quality being discharged from the Site. This is primarily accomplished through the settling and capture of total suspended solids and other particulate matter, and by providing oil-water separation.

4.2 PROPOSED SITE CHARACTERISTICS AND DRAINAGE SYSTEM LAYOUT

Several alternatives for the updated site drainage system layout were analyzed. Project goals included the following:

1. Generally maintain the existing drainage patterns;
2. Divert stormwater emanating from the upgradient portions of the drainage area away from the close proximity of the ISFSI, to minimize the potential for flooding during typical storm events;
3. Utilize the existing design outlet point;
4. Maintain a level, constant grade along the length of the HSM pads;
5. Efficiently drain water away from the pads and prevent ponding within the ISFSI site during typical storm events; and
6. Avoid locating drainage structures beneath the HSM pads.

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[3] Connecticut Department of Transportation. Drainage Manual, 2000.
[4] 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, 2002.

An additional consideration in the drainage design is the grade of the ISFSI site. The ISFSI site is in a topographic depression. The ISFSI site grade is Elevation 21 while the grade of the surrounding vicinity ranges from Elevation 28 to Elevation 19. This means that the ISFSI site would generally accumulate runoff from adjacent areas that is not appropriately diverted.

To achieve these goals, GZA selected the approach described below. The installation of the ISFSI drainage structures has been phased to coincide with Millstone's fuel storage requirements. During Phase I, which was completed in 2004, the Equipment Laydown Area drainage system was fully constructed along with the reconstruction of the outlet. Within the ISFSI site, a concrete pad and concrete apron was constructed to store 19 HSMs. The section of trench drain collecting runoff from this pad and apron was installed during Phase I. As discussed in earlier sections, the drainage improvements completed during Phase I are:

1. Division of the drainage system into two trunklines, with one conveying runoff from the Sub-Areas 1 and 2 and a second system conveying runoff from the Equipment Laydown Area and ISFSI site. The overall existing site drainage patterns was maintained under the proposed conditions; runoff continues to generally travel from the northwest to the southeast.

2. The design outlet point remained at the same location. However, due to the hydraulic profile required to pass the design flow, the invert of the 30-inch diameter outlet at the railroad outlet was lowered from Elevation 13.0 to Elevation 11.0.

3. A trunkline to convey runoff from Sub-Areas 1 and 2 was constructed. The trunkline begins at a new manhole located east of Building 532, allowing stormwater to flow in an easterly direction adjacent to the Access Road. The new manhole was constructed to replace an older manhole at the same location. The trunkline crosses the Access Road where the road bends to the east. At this point, water in the trunkline was routed along the eastern shoulder of the Access Road and discharge at the existing outlet (No. DSN 011).

4. Two new catch basins were installed within the Equipment Laydown Area to take advantage of existing site grading, and to minimize potential ponding and flooding.

5. Structural Best Management Practices included sumped catch basins and riprap installation (energy dissipater) at the 30-inch discharge outlet.

As part of the proposed modifications, GZA proposes the following drainage approach to complete the drainage network at the ISFSI site:

1. In addition to the constructed 210-feet long trench drain at the Phase I ISFSI, four new catch basins will be constructed within the concrete aprons at the western-most

end of the ISFSI site to intercept runoff from the concrete pads and aprons. Two of the four catch basins will be used to intercept runoff from the northern portion of the site and the other two will be used to intercept runoff from the southern portion of the site. One of the two catch basins intercepting flow from the southern portion of the site will be located at the present location of Drainage Manhole No. 5 (DMH#5). DMH#5 will be removed and replaced with the new catch basin.

2. The catch basins intercepting runoff from the northern portion of the ISFSI site will be connected to the existing catch basin at the northern end of the site (CB#7) using 12- inch diameter RCPs. A drainage manhole (sump) will be required at the northern end of the site to connect the 12-inch RCP to CB#7. The catch basin replacing DMH#5 will be connected to the existing DMH#6 using a 21-inch RCP. The existing 15-inch RCP connecting DMH#5 to DMH#6 will be removed. The second catch basin intercepting runoff from the southern portion of the ISFSI site will be connected to the existing DMH#7 at the southern end of the site using 12-inch diameter RCP.

3. The grade of the concrete aprons will remain at the existing grade (Elevation 21.0 ft) with the rims of the catch basins at elevation 20.9 ft to convey surface runoff to the inlets. The existing trench drain was constructed to maintain the level grade required within the ISFSI site. The adjacent apron areas were sloped (1 percent grade) at right angles to the pads and the trench drain grate (rim elevation 20.75 ft.). The trench drain discharges to a sump, and in turn to the trunk line located along the southern end of the ISFSI site.

4. The existing 128-foot long 15-inch RCP that connects the existing catch basin no.3 (CB#3) to the existing DMH#5 will be reconstructed at a different grade as shown of the revised site plans.

5. Structural Best Management Practices, including, but not limited to deep sump catch basins with hooded outlet pipes will be included in the design.

The ISFSI site construction has slightly modified the individual drainage sub-areas, as indicated on **Figure 3**. Additional detail related to site grading and drainage features are presented in the *Site Plans*.

4.3 DRAINAGE CALCULATIONS – FULL BUILD-OUT CONDITION

The hydrology of the proposed site condition was analyzed by GZA using the HEC-HMS program. The results are presented in **Appendix B**. The limits of the drainage sub-areas were modified slightly to reflect the change in grading and pipe rerouting. Other input variables including runoff potential (expressed as a Curve Number) and time of concentration, were adjusted based on minor changes to surface cover and shorter in-pipe travel times. Resultant peak rates of runoff for the various frequency storms are summarized in **Table 1.** The proposed conditions resulted in no appreciable change in peak runoffs compared to the existing conditions. The partial construction of the ISFSI site in 2004 resulted in a minor (5 percent or less) increase in peak run-off. This increase is not appreciable, as it will not materially increase water surface profiles or flooding potential to the freshwater pond, into which the runoff ultimately discharges.

The hydrologic and hydraulic analysis of the drainage pipe network in the access roadway and ISFSI Area was developed by GZA using StormCAD®. As much as was practically possible, the drainage system modifications were designed to operate under open channel conditions (i.e. resultant 25-year design hydraulic grade line (HGL) set below the crown of pipe). Due to site grading and Phase I ISFSI as-built condition constraints, some pipe sections may experience pressure flow during transient peak flow conditions during the 25-year design storm. This does not compromise the drainage system nor present an unacceptable risk to the ISFSI. Per design guidance by the Federal Highway Administration (FHWA)[5], "pipes may be designed to operate under pressure so long as the hydraulic gradient is below the intake lip of the inlet which may be affected". The FHWA recommended allowance between the hydraulic grade line and the intake lip is 0.75 feet. The StormCAD® computations for the proposed drainage system are provided in **Appendix C**.

5.0 POST CONSTRUCTION STORM WATER MANAGEMENT

Post construction storm water management will include the use of Best Management Practices (BMPs). BMPs are defined as "structural, non-structural, and managerial techniques that prevent or reduce non-point source pollutants from entering receiving waters." Phase I ISFSI drainage structures included the BMPs discussed below. The full-build out ISFSI will also utilize these BMPs, discussed below.

As noted previously, upon completion of construction, the ISFSI site and related drainage improvements will be incorporated into Millstone's existing "*General Permit for the Discharge of Stormwater Associated with Industrial Activities*". Managerial requirements will be established in that permit.

5.1 CATCH BASINS

Deep sump catch basins will be used at each of the inlets to the storm water collection system. Deeps sump catch basins are designed to remove trash, debris, and some sediment and oil from storm water runoff. They operate as modified catch basins, with inverted discharge pipes or hoods and sumps which are typically four times the diameter of the inflow pipe. Storm water may only exit the catch basin through the bottom opening of the pipe. A permanent pool of water remains in the sump. Oil and grease float on the water surface. During storms, the discharge pipe becomes submerged as the water level in the sump increases. The floating oil and grease are not discharged, but rather continue to float on top of the water surface. Some sediment removal is achieved by settling within the

[5] Design of Urban Highway Drainage, FHWA-TS-79-225, August 1979.

deep sump. With proper maintenance, deep sump catch basins with hooded outlets typically provide for 25 percent Total Suspended Solid (TSS) removal, on an average annual basis. Deep sump catch basins, when left unmaintained can however become a source of pollutants or a mosquito breeding habitat between rainfall events. They are also not effective in removing soluble or fine particles.

5.2 VELOCITY DISSIPATION

Velocity dissipation devices are typically structurally lined aprons placed between storm water outfalls and a stable downstream channel. They prevent scour and minimize the potential for downstream erosion by reducing the velocity of concentrated storm water flows. Velocity dissipation devices are not anticipated to be needed during the final construction phase. Drainage system improvements during Phase I included the provision of additional velocity dissipation measures at the 30-inch outfall, including a headwall and riprap outlet protection. A sand filter blanket and geotextile was added to protect the material under the riprap from possible scouring.

6.0 EROSION AND SEDIMENT CONTROLS

The *Revised Site Plans* include a Soil Erosion and Sediment Control plan. The following describes the proposed erosion and sediment control measures to be implemented during construction.

6.1 EROSION AND SEDIMENT CONTROL MEASURES

While the Phase I construction required clearing and disturbance of less than 3 acres in area, it involved extensive earthwork. Cuts of up to about 8 feet were required to achieve the proposed site grades. This involved the construction of earth slopes at the north and west portion of the ISFSI site. In addition, over-excavation to about Elevation 10 was required to remove unsuitable soils beneath the concrete pads. Approximately 25,000 to 30,000 cubic yards of soil was excavated. A portion of this soil was placed at the Soil Placement Area. The remainder was temporarily stockpiled and replaced within the ISFSI site. The final phase of construction will include some soil excavation in addition to removal and stockpiling of the existing gravel on the ISFSI site. Similar to what was done during Phase I, excess soil will be placed at the Soil Placement Area. Similar erosion and sediment control concerns encountered during the Phase I construction are expected during the final construction (full build-out) phase. These erosion and sediment control concerns include the following:

1. Erosion of the earth slopes, the cleared ISFSI site and soil / gravel stockpiles. Unless properly managed, sediment from this erosion would run off to other areas of the ISFSI site.

2. Soil excavation and stockpiling, and related activities, will generate significant dust if not adequately controlled.

3. Placement of soil at the Soil Placement Area. Existing grades within this area slope to the east-southeast towards a stream and wetlands area.

The principal pollution concerns include:

1. Temporary on-site storage of petroleum products and fueling of construction equipment.
2. On-site storage of cement.

The following erosion and sediment control techniques will be used during the final phase of the ISFSI construction and will be employed to minimize erosion and transport of sediment to resource areas, and to protect against pollution from hazardous materials during subsequent earthwork and final construction phase of the project. Adjacent or nearby resources areas include inland wetlands located northeast and east of the ISFSI site, and the freshwater pond located east of the ISFSI site.

6.1.1 Site Clearing and Excavation

Prior to any site clearing activities, silt fence and hay bale barriers will be placed around the perimeter of the ISFSI site. Clearing will be limited to those areas necessary to complete the proposed work. This generally includes the limits of the ISFSI site, localized areas of the Equipment Laydown Area and areas where utility trenching will occur. Disturbed areas will be kept to a minimum.

6.1.2 Hay Bale / Silt Fence Barriers

Hay bale/silt fence barriers will be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site, in addition to areas where high runoff velocities or high sediment loads are expected. The silt fences and hay bale barrier are to be replaced as determined by periodic field inspections.

6.1.3 Catch Basin Inlet Protection

Newly constructed and existing catch basins will be protected with hay bale barriers (where appropriate) or silt sacks throughout construction.

6.1.4 Construction Site Entrance / Exit

To reduce the tracking of sediment from the construction site onto other areas of the Millstone Property and to public ways, as well as the production of airborne dust, stabilized construction entrances/exits will be established at all permanent unimproved construction staging areas, including the Soil Laydown Area. The entrances/exits will consist of a 2- to 3-inch thick pad of crushed stone underlain with a filter cloth or a bituminous concrete apron and will be constructed on level ground.

6.1.5 Slope Protection

Exposed soil slopes will be especially susceptible to erosion. Temporary sediment protection from unprotected slopes will be provided using silt fence/hay bale installations. Should erosion become excessive the Contractor will install matting such as straw, jute, wood fiber, and/or plastic netting. The matting provides cushioning against splash erosion from raindrop impact, does not generate high velocity runoff, captures a great deal of sediment, and will provide long-term protection. Permanent slope protection will be provided by covering the slopes with a geotextile and crushed stone.

6.1.6 Temporary Sediment Basins

The contractor will be allowed to utilize temporary sediment basins, if needed. The basins will be designed either as excavations or bermed storm water detention structures (depending on grading) that will retain runoff for a sufficient period of time to allow suspended soil particles to settle out prior to discharge. These temporary basins will be located based on construction needs as determined by the contractor in consultation with the DNC's Project Manager. A perforated riser surrounded by a crushed stone filter will be typically used to control discharge from the basin. Points of discharge from sediment basins will be stabilized to minimize erosion.

6.1.7 Stockpiled Materials

Any stockpiles created during construction activities will be surrounded with hay bales and silt fence, where possible. Other alternatives utilized may include curb inlet filters or gravel filter berms laid around the perimeter of the stockpile. Stockpiles will be covered prior to inclement weather, graded to shed water, and covered at the end of each workday with plastic.

6.1.8 Soil Placement Area

Soil deposited at the Soil Placement Area will be placed in controlled lifts and graded to drain. Establishment of a permanent vegetative cover was established by loaming and hydro-seeding at the end of Phase I. Establishment of a permanent vegetative cover will be established by loaming and hydro-seeding at the end of any later construction phases.

6.1.9 Winter Stabilization

If construction is temporarily discontinued during winter months, all areas disturbed areas will be stabilized with straw mulch, hydro-seeding, mulching, or erosion control blankets as necessary to control erosion.

6.1.10 Outlet Protection

Permanent outlet protection, consisting of riprap channel lining, was provided at the storm water outlet to reduce storm water velocities and enhance sedimentation prior to discharge to the adjacent pond.

6.1.11 Dust Control

Standard dust control measures, including use of water trucks, misting and placement of calcium chloride will be used.

6.1.12 Construction Dewatering

Where possible, the wastewater discharge from construction dewatering is to be infiltrated into the ground in temporary sediment/infiltration basins. The existing soils may have limited infiltration capacity. Construction dewatering wastewater discharged to a surface water body will be pre-treated for sediment removal by residing in a fractionation/sedimentation tank or sediment basin prior to discharge.

6.1.13 Equipment Fueling

Equipment fueling and other activities including petroleum, oil and other potentially hazardous substances will be performed at a pre-approved, designated area with appropriate spill prevention and control measures. This area will be located on an asphalt paved surface, away from catch basins and other drainage structures. Portable secondary containment will be used, and sorbent materials will typically be placed around the perimeter of the fueling area, during all fueling activities. Non-liquid hazardous materials (e.g., cement) will be stored in a protected area and covered.

6.2 INSPECTION AND MAINTENANCE

Areas disturbed by the construction, including construction entrances, will be inspected to ensure that the Erosion and Sediment Control measures are correctly installed and maintained. Inspections of the active work area will occur weekly and after every significant precipitation event (exceeding ½-inch precipitation). Inspection reports will be maintained.

6.3 SEQUENCE OF GRADING AND CONSTRUCTION ACTIVITIES

The following provides a summary of the proposed sequence of grading and construction activities and the installation of the erosion and sediment control measures for proposed drainage modifications.

1. Install stabilized construction entrance and exit as needed
2. Install perimeter hay bales and silt fence as necessary
3. Provide catch basin inlet protection at existing catch basins
4. Perform stripping (removal of gravel surface) at the ISFSI site
5. Provide protection for all stockpiles
6. Prepare temporary sedimentation basins, as may be required
7. During stripping and excavation, install berms to collect site runoff as required.
8. Implement other dewatering control measures (e.g. frac tanks w/filters,) as required
9. Begin earthwork within the ISFSI Site
10. In areas where water flow is concentrated, install crushed stone or hay bale check dams
11. Upon completion of earthwork within the ISFSI site, install remaining drainage structures
12. Provide catch basin inlet protection at newly constructed catch basins
13. Construct concrete pads and aprons, and gravel surface within the ISFSI Site
14. Complete grading
15. Remove accumulated sediment from basins and other sediment control devices
16. Perimeter erosion control will remain in place until permanent stabilization has been achieved
17. Loam and seed the Soil Placement Area

TABLES

Table 1

Rainfall / Runoff Modeling Results

Results of Existing Conditions Analysis

Drainage area	Peak Flow (cfs)			
	2-year storm	10-year storm	25-year storm	100-year storm
Sub-Area 1	2	4	5	6
Sub-Area 2	4	12	16	24
Sub-Area 3	13	22	25	32
Sub-Area 4	4	6	7	9
Site	19	33	39	53

Note: Peak flows for site represent combined hydrographs. Individual drainage areas represent unrouted peak flows

Results of Proposed Conditions Analysis

Drainage area	Peak Flow (cfs)			
	2-year storm	10-year storm	25-year storm	100-year storm
Sub-Area 1	2	4	5	6
Sub-Area 2	4	12	16	24
Sub-Area 3	16	24	29	37
Sub-Area 4	2	4	4	5
Site	20	34	40	54

Note: Peak flows for site represent combined hydrographs. Individual drainage areas represent
unrouted peak flows.

Comparison of Existing and Proposed Conditions Results

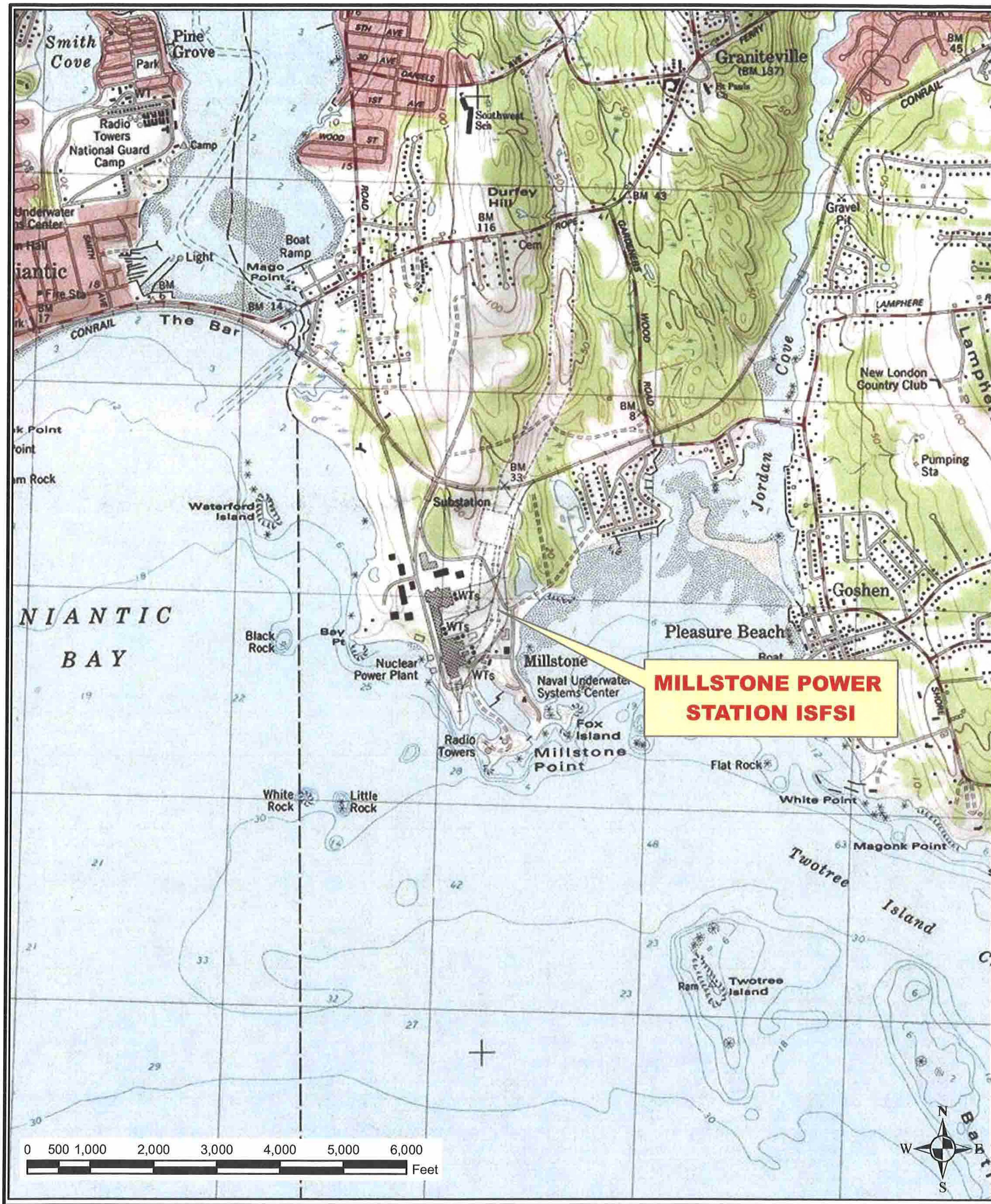
	Peak Flow (cfs)			
	2-year storm	10-year storm	25-year storm	100-year storm
Existing Conditions	19	33	39	53
Proposed Conditions	20	34	40	54
Change	1	1	1	1

