APPENDIX H.1
INTRODUCTION AND GENERAL DESCRIPTION OF INSTALLATION CANISTERIZED GTCC WASTE

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H.1 INTRODUCTION AND GENERAL DESCRIPTION OF INSTALLATION

H.1.1 Introduction

Consistent with Chapter 1 of this SAR, the WCS CISF is intended to provide dry storage capacity for commercial spent nuclear fuel (SNF) and Greater-than-Class C (GTCC) waste contained in a dual-purpose (transportation/storage) cask and canister. This Appendix describes GTCC waste storage at the WCS CISF in both NUHOMS® and VCC storage overpacks. An overview of the CISF and the Storage Overpacks is provided in Chapter 1 of this SAR.

This Appendix demonstrates compliance with the requirements of the site-specific license provisions of 10 CFR 72.6 and follows the guidance in ISG-17 [H.1-1] regarding the GTCC waste storage program at the WCS CISF. Specifically, the GTCC waste storage program described here ensures that (1) adequate protective measures are in place to confirm safe storage within the WCS CISF, (2) the co-location of GTCC waste does not have an adverse effect on the safe storage of SNF and the safe operation of the WCS CISF, and (3) the storage of GTCC waste will not have an adverse effect on public health and safety, and the environment.

The GTCC wastes, as stored at the WCS CISF, are (1) only reactor-related, (2) in solid form, and (3) stored in a separate container (i.e., GTCC waste is not stored in a cask that also contains SNF).

GTCC waste containers contain solid reactor-related waste only, consisting of activated reactor vessel internals and other in-core instrumentation. A description and characterization of the GTCC waste is provided in Appendix H.7 and Section H.3.1.1. There is no liquid or process GTCC waste stored at the WCS CISF.

The external characteristics of the GTCC canister are similar, if not identical, to those of the SNF canisters and the GTCC canisters are to be stored in the same storage overpacks as the SNF canisters. To the extent possible, the same procedures and individuals with the same training and qualifications as those used in SNF transfer operations are used. The organization, programs, and protective measures in place to ensure safe storage of the SNF remain in place to ensure continued safe storage of the canisterized SNF and the canisterized GTCC waste.

Storage of canisterized GTCC waste at the WCS CISF has no adverse effect on the safe storage of the SNF and safe operation of the WCS CISF. The storage of the canisterized GTCC waste has no adverse effect on public health and safety or the environment.

H.1.1.1 Principal Functions of the Installation

In addition to the storage of canisterized SNF assemblies, the WCS CISF design provides temporary dry storage for canisterized GTCC waste. The WCS CISF is designed for dry transfer operations.

H.1.2 General Description of the Installation

A general description of the installation is provided in Section 1.2 of this SAR.

H.1.2.1 GTCC Waste Canisters

The GTCC waste canisters are high integrity stainless steel, welded vessels that provide confinement of radioactive materials, encapsulates the waste in an inert atmosphere, and provides biological shielding (in the axial directions) during canister transfer and storage. It provides full canisterization for the GTCC waste during transfer and storage in the storage overpacks. The GTCC waste canisters are stored within the WCS CISF boundaries. The design requirements and design descriptions for the authorized canisters are provided in Appendices H.3 and H.4.

H.1.3 General System Description

H.1.3.1 Storage Systems

The Storage Systems authorized for storage at the WCS CISF are described in Sections 1.2.4.1 and 1.3 and are listed in Table 1-1 of this SAR.

H.1.3.2 Transfer System

The Transfer Systems authorized for use at the WCS CISF are described in Section 1.3.1 of this SAR.

H.1.4 Identification of Agents and Contractors

See Section 1.5 of this SAR.

H.1.5 Material Incorporated by Reference

See Section 1.6 of this SAR.

H.1.6 References

H.1-1 Spent Fuel Project Office Interim Staff Guidance–17 "Interim Storage of Greater Than Class C Waste."

APPENDIX H.2
SITE CHARACTERISTICS
CANISTERIZED GTCC WASTE

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H.2 SITE CHARACTERISTICS

See Chapter 2 of this SAR.

APPENDIX H.3
PRINCIPAL DESIGN CRITERIA
CANISTERIZED GTCC WASTE

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H.3 PRINCIPAL DESIGN CRITERIA

This section describes the principal design criteria, which are unique to the canisterized GTCC waste storage program at the WCS CISF. The design criteria for the WCS CISF are presented in Chapter 3 of this SAR.

H.3.1 Purpose of Installation

In addition to the SNF storage, the WCS CISF is designed to provide interim storage for canisterized GTCC waste.

The transfer and storage of canisterized GTCC waste and general operating functions at the WCS CISF are similar to those described in Chapters 1 – 15 and system specific Appendices (A-G) for SNF. The existing structures containing the SNF assemblies are neither altered nor disturbed during the transfer and storage of canisterized GTCC waste.

H.3.1.1 Material to be Stored

Canisterized GTCC waste is non-fuel related material generated as a result of plant operation and decommissioning where the radionuclide concentration limits for Class C waste in 10 CFR 61.55 are exceeded. This waste may include such components as incore components, core support structures, and small reactor related miscellaneous parts resulting from the reactor vessel internals segmentation/decommissioning processes. All waste stored within the GTCC canister are activated metals, incore instrument tips, and associated surface contamination.

The total amount of canisterized GTCC waste to be stored at the WCS CISF is up to 231.3 MT (510,000 pounds).

The physical, thermal and radiological characteristics of GTCC canisters are described in the Rancho Seco FSAR, Appendix C [H.3-1], for the GTCC waste proposed for storage at the WCS CISF for storage in a NUHOMS® System. The GTCC waste stored in NAC systems is described in the applicable transportation cask SAR and Certificate of Compliance (CoC) listed by docket number in Table 1-1. GTCC waste for NAC systems could be received from Maine Yankee (GTCC-Canister-MY), Connecticut Yankee (GTCC-Canister-CY), Yankee Rowe (GTCC-Canister-YR), and Zion (GTCC-Canister-ZN). For GTCC-Canister-MY, the GTCC waste is described in the NAC-UMS transportation cask SAR, Section 1.3.1.1.2 [H.3-2]. For GTCC-Canister-CY and GTCC-Canister-YR, the GTCC waste is described in the NAC-STC transportation cask SAR, Section 1.2.3.2 [H.3-3]. For GTCC-Canister-ZN, the GTCC waste is described in the NAC-MAGNATRAN SAR, Section 1.3.2 [H.3-4].

H.3.1.2 General Operating Functions

The operating functions related to the GTCC waste canisters are similar to those addressed in Chapter 5 and the referenced Operating Procedures in the referenced Appendices for the applicable cask systems listed in Table 5-1.

Each aspect of radiation protection, containment, and heat rejection is accomplished through passive means.

H.3.2 Structural and Mechanical Safety Criteria

The GTCC waste canisters are components that are classified as important-to-safety along with the other components described in Section 3.4 and Table 3-5 and the reference appendices for the applicable cask systems listed in Table 3-1 of this SAR.

H.3.2.1 Seismic Design

The GTCC waste canisters are analyzed for seismic loading equal to those ground accelerations described in Section 3.2.3 and are determined acceptable. Resulting stresses in the GTCC shell assembly are bounded by the SNF canister stress results because the total GTCC waste canisters loaded weights are bounded by that analyzed for the SNF canisters.

H.3.2.2 Load Combination Criteria

H.3.2.2.1 Storage Overpacks

The design approach, design criteria and loading combinations for the storage overpacks are addressed in the referenced Appendices for the applicable cask system listed in Table 3-1.

H.3.2.2.2 GTCC Waste Canisters

Table 1-1 includes the authorized GTCC canisters which are designed to withstand the effects of the site characteristics and environmental conditions associated with normal operation, maintenance, and testing of the WCS CISF and to withstand postulated off-normal and accident conditions. Environmental conditions are provided in Table 1-2.

H.3.3 Safety Protection System

H.3.3.1 General

The WCS CISF is designed for safe containment during GTCC waste storage. The components, structures, and equipment, which are designed to assure that this safety objective is met, are summarized in Section 3.4 and the referenced Appendices for the applicable cask system listed in Table 3-1. In addition, the GTCC waste canister is designated as a component important to safety. The key elements of the WCS CISF and its operation that require special design consideration are:

1. The closure seal welds on the GTCC waste canister shells to form a confinement boundary to maintain a helium atmosphere.

2. Minimizing personnel radiation exposure during GTCC waste canister transfer and storage operations.

3. Design of the casks and GTCC waste canisters for postulated accidents.

4. Design of the storage overpacks with passive ventilation system for effective decay heat removal to ensure the integrity of the GTCC waste canister.

H.3.3.2 Protection by Equipment and Instrumentation Selection

H.3.3.2.1 Equipment

Handling operations of GTCC waste canisters are the same as for the SNF canisters.

H.3.3.2.2 Instrumentation

No instrumentation is required for the storage of GTCC waste canisters.

H.3.3.3 Nuclear Criticality Safety

Nuclear criticality is not applicable to the design of GTCC waste canisters.

H.3.3.4 Radiological Protection

The WCS CISF is designed to maintain on-site and offsite doses ALARA during transfer operations and long term storage conditions. The storage of GTCC waste canisters does not alter nor impact the access control, shielding, or radiological alarm systems described in balance of this SAR.

H.3.3.5 Fire and Explosion Protection

Fire and explosion protection is addressed in Section 3.3.6 of this SAR. Storage of GTCC waste does not affect the outcome of this analysis.

H.3.3.6 Materials Handling and Storage

H.3.3.6.1 GTCC Waste Handling and Storage

The handling of GTCC waste canisters within the WCS CISF is addressed in Chapter 5 and the referenced Operating Procedures in the referenced Appendices for the applicable cask system listed in Table 5-1.

