April 28 2000
Revision 2; Amendment 1
(Amended July 31, 2000)
108020300-PN0001-R02:A01

CONSTRUCTION SITE STORMWATER CONTROL AND POLLUTION PREVENTION PLAN

For The

Pre-Construction Activities
Bethel Valley/Bear Creek Access Road
24" Water Line
Initial Site Preparation
Storm Water Detention Pond
Construction Packages S21A, S21B, S25A, and S25B

Prepared By:
Knight Jacobs Joint Venture
Barge, Waggoner, Sumner and Cannon, Inc.
Oak Ridge, Tennessee
BWSC 25209-20

1.0 INTRODUCTION

This Construction Site Stormwater Control Plan (CSSWCP) was prepared in accordance with Tennessee Department of Environment and Conservation (TDEC) Rule 1200-4-10-.05, the Tennessee Erosion and Sediment Control Handbook, Guide to Forestry Best Management Practices (published by the Tennessee Division of Forestry), and good engineering practice. The plan describes and ensures implementation of practices which will be used to reduce pollutants in stormwater discharges associated with construction activity for the Spallation Neutron Source (SNS) Pre-Construction Activities: Construction Package S21A, Bear Creek Access Road; Construction Package S21B, Bethel Valley Access Road and 24" Water Line; Construction Package S25A, Initial Site Preparation; and Construction Package S25B, Storm Water Detention Pond.

The SNS project site encompasses a total of 110 acres and will be constructed in phases over a period of approximately 5 years. Construction packages S21A, S21B, S25A, and S25B are the first three phases of the site construction work. The plan will be amended to include subsequent phases of the project as design for each phase is completed.

1.1 Plan Amendment

The CSSWCP shall be amended whenever a future phase of the project begins construction and/or there are changes in design, construction, operation, or maintenance, which have a significant effect on the potential for a discharge of pollutants to surface waters of Tennessee which have not otherwise been addressed in the plan. The CSSWCP shall also be amended if the plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources associated with the construction project.

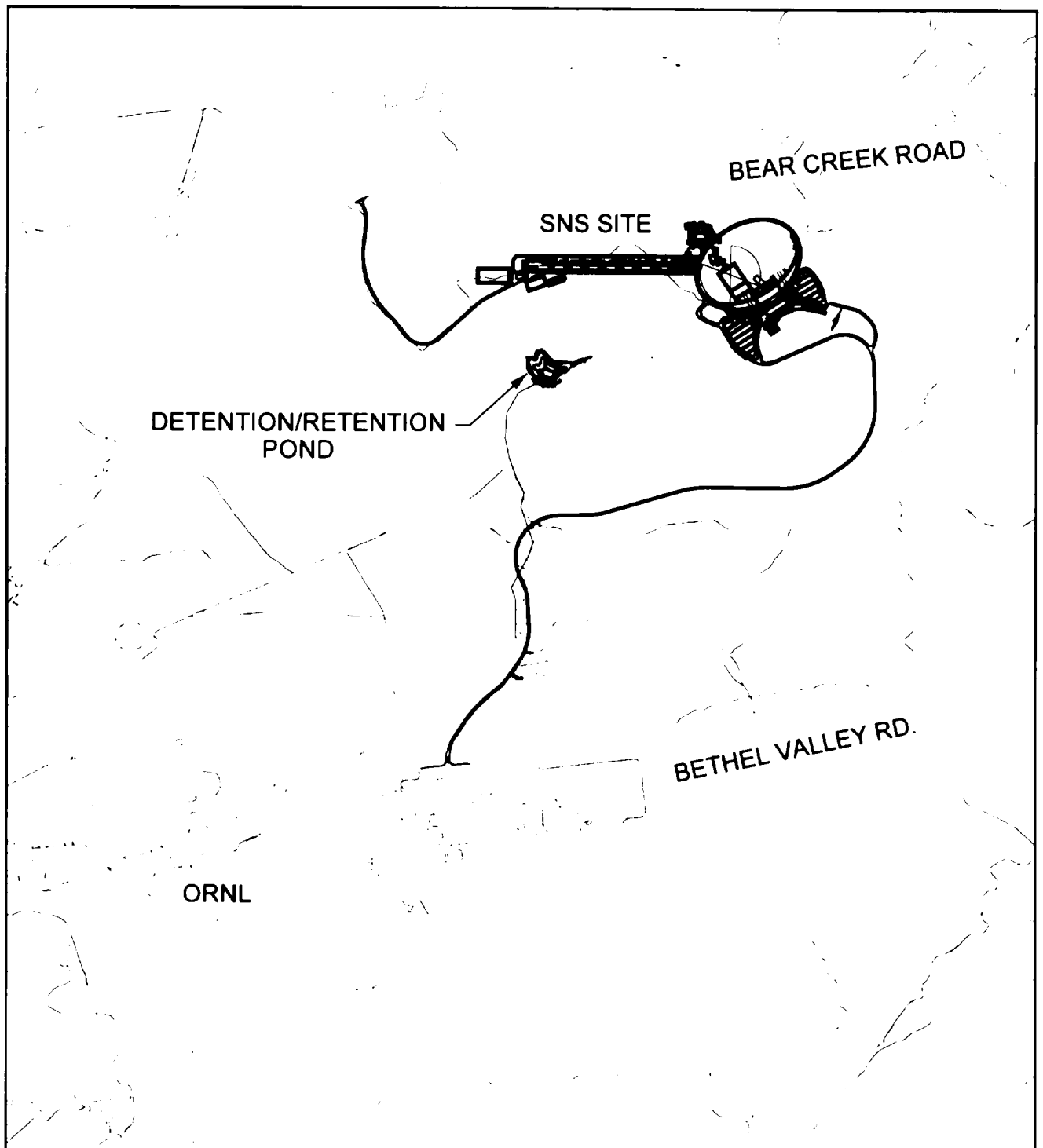
When amendments are made to the plan, a heavy black bar will be placed to the right of the revised text to indicate a change from the previously issued document.

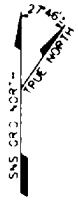
2.0 SITE DESCRIPTION

2.1 Project Description and Orientation

The Spallation Neutron Source will be a state-of-the-art facility for the production of neutrons for use in scientific research. The facility will consist of four main components: a proton source (the front end), a linear accelerator (linac), a beam transport and ring system, and an experiment building which will house a mercury target. Additional support facilities will be constructed.

The facility will be built on Department of Energy property north of Bethel Valley Road and south of Bear Creek Road near Oak Ridge National Laboratory (Figure 1), approximately 2.5 miles east of Hwy 95. The site is located on Chestnut Ridge near the boundary





SPALLATION NEUTRON SOURCE

LOCATION MAP

Figure 1

07/31/00 J:\c . fg. 001.dgn PREPARED BY: BARGE, WAGGONER, SUMNER AND CANNON, INC.

between Roane and Anderson counties. Most of the facility will be in Roane County, but a small portion of the project area is in Anderson County. The project area is situated between 35° 56' and 35° 58' north latitude and 84° 16' and 84° 20' west longitude.

Figure 2 depicts the overall site plan, including the two access roads and the storm water detention pond. The purpose of this plan is to ensure the erosion of soil and the discharge of other pollutants into waters of the State are minimized.

2.2 Scope of the Plan

This is a relatively long duration construction project; the projected completion date is December 2005. During this 5-year period there will be many phases of construction. Most phases will be conducted under the control the Construction Manager, Knight Jacobs. Some of the earlier phases of construction, which are of relatively short duration, will be conducted by the management contractor for ORNL, and subcontractors procured by the ORNL management contractor to harvest merchantable timber from the site. A CSSWCP was developed for these activities dated October 14, 1999.