Table 2

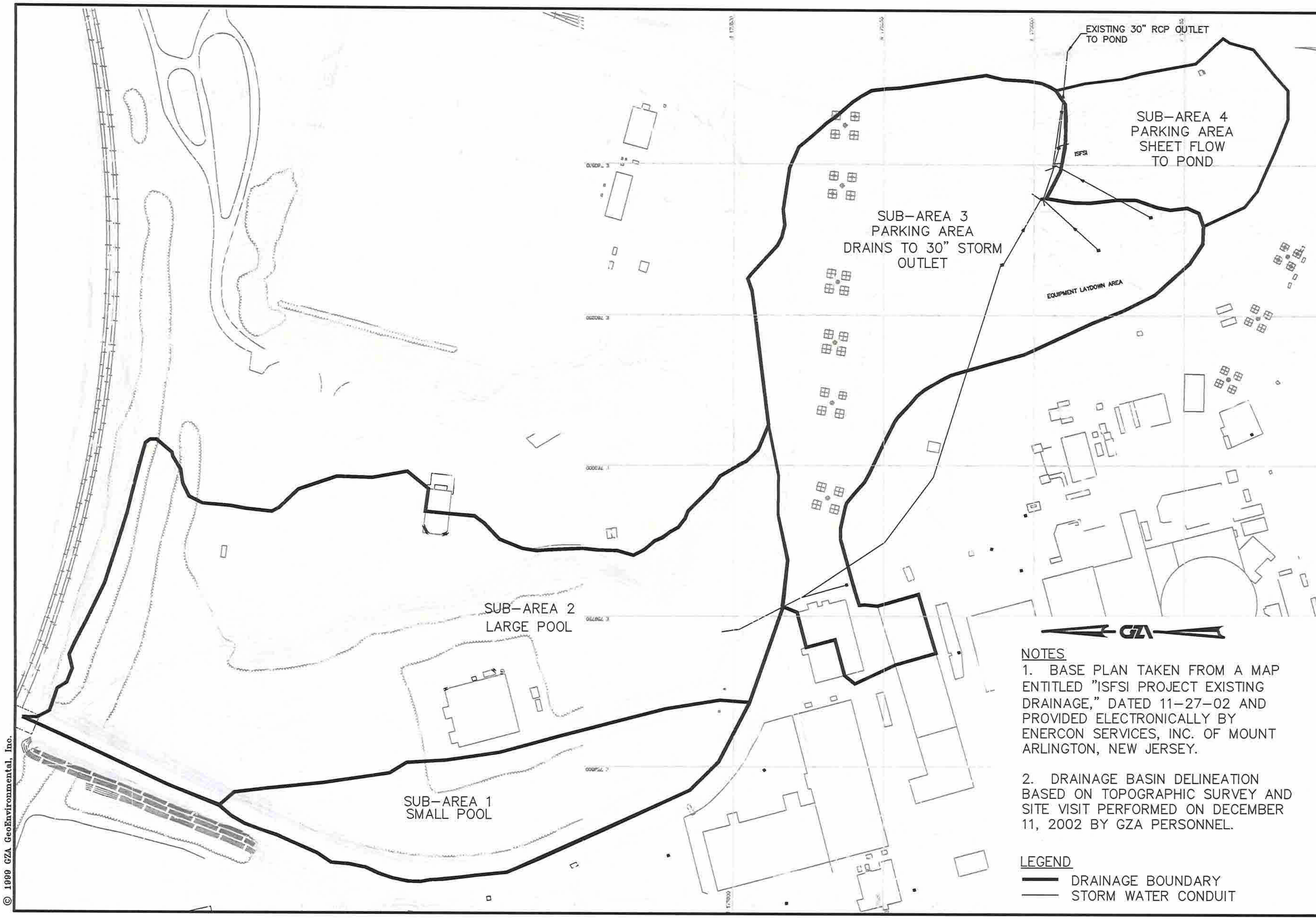
Combined Pipe/Node Report

Upstream Node	Downstream Node	Section Size	Mannings n	Full Capacity (cfs)	Total System Flow (cfs)	Average Velocity (ft/s)	Length (ft)	Constructed Slope (ft/ft)	Upstream Inlet Rational Flow (cfs)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Cover (ft)	Downstream Cover (ft)
CB#1	DMH#1	30 inch	0.013	29.07	17.06	5.86	342	0.005	5.06	30.5	33	24.87	23.82	3.13	6.68
DMH#1	DMH#2	30 inch	0.013	44.59	17	8.14	192	0.012	N/A	33	30.1	23.82	20	6.68	7.6
DMH#2	DMH#3	30 inch	0.013	29	16.94	5.14	218	0.005	N/A	30.1	27.5	20	18.9	7.6	6.1
CB#2	DMH#3	15 inch	0.013	10.21	6	7.99	80	0.025	6	26.5	27.5	22	20	3.25	6.25
DMH#3	DMH#4	30 inch	0.013	58	21.73	10.01	329	0.020	N/A	27.5	19.7	18.9	12.32	6.1	4.88
CB#6	DMH#4	15 inch	0.013	4.57	4.31	4.56	15	0.005	4.31	19.5	19.7	15.25	15.18	3	3.27
I-12	I-11	12 inch	0.013	2.53	1.26	1.6	195	0.005	1.26	20.9	20.9	17.84	16.86	2.06	3.04
I-11	J-10	12 inch	0.013	2.55	2.3	2.93	45	0.005	1.2	20.9	20.9	16.86	16.63	3.04	3.27
J-10	CB#7	12 inch	0.013	2.52	2.28	2.91	50	0.005	N/A	20.9	20.9	16.63	16.38	3.27	3.52
CB#7	CB#8	12 inch	0.01	3.27	2.74	3.48	168	0.005	2.02	20.9	20.9	16.38	15.54	3.52	4.36
CB#8	DMH#12	12 inch	0.01	3.27	3.12	3.97	168	0.005	0.52	20.9	20.9	15.54	14.7	4.36	5.2
DMH#12	DMH#10	15 inch	0.013	11.88	3.04	2.48	21	0.034	N/A	20.9	20.9	14.47	13.76	5.18	5.89
CB#3	I-13	15 inch	0.013	4.57	4.48	4.18	128	0.005	4.48	24.5	24.2	17.64	17	5.61	5.95
I-13	DMH#6	21 inch	0.013	11.2	6.48	2.69	168	0.005	N/A	20.9	21	16.91	16.07	2.24	3.18
CB#4	DMH#6	15 inch	0.013	4.57	4.55	3.71	6	0.005	4.55	20.7	21	16.45	16.39	3	3.36
DMH#6	DMH#15	21 inch	0.013	11.2	8.42	3.5	153	0.005	N/A	21	21	16.07	15.3	3.18	3.95
I-14	DMH#15	12 inch	0.013	3.09	1.15	1.46	19	0.008	1.15	20.9	21	15.5	15.35	4.4	4.65
DMH#15	DMH#7	21 inch	0.013	11.88	11.97	4.97	16	0.005	N/A	21	20.9	15.3	15.21	3.95	3.94
DMH#7	DMH#8	21 inch	0.013	11.2	11.96	4.97	84	0.005	N/A	20.9	20.9	15.21	14.79	3.94	4.36
DMH#13	DMH#8	15 inch	0.013	5.9	2.02	1.65	6	0.008	2.02	20.75	20.9	15.75	15.7	3.75	3.95
DMH#8	DMH#9	24 inch	0.013	9.05	13.59	4.33	50	0.002	N/A	20.9	20.9	15.05	14.97	3.85	3.93
DMH#9	DMH#10	24 inch	0.013	11.19	13.56	4.32	237	0.002	N/A	20.9	20.9	14.97	14.39	3.93	4.51
DMH#10	DMH#11	24 inch	0.013	10.12	16.22	5.79	40	0.002	N/A	20.9	20.5	14.39	14.31	4.51	4.19
CB#5	DMH#11	12 inch	0.013	2.52	1.51	3.44	10	0.005	1.51	20.5	20.5	16.5	16.45	3	3.05
DMH#11	DMH#4	30 inch	0.013	29.22	17.42	3.66	65	0.005	N/A	20.5	19.7	12.65	12.32	5.35	4.88
DMH#4	O-1	30 inch	0.013	44.47	39.07	9.79	91	0.012	N/A	19.7	16.5	12.07	11	5.13	3

FIGURES



GZA	PROJ. MGR.: DML DESIGNED BY: KDH REVIEWED BY:PHB OPERATOR: KDH DATE: 12 -20 -11	LOCUS MAP	JOB NO. 171138
		INDEPENDENT SPENT FUEL STORAGE INSTALLATION	FIGURE NO. 1



NOTES

1. BASE PLAN TAKEN FROM A MAP ENTITLED "ISFSI PROJECT EXISTING DRAINAGE," DATED 11-27-02 AND PROVIDED ELECTRONICALLY BY ENERCON SERVICES, INC. OF MOUNT ARLINGTON, NEW JERSEY.

2. DRAINAGE BASIN DELINEATION BASED ON TOPOGRAPHIC SURVEY AND SITE VISIT PERFORMED ON DECEMBER 11, 2002 BY GZA PERSONNEL.

LEGEND

▬ (heavy line)	DRAINAGE BOUNDARY
— (thin line)	STORM WATER CONDUIT

PROJ MGR: DML DESIGNED BY: KDH REVIEWED BY: PHB	OPERATOR: KDH DATE: 01/10/12

GZA GeoEnvironmental, Inc.

SCALE: 1" = 150'

0 75' 150' 300'

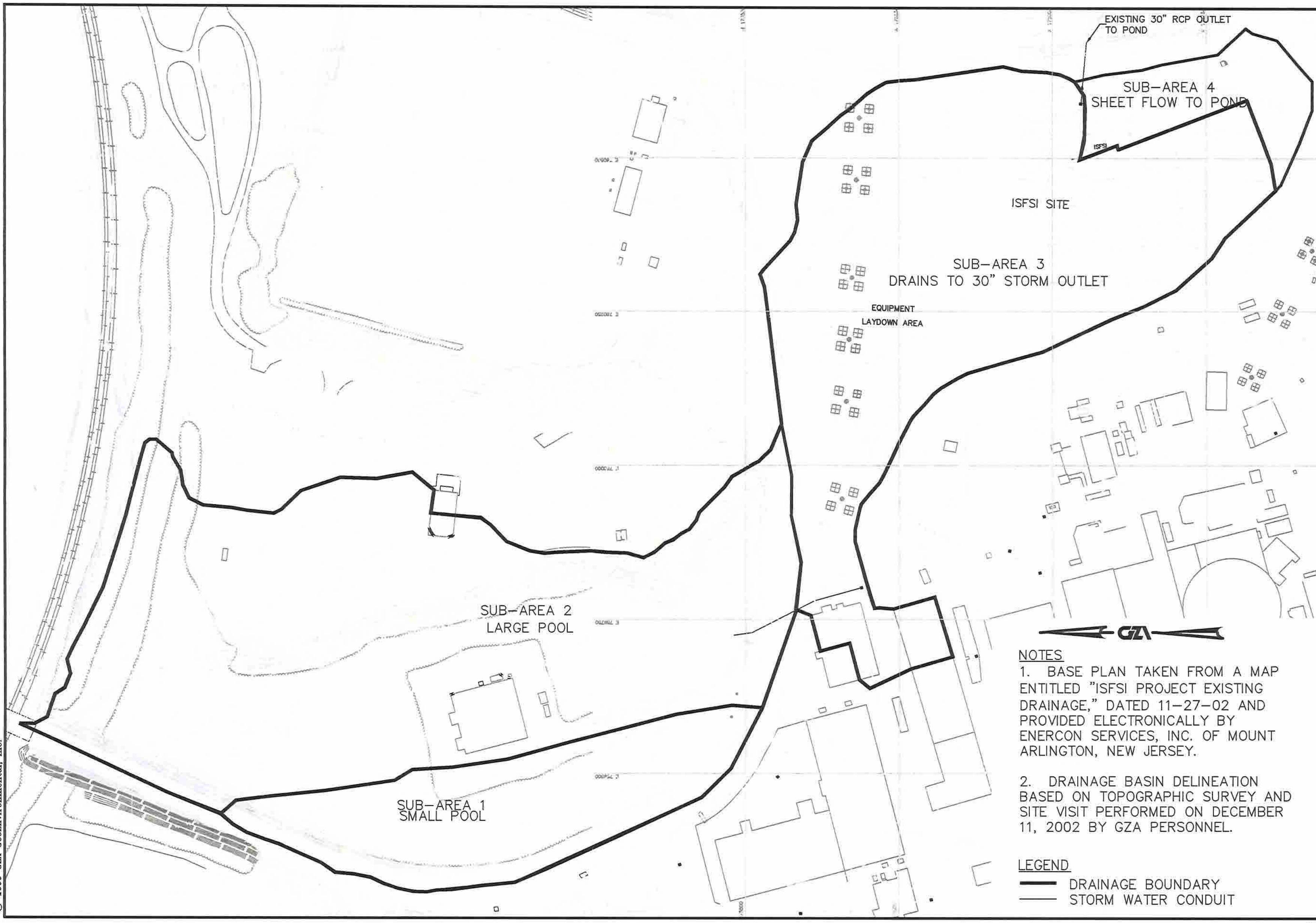
MILLSTONE POWER PLANT/DNC

WATERFORD, CONNECTICUT

PRE-CONSTRUCTION CONDITIONS
DRAINAGE AREA PLAN

JOB NO. 171138.00

FIGURE NO. 2



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LEGEND

- DRAINAGE BOUNDARY
- STORM WATER CONDUIT

PROJ MGR: DML	OPERATOR: KDH
DESIGNED BY: KDH	
REVIEWED BY: PHB	DATE: 1/10/12

GZA GeoEnvironmental, Inc.

SCALE: 1" = 150'

0 75' 150' 300'

MILLSTONE POWER PLANT/DNC

WATERFORD, CONNECTICUT

PROPOSED CONDITIONS DRAINAGE AREA PLAN

JOB NO. 171138.00

FIGURE NO. 3

File?

APPENDIX A
GZA LIMITATIONS

LIMITATIONS

1. This Drainage Report ("Report") has been prepared by GZA GeoEnvironmental, Inc. ("GZA") for the exclusive use of Dominion Nuclear Connecticut, Inc. for specific application for an Independent Spent Fuel Storage Installation ("ISFSI") at the Millstone Power Station located in Waterford, Connecticut, to the Connecticut Siting Council, in accordance with generally accepted engineering practices. No other warranty, express or implied, is made.

2. The observations described in the Report were made under the conditions stated herein. The conclusions presented in the Report were based solely upon the services described therein.

3. In preparing the Report, GZA has relied on certain information provided by Enercon Services, Inc. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this work.

4. In the event that any changes in the nature, design, or location of the drainage structures for the ISFSI Project are planned, the conclusions and recommendations contained in the Report shall not be considered valid unless the changes are reviewed and conclusions of the Report modified or verified by GZA.

5. It is recommended that GZA be retained to provide engineering services during construction of the drainage improvements for this project. This is to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event conditions differ from those anticipated prior to the start of construction.

6. In preparing this report, GZA has relied upon topographic survey data prepared by others and soil characteristics as reported by the National Resource Conservation Service (formerly known as the SCS). GZA did not independently verify the accuracy of that data.

7. GZA based the hydrologic analysis of existing conditions on the site plans made available to GZA as of the date of the Report. In the event that any other site changes are planned, the conclusions and recommendations contained in the Report shall not be considered valid unless the changes are reviewed and conclusions of the Report modified or verified by GZA.

8. The analysis presented is for the rainfall volumes and distributions stated herein. For storm conditions other than those analyzed, the response of the sites drainage network has not been analyzed.

APPENDIX B
RESULTS OF HYDROLOGIC (HEC-HMS) ANALYSES

CURVE NUMBERS

CURVE NUMBER CALCULATIONS

Pre-Construction Conditions

Sub-Area 1 - Small Pool

Cover		Soil Group	CN	Product
Impervious Cover	24826	C	98	2432948
Woods, Good Condition	104143	C	70	7290010
Total	128969			9722958
Weighted CN				76

Sub-Area 2 - Large Pool Drainage Area

Cover	Area	Soil Group	CN	Product
Impervious Cover	51619	C	98	5058662
Open space, Fair Conditon	193945	A	49	9503305
Woods, Good Condition	228291	C	70	15980370
Total	473855			30542337
Weighted CN				65

Sub-Area 3 - Parking Areas to Storm Drain

Cover		Soil Group	CN	Product
Impervious Cover	105050	Ud	98	10294900
Gravel	231288	Ud	85	19659480
Grass, Fair Condition	0	Ud	69	0
Total	336338			29954380
Weighted CN				90

Sub-Area 4 - Disconnected Parking Area

Cover		Soil Group	CN	Product
Impervious Cover	38000	Ud	98	3724000
Gravel	44727	Ud	85	3801795
Grass, Good Condition	0	Ud	61	0
Total	82727			7525795
Weighted CN				91

CURVE NUMBER CALCULATIONS

Existing Conditions

Sub-Area 1 - Small Pool

Cover		Soil Group	CN	Product
Impervious Cover	24826	C	98	2432948
Woods, Good Condition	104143	C	70	7290010
Total	128969			9722958
Weighted CN				76

Sub-Area 2 - Large Pool Drainage Area

Cover	Area	Soil Group	CN	Product
Impervious Cover	51619	C	98	5058662
Open space, Fair Conditon	193945	A	49	9503305
Woods, Good Condition	228291	C	70	15980370
Total	473855			30542337
Weighted CN				65

Sub-Area 3 - Parking Areas to Storm Drain

Cover		Soil Group	CN	Product
Impervious Cover	185000	Ud	98	18130000
Gravel	184792	Ud	85	15707320
Grass, Fair Condition	0	Ud	69	0
Total	369792			33837320
Weighted CN				92

Sub-Area 4 - Disconnected Parking Area

Cover		Soil Group	CN	Product
Impervious Cover	24668	Ud	98	2417464
Gravel	24605	Ud	85	2091425
Grass, Good Condition	0	Ud	61	0
Total	49273			4508889
Weighted CN				92

CURVE NUMBER CALCULATIONS

Proposed Conditions

Sub-Area 1 - Small Pool

Cover		Soil Group	CN	Product
Impervious Cover	24826	C	98	2432948
Woods, Good Condition	104143	C	70	7290010
Total	128969			9722958
Weighted CN				76

Sub-Area 2 - Large Pool Drainage Area

Cover	Area	Soil Group	CN	Product
Impervious Cover	51619	C	98	5058662
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Total	473855			30542337
Weighted CN				65

Sub-Area 3 - ISFI Sub-Drainage Area

Cover		Soil Group	CN	Product
Impervious Cover	194700	Ud	98	19080600
Gravel	175092	Ud	85	14882820
Grass, Fair Condition	0	Ud	69	0
Total	369792			33963420
Weighted CN				92

Sub-Area 4 - Disconnected Parking Area

Cover		Soil Group	CN	Product
Impervious Cover	24668	Ud	98	2417464
Gravel	24605	Ud	85	2091425
Grass, Good Condition	0	Ud	61	0
Total	49273			4508889
Weighted CN				92

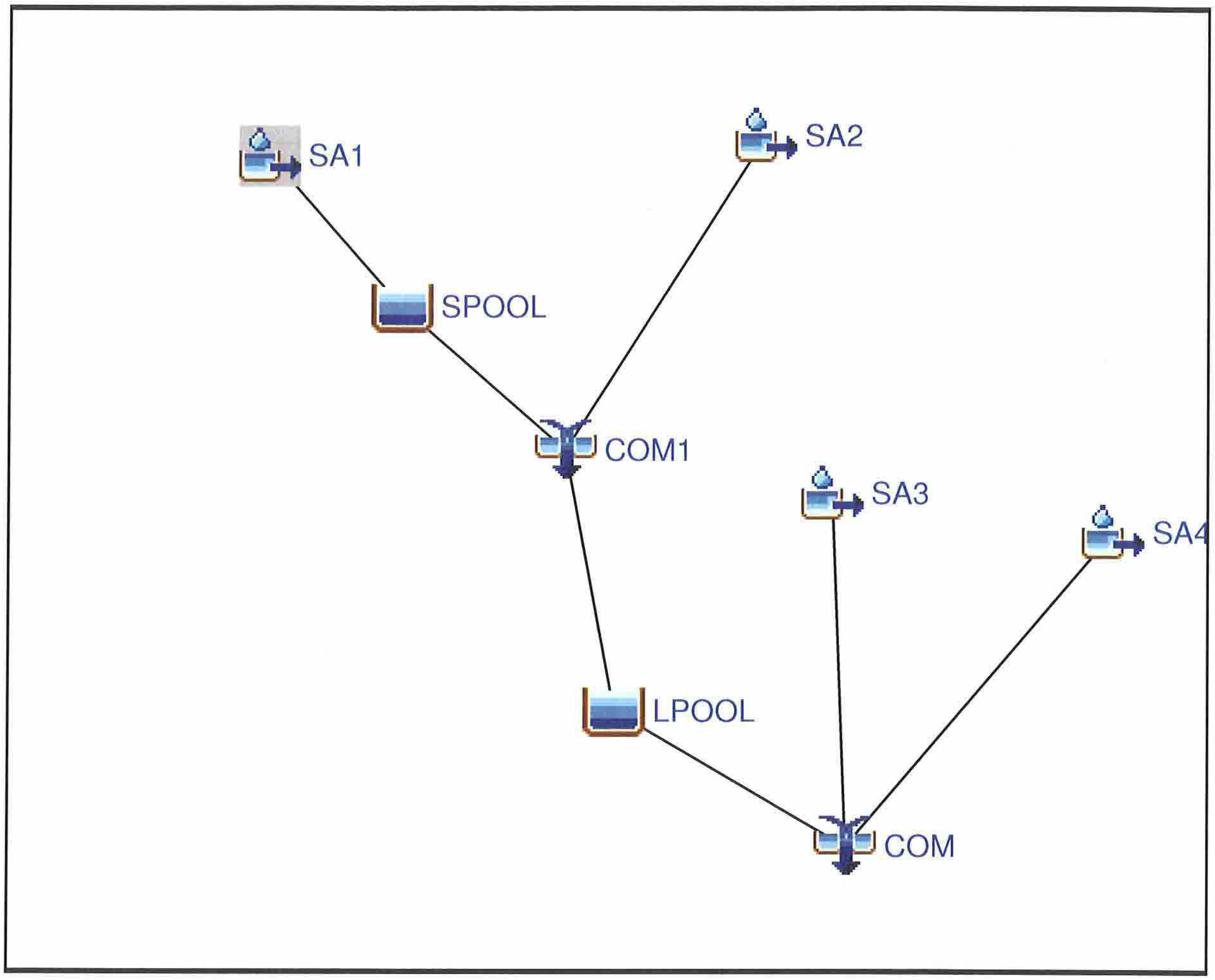
HMS OUTPUT FILES

HEC-HMS

Project : Millstone

Basin Model : 2YR POST

Jan 18 12:14:02 EST 2012



Project: Millstone

Simulation Run: 2YR POST Junction: COM

Start of Run:	01Jan1999, 00:00	Basin Model:	2YR POST
End of Run:	02Jan1999, 04:00	Meteorologic Model:	2yr post
Compute Time:	19Dec2011, 09:25:40	Control Specifications:	2yr post

Volume Units: IN

Computed Results

Peak Outflow :	20.3 (CFS)	Date/Time of Peak Outflow :	01Jan1999, 12:24
Total Outflow :	1.36 (IN)		

Project: Millstone Simulation Run: 2YR POST

Start of Run:	01Jan1999, 00:00	Basin Model:	2YR POST
End of Run:	02Jan1999, 04:00	Meteorologic Model:	2yr post
Compute Time:	19Dec2011, 09:25:40	Control Specifications:	2yr post

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
SA2	0.0170	4.3	01Jan1999, 12:30	0.70
SA1	0.0046	1.8	01Jan1999, 12:42	1.23
SPOOL	0.0046	0.0	01Jan1999, 00:00	0.00
COM1	0.0216	4.3	01Jan1999, 12:30	0.55
LPOOL	0.0216	4.1	01Jan1999, 12:36	0.54
SA3	0.0133	15.7	01Jan1999, 12:18	2.54
SA4	0.0018	2.3	01Jan1999, 12:18	2.54
COM	0.0367	20.3	01Jan1999, 12:24	1.36

```
Basin: 2YR POST
     Description: MILLSTONE POWER PLANT WATERFORD, CT GZA JOB #171138.00 2-YEAR
PROPOSED CONDITION ANALYSIS
     Last Modified Date: 23 January 2012
     Last Modified Time: 21:04:38
     Version: 3.5
     Filepath Separator: \
     Unit System: English
     Missing Flow To Zero: No
     Enable Flow Ratio: No
     Allow Blending: No
     Compute Local Flow At Junctions: No

     Enable Sediment Routing: No

     Enable Quality Routing: No
End:

Subbasin: SA2
     Canvas X: 95.69310344827586
     Canvas Y: 262.4137931034483
     Area: 0.0170
     Downstream: COM1

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 65

     Transform: SCS
     Lag: 15.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA1
     Canvas X: -48.80344827586205
     Canvas Y: 256.45517241379315
     Area: 0.0046
     Downstream: SPOOL

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 75

     Transform: SCS
     Lag: 30.6
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Reservoir: SPOOL
     Canvas X: -10.072413793103436
     Canvas Y: 213.25517241379313
```

```
     Downstream: COM1

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 28.0
     Storage-Outflow Table: SPOOL(2YR POST)
     Elevation-Storage Table: SPOOL(2YR POST)
     Primary Table: Storage-Outflow
End:

Junction: COM1
     Description: COMBINE SUB-AREA 2 WITH OVERFLOW FROM SUB-AREA 1
     Canvas X: 37.59655172413794
     Canvas Y: 171.54482758620694
     Downstream: LPOOL
End:

Reservoir: LPOOL
     Canvas X: 52.400000000000006
     Canvas Y: 95.19999999999999
     Downstream: COM

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 24.2
     Storage-Outflow Table: LPOOL(2YR POST)
     Elevation-Storage Table: LPOOL(2YR POST)
     Primary Table: Storage-Outflow
End:

Subbasin: SA3
     Canvas X: 115.0586206896552
     Canvas Y: 158.88275862068969
     Area: 0.0133
     Downstream: COM

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 92

     Transform: SCS
     Lag: 12.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA4
     Canvas X: 196.2448275862069
     Canvas Y: 147.71034482758623
     Area: 0.0018
     Downstream: COM

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
```