H.3.3.6.2 Radioactive Waste Treatment

The WCS CISF does not generate radioactive waste. Any secondary waste generated during transportation cask receipt and decontamination operations in the Cask Handling Building (CHB) are handled as described in Section 6.1.4.

H.3.3.6.3 Waste Storage Facilities

Waste storage facilities are neither required nor provided for at the WCS CISF.

H.3.3.7 Industrial and Chemical Safety

No hazardous chemicals or chemical reactions are involved in the operation of the WCS CISF. Industrial safety relating to handling of the cask and waste canister are addressed by procedures, which meet Occupational Safety and Health Administration (OSHA) requirements.

H.3.4 Decommissioning Considerations

WCS CISF decommissioning considerations are addressed in Section 13.6.

H.3.5 Summary of WCS CISF Design Criteria

The GTCC waste canisters are designed as Important-to-Safety components. For design requirements specific to the Storage Systems containing SNF, see the reference appendices for the applicable cask systems listed in Table 3-1 of this SAR.

H.3.6 References

H.3-1 "Rancho Seco Independent Spent Fuel Storage Installation Safety Analysis Report," NRC Docket No. 72-11, Revision 4.

H.3-2 NAC International, "Safety Analysis Report for the UMS® Universal Transport Cask," Revision 2, CoC 9270 Revision 4, USNRC Docket Number 71-9270.

H.3-3 NAC International, "NAC-STC, NAC Storage Transport Cask Safety Analysis Report," Revision 17, CoC 9235 Revision 13, USNRC Docket Number 71-9235.

H.3-4 NAC International, "Safety Analysis Report for the MAGNATRAN Transport Cask," Revisions 12A, 14A, 15A, and 16A, USNRC Docket Number 71-9356.

APPENDIX H.4
INSTALLATION DESIGN
CANISTERIZED GTCC WASTE

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H.4 INSTALLATION DESIGN

H.4.1 Summary Description

The layout and principal features of the WCS CISF are described in Section 4.1 of this SAR.

H.4.2 Storage Systems

The WCS CISF uses the Storage Overpacks for storage of SNF canisters as well as GTCC waste canisters. All canisters (SNF and GTCC) for a given system identified in Table 1-1 have the same exterior dimensions, are functionally identical, and designed to be accepted by the applicable identified transportation cask, transfer cask and Storage Overpack.

H.4.2.1 Design Basis and Safety Assurance

The intent of the WCS CISF is to provide safe containment during dry storage of SNF and GTCC waste. Consistent with 10 CFR 72.3, the only components at the WCS CISF important-to-safety are those identified in Table 3-4 and Table 3-5. The Storage Overpacks and canisters are self-contained, independent, passive systems and do not rely on any other systems or components for their operation. The other components identified as important-to-safety in Table 3-4 and Table 3-5 such as the Canister Transfer System, Transfer Casks, GTCC waste canisters, and SNF canisters rely on other systems during receipt and transfer operations; but in storage, the GTCC waste canisters and SNF canisters are self-contained, independent, and passive.

The following sections discuss the conformance of the WCS CISF with applicable 10 CFR Part 72 design criteria.

H.4.2.2 Compliance with General Design Criteria

H.4.2.2.1 10 CFR 72.122 Overall Requirements

1. Quality standards Quality assurance requirements are addressed in Section 1.4.4.3.

2. Protection against environmental conditions and natural phenomena Extreme environmental conditions for the WCS CISF are defined in Table 1-2 and Chapter 12. The design criteria in Section 3.2 require that the storage systems be designed to withstand the design earthquake, high ambient temperature and humidity, and extreme winds.

3. Protection against fire and explosion The design criteria require that the storage system be designed so that it can continue to perform its safety functions effectively under credible fire and explosion exposure conditions. As addressed in Section 3.3.6, no large fire or explosion within the WCS CISF is considered credible.

4. Sharing of structures, systems, and components Section 4.1.2 states that the storage system and other WCS CISF support systems are not shared with any other facilities except the counting laboratories as addressed in Section 9.5.2, and WCS CISF activities do not impair any activities at the other *Waste Control Specialists* facilities adjacent to the WCS CISF.

5. Proximity of sites The design and operation of the WCS CISF results in minimal risk to the health and safety of the public.

6. Testing and maintenance of systems and components The design criteria require that the Storage Overpacks be designed to permit inspection, maintenance, and testing. Although the canisterized GTCC storage system requires minimum maintenance, the design of the WCS CISF allows for appropriate testing, inspection, and maintenance, if required.

7. Emergency capability Scenarios requiring emergency actions are neither considered credible, nor postulated to occur. Nevertheless, the *Waste Control Specialists* Consolidated Emergency Response Plan is in effect to meet the requirements in 10 CFR 72.32.

8. Confinement barriers and systems The design of the storage systems ensures that GTCC waste remains contained within its canister, is protected from degradation during storage and that the waste is maintained in a safe condition.

9. Instrumentation and control systems No control systems are needed for the storage systems to perform their safety functions. The parameters that affect the long-term safe storage of SNF are structural integrity of confinement, shielding, and passive cooling (heat rejection). Technical Specifications are in place to ensure adequate thermal performance of the Storage Overpacks.

10. Control room or control areas The WCS CISF is a passive installation, with no need for operator actions. No control room is needed for normal WCS CISF operations.

11. Utility services There are no utility or emergency systems required to perform safety functions at the WCS CISF. Section 4.3 addresses auxiliary system requirements.

12. Retrievability The design features of the GTCC canisters affecting retrievability are functionally identical to those used for the SNF canisters. By using a design similar to that of SNF canisters, the stored waste could be transferred directly to a DOE facility after DOE acceptance of the waste. The steps involved in retrieving the canisterized GTCC waste for offsite shipment are provided in Chapter 5 and the referenced Operating Procedures in the referenced Appendices for the applicable cask system listed in Table 5-1.

H.4.2.2.2 10 CFR 72.124 Criteria for Nuclear Criticality Safety

Criticality control is not applicable to the storage of canisterized GTCC waste.

H.4.2.2.3 10 CFR 72.126 Criteria for Radiological Protection

Criteria for radiological protection do not differ from the transfer and storage of canisterized SNF described in this SAR.

H.4.2.2.4 10 CFR 72.128 Criteria for Spent Fuel, High-level Radioactive Waste, Reactor-Related Greater than Class C Waste and other Radioactive Waste Handling and Storage

Criteria for waste transfer and storage do not differ from transfer and storage of canisterized SNF described in this SAR.

H.4.2.2.5 10 CFR 72.130 Criteria for Decommissioning

Operation of the WCS CISF does not result in contamination on the outside surface of the GTCC canisters or any other WCS CISF components above administrative limits.

Decommissioning considerations for the WCS CISF are addressed in Section 13.6 of this SAR.

H.4.2.3 Structural Specifications

Safe storage of canisterized GTCC waste depends only on the capability of the storage system to fulfill its design functions. The design criteria for the storage system ensures that its exposure to credible site hazards does not impair its safety function.

H.4.2.4 Individual Unit Description

H.4.2.4.1 Storage Overpacks

Table 1-1 identifies the storage overpack applicable for each GTCC waste canister authorized for storage at the WCS CISF. The location for descriptions of the various storage overpacks is provided in Table 4-1 with the description provided in the referenced Appendices for the applicable cask system.

H.4.2.4.2 GTCC Waste Canisters

The GTCC waste canisters authorized for storage at the WCS CISF are high integrity stainless steel, welded vessels which provide confinement of radioactive materials, encapsulate the waste in a helium atmosphere, and together with a transfer cask or Storage Overpack, provide biological shielding during canister transfer and long term storage.

The GTCC waste canisters are all licensed for transport under a 10 CFR Part 71 CoC listed in Table 1-1. Drawings for each of the authorized GTCC waste canisters are listed in Section H.4.8.

The auxiliary systems that support the transfer operations associated with the GTCC waste canisters are described in Section 4.3 of this SAR.

H.4.3 Decontamination System

H.4.3.1 Equipment Decontamination

The only decontamination activity performed at the WCS CISF is the removal of contamination from the outside surfaces of the transportation cask upon arrival at the site. Such contamination would be due to possible weeping of the transportation cask surface during transport to the site because the transport cask may have been immersed in fuel pools prior to arrival at the WCS CISF. The canisters and storage overpacks arrive clean and remain clean for all transfer and storage operations at the WCS CISF.

H.4.3.2 Personnel Decontamination

No personnel decontamination facilities are needed at the WCS CISF. Personnel decontamination is conducted, if necessary, using the *ISP* Radiation Protection Program procedures.

H.4.4 Repair and Maintenance

H.4.4.1 Repair

No repair operations are anticipated once the GTCC waste canisters are placed into storage.

H.4.4.2 Maintenance

Periodic maintenance is not required. Maintenance of a minor nature can be performed within the Storage Area, without the need to move the canisters. Major maintenance operations are not required at the WCS CISF related to the GTCC waste canisters. Storage system design features minimize or eliminate the need for maintenance. The GTCC waste canister shells are made of corrosion-resistant stainless steel. The GTCC shell internal is backfilled with helium preventing corrosion on the inside of the canister.

H.4.5 Cathodic Protection

The WCS CISF is dry and above ground so that cathodic protection in the form of impressed current is not required. The normal operating environment for all metallic components is above ambient air temperatures so that there is no opportunity for condensation on those surfaces.

The austenitic stainless steel GTCC canisters require no corrosion protection for any foreseeable event. Any carbon steel portions inside the canisters are contained within a sealed, dried, and inert environment backfilled with helium and is not subject to corrosion.

H.4.6 Waste Handling Operation Systems

GTCC waste canister handling operations are performed with the same equipment used for handling canisters containing SNF. Radiation protection of individuals involved in handling canisters is addressed in Chapter 9.

The steps involved for receiving, transferring, storing and eventual retrieval and shipment off-site for the canisterized GTCC are the same as those for canisters containing SNF and are provided in Chapter 5 and the referenced Operating Procedures in the referenced Appendices for the applicable cask system listed in Table 5-1.