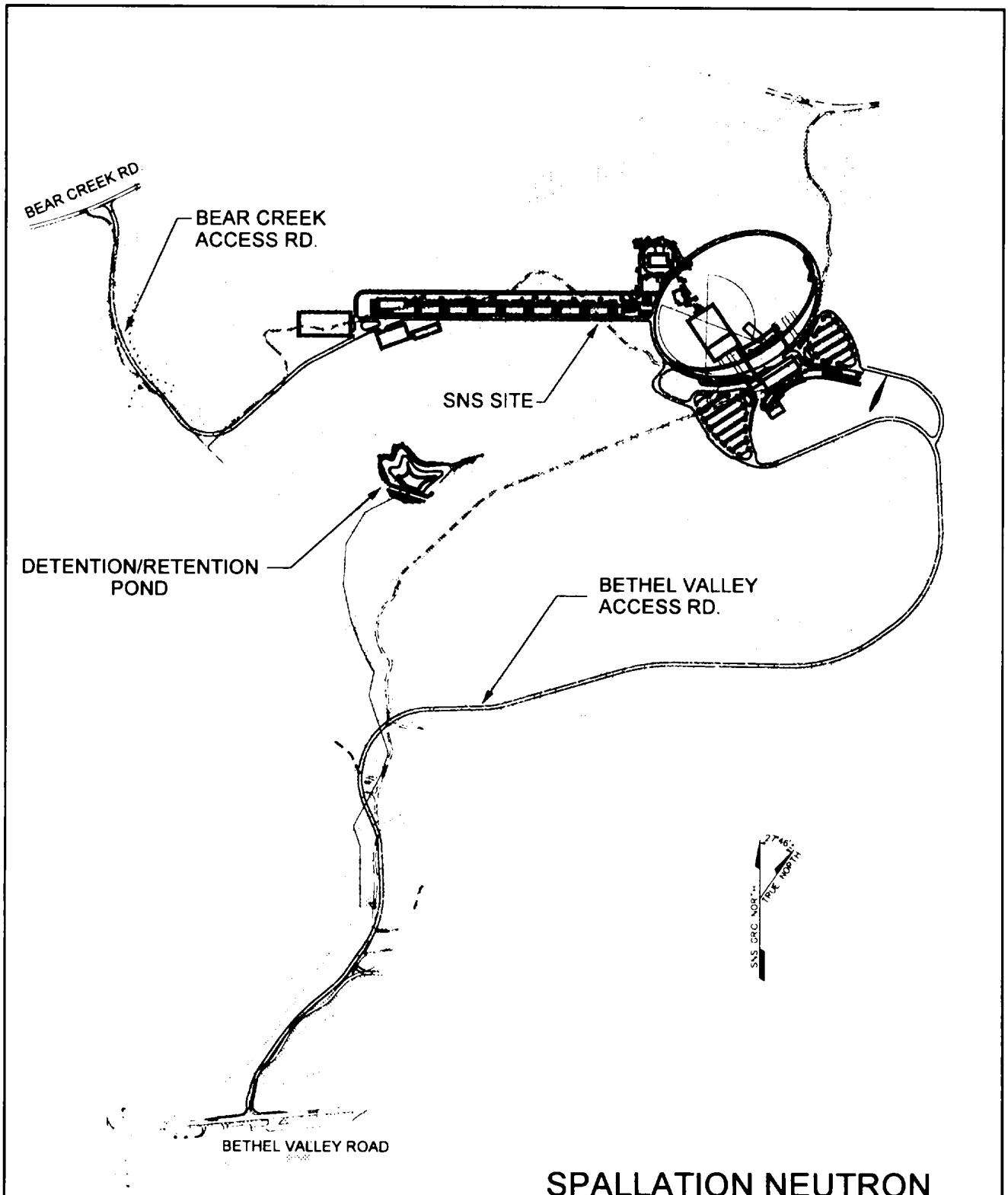
Knight Jacobs is contractually responsible for preparing a CSSWCP for their activities on the site. This plan was prepared by Barge, Waggoner, Sumner and Cannon, Inc., the engineer of record for construction activities covered under this plan. This amendment provides for modifications and additions to erosion control measures and amends the plan to address issues discovered after significant rainfall events

This plan combines the original plan prepared by Lockheed Martin Energy Research (October 14, 1999) with the one prepared for the Bear Creek Access Road, the Bethel Valley Access Road and 24" Water Line, the Initial Site Preparation, and the Storm Water Detention Pond into one comprehensive CSSWCP for all site disturbance activities.

A detailed description of the construction activities covered under this plan can be found in Appendix 1.

2.3 Site Drainage and Aquatic Resources

Two streams on the Bethel Valley Access Road site, identified on the S16A map as the upper reaches of White Oak Creek, have been designated as Waters of the State by the Tennessee Department of Environment and Conservation (TDEC). White Oak Creek is a tributary of the Clinch River. All stormwater from the Bethel Valley Access Road site will enter these streams. Four wetland areas with a total area of 2.5 acres exist along the tributary that is adjacent to the lower portion of the Bethel Valley Access Road.



SPALLATION NEUTRON SOURCE

SITE PLAN

Figure 2

07/31/00 J:\c fg_002.dgn PREPARED BY: BARGE, WAGGONER, SUMNER AND CANNON, INC.

Where the Bethel Valley Access Road crosses White Oak Creek, 0.055 acres of this wetland will be impacted. A mitigation plan has been developed for this impact. According to the requirements of the Environmental Impact Statement for SNS, a vegetative buffer of 100 ft. must be maintained from the edge of the stream except where the existing road is located closer than this distance to the stream. One crossing of White Oak Creek will be required.

Just north of this crossing, the road turns to the east and climbs towards the core site. This segment of the Bethel Valley Access Road will be built parallel to an eastern unnamed tributary of White Oak Creek. Two crossings of this drainage are necessary for road construction. These crossings are covered under a General TDEC Permit for minor road crossings. Four wetland areas totaling 0.12 acres in size exist within this drainage along the upper reaches of the road near the core site. There will be no impact to these upper wetland areas.

Along the west side of the Bear Creek Access Road, there is a short segment of an unnamed tributary of Bear Creek that has been designated as Waters of the State by TDEC. This stream will not be impacted by construction activity. A minimum vegetative buffer of 25 ft. must be maintained along this stream. Stormwater from the Bear Creek Access Road will discharge into this unnamed tributary to Bear Creek. No crossings of the stream are necessary.

The 24" water line relocation does not affect any aquatic resources.

The disturbed area within the core SNS project site for Initial Site Preparation will consist of approximately 70 acres. The disturbed area for the Bear Creek Access Road consists of approximately 5.3 acres. Of this disturbed area, approximately 1.9 acres in the Bear Creek drainage basin will be made impervious as a result of subsequent construction. The disturbed area for the Bethel Valley Access Road will be approximately 21.5 acres, with approximately 5.1 acres of impervious area. The 24 " water line will disturb 1.8 acres, with no impervious area. Therefore, the total disturbed area will be approximately 98.6 acres, with 7 acres being impervious, excluding the core project site.

The post-development runoff for the Bear Creek Access Road for a 1" storm is estimated to be 0.26 acre feet, entering an unnamed tributary of Bear Creek. The estimated runoff for the entire site after development is estimated to be 2.14 acre feet. The post-development runoff for the Bethel Valley Access Road is estimated to be 0.6067 acre feet entering White Oak Creek. The calculations that support these flows are provided in Appendix 2.