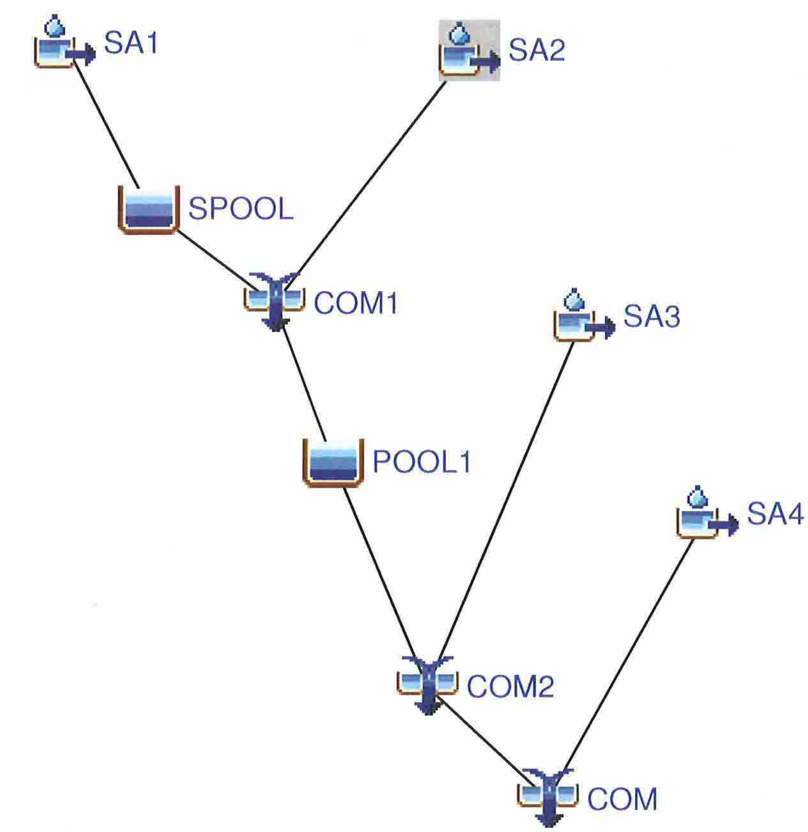
```
     Curve Number: 92

     Transform: SCS
     Lag: 9.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM
     Description: COMBINE HYDROGRAPHS TO ESTIMATE TOTAL DISCHARGE TO POND
     Canvas X: 118.78275862068968
     Canvas Y: 56.09655172413795
End:

Basin Schematic Properties:
     Last View N: 5000.0
     Last View S: -5000.0
     Last View W: -5000.0
     Last View E: 5000.0
     Maximum View N: 300.40000000000003
     Maximum View S: 19.6
     Maximum View W: 36.2
     Maximum View E: 138.8
     Extent Method: Elements
     Buffer: 0
     Draw Icons: Yes
     Draw Icon Labels: Yes
     Draw Map Objects: No
     Draw Gridlines: No
     Draw Flow Direction: No
     Fix Element Locations: No
     Fix Hydrologic Order: No
End:
```

HEC-HMS

Project : Millstone

Basin Model : 2YR PRE

Jan 18 12:15:54 EST 2012



Project: Millstone
Simulation Run: 2YR PRE Junction: COM

Start of Run:	01Jan1999, 00:00	Basin Model:	2YR PRE
End of Run:	02Jan1999, 04:00	Meteorologic Model:	2yr pre
Compute Time:	19Dec2011, 09:26:30	Control Specifications:	2yr pre

Volume Units: IN

Computed Results

Peak Outflow :	19.4 (CFS)	Date/Time of Peak Outflow :	01Jan1999, 12:24
Total Outflow :	1.30 (IN)		

Project: Millstone Simulation Run: 2YR PRE

Start of Run: 01Jan1999, 00:00 Basin Model: 2YR PRE
End of Run: 02Jan1999, 04:00 Meteorologic Model: 2yr pre
Compute Time: 19Dec2011, 09:26:30 Control Specifications: 2yr pre

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
SA2	0.0170	4.3	01Jan1999, 12:30	0.70
SA1	0.0046	1.8	01Jan1999, 12:42	1.23
SPOOL	0.0046	0.0	01Jan1999, 00:00	0.00
COM1	0.0216	4.3	01Jan1999, 12:30	0.55
POOL1	0.0216	4.1	01Jan1999, 12:36	0.54
SA3	0.0121	13.4	01Jan1999, 12:18	2.35
COM2	0.0337	16.3	01Jan1999, 12:24	1.19
SA4	0.0030	3.7	01Jan1999, 12:18	2.45
COM	0.0367	19.4	01Jan1999, 12:24	1.30

```
Basin: 2YR PRE
     Description: MILLSTONE POWER PLANT WATERFORD, CT GZA JOB #171138.00 2-YEAR
EXISTING CONDITION ANALYSIS
     Last Modified Date: 23 January 2012
     Last Modified Time: 21:04:51
     Version: 3.5
     Filepath Separator: \
     Unit System: English
     Missing Flow To Zero: No
     Enable Flow Ratio: No
     Allow Blending: No
     Compute Local Flow At Junctions: No

     Enable Sediment Routing: No

     Enable Quality Routing: No
End:

Subbasin: SA2
     Canvas X: 84.45358090185675
     Canvas Y: 327.82281167108755
     Area: 0.0170
     Downstream: COM1

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 65

     Transform: SCS
     Lag: 15.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA1
     Canvas X: -64.91299734748011
     Canvas Y: 329.71352785145893
     Area: 0.0046
     Downstream: SPOOL

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 75

     Transform: SCS
     Lag: 30.6
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Reservoir: SPOOL
     Canvas X: -33.716180371352806
     Canvas Y: 268.26525198939
```

```
     Downstream: COM1

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 28.0
     Storage-Outflow Table: SPOOL(2YR PRE)
     Elevation-Storage Table: SPOOL(2YR PRE)
     Primary Table: Storage-Outflow
End:

Junction: COM1
     Description: COMBINE SUB-AREA 2 WITH OVERFLOW FROM SUB-AREA 1
     Canvas X: 12.606366047745354
     Canvas Y: 234.2323607427056
     Downstream: POOL1
End:

Reservoir: POOL1
     Canvas X: 34.34960212201591
     Canvas Y: 175.62015915119363
     Downstream: COM2

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 24.2
     Storage-Outflow Table: POOL1(2YR PRE)
     Elevation-Storage Table: POOL1(2YR PRE)
     Primary Table: Storage-Outflow
End:

Subbasin: SA3
     Canvas X: 126.9946949602122
     Canvas Y: 229.50557029177722
     Area: 0.0121
     Downstream: COM2

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 90

     Transform: SCS
     Lag: 12.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM2
     Description: COMBINE HYDROGRAPHS TO ESTIMATE DISCHARGE FROM 30" DRAIN TO POND
     Canvas X: 69.6
     Canvas Y: 92.4
     Downstream: COM
End:

Subbasin: SA4
     Canvas X: 172.3718832891247
     Canvas Y: 156.7129973474801
     Area: 0.0030
     Downstream: COM
```

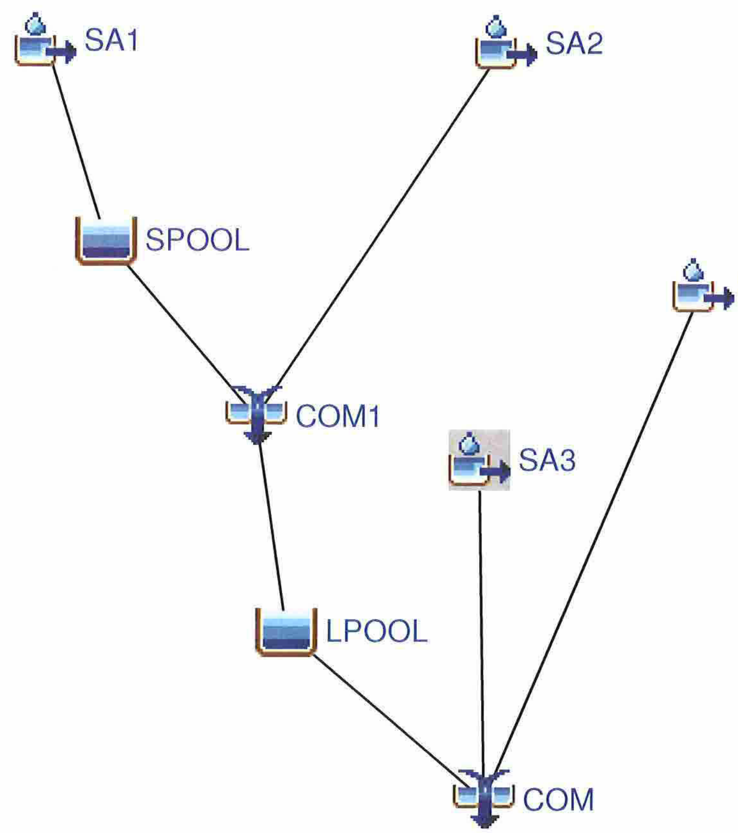
```
     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 91

     Transform: SCS
     Lag: 9.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM
     Description: COMBINE HYDROGRAPHS TO ESTIMATE TOTAL DISCHARGE TO POND
     Canvas X: 113.75968169761273
     Canvas Y: 50.83289124668431
End:

Basin Schematic Properties:
     Last View N: 5000.0
     Last View S: -5000.0
     Last View W: -5000.0
     Last View E: 5000.0
     Maximum View N: 373.20000000000005
     Maximum View S: 16.8
     Maximum View W: 37.2
     Maximum View E: 112.80000000000001
     Extent Method: Elements
     Buffer: 0
     Draw Icons: Yes
     Draw Icon Labels: Yes
     Draw Map Objects: No
     Draw Gridlines: No
     Draw Flow Direction: No
     Fix Element Locations: No
     Fix Hydrologic Order: No
End:
```

HEC-HMS

Project : Millstone

Basin Model : 10YR POST

Jan 18 11:59:40 EST 2012



Project: Millstone

Simulation Run: 10YR POST Junction: COM

Start of Run:	01Jan1999, 00:00	Basin Model:	10YR POST
End of Run:	02Jan1999, 04:00	Meteorologic Model:	10yr post
Compute Time:	19Dec2011, 09:08:14	Control Specifications:	10yr post

Volume Units: IN

Computed Results

Peak Outflow :	34.3 (CFS)	Date/Time of Peak Outflow :	01Jan1999, 12:18
Total Outflow :	2.44 (IN)		

Project: Millstone Simulation Run: 10YR POST

Start of Run: 01Jan1999, 00:00 Basin Model: 10YR POST
End of Run: 02Jan1999, 04:00 Meteorologic Model: 10yr post
Compute Time: 19Dec2011, 09:08:14 Control Specifications: 10yr post

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
SA2	0.0170	11.7	01Jan1999, 12:24	1.65
SA1	0.0046	3.7	01Jan1999, 12:42	2.45
SPOOL	0.0046	0.0	01Jan1999, 00:00	0.00
COM1	0.0216	11.7	01Jan1999, 12:24	1.30
LPOOL	0.0216	9.3	01Jan1999, 12:36	1.29
SA3	0.0133	24.8	01Jan1999, 12:18	4.09
SA4	0.0018	3.6	01Jan1999, 12:18	4.09
COM	0.0367	34.3	01Jan1999, 12:18	2.44

```
Basin: 10YR POST
     Description: MILLSTONE POWER PLANT WATERFORD, CT GZA JOB #171138.00 10-YEAR
PROPOSED CONDITIONS ANALYSIS
     Last Modified Date: 23 January 2012
     Last Modified Time: 21:03:16
     Version: 3.5
     Filepath Separator: \
     Unit System: English
     Missing Flow To Zero: No
     Enable Flow Ratio: No
     Allow Blending: No
     Compute Local Flow At Junctions: No

     Enable Sediment Routing: No

     Enable Quality Routing: No
End:

Subbasin: SA2
     Canvas X: 91.22413793103449
     Canvas Y: 284.75862068965523
     Area: 0.0170
     Downstream: COM1

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 65

     Transform: SCS
     Lag: 15.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA1
     Canvas X: -42.84482758620689
     Canvas Y: 285.5034482758621
     Area: 0.0046
     Downstream: SPOOL

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 75

     Transform: SCS
     Lag: 30.6
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Reservoir: SPOOL
     Canvas X: -24.968965517241372
     Canvas Y: 228.15172413793107
```

```
     Downstream: COM1

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 28.0
     Storage-Outflow Table: SPOOL(10YR POST)
     Elevation-Storage Table: SPOOL(10YR POST)
     Primary Table: Storage-Outflow
End:

Junction: COM1
     Description: COMBINE SUB-AREA 2 WITH OVERFLOW FROM SUB-AREA 1
     Canvas X: 18.975862068965526
     Canvas Y: 176.7586206896552
     Downstream: LPOOL
End:

Reservoir: LPOOL
     Canvas X: 27.9137931034483
     Canvas Y: 114.19310344827588
     Downstream: COM

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 24.2
     Storage-Outflow Table: LPOOL(10YR POST)
     Elevation-Storage Table: LPOOL(10YR POST)
     Primary Table: Storage-Outflow
End:

Subbasin: SA3
     Canvas X: 83.77586206896554
     Canvas Y: 164.09655172413795
     Area: 0.0133
     Downstream: COM

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 92

     Transform: SCS
     Lag: 12.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA4
     Canvas X: 149.2275862068966
     Canvas Y: 214.37241379310342
     Area: 0.0018
     Downstream: COM

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
```

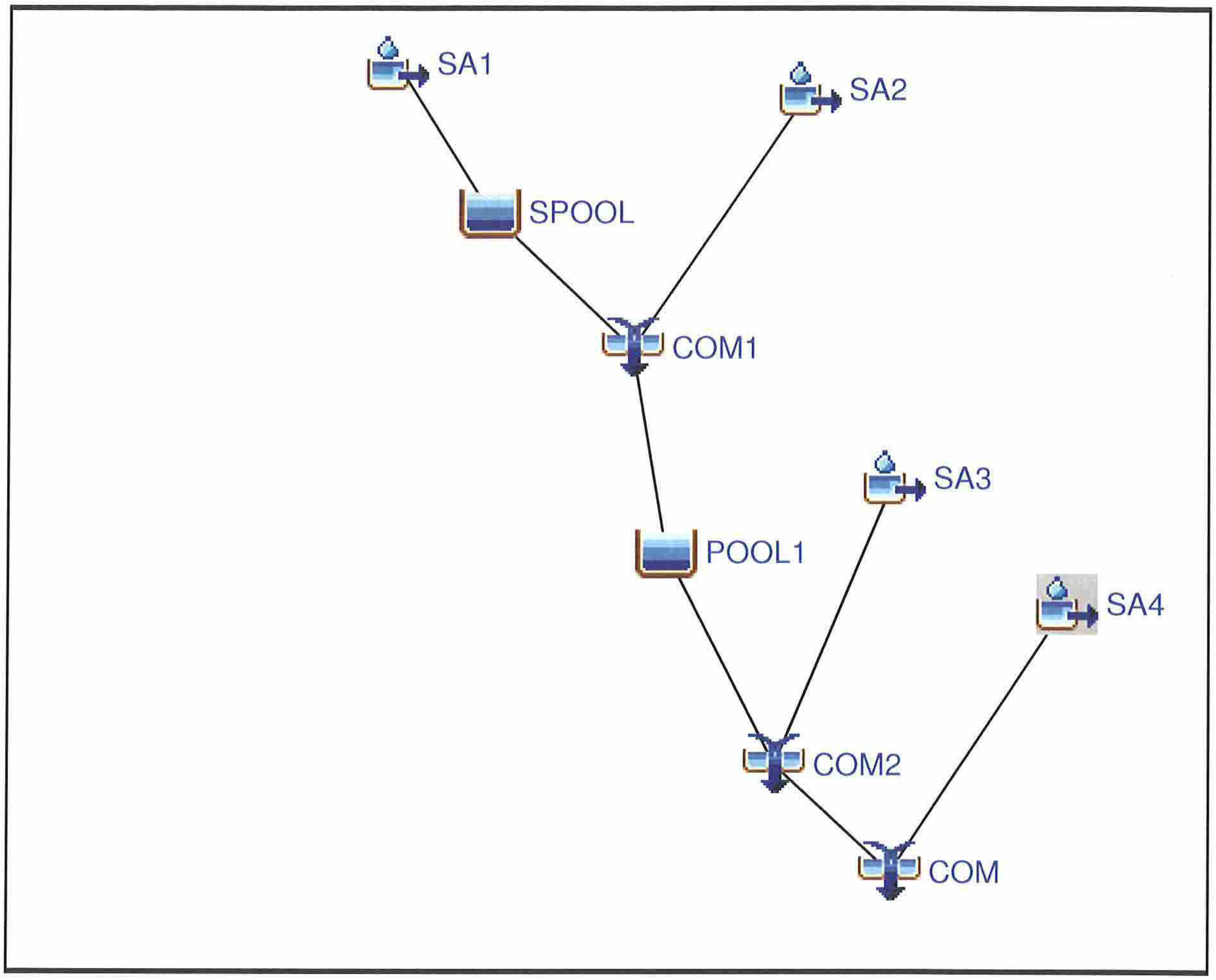
```
     Curve Number: 92

     Transform: SCS
     Lag: 9.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM
     Description: COMBINE HYDROGRAPHS TO ESTIMATE TOTAL DISCHARGE TO POND
     Canvas X: 85.26551724137933
     Canvas Y: 65.03448275862073
End:

Basin Schematic Properties:
     Last View N: 5000.0
     Last View S: -5000.0
     Last View W: -5000.0
     Last View E: 5000.0
     Maximum View N: 300.40000000000003
     Maximum View S: 19.6
     Maximum View W: 36.2
     Maximum View E: 138.8
     Extent Method: Elements
     Buffer: 0
     Draw Icons: Yes
     Draw Icon Labels: Yes
     Draw Map Objects: No
     Draw Gridlines: No
     Draw Flow Direction: No
     Fix Element Locations: No
     Fix Hydrologic Order: No
End:
```

HEC-HMS

Project : Millstone

Basin Model : 10YR PRE

Jan 18 12:03:30 EST 2012



Project: Millstone

Simulation Run: 10YR PRE Junction: COM

Start of Run:	01Jan1999, 00:00	Basin Model:	10YR PRE
End of Run:	02Jan1999, 04:00	Meteorologic Model:	10yr pre
Compute Time:	19Dec2011, 09:11:50	Control Specifications:	10yr pre

Volume Units: IN

Computed Results

Peak Outflow :	33.5 (CFS)	Date/Time of Peak Outflow :	01Jan1999, 12:18
Total Outflow :	2.36 (IN)		

Project: Millstone Simulation Run: 10YR PRE

Start of Run: 01Jan1999, 00:00 Basin Model: 10YR PRE
End of Run: 02Jan1999, 04:00 Meteorologic Model: 10yr pre
Compute Time: 19Dec2011, 09:11:50 Control Specifications: 10yr pre

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
SA2	0.0170	11.7	01Jan1999, 12:24	1.65
SA1	0.0046	3.7	01Jan1999, 12:42	2.45
SPOOL	0.0046	0.0	01Jan1999, 00:00	0.00
COM1	0.0216	11.7	01Jan1999, 12:24	1.30
POOL1	0.0216	9.3	01Jan1999, 12:36	1.29
SA3	0.0121	21.7	01Jan1999, 12:18	3.88
COM2	0.0337	28.0	01Jan1999, 12:24	2.22
SA4	0.0030	5.9	01Jan1999, 12:18	3.98
COM	0.0367	33.5	01Jan1999, 12:18	2.36

```
Basin: 10YR PRE
     Description: MILLSTONE POWER PLANT WATERFORD, CT GZA JOB #171138.00 10-YEAR
EXISTING CONDITION ANALYSIS
     Last Modified Date: 23 January 2012
     Last Modified Time: 21:03:37
     Version: 3.5
     Filepath Separator: \
     Unit System: English
     Missing Flow To Zero: No
     Enable Flow Ratio: No
     Allow Blending: No
     Compute Local Flow At Junctions: No

     Enable Sediment Routing: No

     Enable Quality Routing: No
End:

Subbasin: SA2
     Canvas X: 101.47002652519893
     Canvas Y: 342.00318302387274
     Area: 0.0170
     Downstream: COM1

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 65

     Transform: SCS
     Lag: 15.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA1
     Canvas X: -50.732625994694985
     Canvas Y: 351.4567639257295
     Area: 0.0046
     Downstream: SPOOL

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 75

     Transform: SCS
     Lag: 30.6
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Reservoir: SPOOL
     Canvas X: -16.699734748010627
     Canvas Y: 297.5713527851459
```

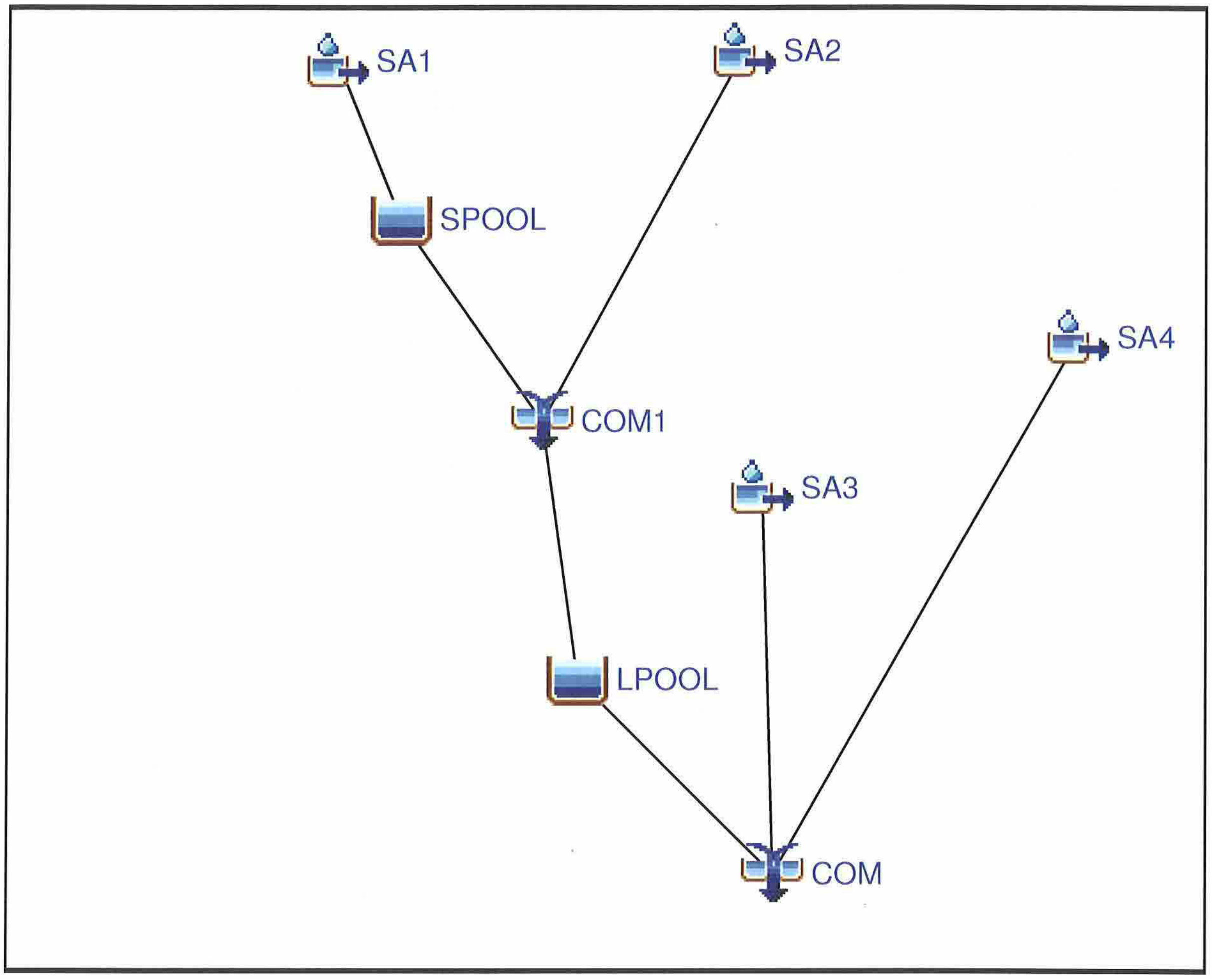
```
     Downstream: COM1

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 28.0
     Storage-Outflow Table: SPOOL(10YR PRE)
     Elevation-Storage Table: SPOOL(10YR PRE)
     Primary Table: Storage-Outflow
End:

Junction: COM1
     Description: COMBINE SUB-AREA 2 WITH OVERFLOW FROM SUB-AREA 1
     Canvas X: 36.240318302387266
     Canvas Y: 247.46737400530506
     Downstream: POOL1
End:

Reservoir: POOL1
     Canvas X: 48.52997347480107
     Canvas Y: 171.83872679045092
     Downstream: COM2

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 24.2
     Storage-Outflow Table: POOL1(10YR PRE)
     Elevation-Storage Table: POOL1(10YR PRE)
     Primary Table: Storage-Outflow
End:

Subbasin: SA3
     Canvas X: 132.6668435013263
     Canvas Y: 199.25411140583554
     Area: 0.0121
     Downstream: COM2

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 90

     Transform: SCS
     Lag: 12.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM2
     Description: COMBINE HYDROGRAPHS TO ESTIMATE DISCHARGE FROM 30" DRAIN TO POND
     Canvas X: 88.23501326259947
     Canvas Y: 93.37400530503976
     Downstream: COM
End:

Subbasin: SA4
     Canvas X: 196.00583554376664
     Canvas Y: 152.9315649867374
     Area: 0.0030
     Downstream: COM
```

```
     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 91

     Transform: SCS
     Lag: 9.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM
     Description: COMBINE HYDROGRAPHS TO ESTIMATE TOTAL DISCHARGE TO POND
     Canvas X: 130.7761273209549
     Canvas Y: 53.66896551724136
End:

Basin Schematic Properties:
     Last View N: 5000.0
     Last View S: -5000.0
     Last View W: -5000.0
     Last View E: 5000.0
     Maximum View N: 373.20000000000005
     Maximum View S: 16.8
     Maximum View W: 37.2
     Maximum View E: 112.80000000000001
     Extent Method: Elements
     Buffer: 0
     Draw Icons: Yes
     Draw Icon Labels: Yes
     Draw Map Objects: No
     Draw Gridlines: No
     Draw Flow Direction: No
     Fix Element Locations: No
     Fix Hydrologic Order: No
End:
```