H.4.7 References

H.4-1 NAC International, "NAC-STC, NAC Storage Transport Cask Safety Analysis Report," Revision 17, CoC 9235 Revision 13, U.S. NRC Docket Number 71-9235.

H.4-2 NAC International, "Safety Analysis Report for the UMS® Universal Transport Cask," Revision 2, CoC 9270 Revision 4, U.S. NRC Docket Number 71-9270.

H.4-3 NAC International, "Safety Analysis Report for the MAGNATRAN Transport Cask," Revisions 12A, 14A, 15A, and 16A, U.S. NRC Docket Number 71-9356.

H.4.8 Supplemental Data Drawings

This section provides a listing of all applicable license drawings associated with the storage of the authorized GTCC waste canisters at the WCS CISF. The drawings are incorporated by reference or enclosed as noted below.

The following drawings are for the NUHOMS® MP187 Cask System GTCC Canister:

1. "NUHOMS® System GTCC Canister Main Assembly (five sheets)," 13302-1005, Revision 0 (Included at the end of this Section).

2. "NUHOMS® System GTCC Canister Closure Installation (one sheet)," 13302-1007, Revision 0 (Included at the end of this Section).

The following are for the NAC-MPC GTCC-Canister-CY and GTCC-Canister-YR

3. "Basket Assembly, GTCC, CY-MPC," Sheets 1 thru 4, 414-887, Rev. 4 (See Section 1.3.2 of the "NAC-STC, NAC Storage Transport Cask Safety Analysis Report" [H.4-1])

4. "Canister Shell, GTCC, CY-MPC," Sheets 1 thru 2, 414-888, Rev. 4 (See Section 1.3.2 of the "NAC-STC, NAC Storage Transport Cask Safety Analysis Report" [H.4-1])

5. "Assembly, Transportable Storage Canister (TSC), GTCC, CY-MPC," Sheets 1 through 3, 414-889, Rev. 7 (See Section 1.3.2 of the "NAC-STC, NAC Storage Transport Cask Safety Analysis Report" [H.4-1])

6. "Loaded Vertical Concrete Cask (VCC), CY-MPC, Waste Control Specialists (WCS)," Sheets 1 of 1, 30039-863, Rev. 0 (included at the end of this Section)

7. "Basket Assembly, 24 GTCC Container, MPC-Yankee," Sheets 1 through 3, 455-887, Rev. 4 (See Section 1.3.2 of the "NAC-STC, NAC Storage Transport Cask Safety Analysis Report" [H.4-1])

8. "Assembly, Transportable Storage Canister (TSC), 24 GTCC Container, MPC-Yankee," Sheets 1 through 2, 455-888, Rev. 8 (See Section 1.3.2 of the "NAC-STC, NAC Storage Transport Cask Safety Analysis Report" [H.4-1])

9. "Loaded Vertical Concrete Cask (VCC), MPC-YANKEE, Waste Control Specialists (WCS)," Sheets 1 through 2, 30039-862, Rev. 0 (included at the end of this Section)

The following are for the NAC-UMS GTCC-Canister-MY

10. "GTCC Waste Basket, Maine Yankee, NAC-UMS," Sheets 1 through 2 790-611, Revision 6 (See Section 1.3.4 of "Safety Analysis Report for the UMS® Universal Transport Cask" [H.4-2])

11. "GTCC Waste Canister, Maine Yankee, NAC-UMS," Sheets 1 through 2, 790-612, Rev. 9 (See Section 1.3.4 of "Safety Analysis Report for the UMS® Universal Transport Cask" [H.4-2])

12. "Loaded Vertical Concrete Cask (VCC), NAC-UMS, Waste Control Specialists (WCS)," Sheets 1 through 2, 30039-590, Rev. 0 (included at the end of this Section)

The following are for the MAGNASTOR GTCC-Canister-MY and GTCC-Canister-ZN

13. "GTCC Waste Basket Liner, MAGNASTOR," Sheets 1 through 2, 71160-711, Rev. 1 (See Section 1.4.3 of the "Safety Analysis Report for the MAGNATRAN Transport Cask" [H.4-3])

14. "Shell Weldment, GTCC TSC, MAGNASTOR," Sheets 1 through 2, 71160-781, Rev. 1 (See Section 1.4.3 of the "Safety Analysis Report for the MAGNATRAN Transport Cask" [H.4-3])

15. "GTCC TSC, Assembly, MAGNASTOR," Sheets 1 through 2, 71160-785, Rev. 3 (See Section 1.4.3 of the "Safety Analysis Report for the MAGNATRAN Transport Cask" [H.4-3])

16. "Loaded Vertical Concrete Cask (VCC), MAGNASTOR, Waste Control Specialists (WCS)", Sheets 1 of 1, 30039-591, Rev. 0 (included at the end of this Section)

PROPRIETARY AND SECURITY RELATED INFORMATION WITHHELD UNDER 10 CFR 2.390

PARTS LIST

ALL DIMENSIONS ARE APPLICABLE AT 70°F AND ALL TOLERANCING APPLIES AFTER WELDING AND FINAL MACHINING UNLESS NOTED OTHERWISE.	TRANSNUCLEAR
DIMENSIONS ARE IN INCHES AND DEGREES UNLESS NOTED OTHERWISE. DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1994. FRACTIONS N/A; DECIMALS .XX ± .05, .XXX ± .015; ANGLES ± 1°	TITLE: SACRAMENTO MUNICIPAL UTILITY DISTRICT NUHOMS® SYSTEM GTCC CANISTER MAIN ASSEMBLY
BREAK AND DEBURR ALL SHARP EDGES .02	
3rd ANGLE PROJECTION	DWG. NO. 13302-1005 · SCALE NONE · SHEET 1 OF 5 · REV. NO. 0
DO NOT SCALE DRAWING	

PROPRIETARY AND SECURITY RELATED INFORMATION WITHHELD UNDER 10 CFR 2.390

ALL DIMENSIONS ARE APPLICABLE AT 70°F AND ALL TOLERANCING APPLIES AFTER WELDING AND FINAL ASSEMBLY UNLESS NOTED OTHERWISE.

DIMENSIONS ARE IN INCHES AND DEGREES UNLESS NOTED OTHERWISE. DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M–1994.

FRACTIONS	DECIMALS	ANGLES
N/A	.xx ± .05	± 1°
	.xxx ± .015	

BREAK AND DEBURR ALL SHARP EDGES .02

3rd ANGLE PROJECTION

DO NOT SCALE DRAWING

TRANSNUCLEAR

TITLE: SACRAMENTO MUNICIPAL UTILITY DISTRICT
NUHOMS® SYSTEM
GTCC CANISTER
MAIN ASSEMBLY

DWG. NO.	SCALE	SHEET	REV. NO.
13302–1005	NONE	2 OF 5	0

PROPRIETARY AND SECURITY RELATED INFORMATION WITHHELD UNDER 10 CFR 2.390

ALL DIMENSIONS ARE APPLICABLE AT 70°F AND ALL TOLERANCING APPLIES AFTER WELDING AND FINAL ASSEMBLY UNLESS NOTED OTHERWISE.	TRANSNUCLEAR
DIMENSIONS ARE IN INCHES AND DEGREES UNLESS NOTED OTHERWISE. DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1994. FRACTIONS N/A; DECIMALS .XX ± .05, .XXX ± .015; ANGLES ± 1°	TITLE: SACRAMENTO MUNICIPAL UTILITY DISTRICT NUHOMS® SYSTEM GTCC CANISTER MAIN ASSEMBLY
BREAK AND DEBURR ALL SHARP EDGES .02	
3rd ANGLE PROJECTION	
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PROPRIETARY AND SECURITY RELATED INFORMATION WITHHELD UNDER 10 CFR 2.390

ALL DIMENSIONS ARE APPLICABLE AT 70°F AND ALL TOLERANCING APPLIES AFTER WELDING AND FINAL ASSEMBLY UNLESS NOTED OTHERWISE.

DIMENSIONS ARE IN INCHES AND DEGREES UNLESS NOTED OTHERWISE. DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1994.

FRACTIONS	DECIMALS	ANGLES
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	.XXX ± .015	

BREAK AND DEBURR ALL SHARP EDGES .02

3rd ANGLE PROJECTION

DO NOT SCALE DRAWING

TRANSNUCLEAR

TITLE: SACRAMENTO MUNICIPAL UTILITY DISTRICT
NUHOMS® SYSTEM
GTCC CANISTER
MAIN ASSEMBLY

DWG. NO.	SCALE	SHEET	REV. NO.
13302-1005	NONE	4 OF 5	0

PROPRIETARY AND SECURITY RELATED INFORMATION WITHHELD UNDER 10 CFR 2.390

ALL DIMENSIONS ARE APPLICABLE AT 70°F AND ALL TOLERANCING APPLIES AFTER WELDING AND FINAL ASSEMBLY UNLESS NOTED OTHERWISE.	TRANSNUCLEAR
DIMENSIONS ARE IN INCHES AND DEGREES UNLESS NOTED OTHERWISE. DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M–1994. FRACTIONS N/A; DECIMALS .xx ± .05, .xxx ± .015; ANGLES ± 1°	TITLE: SACRAMENTO MUNICIPAL UTILITY DISTRICT NUHOMS® SYSTEM GTCC CANISTER MAIN ASSEMBLY
BREAK AND DEBURR ALL SHARP EDGES .02	
3rd ANGLE PROJECTION	
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PROPRIETARY AND SECURITY RELATED INFORMATION WITHHELD UNDER 10 CFR 2.390