Permanent stormwater detention facilities required for this development will be constructed in this phase of the project, including a permanent erosion and sediment control and stormwater detention basin in the White Oak Creek drainage basin. Virtually all post-development flows from impervious surfaces will flow into this basin. The basin is sized to contain sediment from the site during construction and to detain stormwater based upon a

10-year pre-development storm and a 25-year post-development storm. The outfall from this basin will be piped to enter White Oak Creek at a point just downstream of the White Oak Creek headwaters monitoring station according to the requirements contained in the Final Environmental Impact Statement for the SNS project. Other permanent measures include underground storm drainage piping, grassed, and rip-rapped swales and permanent stabilization of disturbed areas.

The soil-disturbing activity will consist of clearing and grubbing for the installation of the erosion and sediment control features, grade work, and excavating for stormwater utilities. The erosion and sediment controls being utilized include check dams, diversion swales, hay bales, regular and heavy duty silt fencing, temporary sediment traps, temporary and permanent vegetative cover, and routine inspections of erosion control measures.

One cultural resource exists on the site, a cabin located along the route of the Bear Creek Access Road. It will not be disturbed by construction.

2.4 Plan Objective

The purpose of this plan is to ensure the erosion of soil and the discharge of other pollutants into waters of the State are minimized. Stormwater management and sediment control measures will be utilized in the construction to minimize off-site sediment migration beyond the limits of disturbance. This plan has been prepared to meet Tennessee regulations, and the following guidelines are listed for compliance:

- The smallest practical area will be cleared and grubbed to allow for grading and equipment operations.
- Where feasible, natural vegetation will be retained and protected from damage.
- Swales will be used to control runoff.
- Silt fencing, hay bales, and sediment traps will be installed to remove sediment from runoff prior to the runoff physically leaving the disturbed area.
- Stabilization shall be accomplished by temporarily or permanently protecting the disturbed surface soil from rainfall impacts and runoff. The long-term vegetation will be established as soon as practical as areas of the project site are brought to finished grade.
- The unnamed tributaries of Bear Creek and White Oak Creek will be protected from physical and/or hydrologic damage.

- There shall be no distinctly visible floating scum, oil or other matter contained in the stormwater discharge.

- The stormwater discharge must result in no materials in concentrations sufficient to be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream.

- The goal is that stormwater discharge should not cause an objectionable color contrast in the receiving stream. However, the physical properties of the soils on this site are such that there will be discoloration of the receiving stream.

3.0 EROSION CONTROL PLAN

The structures described in this section are to be used for the control of stormwater, erosion, and sediment migration.

Materials used for erosion and sediment control will conform to specifications provided in the following subsections and those shown on the drawings and in the technical specifications. For Pre-Construction Activities, drawings that depict the erosion controls were prepared and are kept on file. For each construction package, a full set of engineering drawings and written specifications sealed by a professional engineer will be produced. These drawings will be kept at the construction site at all times.

All construction activities along and within the streams and wetlands on site shall be carried out in conformance with this plan, the drawings and specifications and in accordance with the provisions of the TDEC General Permits, and individual Aquatic Resource Alteration Permits. The subcontractor performing the work shall be provided copies of the applicable permit regulations and shall comply with the provisions of such.

3.1 Inspections

Qualified personnel shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, structural control measures, and locations where vehicles enter or exit the site at least once every seven calendar days and within 24 hours of the end of a storm that is 0.5 inch or greater of total precipitation within a 24-hour period. In periods of prolonged rainfall, daily checking and repairing is necessary. Any erosion control feature that has collected an amount of sediment that would render it ineffective in the next storm event should be cleaned completely and returned to full capacity. Each inspection should be documented.

3.1.1 Pollutants

Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the plan shall be observed to ensure they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.

The amount of material that is eroding from the upper areas of the site should be reduced to the maximum extent possible. This can be accomplished with interior sediment traps, silt fences, and in general grading with an eye toward the direction of runoff on the interior of the site. To the maximum extent possible runoff should be directed to the south such that it is routed through the Stormwater Detention Pond to White Oak Creek and not to the north and Bear Creek.

3.1.2 Plan Revisions

If the inspection shows that the planned measures are not effectively preventing pollution, changes to sediment and erosion controls to minimize the discharge at sediment from the site will be implemented as soon as practicable. This plan shall be revised or amended no later than fifteen calendar days following the inspection.

3.1.3 Reports

A specific individual shall be designated to be responsible for erosion and sediment controls on the site. An example inspection report summarizing the scope of an inspection is provided in Appendix 3. Each inspection performed shall be made and retained as part of the stormwater plan for at least three years from the date that the site is finally stabilized. At a minimum the inspection report shall contain name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the stormwater pollution prevention plan, and actions taken in accordance with Section 3.1. Such reports shall identify any incidents of non-compliance and corrective actions taken. Where a report does not identify any incidents of non-compliance, the report shall contain evidence that the facility is in compliance with the stormwater plan. The report shall be signed by the individual responsible for erosion and sediment controls and the Project Superintendent or his appointed representative.

3.1.4 Right of Entry

The Director of TDEC, Regional Administrator of the U.S. EPA, or their authorized representatives, with notification prior to entry and upon presentation of credentials shall have the right to:

1. Enter on the site or where inspection records are kept and at reasonable times copy these records;

2. Inspect at reasonable times any monitoring equipment or method of collection, treatment, pollution management or discharge facilities; and

3. Sample at reasonable times any discharge of pollutants.

3.2 Stormwater Management Measures

Stormwater will be managed as outlined in this document and on drawings produced for Pre-Construction Activities. Stormwater will be managed according to the engineering drawings and specifications for the various construction packages. A listing of the drawings by construction package can be found in Appendix 1.

A series of sketches have been developed that address in detail various components of the erosion control effort. The sketches are as follows:

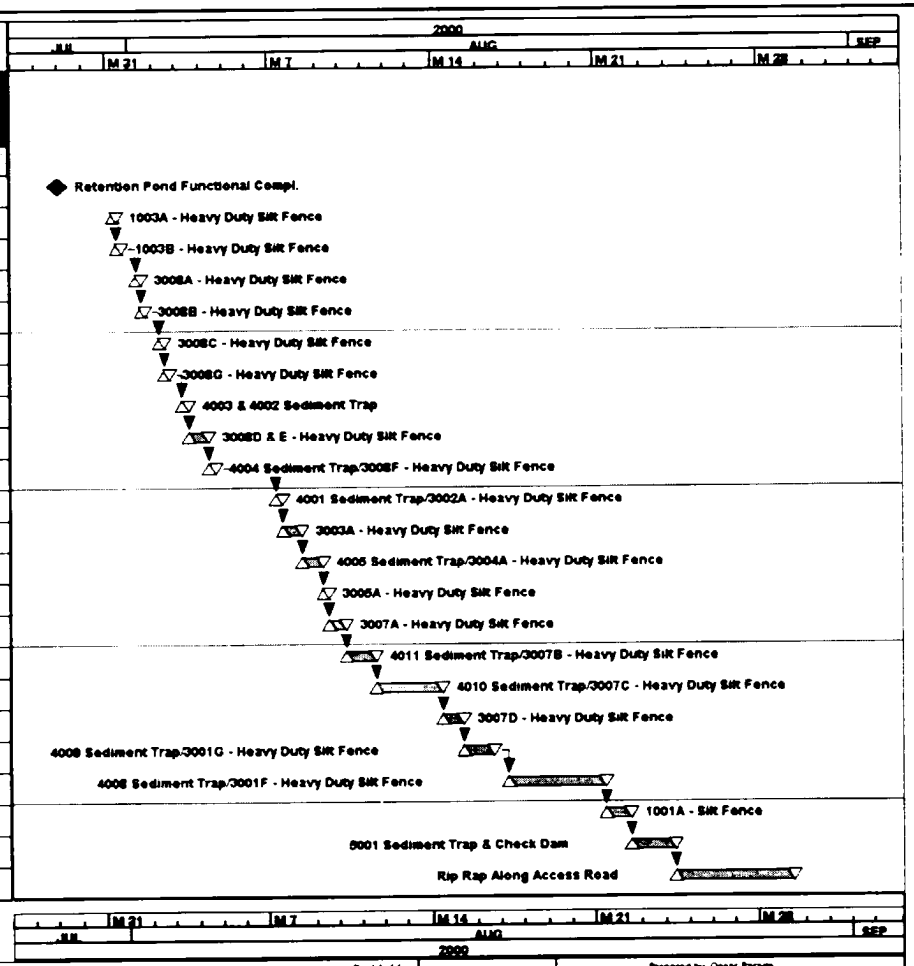
Sketch Number	Title
C.SK.004	Erosion Control Measures - Existing Conditions
C.SK.005	Erosion Control Measures - Proposed Modifications and Additions
C.SK.006	Erosion Control Sediment Ponds
C.SK.008	Erosion Control Measures - Existing Conditions
C.SK.060	Erosion Control Measures – Proposed Seeding Schedule