Project : Millstone

Basin Model : 25YR POST

Jan 18 12:07:35 EST 2012



Project: Millstone
Simulation Run: 25YR POST Junction: COM

Start of Run:	01Jan1999, 00:00	Basin Model:	25YR POST
End of Run:	02Jan1999, 04:00	Meteorologic Model:	25yr post
Compute Time:	18Jan2012, 12:08:33	Control Specifications:	25yr post

Volume Units: IN

Computed Results

Peak Outflow :	40.2 (CFS)	Date/Time of Peak Outflow :	01Jan1999, 12:18
Total Outflow :	2.95 (IN)		

Project: Millstone Simulation Run: 25YR POST

Start of Run: 01Jan1999, 00:00 Basin Model: 25YR POST
End of Run: 02Jan1999, 04:00 Meteorologic Model: 25yr post
Compute Time: 18Jan2012, 12:08:33 Control Specifications: 25yr post

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
SA2	0.0170	15.5	01Jan1999, 12:24	2.14
SA1	0.0046	4.5	01Jan1999, 12:42	3.03
SPOOL	0.0046	0.0	01Jan1999, 00:00	0.00
COM1	0.0216	15.5	01Jan1999, 12:24	1.68
LPOOL	0.0216	12.5	01Jan1999, 12:36	1.67
SA3	0.0133	28.8	01Jan1999, 12:18	4.77
SA4	0.0018	4.2	01Jan1999, 12:18	4.77
COM	0.0367	40.2	01Jan1999, 12:18	2.95

```
Basin: 25YR POST
     Description: MILLSTONE POWER PLANT WATERFORD, CT GZA JOB #171138.00 25-YEAR
PROPOSED CONDITIONS ANALYSIS
     Last Modified Date: 23 January 2012
     Last Modified Time: 21:04:05
     Version: 3.5
     Filepath Separator: \
     Unit System: English
     Missing Flow To Zero: No
     Enable Flow Ratio: No
     Allow Blending: No
     Compute Local Flow At Junctions: No

     Enable Sediment Routing: No

     Enable Quality Routing: No
End:

Subbasin: SA2
     Canvas X: 89.7344827586207
     Canvas Y: 286.9931034482759
     Area: 0.0170
     Downstream: COM1

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 65

     Transform: SCS
     Lag: 15.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA1
     Canvas X: -28.69310344827585
     Canvas Y: 284.01379310344834
     Area: 0.0046
     Downstream: SPOOL

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 75

     Transform: SCS
     Lag: 30.6
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Reservoir: SPOOL
     Canvas X: -10.072413793103436
     Canvas Y: 238.5793103448276
```

```
     Downstream: COM1

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 28.0
     Storage-Outflow Table: SPOOL(25YR POST)
     Elevation-Storage Table: SPOOL(25YR POST)
     Primary Table: Storage-Outflow
End:

Junction: COM1
     Description: COMBINE SUB-AREA 2 WITH OVERFLOW FROM SUB-AREA 1
     Canvas X: 30.89310344827588
     Canvas Y: 179.73793103448278
     Downstream: LPOOL
End:

Reservoir: LPOOL
     Canvas X: 42.06551724137931
     Canvas Y: 104.51034482758624
     Downstream: COM

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 24.2
     Storage-Outflow Table: LPOOL(25YR POST)
     Elevation-Storage Table: LPOOL(25YR POST)
     Primary Table: Storage-Outflow
End:

Subbasin: SA3
     Canvas X: 95.60000000000001
     Canvas Y: 160.0
     Area: 0.0133
     Downstream: COM

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 92

     Transform: SCS
     Lag: 12.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA4
     Canvas X: 186.56206896551726
     Canvas Y: 204.31724137931036
     Area: 0.0018
     Downstream: COM

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
```

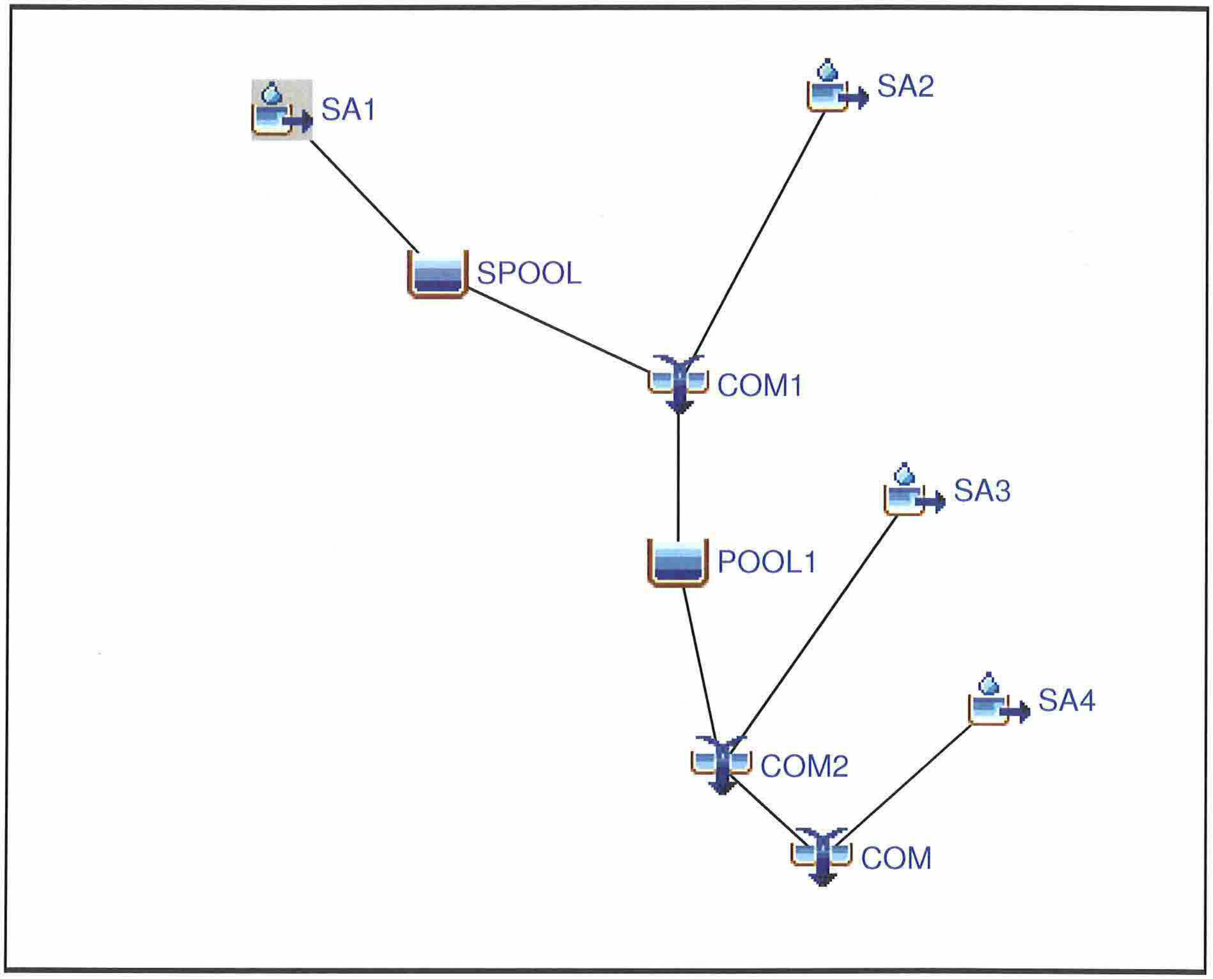
```
     Curve Number: 92

     Transform: SCS
     Lag: 9.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM
     Description: COMBINE HYDROGRAPHS TO ESTIMATE TOTAL DISCHARGE TO POND
     Canvas X: 97.92758620689658
     Canvas Y: 47.903448275862104
End:

Basin Schematic Properties:
     Last View N: 5000.0
     Last View S: -5000.0
     Last View W: -5000.0
     Last View E: 5000.0
     Maximum View N: 300.40000000000003
     Maximum View S: 19.6
     Maximum View W: 36.2
     Maximum View E: 138.8
     Extent Method: Elements
     Buffer: 0
     Draw Icons: Yes
     Draw Icon Labels: Yes
     Draw Map Objects: No
     Draw Gridlines: No
     Draw Flow Direction: No
     Fix Element Locations: No
     Fix Hydrologic Order: No
End:
```

HEC-HMS

Project : Millstone

Basin Model : 25YR PRE

Jan 18 12:11:21 EST 2012



Project: Millstone
Simulation Run: 25YR PRE Junction: COM

Start of Run:	01Jan1999, 00:00	Basin Model:	25YR PRE
End of Run:	02Jan1999, 04:00	Meteorologic Model:	25yr pre
Compute Time:	19Dec2011, 09:24:13	Control Specifications:	25yr pre

Volume Units: IN

Computed Results

Peak Outflow :	39.5 (CFS)	Date/Time of Peak Outflow :	01Jan1999, 12:18
Total Outflow :	2.87 (IN)		

Project: Millstone Simulation Run: 25YR PRE

Start of Run: 01Jan1999, 00:00 Basin Model: 25YR PRE
End of Run: 02Jan1999, 04:00 Meteorologic Model: 25yr pre
Compute Time: 19Dec2011, 09:24:13 Control Specifications: 25yr pre

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
SA2	0.0170	15.5	01Jan1999, 12:24	2.14
SA1	0.0046	4.5	01Jan1999, 12:42	3.03
SPOOL	0.0046	0.0	01Jan1999, 00:00	0.00
COM1	0.0216	15.5	01Jan1999, 12:24	1.68
POOL1	0.0216	12.4	01Jan1999, 12:36	1.67
SA3	0.0121	25.3	01Jan1999, 12:18	4.55
COM2	0.0337	33.5	01Jan1999, 12:24	2.71
SA4	0.0030	6.9	01Jan1999, 12:18	4.66
COM	0.0367	39.5	01Jan1999, 12:18	2.87

```
Basin: 25YR PRE
     Description: MILLSTONE POWER PLANT WATERFORD, CT GZA JOB #171138.00 25-YEAR
EXISTING CONDITION ANALYSIS
     Last Modified Date: 23 January 2012
     Last Modified Time: 21:04:21
     Version: 3.5
     Filepath Separator: \
     Unit System: English
     Missing Flow To Zero: No
     Enable Flow Ratio: No
     Allow Blending: No
     Compute Local Flow At Junctions: No

     Enable Sediment Routing: No

     Enable Quality Routing: No
End:

Subbasin: SA2
     Canvas X: 111.8689655172414
     Canvas Y: 342.9485411140584
     Area: 0.0170
     Downstream: COM1

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 65

     Transform: SCS
     Lag: 15.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA1
     Canvas X: -93.27374005305042
     Canvas Y: 335.385676392573
     Area: 0.0046
     Downstream: SPOOL

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 75

     Transform: SCS
     Lag: 30.6
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Reservoir: SPOOL
     Canvas X: -35.606896551724134
     Canvas Y: 273.937400530504
```

```
     Downstream: COM1

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 28.0
     Storage-Outflow Table: SPOOL(25YR PRE)
     Elevation-Storage Table: SPOOL(25YR PRE)
     Primary Table: Storage-Outflow
End:

Junction: COM1
     Description: COMBINE SUB-AREA 2 WITH OVERFLOW FROM SUB-AREA 1
     Canvas X: 53.400000000000006
     Canvas Y: 232.80000000000004
     Downstream: POOL1
End:

Reservoir: POOL1
     Canvas X: 53.400000000000006
     Canvas Y: 168.00000000000003
     Downstream: COM2

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 24.2
     Storage-Outflow Table: POOL1(25YR PRE)
     Elevation-Storage Table: POOL1(25YR PRE)
     Primary Table: Storage-Outflow
End:

Subbasin: SA3
     Canvas X: 140.82162162162166
     Canvas Y: 194.4648648648649
     Area: 0.0121
     Downstream: COM2

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 90

     Transform: SCS
     Lag: 12.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM2
     Description: COMBINE HYDROGRAPHS TO ESTIMATE DISCHARGE FROM 30" DRAIN TO POND
     Canvas X: 69.6
     Canvas Y: 92.4
     Downstream: COM
End:

Subbasin: SA4
     Canvas X: 171.85945945945946
     Canvas Y: 116.33513513513515
     Area: 0.0030
     Downstream: COM
```

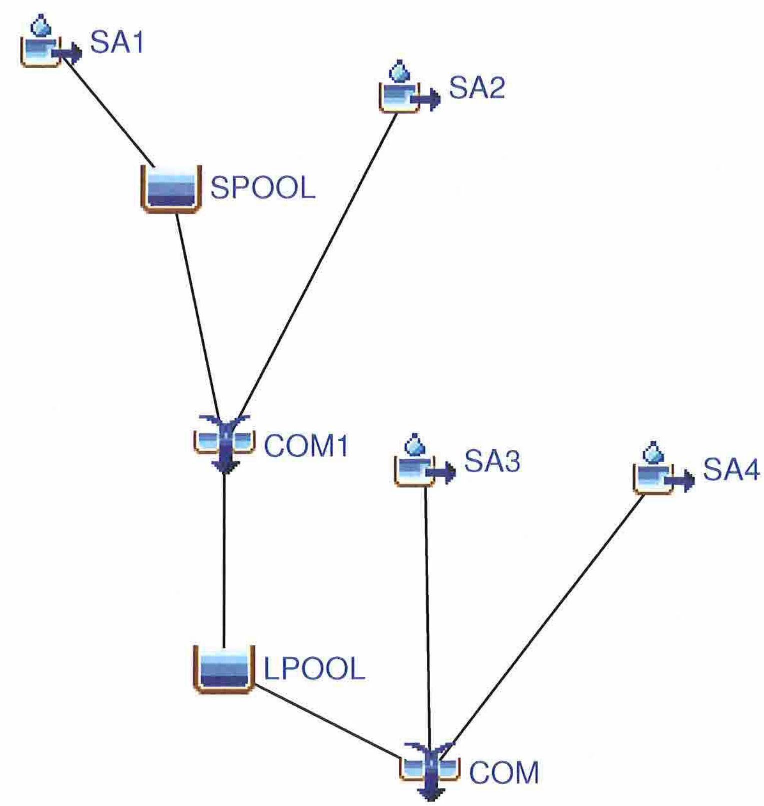
```
     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 91

     Transform: SCS
     Lag: 9.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM
     Description: COMBINE HYDROGRAPHS TO ESTIMATE TOTAL DISCHARGE TO POND
     Canvas X: 106.19681697612737
     Canvas Y: 58.39575596816974
End:

Basin Schematic Properties:
     Last View N: 5000.0
     Last View S: -5000.0
     Last View W: -5000.0
     Last View E: 5000.0
     Maximum View N: 373.20000000000005
     Maximum View S: 16.8
     Maximum View W: 37.2
     Maximum View E: 112.80000000000001
     Extent Method: Elements
     Buffer: 0
     Draw Icons: Yes
     Draw Icon Labels: Yes
     Draw Map Objects: No
     Draw Gridlines: No
     Draw Flow Direction: No
     Fix Element Locations: No
     Fix Hydrologic Order: No
End:
```

HEC-HMS

Project : Millstone

Basin Model : 100YR POST

Jan 18 11:50:03 EST 2012



Project: Millstone

Simulation Run: 100YR POST Junction: COM

Start of Run:	01Jan1999, 00:00	Basin Model:	100YR POST
End of Run:	02Jan1999, 04:00	Meteorologic Model:	100yr post
Compute Time:	18Jan2012, 11:51:43	Control Specifications:	100yr post

Volume Units: IN

Computed Results

Peak Outflow :	54.0 (CFS)	Date/Time of Peak Outflow :	01Jan1999, 12:24
Total Outflow :	4.05 (IN)		

Project: Millstone Simulation Run: 100YR POST

Start of Run: 01Jan1999, 00:00 Basin Model: 100YR POST
End of Run: 02Jan1999, 04:00 Meteorologic Model: 100yr post
Compute Time: 18Jan2012, 11:51:43 Control Specifications: 100yr post

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
SA2	0.0170	23.7	01Jan1999, 12:24	3.18
SA1	0.0046	6.4	01Jan1999, 12:42	4.24
SPOOL	0.0046	0.2	01Jan1999, 22:18	0.36
COM1	0.0216	23.7	01Jan1999, 12:24	2.58
LPOOL	0.0216	18.6	01Jan1999, 12:36	2.57
SA3	0.0133	36.6	01Jan1999, 12:18	6.15
SA4	0.0018	5.3	01Jan1999, 12:18	6.15
COM	0.0367	54.0	01Jan1999, 12:24	4.05

```
Basin: 100YR POST
     Description: MILLSTONE POWER PLANT WATERFORD, CT GZA JOB #171138.00 100-YEAR
PROPOSED CONDITIONS ANALYSIS
     Last Modified Date: 23 January 2012
     Last Modified Time: 21:02:38
     Version: 3.5
     Filepath Separator: \
     Unit System: English
     Missing Flow To Zero: No
     Enable Flow Ratio: No
     Allow Blending: No
     Compute Local Flow At Junctions: No

     Enable Sediment Routing: No

     Enable Quality Routing: No
End:

Subbasin: SA2
     Canvas X: 105.62972972972973
     Canvas Y: 264.1405405405406
     Area: 0.0170
     Downstream: COM1

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 65

     Transform: SCS
     Lag: 15.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA1
     Canvas X: 1.1000000000000085
     Canvas Y: 278.0551724137931
     Area: 0.0046
     Downstream: SPOOL

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 75

     Transform: SCS
     Lag: 30.6
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Reservoir: SPOOL
     Canvas X: 36.2
     Canvas Y: 235.60000000000002
```

```
     Downstream: COM1

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 28.0
     Storage-Outflow Table: SPOOL(100YR POST)
     Elevation-Storage Table: SPOOL(100YR POST)
     Primary Table: Storage-Outflow
End:

Junction: COM1
     Description: COMBINE SUB-AREA 2 WITH OVERFLOW FROM SUB-AREA 1
     Canvas X: 52.400000000000006
     Canvas Y: 160.0
     Downstream: LPOOL
End:

Reservoir: LPOOL
     Canvas X: 52.400000000000006
     Canvas Y: 95.19999999999999
     Downstream: COM

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 24.2
     Storage-Outflow Table: LPOOL(100YR POST)
     Elevation-Storage Table: LPOOL(100YR POST)
     Primary Table: Storage-Outflow
End:

Subbasin: SA3
     Canvas X: 109.8448275862069
     Canvas Y: 155.9034482758621
     Area: 0.0133
     Downstream: COM

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 92

     Transform: SCS
     Lag: 12.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA4
     Canvas X: 179.1137931034483
     Canvas Y: 153.66896551724142
     Area: 0.0018
     Downstream: COM

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
```

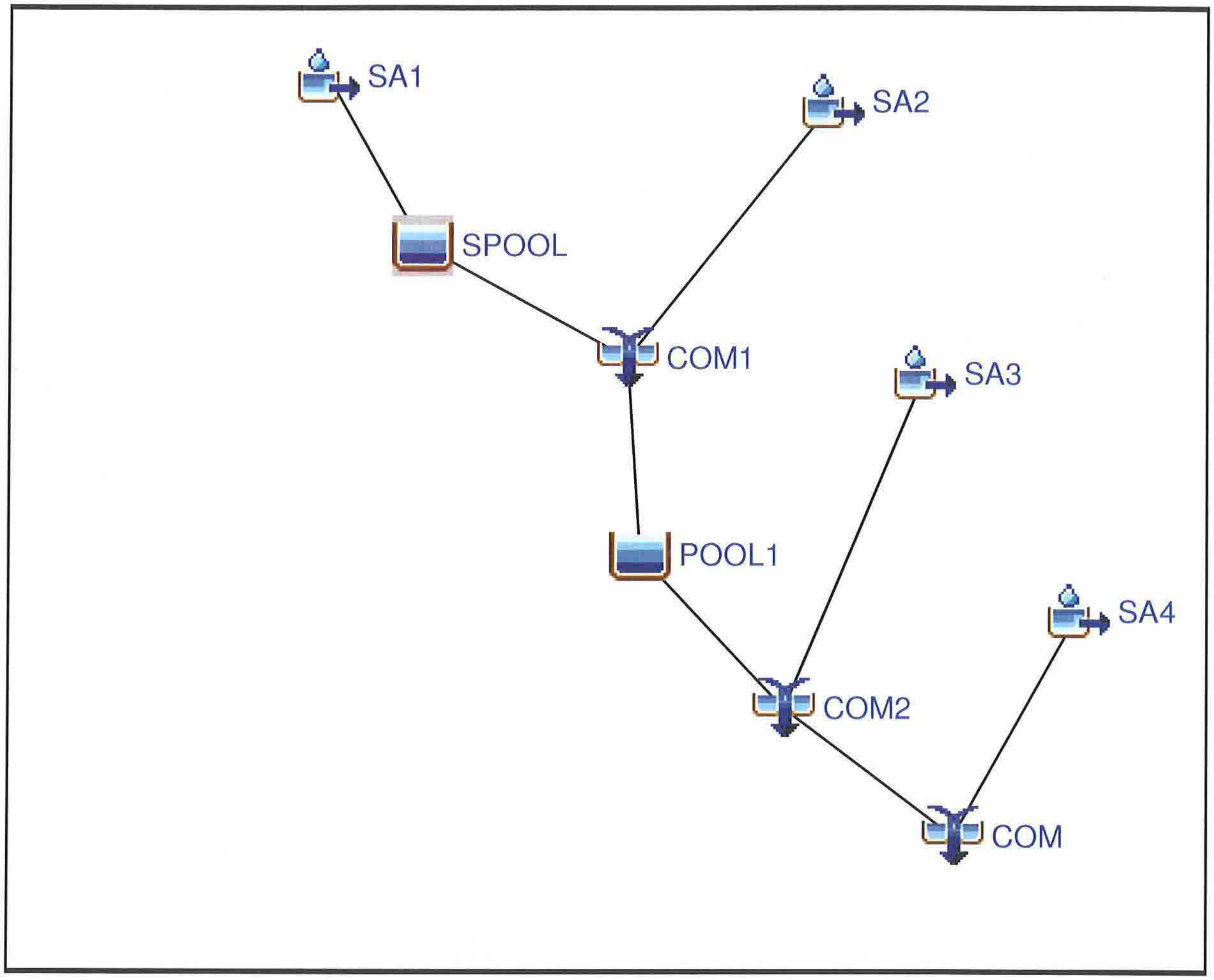
```
     Curve Number: 92

     Transform: SCS
     Lag: 9.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM
     Description: COMBINE HYDROGRAPHS TO ESTIMATE TOTAL DISCHARGE TO POND
     Canvas X: 111.3344827586207
     Canvas Y: 65.03448275862073
End:

Basin Schematic Properties:
     Last View N: 5000.0
     Last View S: -5000.0
     Last View W: -5000.0
     Last View E: 5000.0
     Maximum View N: 300.40000000000003
     Maximum View S: 19.6
     Maximum View W: 36.2
     Maximum View E: 138.8
     Extent Method: Elements
     Buffer: 0
     Draw Icons: Yes
     Draw Icon Labels: Yes
     Draw Map Objects: No
     Draw Gridlines: No
     Draw Flow Direction: No
     Fix Element Locations: No
     Fix Hydrologic Order: No
End:
```