ALL DIMENSIONS ARE APPLICABLE AT 70°F AND ALL TOLERANCING APPLIES AFTER WELDING AND FINAL MACHINING UNLESS NOTED OTHERWISE.	TRANSNUCLEAR
DIMENSIONS ARE IN INCHES AND DEGREES UNLESS NOTED OTHERWISE. DIMENSIONING AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M–1994. FRACTIONS N/A; DECIMALS .XX ± N/A, .XXX ± N/A; ANGLES ± N/A	TITLE: SACRAMENTO MUNICIPAL UTILITY DISTRICT NUHOMS® SYSTEM GTCC CANISTER CLOSURE INSTALLATION
BREAK AND DEBURR ALL SHARP EDGES N/A	
3rd ANGLE PROJECTION	
DO NOT SCALE DRAWING	DWG. NO. 13302–1007 · SCALE NONE · SHEET 1 OF 1 · REV. NO. 0

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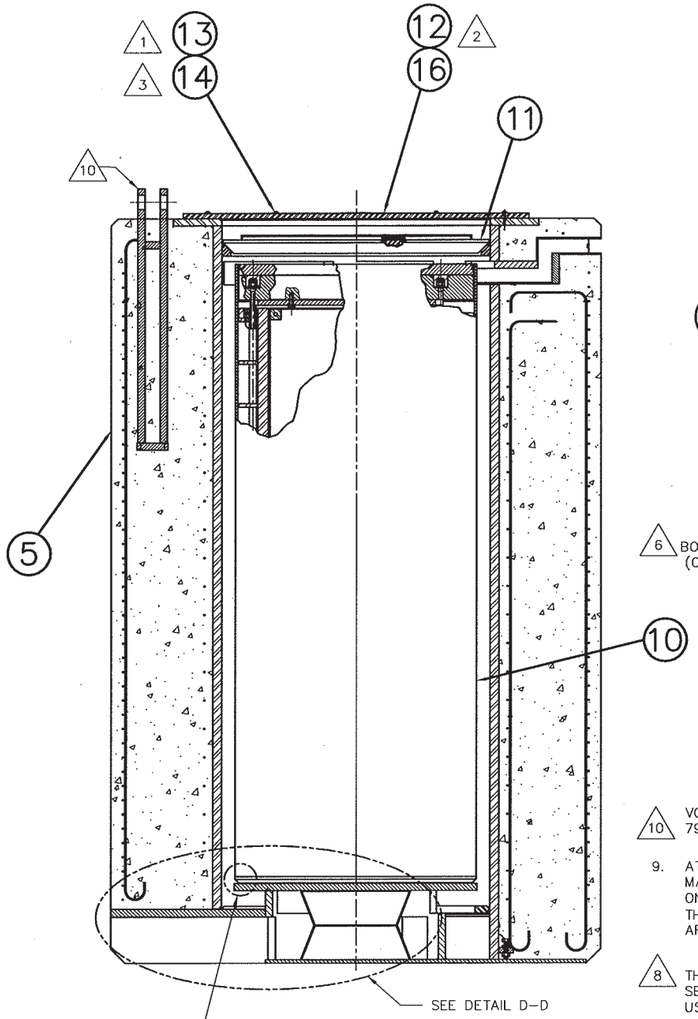
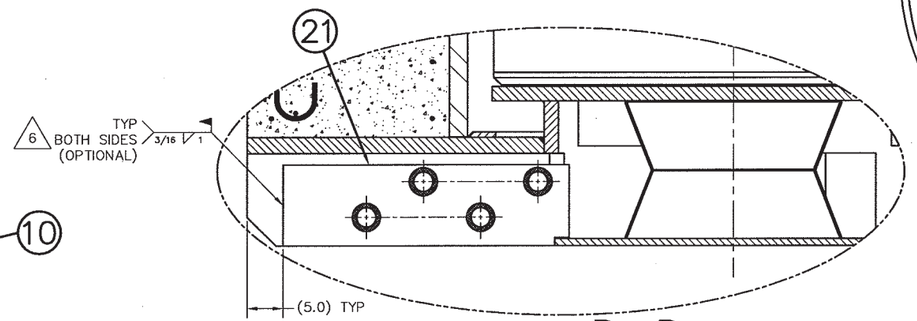
REV	CHANGE
0	INITIAL ISSUE

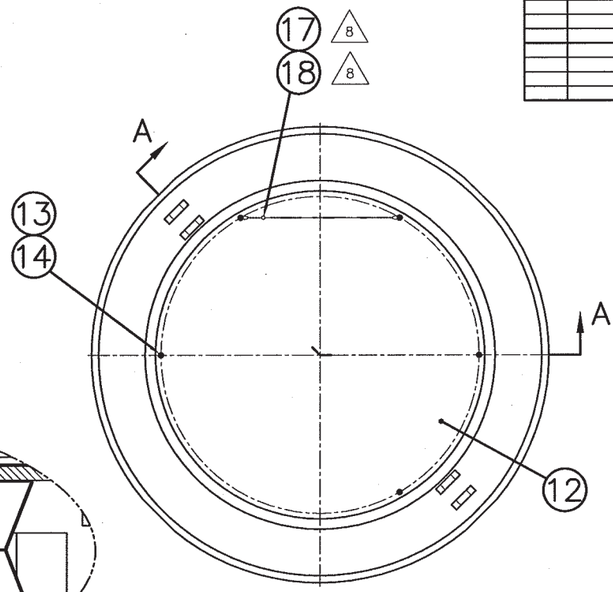


SECTION A–A

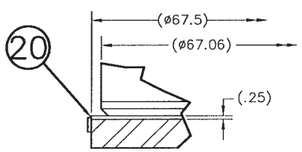
95 LOADED CONCRETE CASK – GTCC



DETAIL D–D
SCALED
OPTIONAL CONFIGURATIONS
(4X ITEM 21 REQ'D FOR EACH)



TOP VIEW



DETAIL B–B
SCALED

10 VCC ASSEMBLY (ITEM 5) TO HAVE LIFT ANCHOR (DRAWING 790–562–92 ALTERNATE CONFIGURATION – D).

9. AT THE OPTION OF THE USER, THE COVER (ITEM 15) MAY BE INSTALLED AS SPECIFIED AS AN ALTERNATIVE ON DRAWING 790–561. IF ALTERNATIVE ASSEMBLY OF THE COVER (ITEM 15) IS PERFORMED, ITEMS 19 AND 20 ARE NOT USED.

8 THE INSTALLATION AND USE OF SECURITY SEAL AND SEAL WIRE (ITEMS 17 AND 18) IS AT OPTION OF THE USER.

7. AT THE OPTION OF THE USER, 790–564 (ASSEMBLY 99, 98, OR 97) MAY BE USED.

6 SHIM PLATES MAY BE UTILIZED TO FACILITATE FIELD WELDING OPERATIONS ON ONE OR BOTH SIDES OF THE SUPPLEMENTAL SHIELDING WELDMENT. LOCATE WELDS APPROX. AS SHOWN.

5. ITEM 13 TO BE 1/2–13 UNC–2A X 3–1/4 LG. HEX HD. WITH A MINIMUM THREAD LENGTH OF 1.75 OR 1/2–13 UNC–2A X 2–1/2 LG. HEX HD.

4 GAP AS REQUIRED FOR FIT–UP.

3 AT CONSTRUCTOR'S OPTION, AN ADDITIONAL WASHER MAY BE ADDED TO FACILITATE LID TO LID BOLT FIT–UP.

2 AT THE OPTION OF THE USER, ONE CIRCULAR LAYER OF SEAL TAPE (ITEM 16) MAY BE APPLIED ON THE FLANGE OF THE VCC JUST INSIDE THE LID BOLT CIRCLE.

1 AT THE OPTION OF THE USER, DRILL A 1/16 DIAMETER HOLE THRU THE MIDDLE OF THE BOLT HEAD, FROM THE MIDDLE OF ONE FLAT TO THE OPPOSITE FLAT. FOR A MINIMUM OF 2 BOLTS PER ASSEMBLY.

NOTES:

NOTE: Regulatory Approval Pending

(WCS Application Only)