The sketches include several new and modified measures designed to improve erosion control on the site.

Figure 3 shows a schedule for providing implementation of the new erosion control measures and seeding. They also reflect a new provision of the plan designed to facilitate inspections and reporting. Designated, pre-identified, problematic areas will be assigned an identifying number. These features will be marked in the field with the number placed on a carsonite marker. This will make it much easier to inspect and maintain these features.

Construction Site Stormwater Control & Pollution Prevention Plan: Erosion Control Measures

Activity ID	Activity Description	Hours	Early Start	Early Finish
INITIAL SITE				
CFCNEC144	Retention Pond Functional Compl.	0		28JUL00
CFCNEC100	1003A - Heavy Duty Silt Fence	5	31JUL00	31JUL00
CFCNEC102	1003B - Heavy Duty Silt Fence	5	31JUL00	31JUL00
CFCNEC104	3008A - Heavy Duty Silt Fence	5	01AUG00	01AUG00
CFCNEC106	3008B - Heavy Duty Silt Fence	5	01AUG00	01AUG00
CFCNEC108	3008C - Heavy Duty Silt Fence	5	02AUG00	02AUG00
CFCNEC110	3008G - Heavy Duty Silt Fence	5	02AUG00	02AUG00
CFCNEC112	4003 & 4002 Sediment Trap	6	03AUG00	03AUG00
CFCNEC114	3008D & E - Heavy Duty Silt Fence	6	03AUG00	04AUG00
CFCNEC116	4004 Sediment Trap/3008F - Heavy Duty Silt	8	04AUG00	04AUG00
CFCNEC118	4001 Sediment Trap/3002A - Heavy Duty Silt	8	07AUG00	07AUG00
CFCNEC120	3003A - Heavy Duty Silt Fence	5	07AUG00	08AUG00
CFCNEC122	4005 Sediment Trap/3004A - Heavy Duty Silt	8	08AUG00	09AUG00
CFCNEC124	3005A - Heavy Duty Silt Fence	5	09AUG00	09AUG00
CFCNEC150	3007A - Heavy Duty Silt Fence	5	09AUG00	10AUG00
CFCNEC126	4011 Sediment Trap/3007B - Heavy Duty Silt	16	10AUG00	11AUG00
CFCNEC128	4010 Sediment Trap/3007C - Heavy Duty Silt	8	11AUG00	14AUG00
CFCNEC130	3007D - Heavy Duty Silt Fence	8	14AUG00	15AUG00
CFCNEC132	4009 Sediment Trap/3001G - Heavy Duty Silt	17	15AUG00	16AUG00
CFCNEC134	4008 Sediment Trap/3001F - Heavy Duty Silt	24	17AUG00	21AUG00
CFCNEC136	1001A - Silt Fence	12	21AUG00	22AUG00
CFCNEC138	5001 Sediment Trap & Check Dam	17	22AUG00	24AUG00
CFCNEC140	Rip Rap Along Access Road	32	24AUG00	29AUG00



Project Start 01MAY00 00:00
Project Finish 25AUG00 11:59
Data Date 24JUL00 00:00
Run Date 31JUL00 10:00

Early Bar
Progress Bar

SNS Conventional Facilities
Figure 3 Erosion Control Measures
Implementation Schedule

Prepared by: Oscar Parada

Date	Revision	Checked	Approved

SPALLATION NEUTRON SOURCE EROSION CONTROL MEASURES

Figure 3

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PREPARED BY: BARGE, WAGGONER, SUMNER AND CANNON, INC.

3.3 Erosion and Sediment Control Measures

3.3.1 Project Sequencing

Soil erosion and sedimentation control measures shall be installed prior to any construction activities taking place, except those construction activities necessary to install such measures and except for those measures as defined in amendment one of this plan, and shall be fully operational during construction. Vegetative ground cover is not to be destroyed, removed, or disturbed more than 20 calendar days before grading or earth moving.

Temporary measures may be removed at the beginning of the workday, but must be replaced at the end of the workday, or at such time as work is halted by rain.

All soil erosion and sedimentation control measures shall be installed in accordance with the project drawings, specifications, and all applicable local, state and federal codes.

Temporary silt fences, hay bales, and sediment detention basins will be located and installed as designated on the drawings referenced in Section 3.2 and in the technical specifications called out in Appendix 1, specifically Section 01568, to detain sediment within the project boundaries. Erosion control devices shall be maintained during all phases of construction.

All areas shall be established with vegetative cover as soon as practicable, with permanent or temporary vegetative cover within 14 days after construction completion. To the extent feasible, appropriate cover shall be applied within seven days on areas that will remain unfinished for more than 30 calendar days. Examples of cover are grass, sod, straw, mulch, fabric mats, etc.

Muddy water to be pumped from excavation and work areas shall be held in settling basins or treated by filtration prior to discharge into surface waters. Water must be discharged through a pipe or lined channel so that the discharge does not cause erosion and sedimentation.

3.3.2 Storm Water Detention Pond

The primary erosion control feature for the areas of the site that drain to White Oak Creek is the storm water detention pond. The pond is located above the headwaters of White Oak Creek as shown on Figure 2. The stormwater detention pond detention performs three functions.

1. When the SNS facility is in operation the pond retains plant-cooling water such that the temperature of the water can reach ambient. The water is then discharged some 4,000 feet below the pond containment to White Oak Creek. The discharge point is below the White Oak Creek headwaters monitoring station.

2. When completed the pond will control the rate at which stormwater is released for the site to White Oak Creek. The pond is designed to reduce the 25-year post-development storm flow to below the rate of the 10-year pre-development flow rate.

3. During construction the pond is configured to function as a sediment pond for approximately 85% of the SNS site. It is imperative that the trapping ability of the pond be maintained during construction by monitoring and removing sediment as it accumulates in the pond.

Full operation of the storm water detention pond is scheduled for not later than September 02, 2000. The storm water detention pond was functionally complete on July 28, 2000.

3.4 Final Stabilization

All disturbed areas shall be established with vegetative cover as soon as practicable, with permanent or temporary vegetative cover within 14 days after construction completion. To the maximum extent feasible, appropriate cover shall be applied within seven days on areas that will remain unfinished for more than 30 calendar days. Examples of cover are grass, sod, straw, mulch, fabric mats, etc. Sediment that has departed the site will be stabilized in place and natural vegetation will be allowed to become established as the final stabilization methodology. Drawing C.SK.060 (Erosion Control Measures – Proposed Planting Schedule) indicates the proposed schedule for providing permanent and temporary cover for the site.