HEC-HMS

Project : Millstone

Basin Model : 100YR PRE

Jan 18 11:56:20 EST 2012



Project: Millstone

Simulation Run: 100YR PRE Junction: COM

Start of Run:	01Jan1999, 00:00	Basin Model:	100YR PRE
End of Run:	02Jan1999, 04:00	Meteorologic Model:	100yr pre
Compute Time:	19Dec2011, 09:03:51	Control Specifications:	100yr pre

Volume Units: IN

Computed Results

Peak Outflow :	53.1 (CFS)	Date/Time of Peak Outflow :	01Jan1999, 12:24
Total Outflow :	3.96 (IN)		

Project: Millstone Simulation Run: 100YR PRE

Start of Run: 01Jan1999, 00:00 Basin Model: 100YR PRE
End of Run: 02Jan1999, 04:00 Meteorologic Model: 100yr pre
Compute Time: 19Dec2011, 09:03:51 Control Specifications: 100yr pre

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
SA2	0.0170	23.7	01Jan1999, 12:24	3.18
SA1	0.0046	6.4	01Jan1999, 12:42	4.24
SPOOL	0.0046	0.2	01Jan1999, 22:18	0.36
COM1	0.0216	23.7	01Jan1999, 12:24	2.58
POOL1	0.0216	18.6	01Jan1999, 12:36	2.57
SA3	0.0121	32.5	01Jan1999, 12:18	5.92
COM2	0.0337	45.9	01Jan1999, 12:24	3.77
SA4	0.0030	8.8	01Jan1999, 12:18	6.04
COM	0.0367	53.1	01Jan1999, 12:24	3.96

```
Basin: 100YR PRE
     Description: MILLSTONE POWER PLANT WATERFORD, CT GZA JOB # 171138.00 100-YEAR
EXISTING CONDITION ANALYSIS
     Last Modified Date: 23 January 2012
     Last Modified Time: 21:02:58
     Version: 3.5
     Filepath Separator: \
     Unit System: English
     Missing Flow To Zero: No
     Enable Flow Ratio: No
     Allow Blending: No
     Compute Local Flow At Junctions: No

     Enable Sediment Routing: No

     Enable Quality Routing: No
End:

Subbasin: SA2
     Canvas X: 109.97824933687002
     Canvas Y: 337.27639257294436
     Area: 0.0170
     Downstream: COM1

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 65

     Transform: SCS
     Lag: 15.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Subbasin: SA1
     Canvas X: -76.25729442970824
     Canvas Y: 346.7299734748011
     Area: 0.0046
     Downstream: SPOOL

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 75

     Transform: SCS
     Lag: 30.6
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Reservoir: SPOOL
     Canvas X: -41.2790450928382
     Canvas Y: 285.2816976127321
```

```
     Downstream: COM1

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 28.0
     Storage-Outflow Table: SPOOL(100YR PRE)
     Elevation-Storage Table: SPOOL(100YR PRE)
     Primary Table: Storage-Outflow
End:

Junction: COM1
     Description: COMBINE SUB-AREA 2 WITH OVERFLOW FROM SUB-AREA 1
     Canvas X: 34.34960212201591
     Canvas Y: 243.68594164456235
     Downstream: POOL1
End:

Reservoir: POOL1
     Canvas X: 39.076392572944314
     Canvas Y: 170.89336870026526
     Downstream: COM2

     Route: Modified Puls
     Routing Curve: Storage-Elevation-Outflow
     Initial Elevation: 24.2
     Storage-Outflow Table: POOL1(100YR PRE)
     Elevation-Storage Table: POOL1(100YR PRE)
     Primary Table: Storage-Outflow
End:

Subbasin: SA3
     Canvas X: 144.01114058355438
     Canvas Y: 238.0137931034483
     Area: 0.0121
     Downstream: COM2

     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 90

     Transform: SCS
     Lag: 12.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM2
     Description: COMBINE HYDROGRAPHS TO ESTIMATE DISCHARGE FROM 30" DRAIN TO POND
     Canvas X: 92.01644562334218
     Canvas Y: 114.17188328912465
     Downstream: COM
End:

Subbasin: SA4
     Canvas X: 200.732625994695
     Canvas Y: 150.09549071618036
     Area: 0.0030
     Downstream: COM
```

```
     Canopy: None

     Surface: None

     LossRate: SCS
     Percent Impervious Area: 0.0
     Curve Number: 91

     Transform: SCS
     Lag: 9.0
     Unitgraph Type: STANDARD

     Baseflow: None
End:

Junction: COM
     Description: COMBINE HYDROGRAPHS TO ESTIMATE TOTAL DISCHARGE TO POND
     Canvas X: 154.41007957559685
     Canvas Y: 66.90397877984083
End:

Basin Schematic Properties:
     Last View N: 5000.0
     Last View S: -5000.0
     Last View W: -5000.0
     Last View E: 5000.0
     Maximum View N: 373.20000000000005
     Maximum View S: 16.8
     Maximum View W: 37.2
     Maximum View E: 112.80000000000001
     Extent Method: Elements
     Buffer: 0
     Draw Icons: Yes
     Draw Icon Labels: Yes
     Draw Map Objects: No
     Draw Gridlines: No
     Draw Flow Direction: No
     Fix Element Locations: No
     Fix Hydrologic Order: No
End:
```

APPENDIX C
RESULTS OF DRAINAGE SYSTEM HYDRAULIC (STORM CAD) ANALYSES

AS-BUILT CONDITIONS

===

Scenario: Base

```
>>>> Info: Subsurface Analysis iterations: 3
>>>> Info: Convergence was achieved.
```

===

Gravity subnetwork discharging at: O-1

```
>>>> Info: Loading and hydraulic computations completed
     successfully.
>>>> Info: P-23 Hydraulic jump formed.
>>>> Info: P-23 Critical depth assumed upstream.
>>>> Warning: P-23 Pipe fails maximum velocity constraint.
>>>> Warning: P-12 Pipe fails minimum slope constraint.
>>>> Warning: P-13 Pipe fails minimum slope constraint.
>>>> Warning: P-13 Pipe discharge is above full flow capacity.
>>>> Warning: P-14 Pipe fails minimum slope constraint.
>>>> Warning: P-14 Pipe discharge is above full flow capacity.
>>>> Warning: P-22 Pipe fails minimum slope constraint.
>>>> Warning: P-22 Pipe discharge is above full flow capacity.
>>>> Info: P-1 Hydraulic jump formed.
>>>> Info: P-1 Critical depth assumed upstream.
>>>> Info: P-2 Hydraulic jump formed.
>>>> Info: P-2 Critical depth assumed upstream.
>>>> Info: P-26 Hydraulic jump formed.
>>>> Info: P-26 Critical depth assumed upstream.
>>>> Warning: P-29 Pipe fails minimum velocity constraint.
>>>> Info: P-10 Hydraulic jump formed.
>>>> Info: P-10 Critical depth assumed upstream.
>>>> Info: P-32 Hydraulic jump formed.
>>>> Info: P-32 Critical depth assumed upstream.
>>>> Warning: P-33 Pipe fails minimum velocity constraint.
```

CALCULATION SUMMARY FOR SURFACE NETWORKS

Label	Inlet Type	Inlet	Total Intercepted Flow (cfs)	Total Bypassed Flow (cfs)	Capture Efficiency (%)	Gutter Spread (ft)	Gutter Depth (ft)
I-8	Generic Inlet	Generic Default 100%	2.41	0.00	100.0	0.00	0.00
I-7	Generic Inlet	Generic Default 100%	4.38	0.00	100.0	0.00	0.00
I-5	Generic Inlet	Generic Default 100%	1.51	0.00	100.0	0.00	0.00
I-1	Generic Inlet	Generic Default 100%	5.06	0.00	100.0	0.00	0.00
I-2	Generic Inlet	Generic Default 100%	6.00	0.00	100.0	0.00	0.00
I-3	Generic Inlet	Generic Default 100%	4.48	0.00	100.0	0.00	0.00
I-4	Generic Inlet	Generic Default 100%	4.55	0.00	100.0	0.00	0.00
I-9	Generic Inlet	Generic Default 100%	0.00	0.00	100.0	0.00	0.00
I-UNDERDRAIN	Generic Inlet	Generic Default 100%	0.99	0.00	100.0	0.00	0.00

CALCULATION SUMMARY FOR SUBSURFACE NETWORK WITH ROOT: O-1

Label	Number of Sections	Section Size	Section Shape	Length (ft)	Total System Flow (cfs)	Average Velocity (ft/s)	Hydraulic Grade Upstream (ft)	Hydraulic Grade Downstream (ft)
P-7	1	30 inch	Circular	91.00	38.78	9.42	14.04	12.92
P-23	1	30 inch	Circular	329.00	25.67	11.39	22.33	14.64
P-24	1	30 inch	Circular	65.00	14.51	3.22	14.68	14.64
P-26	1	30 inch	Circular	218.00	16.92	5.92	23.60	22.80
P-27	1	15 inch	Circular	80.00	9.97	8.12	24.70	22.80
P-25	1	12 inch	Circular	10.00	1.51	3.44	17.05	16.97
P-22	1	24 inch	Circular	40.00	13.48	5.32	16.00	15.63
P-2	1	30 inch	Circular	324.00	17.00	5.95	25.22	23.93

P-14	1	24 inch	Circular	237.00	13.06	4.17	17.06	16.31
P-29	1	15 inch	Circular	21.00	0.89	0.73	16.31	16.31
P-1	1	30 inch	Circular	209.00	17.06	5.94	26.27	25.50
P-13	1	24 inch	Circular	50.00	13.11	4.17	17.45	17.28
P-33	1	12 inch	Circular	168.00	0.96	1.24	16.38	16.32
P-12	1	21 inch	Circular	86.00	10.01	4.16	17.95	17.61
P-18	1	15 inch	Circular	9.00	4.38	3.71	17.64	17.61
P-32	1	12 inch	Circular	168.00	0.99	2.87	16.80	16.38
P-17	1	12 inch	Circular	14.00	2.41	3.06	18.23	18.17
P-31	1	21 inch	Circular	16.00	8.27	3.44	18.21	18.17
P-30	1	21 inch	Circular	153.00	8.40	3.49	18.73	18.30
P-10	1	15 inch	Circular	168.00	4.43	4.97	20.46	18.85
P-16	1	15 inch	Circular	6.00	4.55	3.71	18.88	18.85
P-9	1	15 inch	Circular	128.00	4.48	4.18	21.26	20.65

Label	Total System Flow (cfs)	Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
O-1	38.69	16.50	12.92	12.92
J-4	38.78	19.70	14.64	14.04
J-3	25.67	27.50	22.80	22.33
J-11	14.51	20.50	14.77	14.68
J-2	16.92	30.10	23.93	23.60
I-2	9.97	26.50	25.21	24.70
I-5	1.51	20.50	17.14	17.05
J-10	13.48	20.90	16.31	16.00
J-1	17.00	33.00	25.50	25.22
J-9	13.06	20.90	17.28	17.06
J-12	0.89	20.75	16.32	16.31
I-1	17.06	30.50	26.55	26.27
J-8	13.11	20.90	17.61	17.45
I-9	0.96	20.67	16.38	16.38
J-7	10.01	20.90	18.17	17.95
I-7	4.38	20.75	17.75	17.64
I-UNDERDRAIN	0.99	20.75	16.80	16.80
I-8	2.41	20.75	18.30	18.23
J-14	8.27	20.90	18.30	18.21
J-6	8.40	21.00	18.85	18.73
J-5	4.43	24.20	20.65	20.46
I-4	4.55	20.70	18.98	18.88
I-3	4.48	24.50	21.40	21.26

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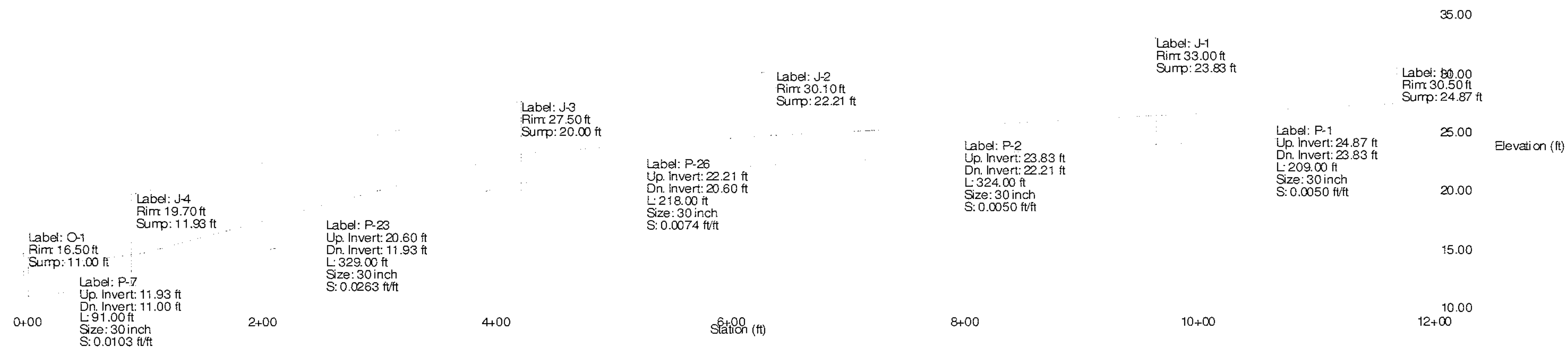
Scenario: Base

Profile
Scenario: Base



Profile
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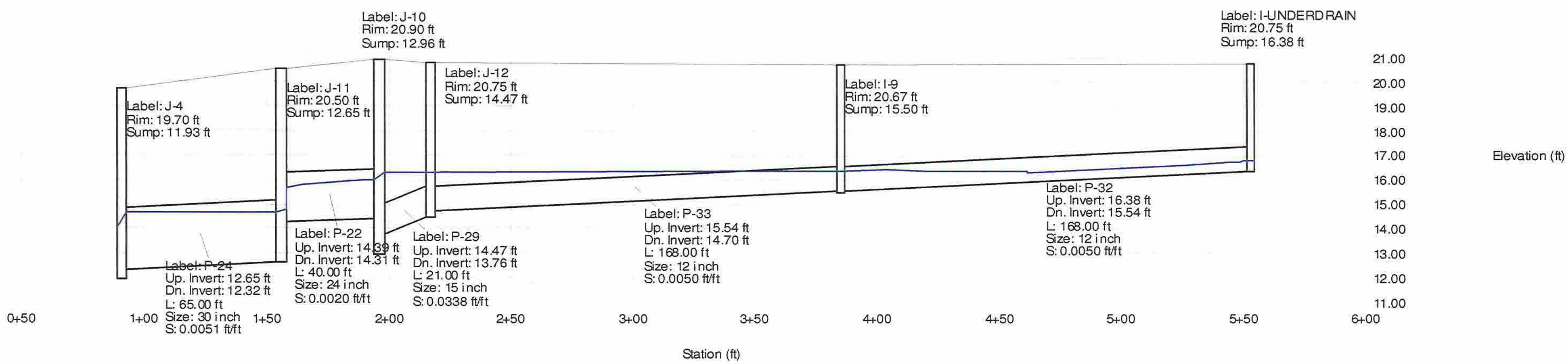

Profile
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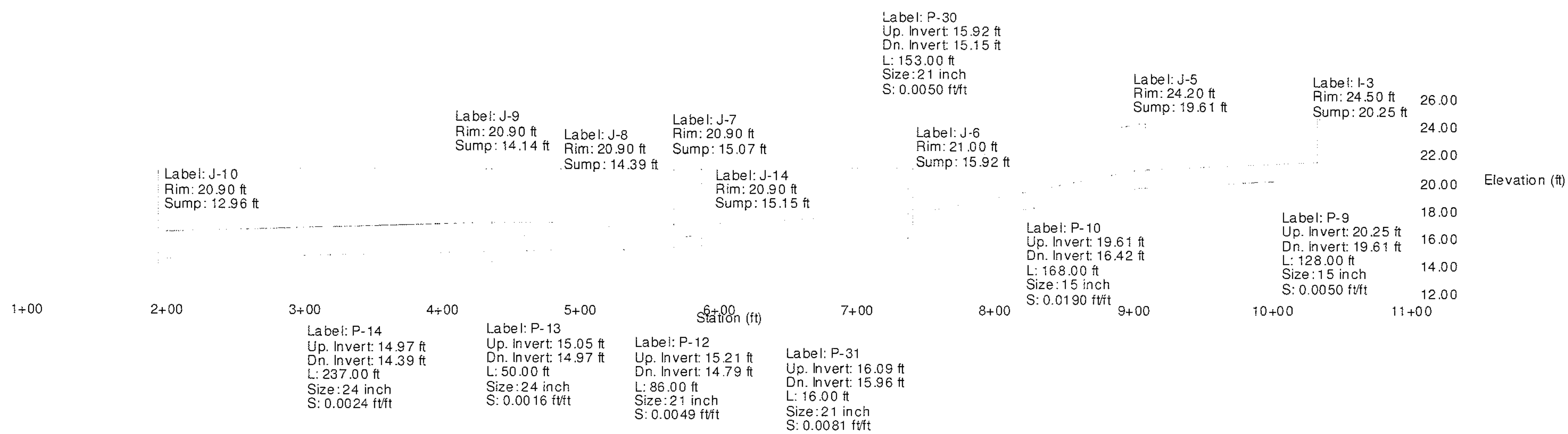


PROPOSED CONDITIONS

===

Scenario: 25 yr Storm

>>>> Info: Subsurface Analysis iterations: 3
>>>> Info: Convergence was achieved.

===

Gravity subnetwork discharging at: O-1

>>>> Info: Loading and hydraulic computations completed successfully.
>>>> Info: P-23 Hydraulic jump formed.
>>>> Info: P-23 Critical depth assumed upstream.
>>>> Warning: P-12 Pipe discharge is above full flow capacity.
>>>> Warning: P-13 Pipe fails minimum slope constraint.
>>>> Warning: P-13 Pipe discharge is above full flow capacity.
>>>> Warning: P-18 Pipe fails minimum velocity constraint.
>>>> Warning: P-14 Pipe fails minimum slope constraint.
>>>> Warning: P-14 Pipe discharge is above full flow capacity.
>>>> Warning: P-22 Pipe fails minimum slope constraint.
>>>> Warning: P-22 Pipe discharge is above full flow capacity.
>>>> Warning: P-31 Pipe discharge is above full flow capacity.
>>>> Warning: P-35 Pipe fails minimum cover constraint.
>>>> Warning: P-35 Pipe fails minimum velocity constraint.
>>>> Warning: P-36 Pipe fails minimum cover constraint.
>>>> Warning: P-37 Pipe fails minimum velocity constraint.

CALCULATION SUMMARY FOR SURFACE NETWORKS

Label	Inlet Type	Inlet	Total Intercepted Flow (cfs)	Total Bypassed Flow (cfs)	Capture Efficiency (%)	Gutter Spread (ft)	Gutter Depth (ft)
CB#6	Generic Inlet	Generic Default 100%	0.00	0.00	100.0	0.00	0.00
DMH#13	Generic Inlet	Generic Default 100%	2.02	0.00	100.0	0.00	0.00
CB#5	Generic Inlet	Generic Default 100%	1.51	0.00	100.0	0.00	0.00
CB#8	Generic Inlet	Generic Default 100%	0.52	0.00	100.0	0.00	0.00
CB#7	Generic Inlet	Generic Default 100%	0.52	0.00	100.0	0.00	0.00
I-11	Generic Inlet	Generic Default 100%	1.20	0.00	100.0	0.00	0.00
I-12	Generic Inlet	Generic Default 100%	1.26	0.00	100.0	0.00	0.00
I-13	Generic Inlet	Generic Default 100%	2.00	0.00	100.0	0.00	0.00
I-14	Generic Inlet	Generic Default 100%	1.35	0.00	100.0	0.00	0.00
CB#4	Generic Inlet	Generic Default 100%	4.76	0.00	100.0	0.00	0.00

CALCULATION SUMMARY FOR SUBSURFACE NETWORK WITH ROOT: O-1

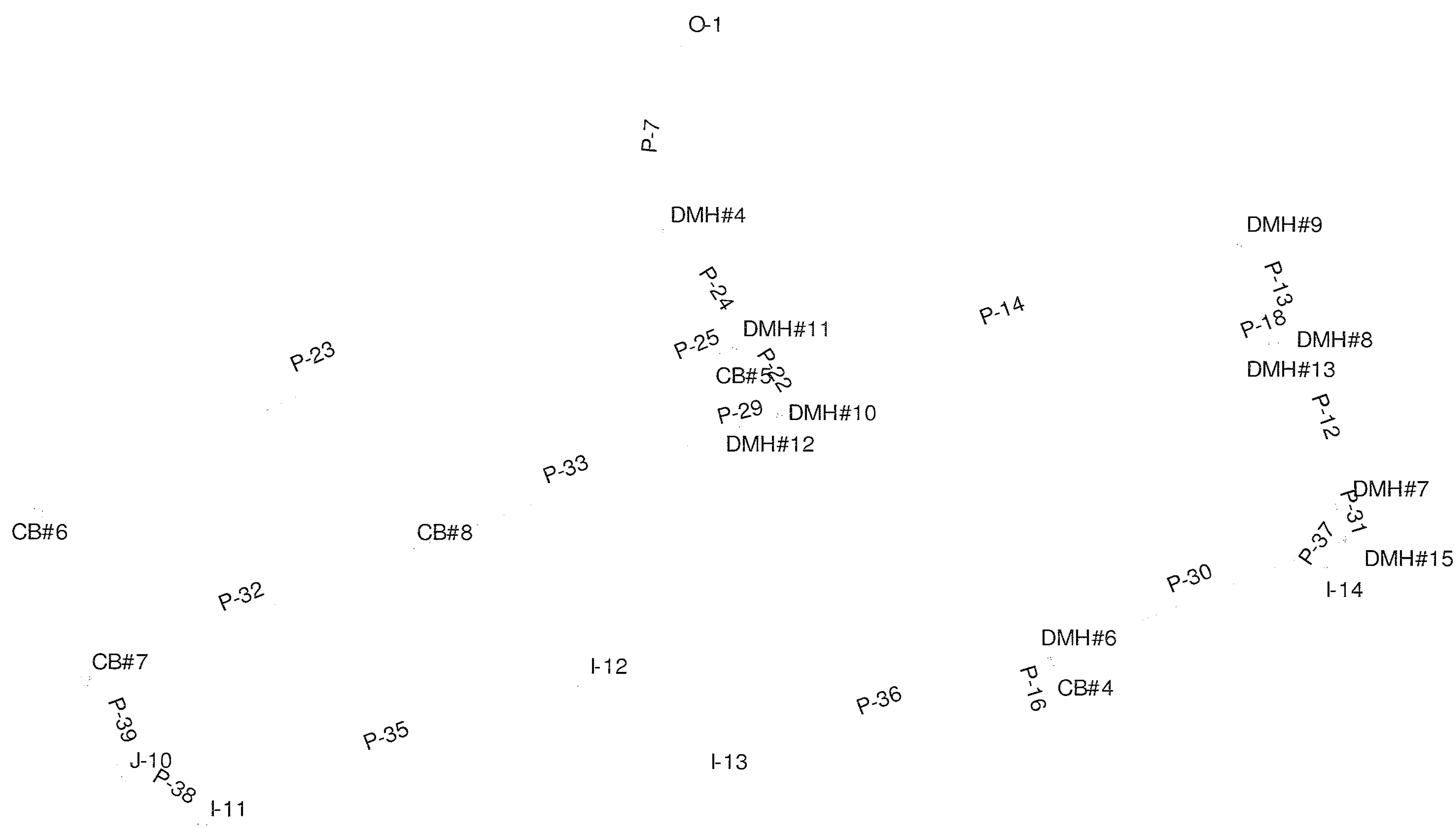
Label	Number of Sections	Section Size	Section Shape	Length (ft)	Total System Flow (cfs)	Average Velocity (ft/s)	Hydraulic Grade Upstream (ft)	Hydraulic Grade Downstream (ft)
P-7	1	30 inch	Circular	91.00	39.07	9.79	14.18	12.84
P-24	1	30 inch	Circular	65.00	17.42	3.66	14.86	14.79
P-23	1	30 inch	Circular	329.00	21.73	9.95	20.49	14.79
P-25	1	12 inch	Circular	10.00	1.51	3.44	17.05	16.97
P-22	1	24 inch	Circular	40.00	16.22	5.79	16.19	15.76
P-14	1	24 inch	Circular	237.00	13.56	4.32	17.41	16.56
P-29	1	15 inch	Circular	21.00	3.04	2.48	16.60	16.56
P-13	1	24 inch	Circular	50.00	13.59	4.33	17.82	17.64
P-33	1	12 inch	Circular	168.00	3.12	3.98	17.41	16.65
P-12	1	21 inch	Circular	84.00	11.96	4.97	18.47	17.99
P-18	1	15 inch	Circular	6.00	2.02	1.65	18.00	17.99
P-32	1	12 inch	Circular	168.00	2.74	3.48	18.12	17.54
P-31	1	21 inch	Circular	16.00	11.97	4.97	18.76	18.66
P-39	1	12 inch	Circular	50.00	2.28	2.91	18.42	18.22