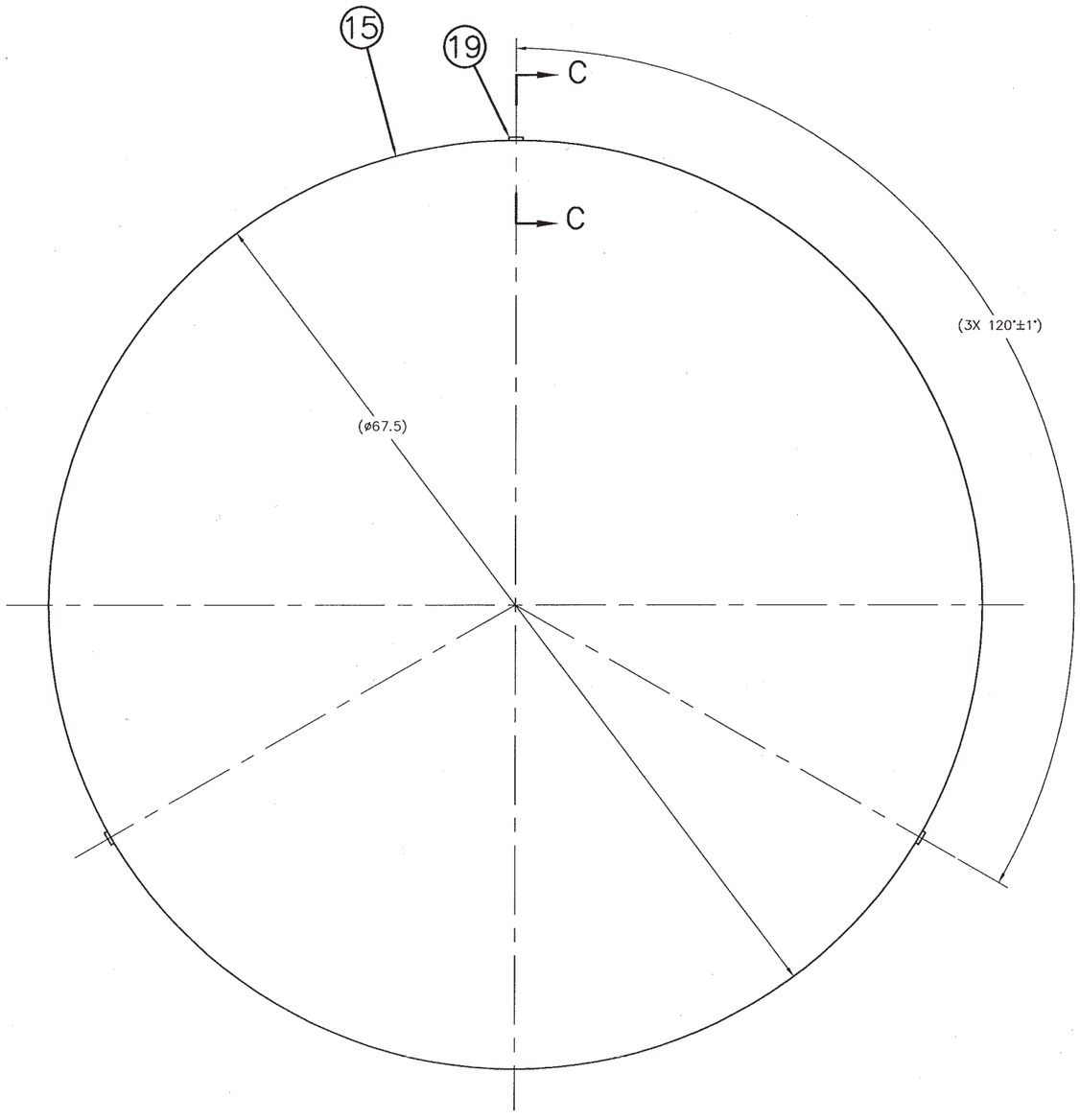
94	95	96	97	98	99	ITEM	NAME	MATERIAL	SPEC	DRAWING No.	DESCRIPTION
ASSY	ASSY	ASSY	ASSY	ASSY	ASSY						
QUANTITY											
						21	SUPPLEMENTAL SHIELDING			790–613–99	
	1					20	COVER PLATE			790–590–94	
3						19	TAB	304 ST. STL.	ASTM A240/A276/A479		1/4 PLATE/BAR
	A/R					18	SEAL WIRE		1/32 DIA WIRE		AMERICAN CASTING CO.
	1					17	SECURITY SEAL		1.0 DIA METAL CUP SEAL		AMERICAN CASTING CO.
	A/R					16	SEAL TAPE	SEMI–RIGID RUBBER	COML		MCMASTER–CARR #8622K23
1						15	COVER	304 ST. STL.	ASTM A240		1/4 PLATE
	6					14	WASHER	ST. STL.	COML		1/2 FLAT WASHER
	6					13	LID BOLT	ST. STL.	COML		SEE NOTE 5
	1					12	CASK LID			790–563–99	
	1					11	SHIELD PLUG			SEE NOTE 7	
	1					10	GTCC TSC ASSEMBLY			790–612–99	
						9	(DELETED)				
						8	(DELETED)				
						7	(DELETED)				
						6	(DELETED)				
	1					5	VCC ASSEMBLY			790–562–95	
						4	(DELETED)				
						3	(DELETED)				
						2	(DELETED)				
						1	(DELETED)				

NAC INTERNATIONAL

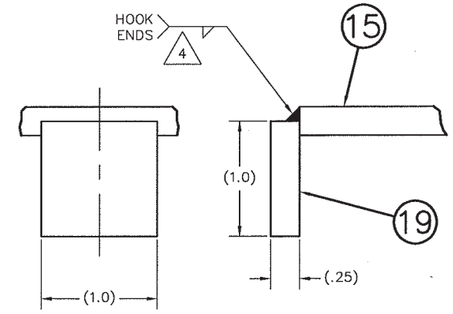
UNLESS OTHERWISE STATED	GROUP	NAME	DATE
DIMENSIONING AND TOLERANCING SHALL BE PER ASME Y14.5M–94	PREPARER		9/2/16
ALL THREAD DEPTH CALLOUTS ARE TO BE CONSIDERED AS A MIN. DEPTH OF PERFECT THREADS.	CHECKER		9-2-16
	PROJECT MANAGER		9-2-16
	ENGINEERING		9-2-16
ALL DIMENSIONS ARE IN INCHES	LICENSING		9/6/16
MACHINED SURFACES TO BE ▽ OR BETTER	QUALITY		9/7/16
NEXT ASSEMBLY: N/A			
DRAWING TYPE: LICENSE			

LOADED VERTICAL CONCRETE CASK (VCC) NAC–UMS®, WASTE CONTROL SPECIALISTS (WCS)

PROJECT	DRAWING	REV
30039	590	0
	SH 1 OF 2	



94 COVER



SECTION C—C
SCALED

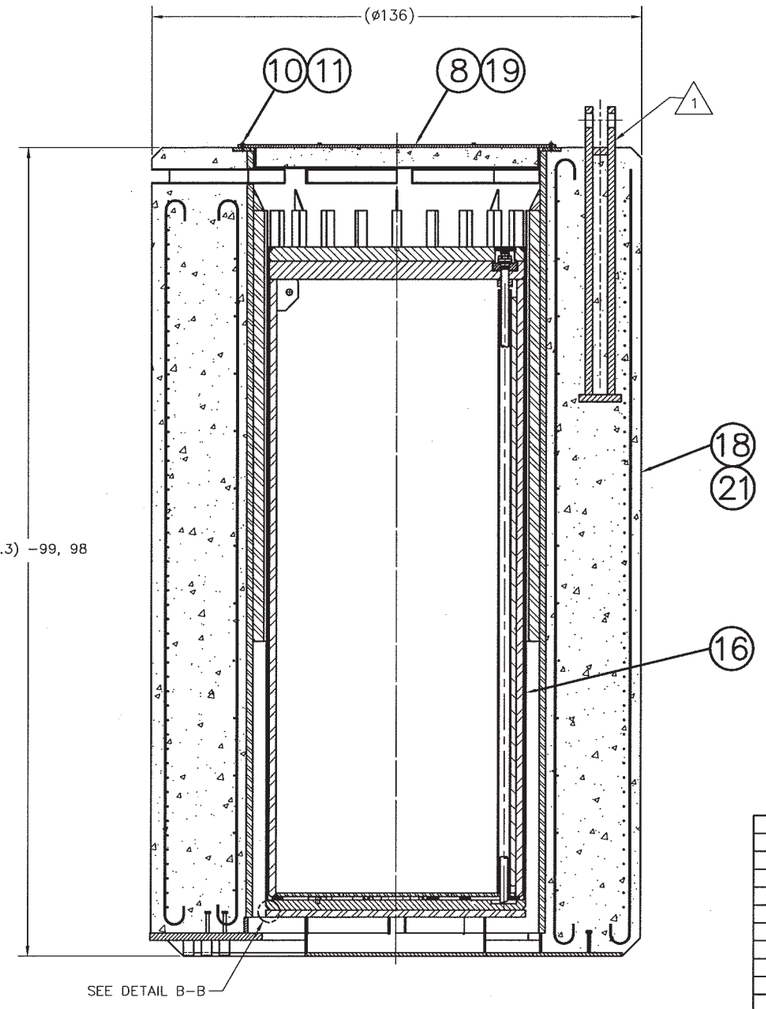
NAC INTERNATIONAL

LOADED VERTICAL
CONCRETE CASK (VCC)
NAC-UMS®
WASTE CONTROL SPECIALISTS
(WCS)

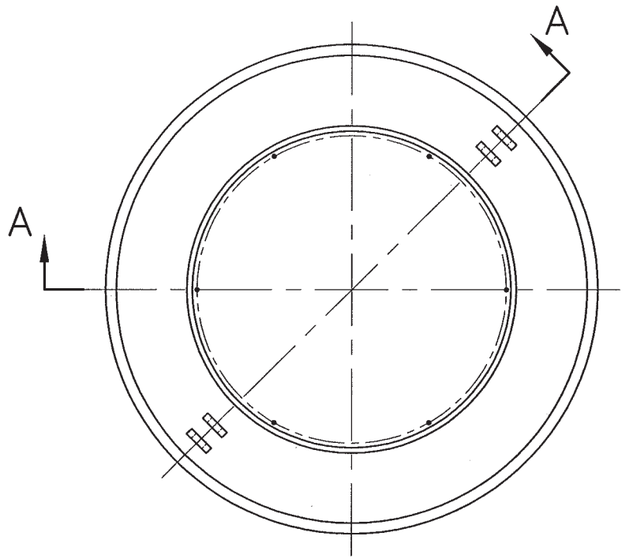
PROJECT	DRAWING	REV
30039	590	0
	SH 2 OF 2	

R-232824

REV	CHANGE
0	INITIAL ISSUE



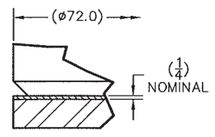
SECTION A–A



TOP VIEW

99 LOADED CONCRETE CASK – GTCC

98 LOADED CONCRETE CASK – GTCC



DETAIL B–B

90	91	92	93	94	95	96	97	98	99	ITEM	NAME	MATERIAL	SPEC	DRAWING No.	DESCRIPTION
ASSY	ASSY	ASSY	ASSY	ASSY	ASSY	ASSY	ASSY	ASSY	ASSY	23	(DELETED)				
										22	(DELETED)				
									1	21	CONCRETE CASK ASSEMBLY			71160–562–94	
										20	(DELETED)				
								1		19	ALTERNATE LID ASSEMBLY			71160–561–91	
								1		18	CONCRETE CASK ASSEMBLY			71160–562–95	
										17	(NOT USED)				
								1	1	16	TSC ASSEMBLY (GTCC)			71160–785–99	
										15	(DELETED)				
										14	(DELETED)				
										13	(DELETED)				
										12	(DELETED)				
								6	6	11	WASHER	ST. STL.	COML		
								6	6	10	LID BOLT	ST. STL.	COML		
										9	(DELETED)				
									1	8	LID ASSEMBLY			71160–561–93	
										7	(DELETED)				
										6	(DELETED)				
										5	(DELETED)				
										4	(DELETED)				
										3	(DELETED)				
										2	(DELETED)				
										1	(DELETED)				
							QUANTITY								