3.4.1 Permanent Vegetative Cover

Establishing permanent vegetative cover will be accomplished by seeding with Kentucky 31 Fescue or equivalent at an appropriate rate.

3.4.2 Temporary Vegetative Cover

Establishing temporary vegetative cover will be accomplished by seeding with Annual Ryegrass or equivalent at an appropriate rate.

4.0 CONSTRUCTION SCHEDULE AND SEQUENCING

Listed in Table 1 is the current construction schedule for the SNS project. All dates are subject to change based on a variety of conditions, including but not limited to weather and funding limitations. For temporary vegetative cover, refer toC.SK.060.

Activity	Start Date	Completion Date	Date Soil Erosion Measures are in Place	Final Vegetative Cover
Bear Creek Access Construction	11/16/99	03/30/00	11/23/99	03/30/00
Bethel Valley and Water Line	03/30/00	09/27/00	04/10/00	10/06/00
Initial Site Preparation	04/15/00	11/20/00	04/30/00	12/04/00
Detention Pond	06/25/00	12/09/00	06/26/00	11/24/00
Final Site Grading and Landscaping	6/15/00	03/30/04	06/30/01	10/10/03

*Table Revised 7/31/2000

Table 1 – Seeding Schedule

Areas of active cut and fill are indicated as clearing limit boundaries and toe of slope depictions on C.SK.005.

4.1 Record Keeping and Reporting

Records of checks and repairs will be maintained on site.

Records and information resulting from the monitoring activities and this plan will be retained for a minimum of 3 years, or longer if requested by TDEC Division of Water

Pollution Control.

Discharges that cause emergencies are required to be reported within 24-hours. Regarding reporting of emergencies:

> In the case of any discharge which would cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice shall be provided to the appropriate Division field office within [as soon as possible and not more than] 24 hours from the time the discharger becomes aware of the circumstances. (The field office should be contacted for names and phone numbers of emergency response personnel.) A written submission must be provided within five days of the time the discharger becomes aware of the circumstances unless this requirement is waived by the Director on a case-by-case basis. The discharger shall provide the Director with the following information:
>
> 1. A description of the discharge;
> 2. The period of discharge, including exact dates and times or, if not corrected, the anticipated time the discharge is expected to continue; and
> 3. The steps being taken to reduce, eliminate, and prevent recurrence of the discharge.
>
> Adverse Impact: The discharger shall take all reasonable steps to minimize any adverse impact to the waters of Tennessee, including such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge. It shall not be a defense for the discharger in an enforcement action that it would have been necessary to halt or reduce the construction activity in order to maintain compliance.

The Contractor shall contact the field office at (865) 594-6035 to obtain the name and phone numbers of TDEC emergency response personnel. A written submission must be provided to the Director within five days.

5.0 SUMMARY AND CONCLUSION

This environmental protection plan is prepared in compliance with the provisions of drawings and specifications, latest revisions, for the S21A, S21B, S25A, and S25B Construction Packages. The plan recognizes the importance of sediment migration and control. Stormwater runoff and sedimentation control will be accomplished through the following:

- Minimizing the size of the disturbed areas,

- Filtering the runoff from the disturbed areas through silt fence, temporary sediment traps and check bales,
- Enhanced inspection and reporting tools and
- Stabilizing all disturbed areas.

Stormwater management and erosion control structures will be maintained during construction activities and for the entire project duration. The structures are specifically designed to minimize the amount of soil which may migrate from the site. It is concluded that the plan, as developed, revised, and amended will be an effective means of controlling erosion.

APPENDIX 1

CONSTRUCTION PACKAGE DESCRIPTIONS

1.0 Pre-Construction

1.1 Construction of Temporary Roads

Land will be disturbed and temporary roads will be constructed to access portions of the site for geophysical explorations. This work began in November 1999.

Other temporary roads (logging roads, etc.) will also be covered under this plan provided that erosion control measures are developed and implemented for those activities, and the temporary roads and associated erosion control measures are included on the drawings associated with this plan.

Timber Harvesting

Harvesting of merchantable timber will take place in conjunction with some of the activities conducted by the management contractor for ORNL. Other timber harvesting will take place separate from and in advance of clearing and grubbing phases conducted by Knight Jacobs or their subcontractors. In some instances, Knight Jacobs or their subcontractors may remove trees and store them on-site for later removal by a separate timber contractor. Some of these activities started in October 1999 and others will start later depending on the Knight Jacobs schedule for other phases of construction.

Inclusion of Other Activities

Other minor activities may be conducted on the site by the management contractor for ORNL which are similar in scale to those mentioned above but which are not specifically mentioned. These activities may be conducted under this plan, provided that sediment and erosion control, and stormwater management controls are developed in accordance with this plan, and as long as these activities, along with their associated erosion controls, are documented on the drawings associated with this plan.

2.0 Bear Creek Access Road, Construction Package S21A

2.1 Description

The construction activity consists of the clearing and grubbing of presently undisturbed land, rough grading for the access road, construction of temporary and permanent erosion control devices, installation of drainage structures, and paving and permanent stabilization of disturbed areas for the Bear Creek Access Road.

There will be cuts and fills along the entire roadway. The necessary fill material for the roadway will be taken from cut sections along the same roadway. No fill material will be brought in from off-site.

2.2 Drawings

Drawings for this package include C500.01-C500.03 and C6.00.01-C6.00.14, prepared by Barge, Waggoner, Sumner and Cannon, Inc., original issue for construction on November 8, 1999.

3.0 Bethel Valley Access Road and 24" Water Line, Construction Package S21B

3.1 Description

The Bethel Valley Access Road extends from Bethel Valley Road to the SNS site. The construction activity will include clearing and grubbing of presently undisturbed land, rough grading for the access road, construction of temporary and permanent erosion control devices, installation of drainage structures, and paving and permanent stabilization of disturbed areas for the Access Road. There will be cuts and fills along the entire roadway. The necessary fill material for the roadway will be taken from cut sections along the same roadway. No fill material will be brought in from off-site.

The 24" Water Line will install approximately 3,100 linear feet of new 24" water line to replace an existing section of line that will be destroyed by SNS site construction. The work will include installation of temporary erosion control measures, clearing of a linear corridor approximately 25' in width, excavation and backfill of the water line trench and establishment of permanent vegetative cover. There will be no new impervious surface as a result of this activity.

3.2 Drawings

Drawings for both of these packages were prepared by Barge, Waggoner, Sumner and Cannon, Inc. The Bethel Valley Access Road drawings include drawings C0.04.01-.03, C5.04.01-.08, and C6.04.01-.65, original issue for construction on February 2, 2000. The 24" water line package includes drawings UWA.0.01-.03, UWA2.01-.02 and UWT.6.01-.02.

4.0 Initial Site Preparation, Construction Package S25A

4.1 Description

This phase of the work includes the mass grading activities on the core site to bring the site elevations for buildings to a point that foundation and building construction can take place. It brings to subgrade elevation the parking areas and main access

roads around the site, places base stone on these roads to facilitate construction access, stockpiles soil for covering the accelerator tunnel with 17' of earth once its construction is complete, and builds the construction support facilities area. In addition, gas and sanitary sewer service is brought to the site from Bethel Valley Road. The permanent stormwater retention/detention facilities are constructed along with an outfall pipe from the pond to a discharge point just north of Bethel Valley Road into White Oak Creek. Additional work includes the installation of other process utility yard piping and primary electrical ductbanks.