P-30	1	21 inch	Circular	153.00	10.92	4.54	19.67	18.95
P-37	1	12 inch	Circular	19.00	1.35	1.71	18.98	18.95
P-38	1	12 inch	Circular	45.00	2.30	2.93	18.61	18.42
P-16	1	15 inch	Circular	6.00	4.76	3.88	19.87	19.83
P-36	1	21 inch	Circular	168.00	6.48	2.69	20.11	19.83
P-35	1	12 inch	Circular	195.00	1.26	1.60	18.92	18.68

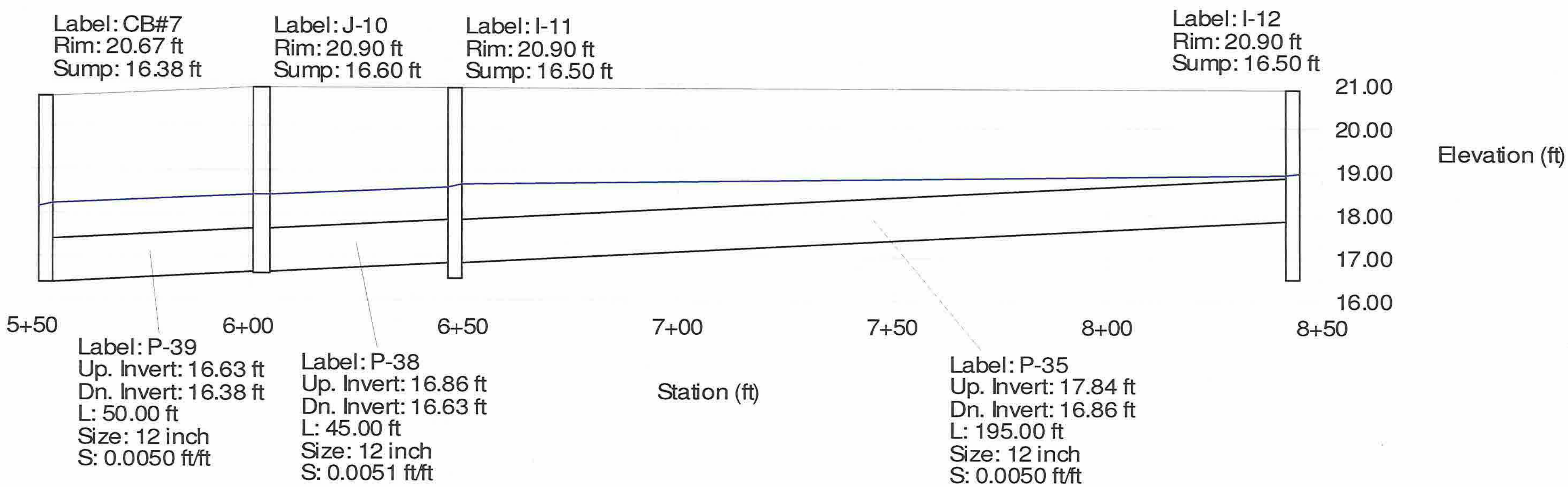
Label	Total System Flow (cfs)	Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
O-1	39.03	16.50	12.84	12.84
DMH#4	39.07	19.70	14.79	14.18
DMH#11	17.42	20.50	14.98	14.86
CB#6	21.73	27.50	20.83	20.49
CB#5	1.51	20.50	17.14	17.05
DMH#10	16.22	20.90	16.56	16.19
DMH#9	13.56	20.90	17.64	17.41
DMH#12	3.04	20.75	16.65	16.60
DMH#8	13.59	20.90	17.99	17.82
CB#8	3.12	20.67	17.54	17.41
DMH#7	11.96	20.90	18.66	18.47
DMH#13	2.02	20.75	18.02	18.00
CB#7	2.74	20.67	18.22	18.12
DMH#15	11.97	20.90	18.95	18.76
J-10	2.28	20.90	18.42	18.42
DMH#6	10.92	21.00	19.83	19.67
I-14	1.35	20.90	19.00	18.98
I-11	2.30	20.90	18.68	18.61
CB#4	4.76	20.70	19.87	19.87
I-13	6.48	20.90	20.11	20.11
I-12	1.26	20.90	18.94	18.92

Completed: 04/02/2012 03:45:35 PM

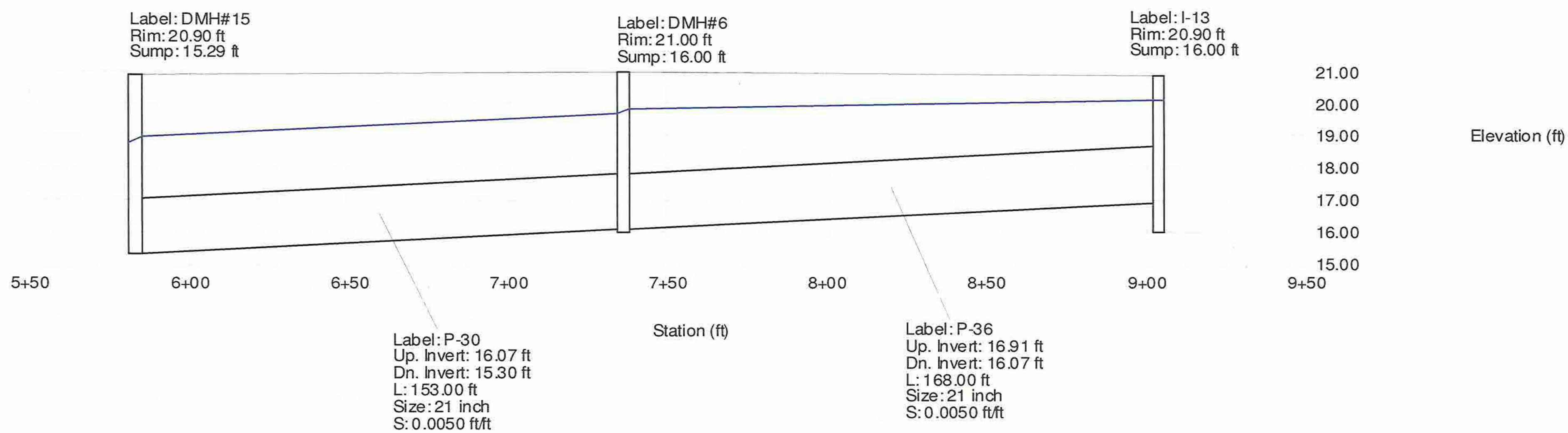
Scenario: 25 yr Storm



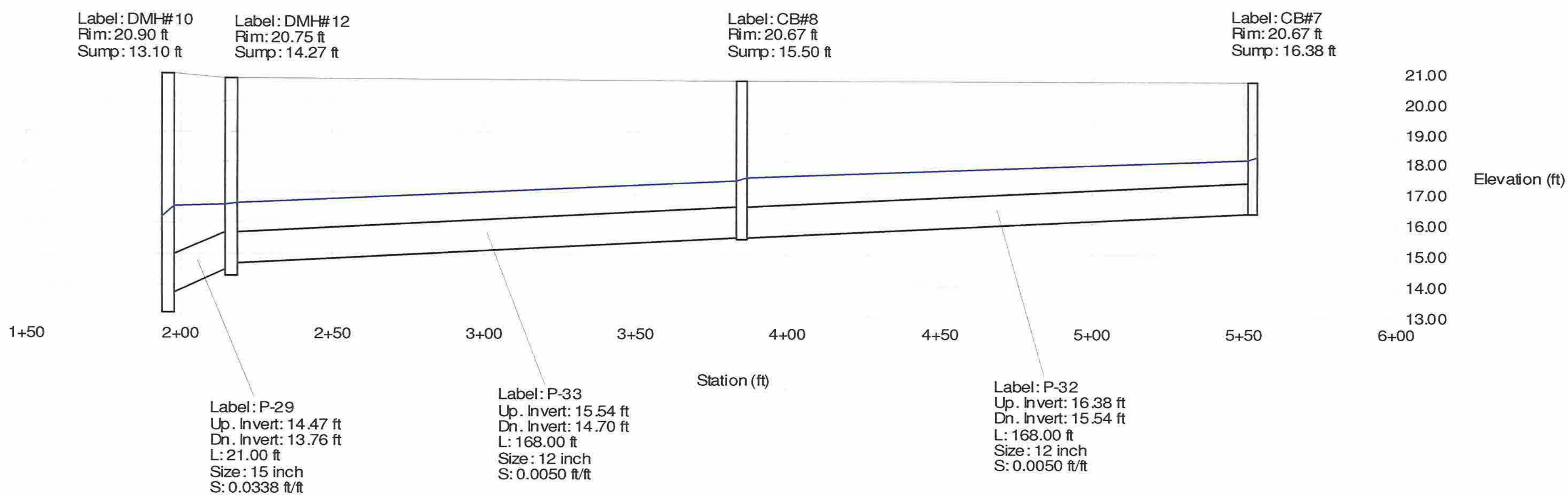
Profile
Scenario: 25 yr Storm



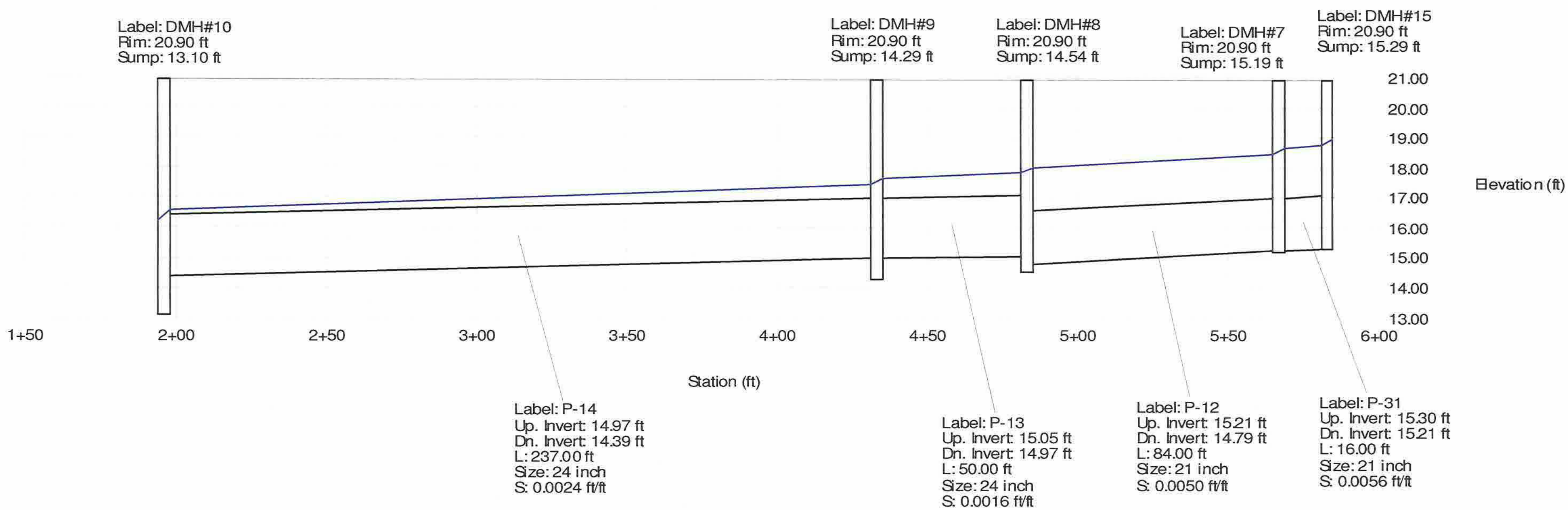
Profile
Scenario: 25 yr Storm



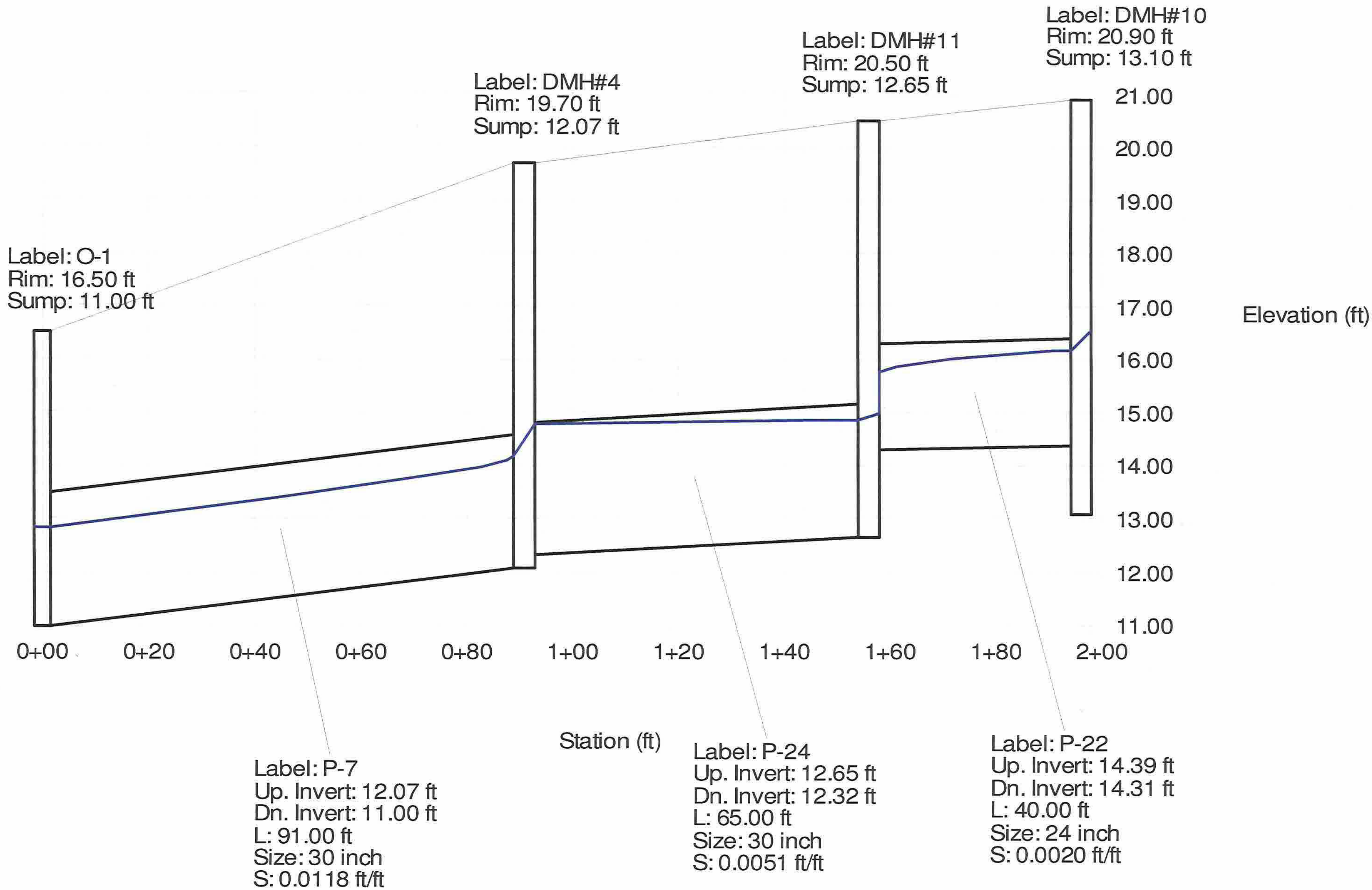
Profile
Scenario: 25 yr Storm



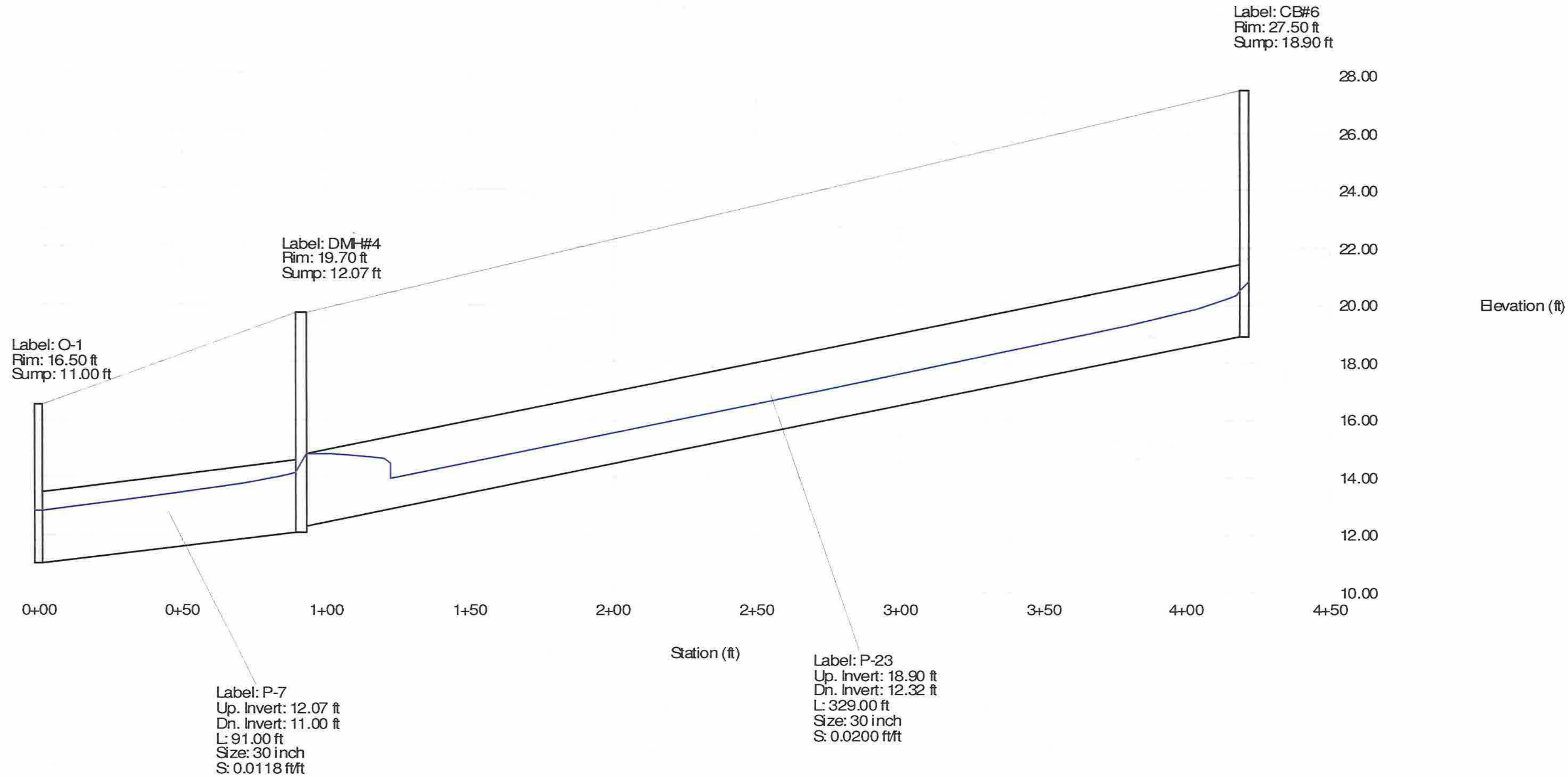
Profile
Scenario: 25 yr Storm



Profile
Scenario: 25 yr Storm



Profile
Scenario: 25 yr Storm



APPENDIX D
QUALITY CONTROL STATEMENTS

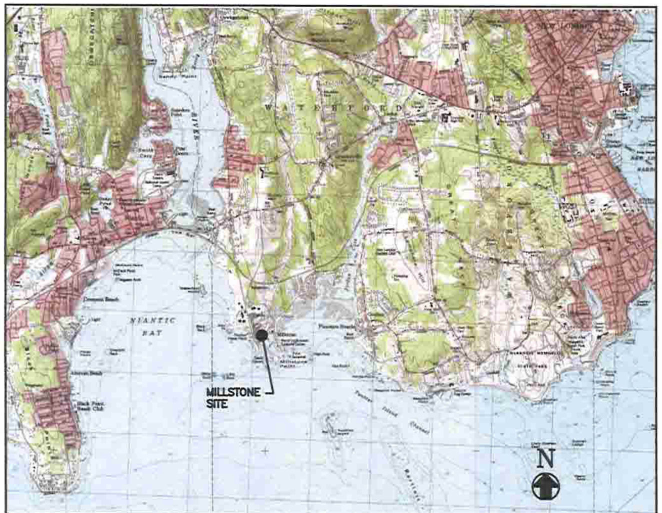
QUALITY CONTROL STATEMENT

The hydrologic and hydraulic analyses for the Independent Spent Fuel Storage Installation Project presented within this Drainage Report were conducted by GZA GeoEnvironmental, Inc. ("GZA") staff engineer, Mr. Kenneth D. Hunu. Oversight of the work and review of associated engineering calculations and drainage design were conducted by Mr. David M. Leone (GZA Hydrologist). Mr. Peter H. Baril is the Engineer-in-Charge and Mr. David M. Leone is the Project Manager. Mr. Daniel C. Stapleton served as the reviewer. Mr. Leone is a hydrologic and hydraulic engineer with over 14 years of experience in civil engineering and surface water hydrology and is also a Professional Engineer. Mr. Baril specializes in urban hydrology and flood control analyses. He is a Registered Professional Engineer as well as a Registered Hydrologist (American Institute of Hydrology). He has over 30 years of experience in the field of water resources engineering, primarily in the areas of surface water hydrology and open channel hydraulics. Mr. Stapleton is a Vice-President of GZA and has degrees in geology and civil engineering and is a Professional Engineer registered in the State of Connecticut.

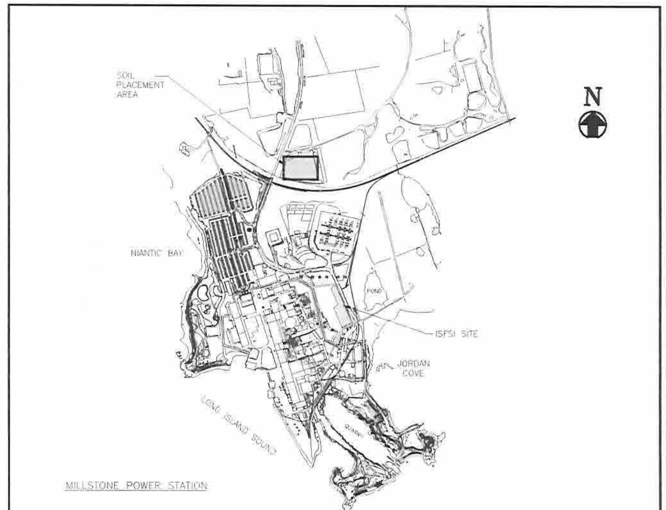
The runoff analysis was carried out using the USCOE HEC-HMS computer software, which has superceded USCOE HEC-1. GZA has successfully applied this software package over the past 10 years on numerous site drainage and dam engineering projects and has independently verified the numerical accuracy of this deterministic model. Likewise, GZA has conducted independent checks, in the form of hand calculations, of friction and shock losses, to verify hydraulic results from the StormCAD computer program used by GZA, under license from Haestad Methods, Inc.