3 (DELETED)

2. (DELETED)

1 LIFT ANCHOR PER 71160–561–95.

NOTES:

NOTE: Regulatory Approval Pending

(WCS Application Only)

UNLESS OTHERWISE STATED
DIMENSIONING AND TOLERANCING SHALL BE PER ASME Y14.5M–94
ALL THREAD DEPTH CALLOUTS ARE TO BE CONSIDERED AS A MIN. DEPTH OF PERFECT THREADS.
ALL DIMENSIONS ARE IN INCHES
MACHINED SURFACES TO BE ▽ OR BETTER
NEXT ASSEMBLY: N/A
DRAWING TYPE: LICENSE

GROUP	NAME	DATE
PREPARER		9/1/16
CHECKER		9-1-16
PROJECT MANAGER		9-2-16
ENGINEERING		9-2-16
LICENSING		9/6/16
QUALITY		9/9/16

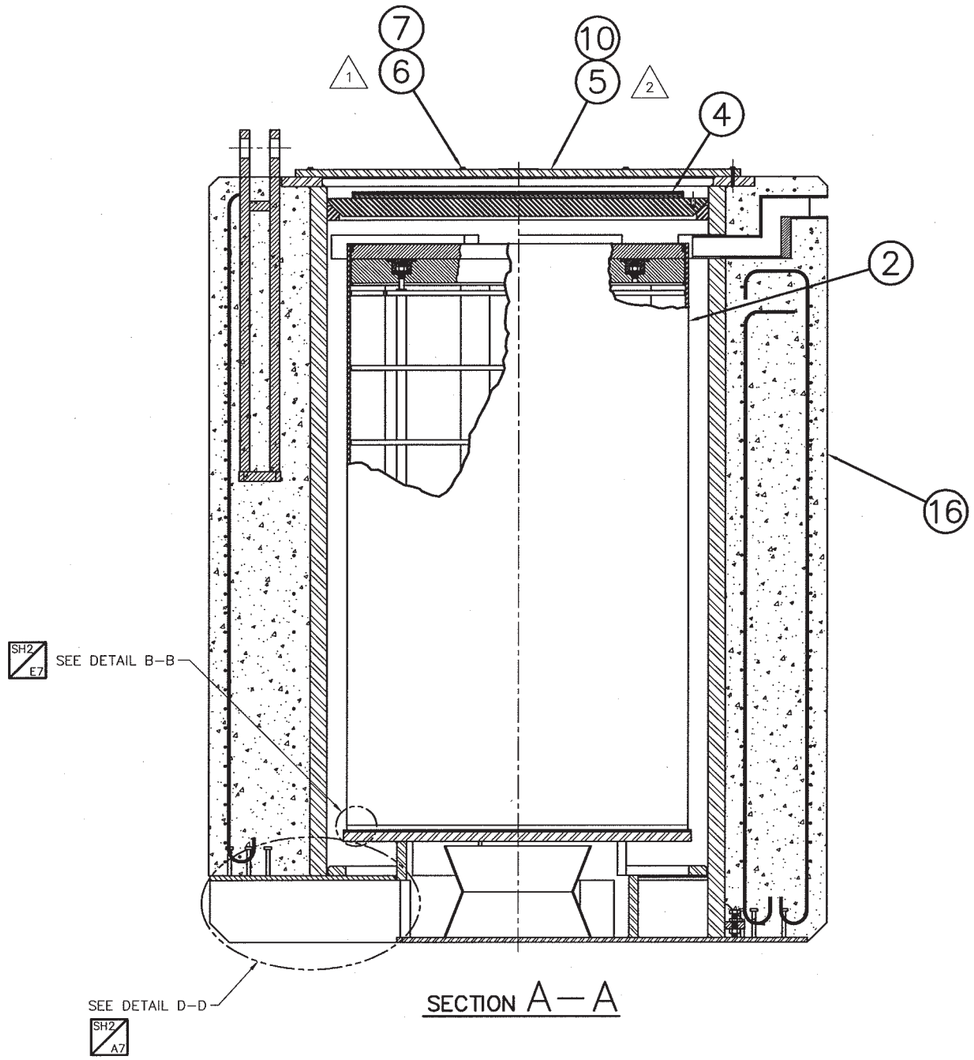
NAC INTERNATIONAL

LOADED CONCRETE CASK, MAGNASTOR,
WASTE CONTROL SPECIALISTS (WCS)

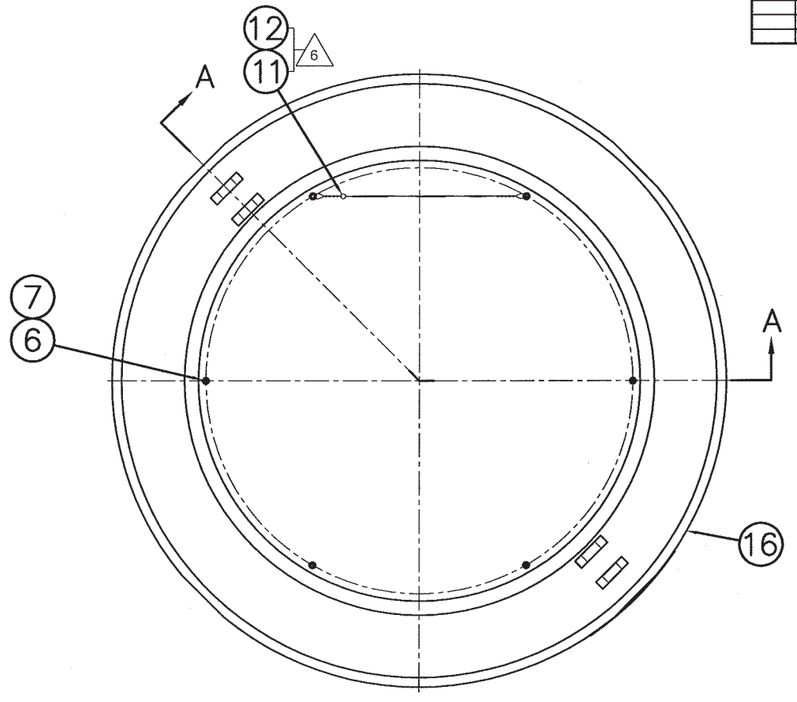
PROJECT 30039 | DRAWING 591 | REV 0 | SH 1 OF 1

R-232826

REV	CHANGE
0	INITIAL ISSUE



SECTION A–A



TOP VIEW

NOTE: Regulatory Approval Pending

(WCS Application Only)

			ITEM	NAME	MATERIAL	SPEC	DRAWING No.	DESCRIPTION
	1		16	VERTICAL CONCRETE CASK			455–866–96	
	4		15	SUPPLEMENTAL SHIELDING			455–913–99	
	1		14	COVER WELDMENT			455–862–97	
3			13	TAB	ST. STL.	ASTM A240/A276		1/4 PLATE/ BAR
	1		12	SECURITY SEAL	COPPER	1.0 DIA METAL CUP SEAL		AMERICAN CASTING CO.
	A/R		11	SEAL WIRE	ST. STL.	1/32 DIA WIRE		AMERICAN CASTING CO.
	A/R		10	SEAL TAPE	SEMIRIGID RUBBER	COML		MCMASTER–CARR #8622K23
1			9	COVER	304 ST. STL.	ASTM A240		1/4 PLATE
	1		8	INSULATION	SILICONE FOAM	COML		ROGERS HT–800, 1/8 THICK
	6		7	WASHER	316 ST. STL.	COML		1/2 FLAT WASHER
	6		6	LID BOLT	316 ST. STL.	COML		SEE NOTE 7
	1		5	LID			455–863–1	
	1		4	SHIELD PLUG			455–864–99	
			3	(DELETED)				
	1		2	CANISTER ASSEMBLY (GTCC)			455–888–99	
			1	(DELETED)				

97 ASSY QUANTITY	98 ASSY	99 ASSY

98 VERTICAL CONCRETE CASK, WITH LIFT ANCHOR GTCC

4. SHIM PLATES MAY BE UTILIZED TO FACILITATE FIELD WELDING OPERATIONS ON ONE OR BOTH SIDES OF THE SUPPLEMENTAL SHIELDING WELDMENT. LOCATE APPROX. AS SHOWN.

3. GAP AS REQUIRED FOR FIT UP.

2. AT THE OPTION OF THE USER, ONE CIRCULAR LAYER OF SEAL TAPE (ITEM 10) MAY BE APPLIED ON THE FLANGE OF THE VCC JUST INSIDE THE LID BOLT CIRCLE.

1. AT THE OPTION OF THE USER, DRILL A 1/16 DIA HOLE THRU THE MIDDLE OF THE BOLT HEAD, FROM THE MIDDLE OF ONE FLAT TO THE OPPOSITE FLAT. FOR A MINIMUM OF 2 BOLTS PER ASSEMBLY.