The work also includes the installation of temporary and permanent erosion control measures on the core site. Permanent stabilization of all cut and fill slopes that will not be disturbed by future construction will take place during this phase of construction.

4.2 Drawings

Drawings for this construction package were prepared by Barge, Waggoner, Sumner and Cannon, Inc. Drawing numbers are as follows: C0.08.01 – 03; C1.08.01; C3.08 series for Blocks F3 – 5, G3 – 5, H3 – 6, J3 – 6, D4 – 5, E4 – 5, K4 – 5; C4.08.01 – 02; U0.08.01 – 02; UNG2.08.01 – 03; UNG 6.08.01; USS 2.08.01 – 06; USS 6.08.01 – 03; UWT 1.08.01; UWT6.08.01; UEL.3.61.D4 – G4; UEL.6.61.01; UEL.3.61.E4 – G4; UEL.5.61.01; and UEL.6.61.01.

5.0 Stormwater Detention Pond, Construction Package S25B

5.1 Description

The work on the stormwater detention/retention pond includes excavation, erosion control, storm drainage, and landscaping for the construction of the pond, dam, and outlet structures, and the installation of an outfall pipe from the pond to a point just south of Bethel Valley Road.

5.2 Drawings

Drawings for this construction package were prepared by Barge, Waggoner, Sumner and Cannon, Inc. Drawing numbers are as follows: C010.01 – .03; C3.10.E6; C3.10.01 – .03; C4.10.01 – 02; L0.10.01; L.10.E6; and L5.10.01.

APPENDIX 2

STORMWATER RUNOFF CALCULATIONS

BY ANW DATE 10/99 SUBJECT SNS - Stormwater SHEET NO. ____ OF ____
CHKD. BY ____ DATE ____ JOB NO. ____

Note: Find the runoff associated with a 1" SCS Storm event at the SNS Site

Assume: ① Pre-Development Curve Number CN = 70 (Woods)
② Post-Development Curve Number CN = 86 (Grass)
③ Post-Development Curve Number CN = 98 (Pavement)

Methodology: Calculate runoff of representative areas then apply factors to watershed area.

① Woods - 0.0004 $\frac{AF}{AC}$
② Grass - 0.0165 $\frac{AF}{AC}$
③ Paved Area - 0.0659 $\frac{AF}{AC}$

I SNS Site (West Area)

Pre-Development; $V = \overset{\text{Area}}{115}(.0004) = 0.046$ AF

Pos-Development;

Roof Area	- 5.18 A
Paved Area	- 13.00 A
Other	- 1.31 A
	19.49 A

Disturbed Area 58 A ∴

Grass - 58 - 19.49 = 38.51 A
Woods - 139 - 38.51 - 19.49 = 81 A
└ Post Area

$V = 81(.0004) + 19.49(.0659) + 38.51(.0165)$

$V = 1.95$ AF

II SNS SITE (East Area)

Pre-Development

$V = 95(.0004) = 0.038$ AF

Post-Development

Woods — grass area

* $V = 67(.0004) + 10(0.0165)$

$V = 0.19$ AC

* Total post area 77

III Bear Creek Access

Disturbed Area — 6.0 A
Paved & Gravel — 2.5 A
Total Watershed Area — 99.6 A

Grass Area = 6.0 - 2.5 = 3.5 A

$V = 93.6(.0004) + 3.5(.0165) + 2.5(.0659)$

$V = 0.26$ AF

Pre: Hydrograph

Input Summary

Total Rainfall	1	(in)	Curve Number	Watershed Area	100 (ac)
Total Duration	24	(hrs)	70	Time of Conc	0.8 (hrs)

Results Summary

Peak Flow Rate:	.07	(cfs)	Total Runoff Volume:	.04	(ac-ft)
Time to Peak:	23.97	(hrs)	Runoff began after:	.86	(in)
Time Runoff Began:	15.12	(hrs)	Max Rainfall Rate:	1.15	(in/hr)

OK

Print

Pre: Hydrograph

Input Summary

Total Rainfall	1	(in)	Curve Number	Watershed Area	100 (ac)
Total Duration	24	(hrs)	86	Time of Conc	0.8 (hrs)

Results Summary

Peak Flow Rate:	9.31 (cfs)	Total Runoff Volume:	1.65 (ac-ft)
Time to Peak:	12.47 (hrs)	Runoff began after:	.33 (in)
Time Runoff Began:	11.62 (hrs)	Max Rainfall Rate:	1.15 (in/hr)

OK

Print

Pre: Hydrograph

Input Summary

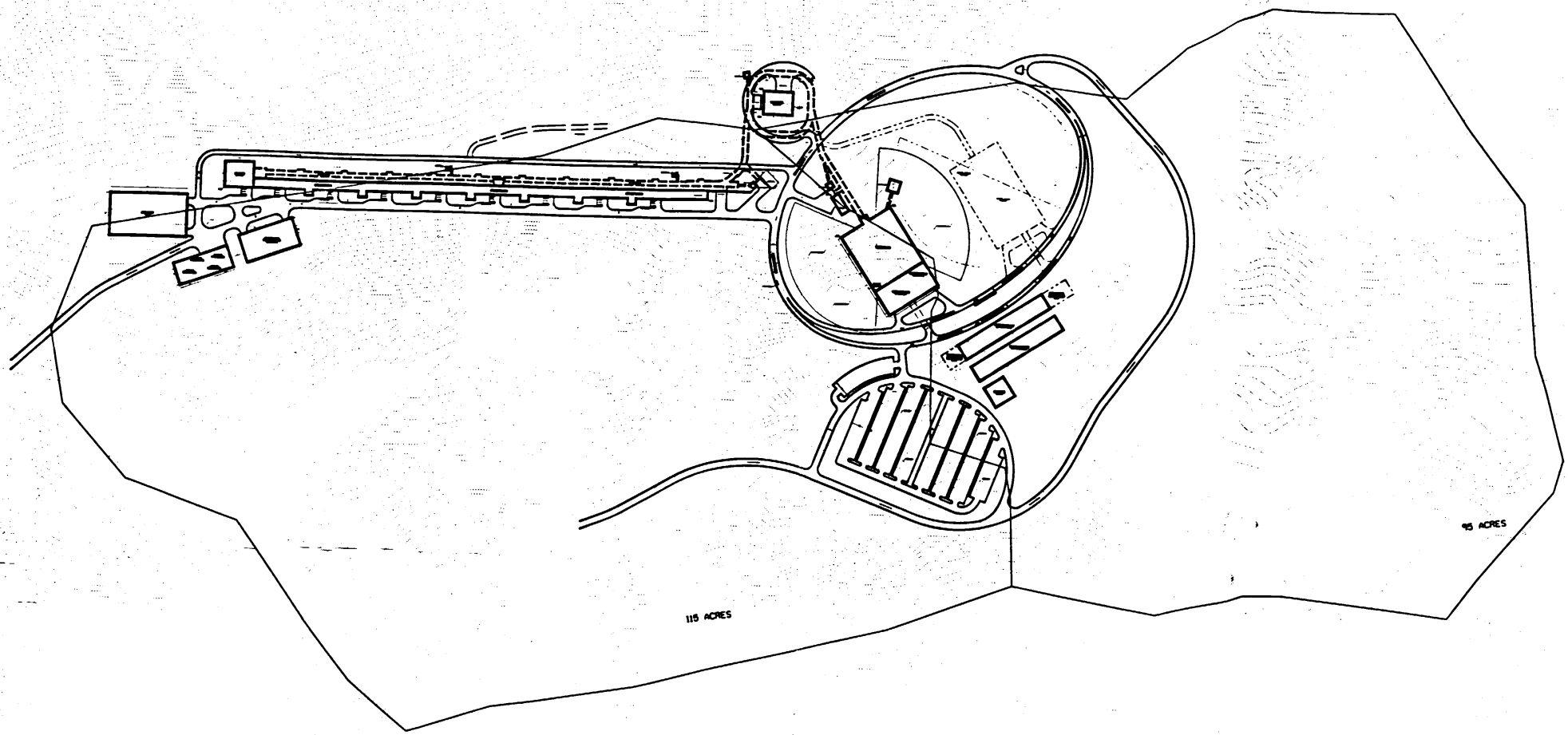
Total Rainfall	1 (in)	Curve Number	Watershed Area	100	(ac)
Total Duration	24 (hrs)	98	Time of Conc	0.8	(hrs)