APPENDIX E
ISFSI DESIGN DRAWINGS

MILLSTONE POWER STATION



SITE LOCUS



SITE LOCATION

LIST OF DRAWINGS	
NO.	DESCRIPTION
1	TITLE SHEET
2	EXISTING CONDITIONS PLAN (PHASE -1)
3	REVISED GRADING PLAN AND DRAINAGE SYSTEM (FULL BUILD-OUT)
4	STORMWATER DRAINAGE DETAILS
5	EROSION AND SEDIMENT CONTROL PLAN (FULL BUILD-OUT)
6	EROSION AND SEDIMENT CONTROL DETAILS
7	SOIL PLACEMENT AREA PLAN AND NOTES

GENERAL NOTES:

1. VERTICAL DATUM IS NATIONAL GEODETIC VERTICAL DATUM OF 1929.
2. 250 FOOT GRID BASED ON THE CONNECTICUT STATE PLANE COORDINATE SYSTEM.
3. BASE PLAN USED FOR ALL DRAWING IS FROM DOMINION NUCLEAR CONNECTICUT DATED FEBRUARY 18, 2004 AND TITLED "25205 – 59007, ISFSI FINAL GRADING AND DRAINAGE PLAN. BASE PLAN WAS PROVIDED ELECTRONICALLY BY DOMINION AS CAD FILE 59007. SCALE 1" = 40'
4. OTHER MAP REFERENCES INCLUDE: "NORTHEAST NUCLEAR ENERGY CO., MILLSTONE STATION, SITE PLAN." SCALE 1" = 100', DATED 08/03/99 AND "THE CONNECTICUT LIGHT & POWER CO. , BERLIN, CONNECTICUT" PROJECT: MILLSTONE POINT, SCALE: 1" = 200', SHEET 1 OF 2 AND 2 OF 2"
5. CERTAIN EXISTING CONDITIONS, INCLUDING CERTAIN UTILITIES, ARE NOT INDICATED ON THE PLANS FOR CLARITY AND SECURITY REASONS. THESE PLANS ARE NOT TO BE USED FOR UTILITY CLEARANCE PURPOSES.
6. POTENTIAL UTILITY INTERFERENCES WILL BE CONFIRMED PRIOR TO CONSTRUCTION. THE ALIGNMENT OF THE PROPOSED OR EXISTING UTILITIES MAY BE ADJUSTED TO AVOID IDENTIFIED INTERFERENCES.

THESE DRAWINGS ARE FOR THE PURPOSE OF CONNECTICUT SITING COUNCIL AND TOWN OF WATERFORD REVIEW.
NOT FOR USE FOR CONSTRUCTION.

REVISIONS TO ORIGINAL DESIGN

Independent Spent Fuel Storage Installation (ISFSI)
Dominion Nuclear Connecticut Inc.
Waterford, Connecticut

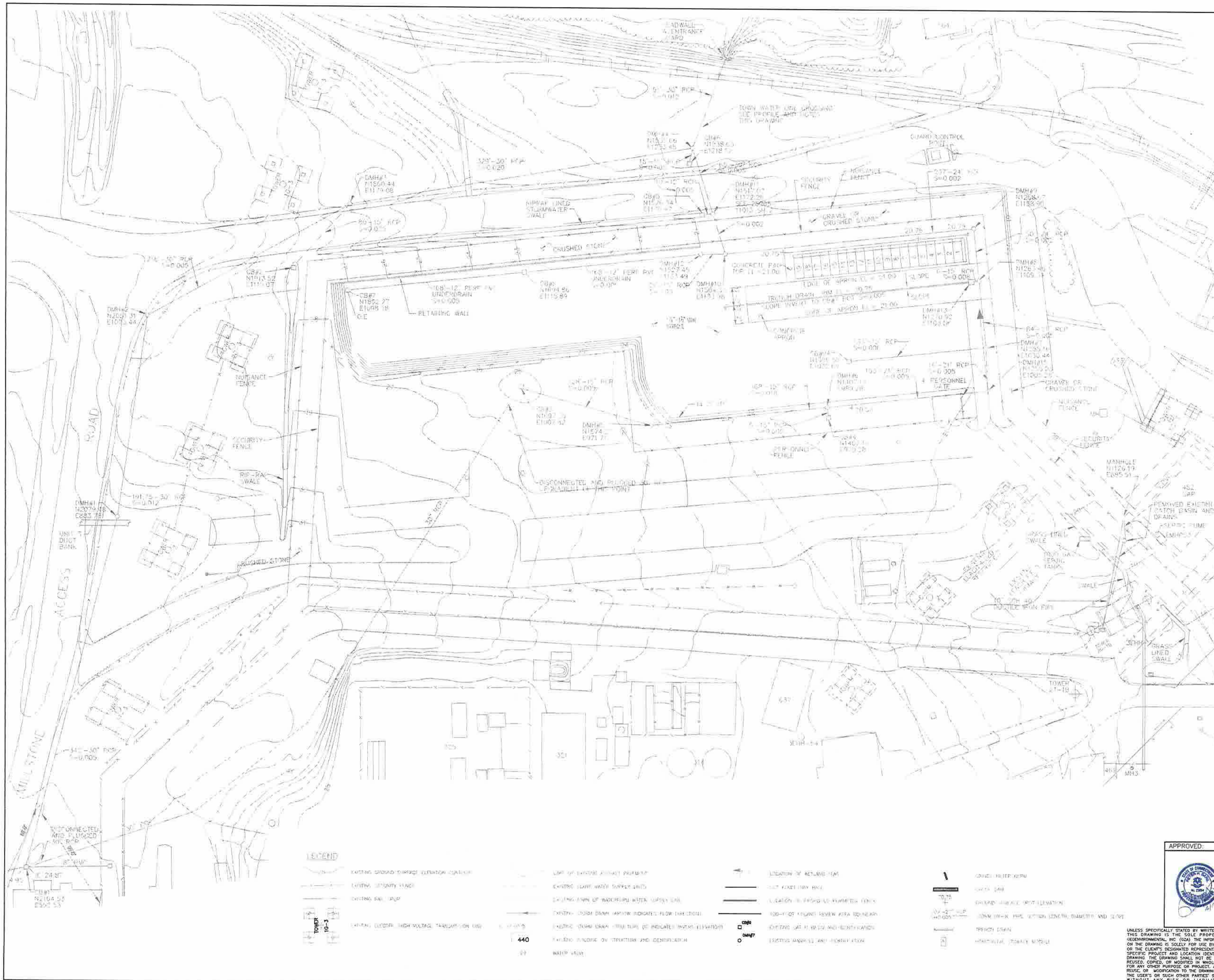
NO.	ISSUE/DESCRIPTION	BY	DATE

MILLSTONE POWER STATION
WATERFORD, CONNECTICUT
COVER SHEET

APPROVED:

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists
PREPARED FOR: DOMINION NUCLEAR CONNECTICUT, INC

PROJ MGR: DML	REVIEWED BY: PHB	CHECKED BY: DCS	DRAWING
DESIGNED BY: KDH	DRAWN BY: KDH	SCALE: AS SHOWN	1
DATE: 04/12/2012	PROJECT NO. 171138.00	REVISION NO.	SHEET NO.



REFERENCES:

1. 25205-58007 (GF) FINAL GRADING & DRAINAGE PLAN DATED 02/18/04, "PROVIDED ELECTRONICALLY BY DOMINION AS CAD FILE 58007"

NOTES:

1. ELEVATIONS SHOWN IN NGVD29 DATUM

DMH#1
RIM=30.50
INV. IN (CB#1)=23.85
INV. OUT (DMH#2)=23.80

DMH#2
RIM=30.10
INV. IN (DMH#1)=19.99
INV. OUT (DMH#3)=19.90

DMH#3
RIM=21.50
INV. IN (DMH#2)=18.90
INV. IN (CB#2)=20.00
INV. OUT (DMH#4)=18.85

DMH#4
RIM=15.70
INV. IN (DMH#3)=12.32
INV. IN (DMH#11)=12.32
INV. IN (CB#6)=15.18
INV. OUT=12.12

DMH#5
RIM=24.20
INV. IN (CB#3)=14.61
INV. OUT (DMH#6)=13.61

DMH#6
RIM=21.00
INV. IN (DMH#5)=16.30
INV. IN (CB#4)=16.35
INV. OUT (DMH#15)=16.07

DMH#7
RIM=20.90
INV. IN (DMH#15)=15.21
INV. IN (DMH#14)=15.36
INV. IN (DMH#9A)=15.80
INV. OUT (DMH#8)=15.21

DMH#8
RIM=20.90
INV. IN (DMH#7)=14.79
INV. IN (DMH#13)=14.79
INV. OUT (DMH#9)=14.75

DMH#9
RIM=20.75
INV. IN (DMH#8)=14.47
INV. OUT (DMH#10)=14.37

DMH#10
RIM=20.40
INV. IN (DMH#9)=14.33
INV. IN (DMH#12)=13.76
INV. OUT (DMH#11)=14.39

DMH#11
RIM=20.50
INV. IN (DMH#10)=14.31
INV. IN (CB#5)=16.45
INV. OUT (DMH#4)=12.65

DMH#12
RIM=20.75
INV. IN (CB#8)=14.70
INV. OUT (DMH#10)=14.45

DMH#13
RIM=20.70
INV. IN(TRENCH)=17.42
INV. OUT (CB#8)=15.75

DMH#14
RIM=20.75
INV. IN(TRENCH)=18.85
INV. OUT (CB#8)=16.09

DMH#15
RIM=21.00
INV. IN(DMH#6)=15.30
INV. OUT (DMH#7)=15.30

CB#1
RIM=30.95
INV. IN (30")=24.95
INV. IN (6")=24.87
INV. OUT (DMH#1)=24.87

CB#2
RIM=20.50
INV. OUT (DMH#3)=22.00

CB#3
RIM=24.50
INV. OUT (DMH#5)=20.25

CB#4
RIM=20.70
INV. OUT (DMH#6)=16.45

CB#5
RIM=20.60
INV. OUT (DMH#11)=16.50

CB#6
RIM=19.50
INV. OUT (DMH#4)=15.25

CB#7
RIM=20.75
INV. OUT (DMH#9)=15.75

CB#8
RIM=20.75
INV. OUT (DMH#7)=16.75

CB#9A
RIM=20.50
INV. OUT (CB#12A)=16.50

DRAINAGE STRUCTURE SCHEDULE

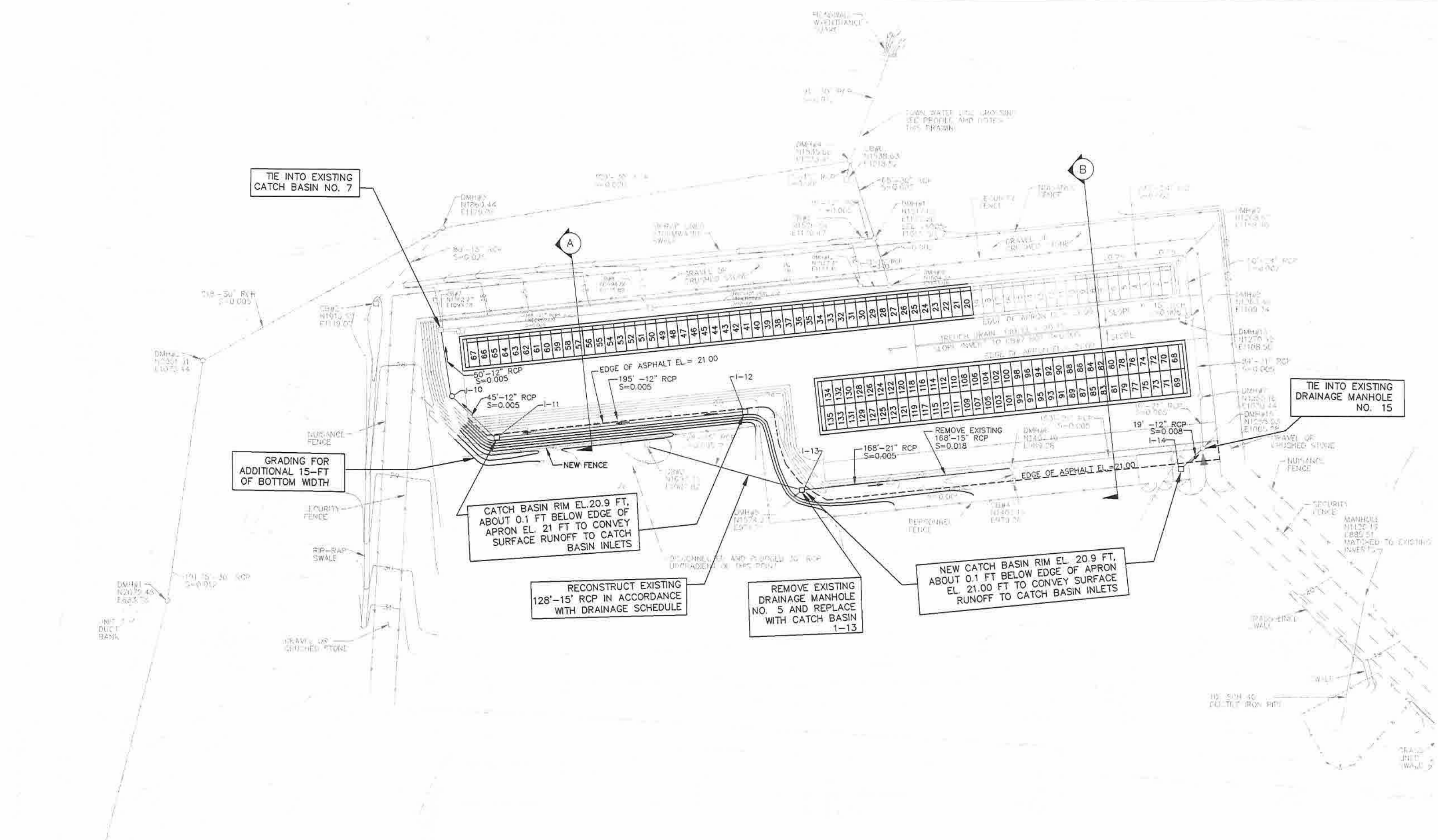
APPROVED:	NO.	ISSUE/DESCRIPTION	BY	DATE

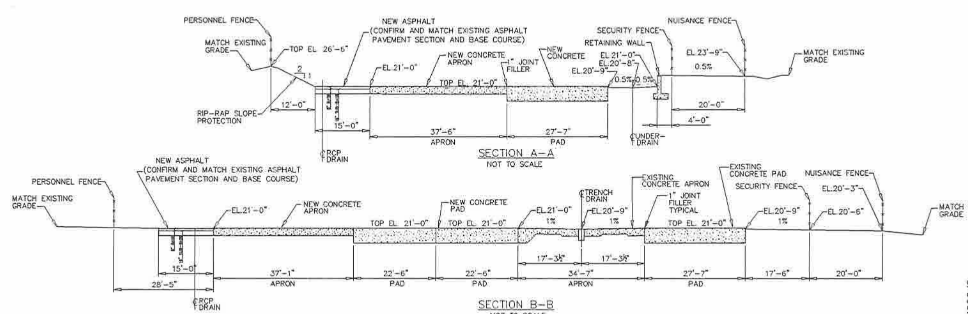
MILLSTONE POWER STATION
WATERFORD, CONNECTICUT

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists
PREPARED FOR: DOMINION NUCLEAR CONNECTICUT INC.

EXISTING CONDITIONS PLAN

PROJ MGR: DML	REVIEWED BY: PHB	CHECKED BY: DCS	DRAWING
DESIGNED BY: KDH	DRAWN BY: KDH	SCALE: AS SHOWN	2
DATE: 04/12/2012	PROJECT NO. 171138.00	REVISION NO. 0	





LEGEND:

- GROUND SURFACE SPOT ELEVATION
- GROUND SURFACE ELEVATION CONTOUR
- EXISTING CATCH BASIN AND IDENTIFICATION
- I-11 □ PROPOSED CATCH BASIN AND IDENTIFICATION
- EXISTING MANHOLE AND IDENTIFICATION
- J-10 ○ PROPOSED MANHOLE AND IDENTIFICATION
- EXISTING STORM DRAIN; PIPE SECTION LENGTH, DIAMETER AND SLOPE
- 209'-30" RCP S=0.005 PROPOSED STORM DRAIN; PIPE SECTION LENGTH, DIAMETER AND SLOPE
- EXISTING TRENCH DRAIN
- DIRECTION OF PIPE FLOW

REFERENCES:

1. 25205-59007, ISFI FINAL GRADING & DRAINAGE PLAN DATED 02/18/04, "PROVIDED ELECTRONICALLY BY DOMINION AS CAD FILE 59007"
2. 25205-59006, ISFI SITE PLAN (FULL BUILD-OUT) DATED 02/18/04, "PROVIDED ELECTRONICALLY BY DOMINION AS CAD FILE 59006&BUILDOUT"

NOTES:

1. ELEVATIONS SHOWN IN NGVD29 DATUM
2. REFER TO DRAWING NO. 4 FOR SCHEDULE OF ELEVATIONS FOR PROPOSED DRAINAGE NETWORK
3. REFER TO DRAWING NO. 2 FOR ADDITIONAL LEGEND INFORMATION

N

0 20 40 80
1 INCH TO 40 FEET

APPROVED:	NO.	ISSUE/DESCRIPTION	BY	DATE

MILLSTONE POWER STATION

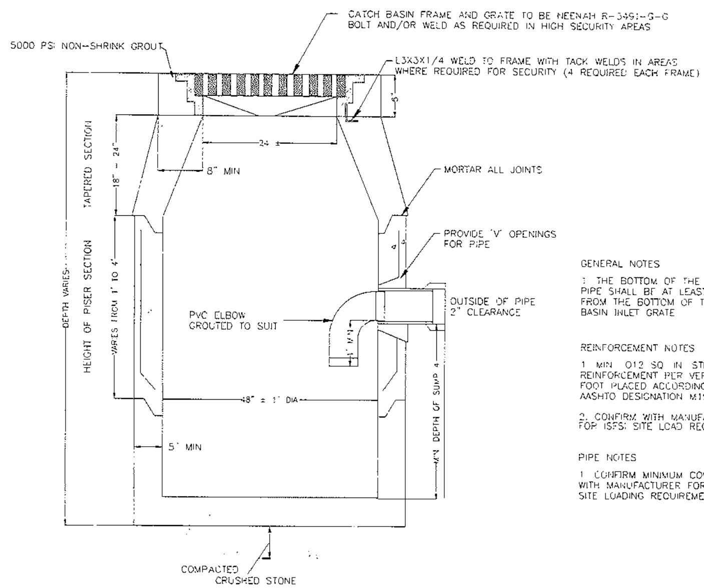
WATERFORD, CONNECTICUT

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists

PREPARED FOR: DOMINION NUCLEAR CONNECTICUT INC.

PROPOSED GRADING AND DRAINAGE PLAN (FULL BUILD-OUT)

PROJ MGR: DML	REVIEWED BY: PHB	CHECKED BY: DCS	DRAWING
DESIGNED BY: KDH	DRAWN BY: KDH	SCALE: AS SHOWN	3
DATE: 04/12/2012	PROJECT NO. 171138.00	REVISION NO.	



GENERAL NOTES

1 THE BOTTOM OF THE OUTLET PIPE SHALL BE AT LEAST 4 FEET FROM THE BOTTOM OF THE CATCH BASIN INLET GRATE

REINFORCEMENT NOTES

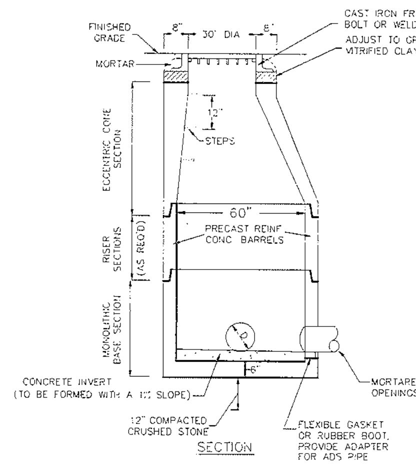
1 MIN 012 SQ IN STEEL REINFORCEMENT PER VERTICAL FOOT PLACED ACCORDING TO AASHTO DESIGNATION M199

2. CONFIRM WITH MANUFACTURER FOR ISFSI SITE LOAD REQUIREMENTS

PIPE NOTES

1 CONFIRM MINIMUM COVER WITH MANUFACTURER FOR ISFSI SITE LOADING REQUIREMENTS

CATCH BASIN DETAIL
NOT TO SCALE



GENERAL NOTES:

1 CO-POLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O C FOR THE FULL DEPTH OF THE MANHOLE

2 'V' PIPE OPENINGS w/ 2" MAX OUTSIDE PIPE CLEARANCE TO BE CAST AS REQUIRED

3 JOINT SEALANT SHALL BE PREFORMED BUTYL RUBBER MASTIC TAPE SEAL THAT COMPLIES w/ AASHTO SPECIFICATION M-198 OR SYNTHETIC RUBBER GASKET THAT COMPLIES w/ C-443 OR C-361

4 DRAIN MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)

REINFORCEMENT NOTES:

1 MIN 012 SQ IN STEEL REINFORCEMENT PER VERTICAL FOOT PLACED ACCORDING TO AASHTO DESIGNATION M199

2. CONFIRM WITH MANUFACTURER FOR ISFSI SITE LOAD REQUIREMENTS

60" DIAMETER PRECAST DRAIN MANHOLE (DMH)
NOT TO SCALE

PROP J-10
RIM=20 9
INV IN (I-11)=16 63
INV OUT (CB#7)=16 63

PROP I-11
RIM=20 9
INV IN (I-12)= 16 86
INV OUT (J-10)=16 86

PROP I-13
RIM=20 9
INV. IN (CB#3)=17 00
INV OUT (DMH#6)=16 91

PROP I-12
RIM=20 9
INV OUT (I-11)=17 84

PROP I-14
RIM=20 9
INV IN (I-13)= 15 35
INV OUT (DMH#7)=15 35

MODIFIED CB#3
RIM=24 50
PROPOSED INV OUT (I-13)= 17 64

MODIFIED DMH#6
RIM=21 00
PROPOSED INV IN (I-13)= 16 39
EXISTING INV IN (CB#4)=16 39
EXISTING INV OUT (DMH#15)=16 07

EXIST DMH#15
RIM=21 00
PROPOSED INV IN (I-14)=15 35
EXISTING INV IN (DMH#6)=15 30
EXISTING INV OUT (DMH#7)=15 30

EXIST CB#7
RIM=20 9
PROPOSED INV IN (J-10)= 16 38
EXISTING INV OUT (CB#8)=16 38

NOTE. ELEVATIONS SHOWN IN FEET (NGVD 29 DATUM)

DRAINAGE STRUCTURE SCHEDULE

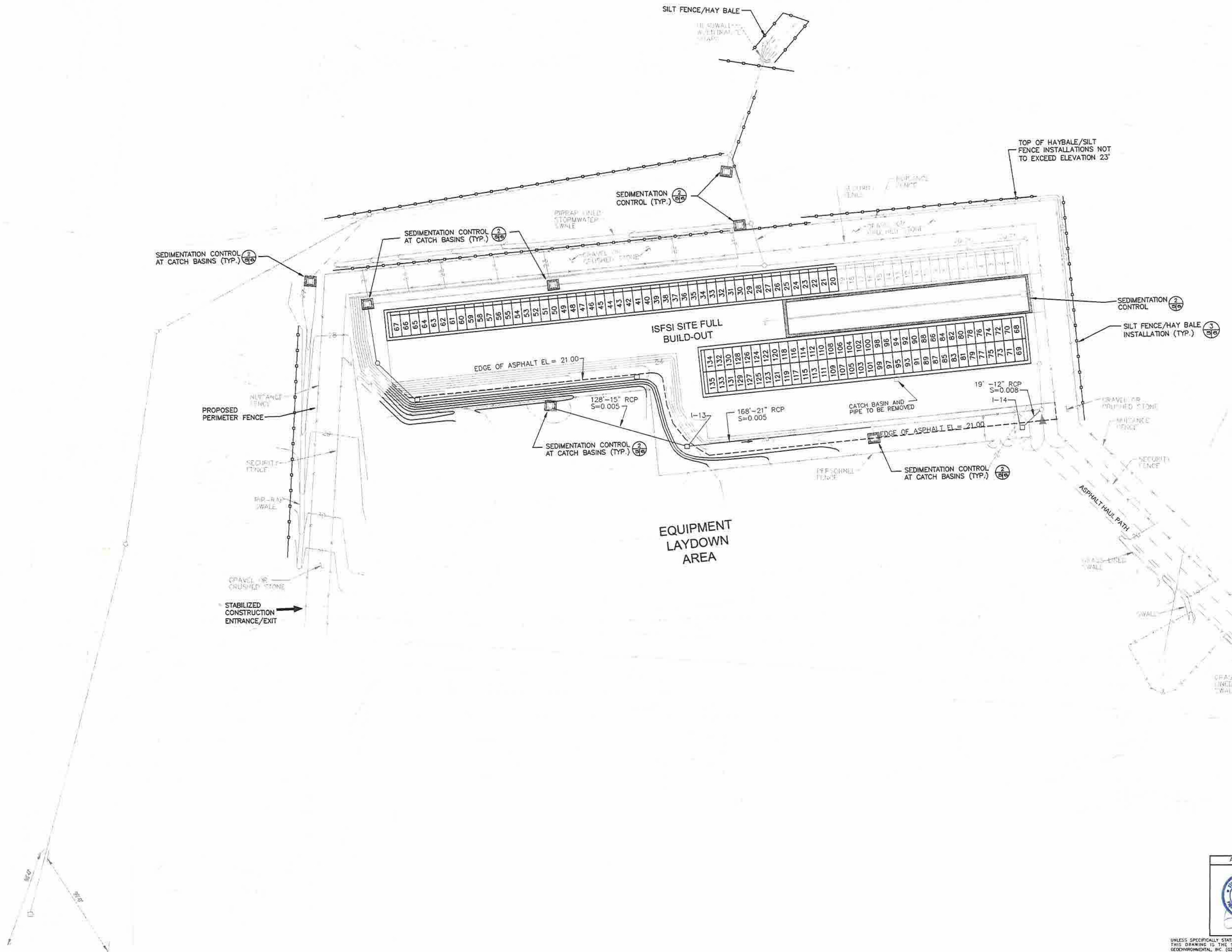
NO.	ISSUE/DESCRIPTION	BY	DATE

MILLSTONE POWER STATION
WATERFORD CONNECTICUT

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists
PREPARED FOR: DOMINION NUCLEAR CONNECTICUT INC

STORM WATER DRAINAGE DETAILS

PROJ MGR DML	REVIEWED BY PH3	CHECKED BY DCS	DRAWING
DESIGNED BY KDH	DRAWN BY KDH	SCALE AS SHOWN	4
DATE 04/12/2012	PROJECT NO 171138 00	REVISION NO	



NOTES:

1. THE ISFSI PROJECT IS SUBJECT TO A STATE OF CONNECTICUT GENERAL PERMIT FOR THE DISCHARGE OF STORMWATER AND DEWATERING WASTEWATERS ASSOCIATED WITH CONSTRUCTION ACTIVITY.
2. THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL ARE TO BE FOLLOWED.
3. SEE DWG. 6 FOR NARRATIVE, NOTES AND DETAILS.
4. SILT FENCE AND HAYBALES ARE NOT TO BE PLACED AGAINST ANY PROTECTED AREA FENCE. REMOVE PRIOR TO INSTALLATION OF PROTECTED AREA FENCE.
5. LOCATION OF TEMPORARY SEDIMENTATION TANKS AND BASINS AND CONTRACTOR FUELING AREA ARE NOT INDICATED AND WILL BE DETERMINED PRIOR TO THE START OF CONSTRUCTION.