NOTES:

8. (DELETED)

7. ITEM 6 TO BE 1/2–13 UNC–2A X 3 1/4 LG HEX HEAD OR 1/2–13 UNC–2A X 2 1/2 LG HEX HEAD.

6. THE INSTALLATION AND USE OF SECURITY SEAL AND SEAL WIRE (ITEM 11 AND 12) IS AT THE OPTION OF THE USER.

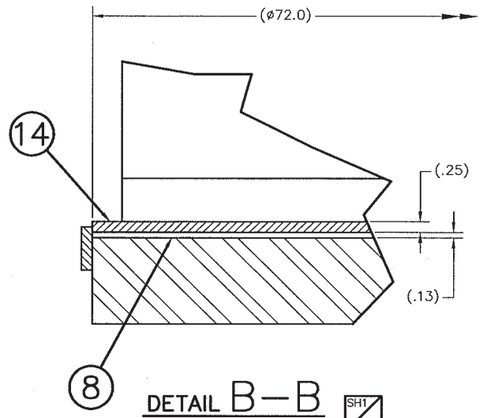
5. (DELETED)

NAC INTERNATIONAL

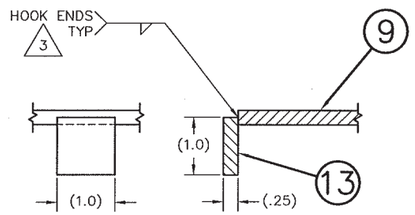
UNLESS OTHERWISE STATED	GROUP	NAME	DATE
DIMENSIONING AND TOLERANCING SHALL BE PER ASME Y14.5M–94	PREPARER		9/2/16
ALL THREAD DEPTH CALLOUTS ARE TO BE CONSIDERED AS A MIN. DEPTH OF PERFECT THREADS.	CHECKER		9-2-16
	PROJECT MANAGER		9-2-16
	ENGINEERING		9-2-16
ALL DIMENSIONS ARE IN INCHES	LICENSING		9/6/16
MACHINED SURFACES TO BE ▽ OR BETTER	QUALITY		9/7/16
NEXT ASSEMBLY: N/A			
DRAWING TYPE: LICENSE			

LOADED VERTICAL CONCRETE CASK (VCC) MPC–YANKEE, WASTE CONTROL SPECIALISTS (WCS)

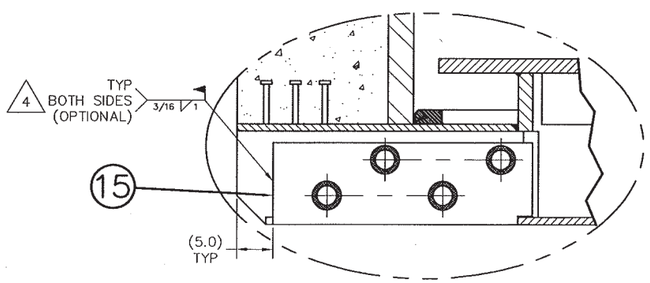
PROJECT	DRAWING	REV
30039	862	0
	SH 1 OF 2	



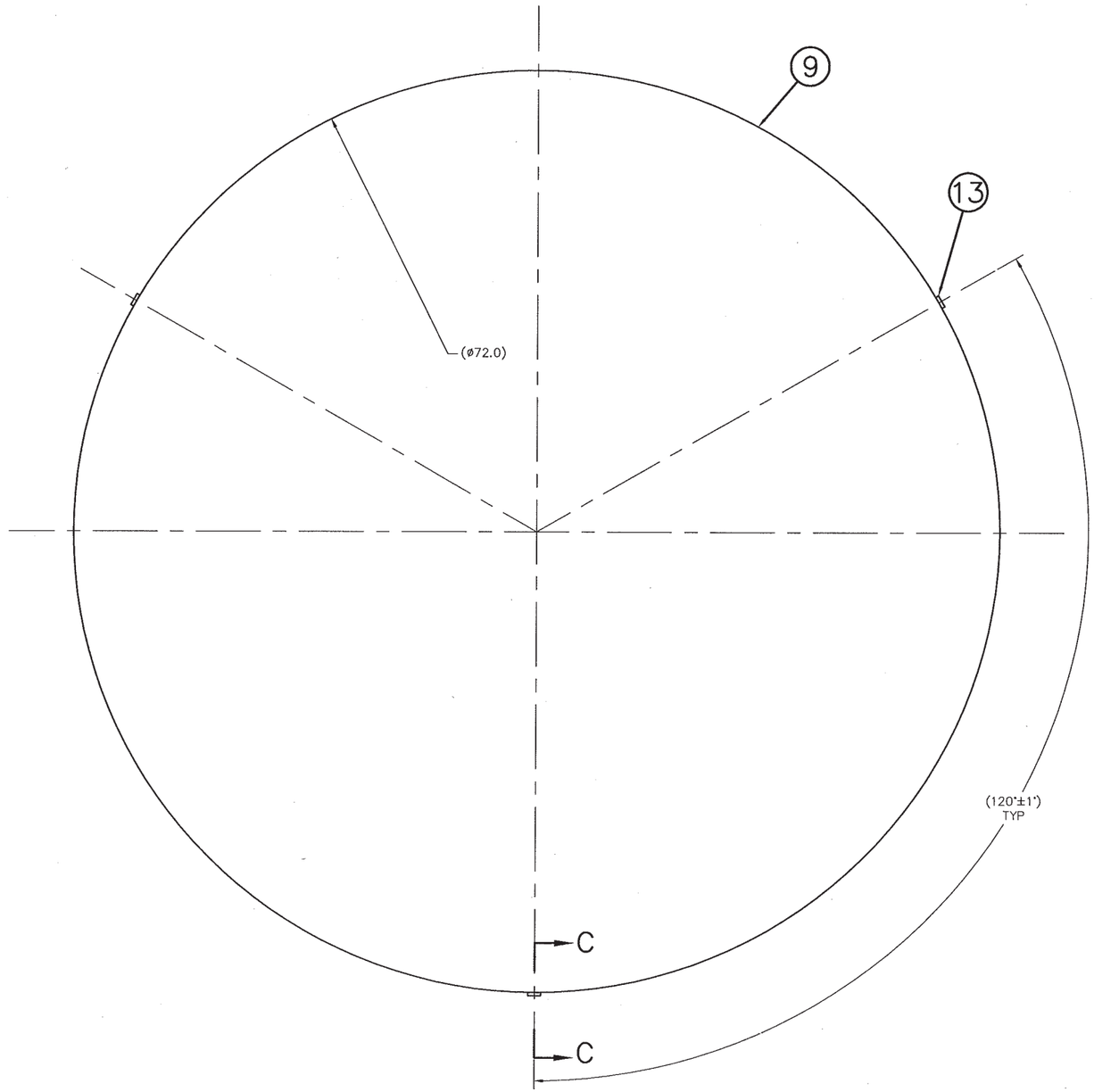
DETAIL B—B
SCALED
SHT D8



SECTION C—C
SCALED



DETAIL D—D
SCALED
OPTIONAL CONFIGURATION
SH1 B8



97 COVER WELDMENT

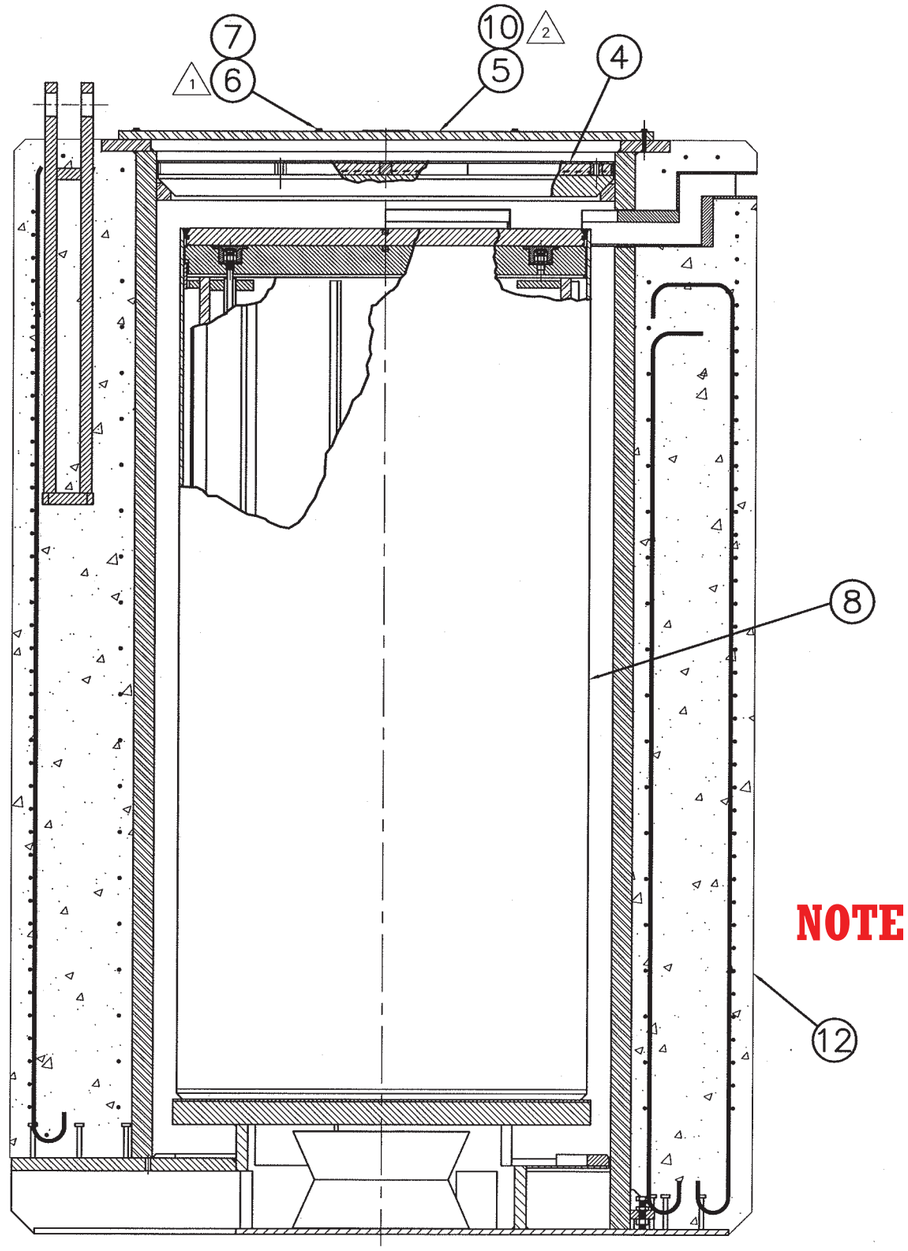
NAC INTERNATIONAL

LOADED VERTICAL CONCRETE CASK (VCC)
MPC—YANKEE
WASTE CONTROL SPECIALISTS (WCS)