Results Summary

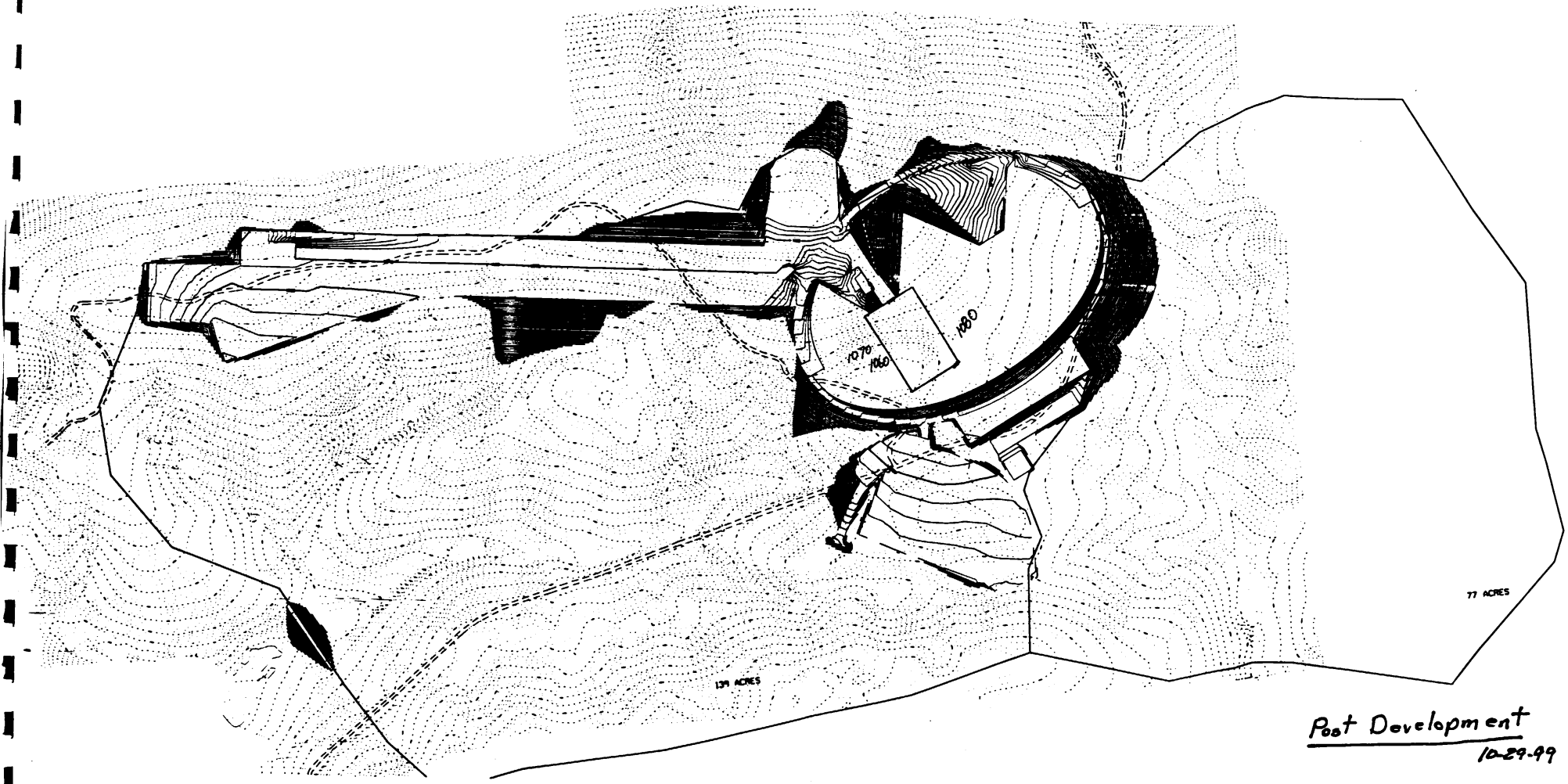
Peak Flow Rate:	47.18	(cfs)	Total Runoff Volume:	6.59	(ac-ft)
Time to Peak:	12.31	(hrs)	Runoff began after:	.04	(in)
Time Runoff Began:	3.46	(hrs)	Max Rainfall Rate:	1.15	(in/hr)

OK

Print



Pre-Development
10-29-99



Post Development
10-29-99

SNS BETHEL VALLEY ACCESS ROAD

TOTAL DISTURBED AREA = 21.5 ac (WOODS) RCN = 70
TOTAL PAVED AREA = 5.1 ac RCN = 98
TOTAL GRASSED AREA = 16.4 ac RCN = 74

RUNOFF FACTORS

WOODS — 0.0004 AF/AC
GRASS — 0.0165 AF/AC
PAVED — 0.0659 AF/AC

PRE-DEVELOPMENT RUNOFF (DISTURBED AREA)

21.5 AC × 0.0004 AF/AC = 0.0086 AF

POST-DEVELOPMENT RUNOFF (DISTURBED AREA)

GRASS	16.4 AC × 0.0165 AF/AC	=	0.2706 AF
PAVED	5.1 AC × 0.0659 AF/AC	=	0.3361 AF
	21.5 AC		0.6067 AF

INCREASE IN RUNOFF DUE TO ROAD CONSTRUCTION (DISTURBED AREA ONLY)

POST-DEVELOPMENT — PREDEVELOPMENT

0.6067 − 0.0086 = 0.5981 AF

APPENDIX 3

CONSTRUCTION SITE EROSION CONTROL MEASURES INSPECTION FORM

All sediment and erosion control measures must be checked weekly in dry periods, and within 24 hours after any rainfall of 0.5 inches or greater within a 24-hour period. Repairs must be made promptly. During prolonged periods of rainfall, daily checking and repairing is required. Records of these checks and repairs must be maintained.

PROJECT: Spallation Neutron Source INSPECTED BY: _____ INSPECTION DATE: ___ / ___ / ____

QUESTIONS	YES	NO	NA	COMMENTS
Are ***silt fencing and hay bales*** in good condition (remaining sediment trapping capacity; no signs of undercutting or bypassing; materials, including bale bindings in good shape)?				
Are ***previously planted and mulched areas*** in good condition (i.e., no replanting or re-mulching is necessary)?				
If ***stored materials*** that can contaminate stormwater (oil, hazardous materials, bulk solids, etc.) are on site, are those materials stored properly?				
Are ***spill kits*** available (for stored materials, vehicles, etc.)?				
Are ***streams and wetlands*** free of significant deposits of construction-derived sediment and debris?				
Are ***wet-weather conveyances*** free of heavy sediment accumulation and accelerated erosion?				
Are ***construction site run-on*** controls (berms, channels, sediment traps, etc.) in good condition and effective?				
Are ***sediment basins and traps*** in good condition (adequate remaining capacity, inlets and discharges are free of debris, no erosion of dams or at points of discharge , etc.)?				
Are ***culverts and stormwater inlets*** free of debris?				
Are areas that have been or will be **unfinished for more than 30 days** stabilized with vegetative cover, mulch, etc.?				
Have ***completed phases*** of construction and areas that have reached ***final grade*** been stabilized with perennial vegetation?				
Is the degree of ***clearing and grubbing minimized***?				