REFERENCES:

1. 25205-59007, ISFI FINAL GRADING & DRAINAGE PLAN DATED 02/18/04, "PROVIDED ELECTRONICALLY BY DOMINION AS CAD FILE 59007"
2. 25205-59006, ISFI SITE PLAN (FULL BUILD-OUT) DATED 02/18/04, "PROVIDED ELECTRONICALLY BY DOMINION AS CAD FILE 59006&BUILDOUT"

N

0 20 40 80
1 INCH TO 40 FEET

NO.	ISSUE/DESCRIPTION	BY	DATE

APPROVED:

MILLSTONE POWER STATION
WATERFORD, CONNECTICUT

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists, ONE EDGEWATER DRIVE NORWOOD, MASSACHUSETTS 02062 (781) 278-3700

PREPARED FOR: DOMINION NUCLEAR CONNECTICUT INC.

EROSION AND SEDIMENT CONTROL PLAN (FULL BUILD-OUT)

PROJ MGR: DML	REVIEWED BY: PHB	CHECKED BY: DCS	DRAWING
DESIGNED BY: KDH	DRAWN BY: KDH	SCALE: AS SHOWN	5
DATE: 04/12/2012	PROJECT NO. 171138.00	REVISION NO.	

EROSION AND SEDIMENT CONTROL NARRATIVE

EROSION AND SEDIMENT CONTROL MEASURES
The following erosion and sediment control techniques are to be employed to minimize erosion and transport of sediment to resource areas during the earthwork and construction phases of the project.

SITE STRIPPING AND EXCAVATION
During the site stripping stage, existing pavement, gravel, rail spurs, etc. within the limits of the ISFSI Site are to be cleared and removed. Prior to any site stripping activities, silt fence and hay bale barriers are to be placed around the outer work perimeter. Disturbance is to be limited to those areas necessary to complete the proposed work.

HAY BALE/SILT FENCE BARRIERS
Hay bale/silt fence barriers are to be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site, in addition to areas where high runoff velocities or high sediment loads are expected. The silt fences and hay bale barriers are to be replaced as determined by periodic field inspections. Hay bales or silt fence should not be placed along the Protected Area fence.

CATCH BASIN INLET PROTECTION
Existing and newly constructed catch basins are to be protected with hay bale barriers (where appropriate) or silt sacks throughout construction.

SLOPE PROTECTION
Slope protection will be provided using silt fence/hay bale installations. If this erosion and sedimentation control method is ineffective, then the Contractor will install matting such as straw, jute, wood fiber, and/or plastic netting.

TEMPORARY SEDIMENT BASINS
Temporary sediment basins will be designed either as excavations or bermed stormwater detention structures (depending on grading) that will retain runoff for a sufficient period of time to allow suspended soil particles to settle out prior to discharge. These temporary basins will be located based on construction needs as determined by the contractor in consultation with the Owner's resident engineer. A perforated riser surrounded by a crushed stone filter will be typically used to control discharge from the basin. Points of discharge from sediment basins will be stabilized to minimize erosion.

STOCKPILED MATERIALS
Stockpiles created during construction activities are to be surrounded with hay bales and silt fence. Other acceptable alternatives include gravel filter berms laid around the perimeter of the stockpile. Stormwater run-off is to be diverted away from stockpiles.

SLOPE STABILIZATION
Stabilization of open slope surfaces is to be implemented within 14 days after grading or construction activities have temporarily or permanently ceased. Slope stabilization is to be used to minimize erosion on slopes of 3:1 or flatter. Establishment of temporary and permanent vegetative cover is to be established by hydro-seeding or sodding. Mulch is to be used after permanent seeding to protect soil from the impact of falling rain and to increase the capacity of the soil to absorb water. Non-vegetative slope stabilization is to include crushed stone and/or gravel surfacing, underlain by a geotextile separation fabric.

WINTER STABILIZATION
Any areas disturbed at any phase of on-site activity conducted during winter conditions will be temporarily stabilized with hand laid straw mulch, hydro-seeding, mulching, or erosion control blankets as necessary to control erosion during winter storm events.

CONSTRUCTION DEWATERING
Dewatering may be required for construction. Where possible, the wastewater discharge is to be infiltrated into the ground. However, the existing soils have limited infiltration capacity. Construction dewatering wastewater discharged to a surface water body is to be pre-treated for sediment removal by residing in a fractionation/sedimentation tank or temporary sediment basin prior to discharge.

CONSTRUCTION SITE ENTRANCE & EXIT
Stabilized construction entrance and exit are to be established at all permanent construction staging areas, including the Soil Placement Area, to reduce the tracking of sediment from the construction site onto other areas of the Millstone Property and to public ways. Street sweeping is be used if the stabilized entrance and exit are not adequate to prevent sediment from being tracked onto the roads.

DUST CONTROL
Standard dust control measures are to be used, such as use of water trucks, misting, mulch, or placement of calcium chloride. These measures are to be used when open dry areas of soil are anticipated on the site. In addition, dust control measures are to be considered prior to clearing and grading activities, which can create the opportunity for large amounts of dust to be blown.

EQUIPMENT FUELING
Equipment fueling and other activities including petroleum, oil and other potentially hazardous substances is to be performed at a pre-approved, designated area with appropriate spill prevention and control measures. This area is to be located on an asphalt paved surface, away from catch basins and other drainage structures, within the Equipment Laydown Area. Portable secondary containment is to be used, and sorbent materials are to be placed around the perimeter of the fueling area, during all fueling activities.

GOOD HOUSEKEEPING AND WASTE DISPOSAL
The site is to be maintained in a clean and orderly fashion, ensuring that no litter, debris, building materials, or similar materials are discharged to waters of the State. All dumpsters are to have covers and intact drain plugs (if applicable) or are to be staged in roofed areas to prevent dumpster/compactor leakage from entering stormwater. No building material residues (internal truck washes) are to be discharged to drainage systems or waters of the state.

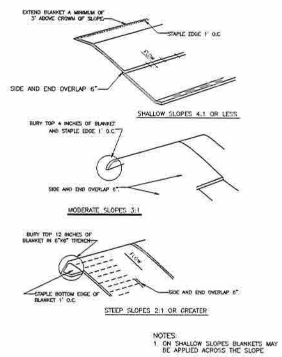
INSPECTION AND MAINTENANCE
Qualified personnel, as determined by Dominion, are to inspect disturbed areas of the construction activity that have not been finally stabilized, structural control measures, and locations where vehicles enter or exit. Inspection is to be performed at least once every seven (7) calendar days and within 24 hours of the end of a storm that is 0.1 inches or greater. Where sites have been temporarily or finally stabilized, such inspection is to be conducted at least once every month for three months.

The focus of the inspection is to determine: 1) whether or not control measures were installed/performed correctly; 2) whether or not there has been damage to measures since they were installed or performed; and 3) what should be done to correct any problems with the measures. Each measure is to be observed to determine if it is still effective. In some cases, specific measurements may be taken to determine if maintenance of the measures are required. For example, sediment depths may be measured to determine if cleaning or replacement is required.

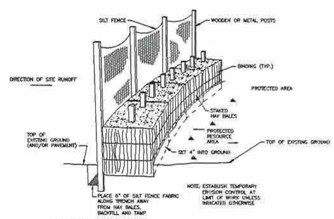
SITE MANAGER
Prior to construction a Site Manager will be designated, who will be responsible for installation, monitoring, inspection and correction of erosion and sediment control measures.

REPORTING AND RECORD KEEPING
In addition to the aforementioned inspection and maintenance procedures, the contractor is to keep a record of the following information:
1. The dates when major grading activities occur in a particular area;
2. The dates when construction activities cease in an area, temporarily or permanently; and
3. The dates when an area is stabilized, temporarily or permanently.
4. A copy of the Stormwater Pollution Control Plan and all reports generated during construction activities are to be retained as required by regulation.

SEQUENCE OF GRADING AND CONSTRUCTION ACTIVITIES
The following provides recommendations for the general sequence of work:
1. Install stabilized construction exits.
2. Install perimeter hay bales and silt fence as necessary.
3. Provide catch basin inlet protection at existing catch basins.
4. Perform Stripping (removal of gravel surface) at ISFSI site.
5. Provide protection for all stockpiles.
6. Prepare temporary sedimentation basins, as may be required.
7. During stripping and excavation, install berms to collect site runoff as required.
8. Implement other dewatering control measures (e.g. frac tanks with filters) as required.
9. Begin earthwork at the ISFSI site.
10. In areas where flow is concentrated, install crushed stone or hay bale check dams.
11. Upon completion of earthwork within the ISFSI Site, install remaining drainage structures.
12. Provide inlet protection at newly constructed catch basins and manholes.
13. Construct concrete pads and aprons within ISFSI Site.
14. Complete grading.
15. Remove accumulated sediment from basins and other sediment control devices.
16. Perimeter erosion control will remain in place until permanent stabilization has been achieved.
17. Loam and seed soil placement area.



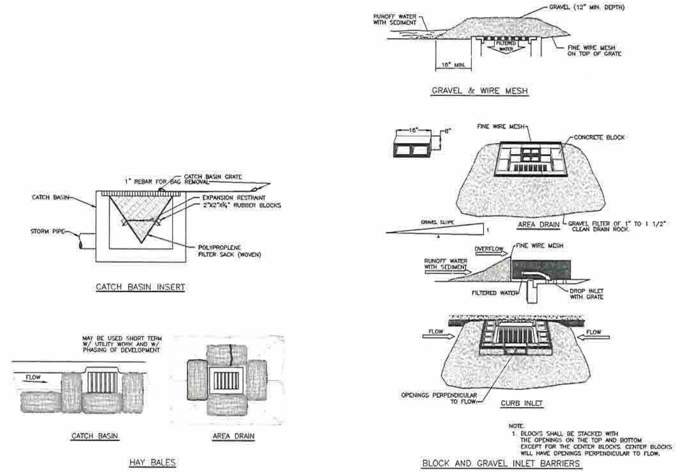
1 / 5|6 **MATTING PROTECTION**
NOT TO SCALE



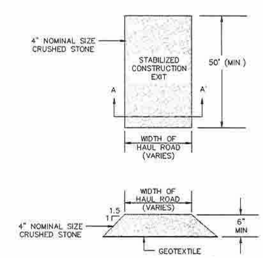
CONSTRUCTION SPECIFICATIONS

1. BALES SHALL BE PLACED WHERE SPECIFIED ON DRAWINGS IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF FOUR (4) INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY TWO WOODEN STAKES DRIVEN THROUGH THE BALE. THE FIRST STAKE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER.
4. IN EXISTING PAVEMENT AREAS, THE CONTRACTOR SHALL SAWCUT AND REMOVE PAVEMENT AS NECESSARY TO INSTALL HAYBALES AND SILTATION FENCE AS SHOWN (i.e. PAVEMENT SHALL BE REMOVED TO ACCOMODATE TOEING-IN OF HAYBALES AND SILTATION FENCE).
5. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

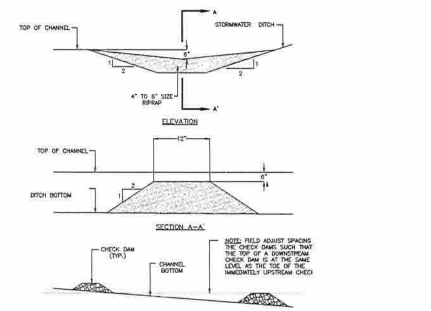
3 / 5|6 **HAY BALE SILT FENCE BARRIER DETAIL**
NOT TO SCALE



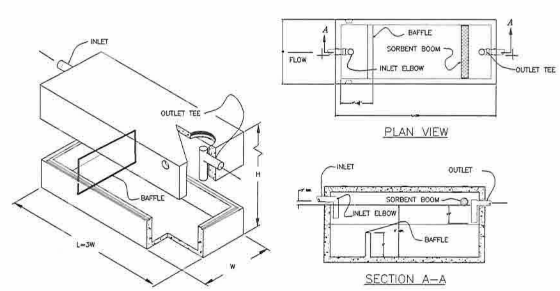
2 / 5|6 **CATCH BASIN INLET PROTECTION**
NOT TO SCALE



4 / 5|6 **STABILIZED CONSTRUCTION EXIT (TYPICAL)**
NOT TO SCALE



5 / 5|6 **DETAILS – ROCK CHECK DAM**
NOT TO SCALE



SEDIMENTATION TANK

GUIDELINES FOR PROPER DESIGN AND USE OF SEDIMENTATION TANKS INCLUDE:

SIZE TANKS TO ADEQUATELY HANDLE DEWATERING FLOWS.

TANKS SHOULD HAVE A MINIMUM DEPTH OF 4 FEET BELOW OUTLET PIPE.

TANK SURFACE AREA (LENGTH x WIDTH) SHOULD EQUAL THE MAXIMUM ANTICIPATED PUMPING RATE (GALLONS PER MINUTE) 0.8 SF/GPM. THE TANK LENGTH SHOULD BE AT LEAST THREE TIMES THE TANK WIDTH.

PLACE THE PUMP DISCHARGE HOSE AT THE INLET END OF THE TANK, AS FAR AS POSSIBLE FROM THE TANK OUTLET TO ENSURE USE OF THE ENTIRE TANK LENGTH. INSTALL A 15-INCH-LONG 90° ELBOW ON THE PUMP DISCHARGE HOSE TO DIRECT THE FLOW TOWARD THE TANK BOTTOM.

INSTALL A BAFFLE INSIDE THE TANK TO SLOW THE FLOW WITHIN THE TANK. THE BAFFLE SHOULD HAVE A MINIMUM HEIGHT OF ONE-HALF THE TANKS'S DEPTH AND SHOULD BE LOCATED 3 FEET FROM THE INLET END.

PLACE A SORBENT BOOM IN THE TANK NEAR THE OUTLET TO AID IN REMOVING PETROLEUM PRODUCTS.

INSTALL A PIPE TEE OF BAFFLE INSIDE THE TANK AT THE OUTLET TO PREVENT DISCHARGE OF FLOATABLES FROM THE TANK'S SURFACE WATER. THIS OUTLET FITTING SHOULD EXTEND 15 INCHES BELOW THE OUTLET INVERT AND UPWARDS TO A HEIGHT 2 INCHES BELOW THE TOP OF THE TANK.

LOCATE THE INVERT OF THE OUTLET PIPE AT LEAST 3 INCHES BELOW INVERT OF THE INLET PIPE. HAVE THE OUTLET HOSE DISCHARGE DIRECTLY TO A CATCH BASIN OR OTHER DRAINAGE STRUCTURE.

IF THE TANK HAS A CLOSED TOP, ADD ACCESS HATCHES AT BOTH INLET AND OUTLET ENDS FOR INSPECTION, SAMPLING AND CLEANING.

INSPECT TANKS DAILY TO INSURE PROPER MAINTENANCE.

CLEAN TANKS WHEN SEDIMENT REACHES 1/4 OF THE TANK'S DEPTH OR WEEKLY, WHICHEVER COMES FIRST. TAKE TANKS OUT OF SERVICE WHEN THEY ARE BEING CLEANED. PLACE SEDIMENT REMOVED FROM THE TANK WITH OTHER MATERIAL EXCAVATED FROM THE SITE.

ENSURE THAT HOSES ARE NOT LEAKING AND THAT TANKS ARE NOT OVERFLOWING, THUS PREVENTING WATER FROM BYPASSING THE TANK AND ENTERING A DRAINAGE SYSTEM.

APPROVED:

NO.	ISSUE/DESCRIPTION	BY	DATE

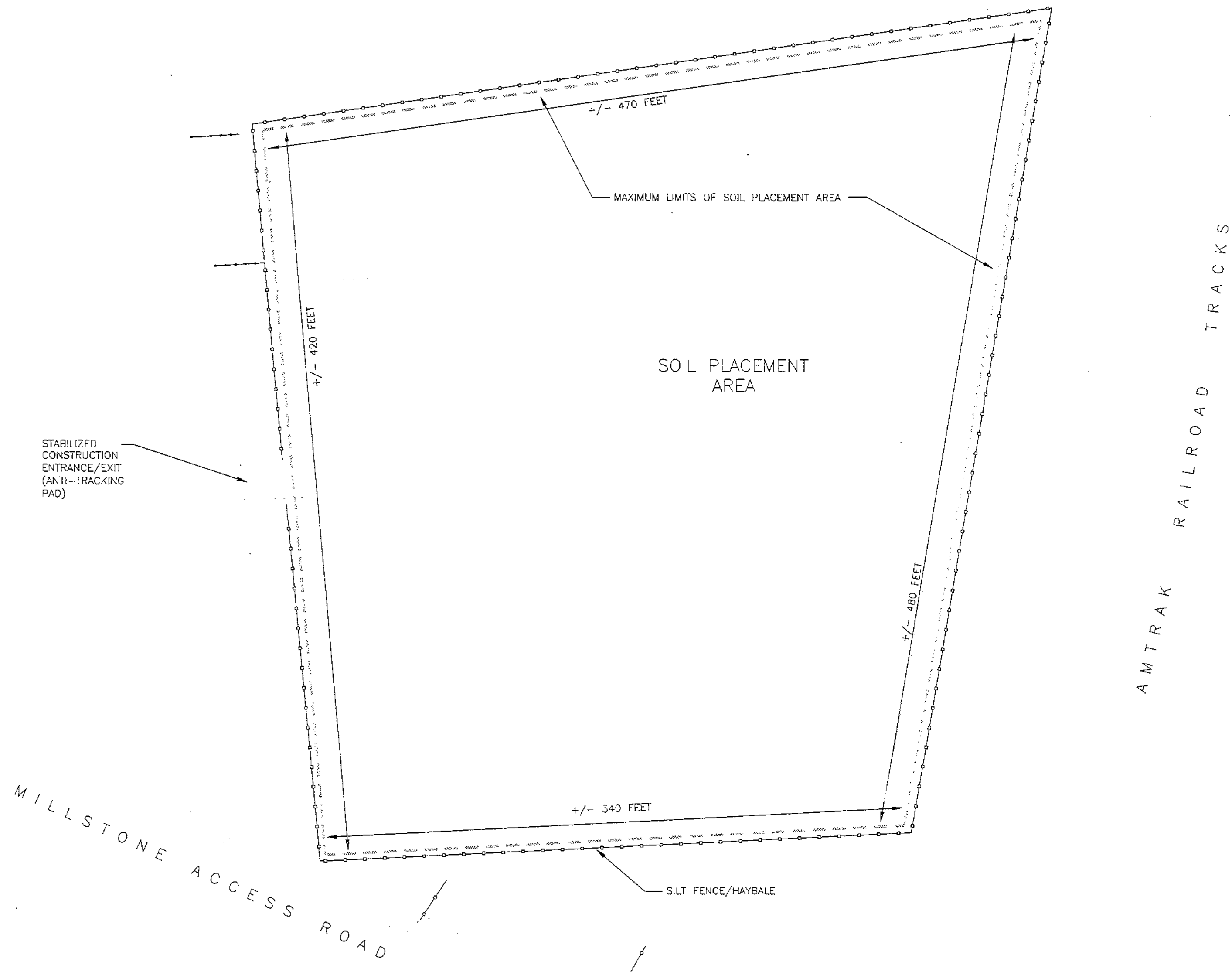
MILLSTONE POWER STATION
WATERFORD, CONNECTICUT

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists, ONE EDGEWATER DRIVE, NORWOOD, MASSACHUSETTS 02062, (781) 278-3700

PREPARED FOR: DOMINION NUCLEAR CONNCECTICUT INC.

EROSION AND SEDIMENT CONTROL DETAILS

PROJ MGR: DML	REVIEWED BY: PHB	CHECKED BY: DCS	DRAWING
DESIGNED BY: KDH	DRAWN BY: KDH	SCALE: AS SHOWN	6
DATE: 04/12/2012	PROJECT NO.: 171138.00	REVISION NO.:	



NOTES

1. SEE DRAWING 2 FOR LEGEND
2. SEE DRAWING 6 FOR EROSION CONTROL DETAILS
3. SOIL TO BE PLACED ON AS-NEEDED BASIS. SOIL TO BE PLACED IN CONTROLLED LIFTS OF 12 INCHES OR LESS AND GRADED TO DRAIN TO THE SOUTH AND EAST TO MAINTAIN PRE-CONSTRUCTION DRAINAGE PATTERN
4. SOIL PLACEMENT AREA TO BE FILLED TO AN EVEN LEVEL TO THE EXTENT PRACTICABLE
5. LOAM AND SEED. MAINTAIN EROSION AND SEDIMENTATION CONTROLS UNTIL VEGETATED
6. WETLANDS ARE PRESENT EAST OF THE SOIL PLACEMENT AREA. NO EXCESS SOIL SHALL BE PLACED WITHIN 100 FEET OF THE WETLANDS
7. APPROXIMATE CAPACITY OF SOIL PLACEMENT AREA
   - ASSUMING AVERAGE THICKNESS OF TWO FEET – 5,000 CUBIC YARDS
   - ASSUMING AVERAGE THICKNESS OF THREE FEET – 8,000 CUBIC YARDS

REFERENCES:

1. SK-PA59007.DON. ISFI SOIL PLACEMENT AREA TOPOGRAPHY PLAN PROVIDED ELECTRONICALLY BY DOMINION AS CAD FILE "SOILTOPO.DWG" ON FEBRUARY 15, 2012

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SOIL PLACEMENT AREA PLAN AND NOTES

PROJ MGR	DML	REVIEWED BY	PHB	CHECKED BY	DCS	DRAWING
DESIGNED BY	KDH	DRAWN BY	KDH	SCALE	AS SHOWN	7
DATE	04/12/2012	PROJECT NO.	171138.00	REVISION NO.		