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All sediment and erosion control measures must be checked weekly in dry periods, and within 24 hours after any rainfall of 0.5 inches or greater within a 24-hour period. Repairs must be made promptly. During prolonged periods of rainfall, daily checking and repairing is required. Records of these checks and repairs must be maintained.

PROJECT: Spallation Neutron Source INSPECTED BY: _____ INSPECTION DATE: ___ / ___ / ____

QUESTIONS	YES	NO	NA	COMMENTS
Are ***ingress and egress points*** to the site in good condition (significant amounts of sediment are not being tracked off site).				
Is timber harvesting being conducted according to ***forestry BMPs***?				
Are erosion controls on the site adequate (are the erosion control measures that are in place doing the job)?				
If stormwater discharges are present during the inspection, are they free of ***distinctly visible floating scum, oil or other matter***?				
If stormwater discharges are present during the inspection, is the receiving stream free from ***objectionable color contrasts*** (caused by the construction-related discharges)?				

APPENDIX 3

CONSTRUCTION SITE EROSION CONTROL MEASURES INSPECTION FORM

All sediment and erosion control measures must be checked weekly in dry periods, and within 24 hours after any rainfall of 0.5 inches or greater within a 24-hour period. Repairs must be made promptly. During prolonged periods of rainfall, daily checking and repairing is required. Records of these checks and repairs must be maintained.

PROJECT: Spallation Neutron Source INSPECTED BY: _____ INSPECTION DATE: ___ / ___ / ____

QUESTIONS	YES	NO	NA	COMMENTS
ADDITIONAL COMMENTS				

APPENDIX 4

CERTIFICATION AND APPROVAL
Construction Package S21A - Bear Creek Access Road

The undersigned Developer hereby certifies that the undersigned Contractor has been retained to perform the construction activities described in this plan and in the referenced drawings and specifications. Further, we the undersigned Developer and Contractor for the above referenced project, certify that we understand the terms and conditions of Rule 1200-4-10-.05 and hereby approve this plan and acknowledge that it is workable, and meets the requirements of this rule.

For The Developer:

By: Michele G. Branton DGB

Printed Name: Michele G. Branton

Title: Acting Deputy Manager for Operations

Company: U.S. Department of Energy

Date: May 9, 2000

For The Contractor:

By: Frank C Kornegay

Printed Name: Frank C. Kornegay

Title: Manager, Environment, Safety, and Health

Company: Spallation Neutron Source Project

Date: May 8, 2000

CERTIFICATION AND APPROVAL
Construction Package S21B - Bethel Valley Access Road & 24" Water Line

The undersigned Developer hereby certifies that the undersigned Contractor has been retained to perform the construction activities described in this plan and in the referenced drawings and specifications. Further, we the undersigned Developer and Contractor for the above referenced project, certify that we understand the terms and conditions of Rule 1200-4-10-.05 and hereby approve this plan and acknowledge that it is workable, and meets the requirements of this rule.

For The Developer:

By: Michele G. Branton MGB

Printed Name: Michele G. Branton

Title: Acting Deputy Manager for Operations

Company: U.S. Department of Energy

Date: May 9, 2000

For The Contractor:

By: Frank C Kornegay

Printed Name: Frank C. Kornegay

Title: Manager, Environment, Safety, and Health

Company: Spallation Neutron Source Project

Date: May 8, 2000

CERTIFICATION AND APPROVAL
Construction Package S25A - Initial Site Preparation

The undersigned Developer hereby certifies that the undersigned Contractor has been retained to perform the construction activities described in this plan and in the referenced drawings and specifications. Further, we the undersigned Developer and Contractor for the above referenced project, certify that we understand the terms and conditions of Rule 1200-4-10-.05 and hereby approve this plan and acknowledge that it is workable, and meets the requirements of this rule.

For The Developer:

By: Michele G. Branton

Printed Name: Michele G. Branton

Title: Acting Deputy Manager for Operations

Company: U.S. Department of Energy

Date: May 9, 2000

For The Contractor:

By: Frank C Kornegay

Printed Name: Frank C. Kornegay

Title: Manager, Environment, Safety, and Health

Company: Spallation Neutron Source Project

Date: May 8, 2000

CERTIFICATION AND APPROVAL
Construction Package S25B - Storm Water Detention Pond

The undersigned Developer hereby certifies that the undersigned Contractor has been retained to perform the construction activities described in this plan and in the referenced drawings and specifications. Further, we the undersigned Developer and Contractor for the above referenced project, certify that we understand the terms and conditions of Rule 1200-4-10-.05 and hereby approve this plan and acknowledge that it is workable, and meets the requirements of this rule.

For The Developer:

By: Michele G. Branton

Printed Name: Michele G. Branton

Title: Acting Deputy Manager for Operations

Company: U.S. Department of Energy

Date: May 9, 2000

For The Contractor:

By: Frank C Kornegay

Printed Name: Frank C. Kornegay

Title: Manager, Environment, Safety, and Health

Company: Spallation Neutron Source Project

Date: May 8, 2000

APPENDIX 5

CONTRACTOR'S SIGNATURE FORM
Construction Package S21A - Bear Creek Access Road

I, the undersigned Contractor for the above referenced project, understand the terms and conditions of Rule 1200-4-10-.05 and that I, and my company, as the case may be, are responsible for and legally liable for complying with this and the applicable state and federal laws. I understand the State of Tennessee or EPA or private actions may be taken against me if the terms and conditions of the Rule are not met.

By: Mitch Carpenter

Printed Name: Mitch Carpenter

Title: Site Manager

Company: Avisco, Inc.

Date: 1/6/00

CONTRACTOR'S SIGNATURE FORM
Construction Package S21B – Bethel Valley Access Road & 24" Water Main

I, the undersigned Contractor for the above referenced project, understand the terms and conditions of Rule 1200-4-10-.05 and that I, and my company, as the case may be, are responsible for and legally liable for complying with this and the applicable state and federal laws. I understand the State of Tennessee or EPA or private actions may be taken against me if the terms and conditions of the Rule are not met.

By: Henry T Perry

Printed Name: HENRY T PERRY

Title: Joint Venture Partner

Company: HME/ETMC

Date: 7/28/00

CONTRACTOR'S SIGNATURE FORM
Construction Package S25A – Initial.Site Preparation

I, the undersigned Contractor for the above referenced project, understand the terms and conditions of Rule 1200-4-10-.05 and that I, and my company, as the case may be, are responsible for and legally liable for complying with this and the applicable state and federal laws. I understand the State of Tennessee or EPA or private actions may be taken against me if the terms and conditions of the Rule are not met.

By: Mitch Carpenter

Printed Name: Mitch Carpenter

Title: Site Manager

Company: Avisco, Inc.

Date: 4/28/00

CONTRACTOR'S SIGNATURE FORM
Construction Package S25B – Storm Water Detention Pond

I, the undersigned Contractor for the above referenced project, understand the terms and conditions of Rule 1200-4-10-.05 and that I, and my company, as the case may be, are responsible for and legally liable for complying with this and the applicable state and federal laws. I understand the State of Tennessee or EPA or private actions may be taken against me if the terms and conditions of the Rule are not met.

By: William J Conner

Printed Name: William J Conner JR

Title: Vice Pres.

Company: Conner Bros Exp. Co Inc.

Date: 6/5/00