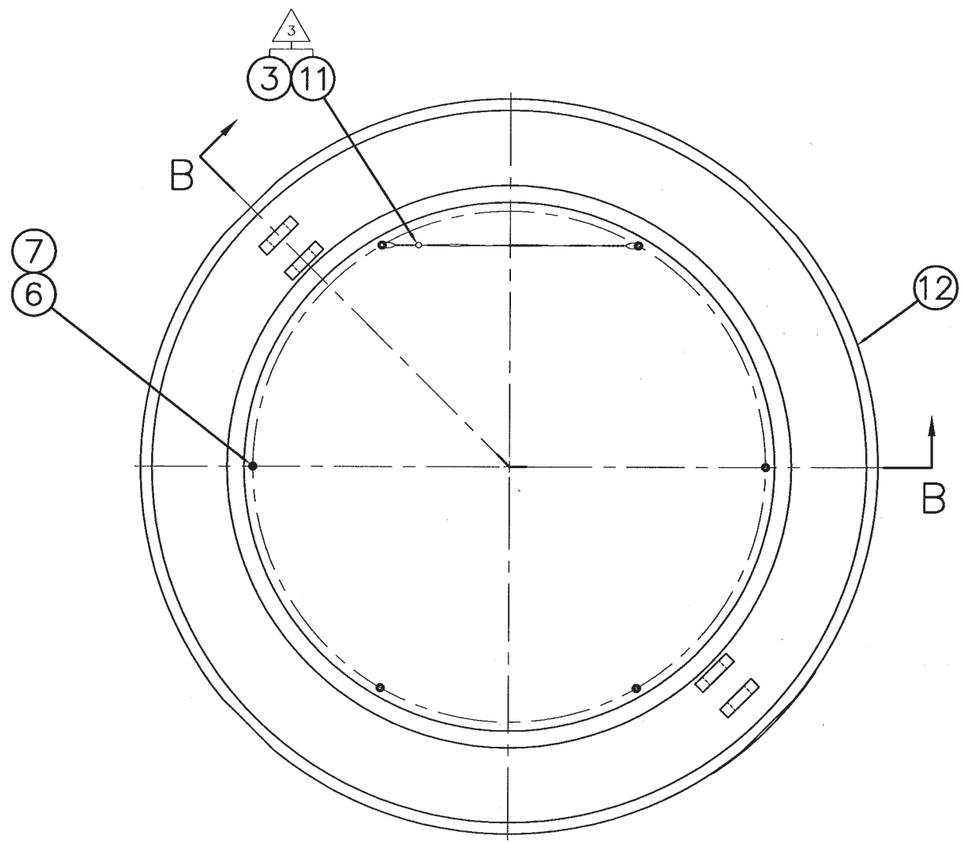
PROJECT	DRAWING	REV
30039	862	0
	SH 2 OF 2	

R-232828

REV	CHANGE
0	INITIAL ISSUE



SECTION B–B



TOP VIEW

NOTE: Regulatory Approval Pending

(WCS Application Only)

94 LOADED GTCC VCC

						ITEM	NAME	MATERIAL	SPEC	DRAWING No.	DESCRIPTION
						14	DELETED				
						13	DELETED				
					1	12	VCC ASSEMBLY			414-866-96	
3 2					A/R	11	SEAL WIRE	ST. STL.	COML		1/32 DIA WIRE
					A/R	10	SEAL TAPE	RUBBER	COML		1" X .032 NOMINAL
						9	(DELETED)				
					1	8	TSC GTCC			414-889-99	
					6	7	WASHER	ST. STL.	COML		1/2 FLAT WASHER
1					6	6	LID BOLT	ST. STL.	COML		1/2-13 UNC-2A X 2 1/2 LG HEX HD
					1	5	LID			414-863-1	
					1	4	SHIELD PLUG			414-864-99	
3					1	3	SECURITY SEAL	COPPER	COML		1.0 DIA METAL CUP SEAL
						2	(DELETED)				
						1	(DELETED)				
94 ASSY	95 ASSY	96 ASSY	97 ASSY	98 ASSY	99 ASSY						
QUANTITY											

2 AT THE OPTION OF THE USER, ONE CIRCULAR LAYER OF SEAL TAPE (ITEM 10) MAY BE APPLIED ON THE FLANGE OF THE VCC JUST INSIDE THE LID BOLT CIRCLE.

1 AT THE OPTION OF THE USER, DRILL A 1/16 DIAMETER HOLE THRU THE MIDDLE OF THE BOLT HEAD, FROM THE MIDDLE OF ONE FLAT TO THE OPPOSITE FLAT. FOR A MINIMUM OF 2 BOLTS PER ASSEMBLY.

3 THE INSTALLATION AND USE OF SECURITY SEAL AND SEAL WIRE (ITEM 3 AND 11) IS AT THE OPTION OF THE USER.

NOTES:

UNLESS OTHERWISE STATED
DIMENSIONING AND TOLERANCING SHALL BE PER ASME Y14.5M-94
ALL THREAD DEPTH CALLOUTS ARE TO BE CONSIDERED AS A MIN. DEPTH OF PERFECT THREADS.
ALL DIMENSIONS ARE IN INCHES
MACHINED SURFACES TO BE ▽ OR BETTER
NEXT ASSEMBLY:
DRAWING TYPE: LICENSE

GROUP	NAME	DATE
PREPARER		9/2/16
CHECKER		9-2-16
PROJECT MANAGER		9-2-16
ENGINEERING		9-2-16
LICENSING		9/6/16
QUALITY		9/9/16

NAC INTERNATIONAL

LOADED VERTICAL CONCRETE CASK (VCC) CY-MPC, WASTE CONTROL SPECIALISTS (WCS)

PROJECT 30039 | DRAWING 863 | REV 0 | SH 1 OF 1

APPENDIX H.5
OPERATION SYSTEMS
CANISTERIZED GTCC WASTE

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H.5 OPERATION SYSTEMS

The tasks required to receive, transfer and store the GTCC waste canisters at the WCS CISF are the same as those provided in Chapter 5 and the referenced Operating Procedures in the referenced Appendices for the applicable cask system listed in Table 5-1.

H.5.1 Operation Description

The GTCC waste canisters are designed to be functionally identical to the SNF canisters of the same system. Existing receipt, transfer and storage procedures, to the extent possible are therefore used for receiving, transferring and storing the GTCC waste canisters. The procedures for these operations applicable to the GTCC waste cansiters are provided in Chapter 5 and the referenced Operating Procedures in the referenced Appendices for the applicable cask system listed in Table 5-1.

H.5.2 GTCC Waste Handling Systems

GTCC waste canister handling is identical to that described in the procedures provided in Chapter 5 and the referenced Operating Procedures in the referenced Appendices for the applicable cask system listed in Table 5-1 except that no SNF is contained in the GTCC waste canisters. The remaining handling systems including transfer systems and equipment and safety features remain unchanged.

APPENDIX H.6
WASTE CONFINEMENT AND MANAGEMENT
CANISTERIZED GTCC WASTE

Table of Contents

H.6 WASTE CONFINEMENT AND MANAGEMENT

H.6.1 Waste Sources

There are no radioactive wastes generated by the storage of GTCC waste at the WCS CISF. The radioactive wastes generated in the CHB are from the potential need to remove contamination (decontaminate) from the outside surfaces of the transportation cask upon arrival at the site. Such contamination would be due to possible weeping of the transportation cask surface during transport to the site because the transport cask may have been immersed in fuel pools prior to arrival at the WCS CISF.

H.6.2 Off-gas Treatment and Ventilation

There is no radioactive off-gas generated by the receipt, transfer and storage of GTCC waste canisters at the WCS CISF.

H.6.3 Liquid Waste Treatment and Retention

There are no liquid wastes generated by the receipt, transfer and storage of GTCC waste canisters at the WCS CISF.

H.6.4 Solid Wastes

There are no solid wastes generated by the storage of GTCC waste canisters at the WCS CISF. Solid low-level radioactive wastes are generated at the WCS CISF as a result of contamination surveillance and transportation cask decontamination activities. These wastes are collected, packaged and temporarily stored at the WCS CISF as described in Section 6.4 of this SAR.

H.6.5 Radiological Impact of Normal Operations - Summary

There are no gaseous effluents, liquid effluents or solid wastes generated by the storage of GTCC waste canisters at the WCS CISF. Section 6.4 describes how the small amounts of solid wastes generated during receipt of the transportation casks are handled.

APPENDIX H.7
RADIATION PROTECTION
CANISTERIZED GTCC WASTE

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H.7 RADIATION PROTECTION

H.7.1 Ensuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA)

The policy and design considerations to maintain exposures ALARA are addressed in Chapter 9 of this SAR.

H.7.2 Radiation Sources

H.7.2.1 Characterization of Sources

Canisterized GTCC waste is non-fuel related material generated as a result of plant operation and decommissioning where the radionuclide concentration limits for Category C in 10 CFR 61.55 are exceeded. This waste may include such components as incore components, core support structures, and small reactor related miscellaneous parts resulting from the reactor vessel internals segmentation/decommissioning processes. All waste stored within the GTCC canister are activated metals, incore instrument tips, and associated surface contamination.

The total amount of canisterized GTCC waste to be stored at the WCS CISF is approximately 510,000 pounds.

The radiological characteristics of GTCC canisters are described in Section 7.2.1 and Table 7-1 of the Rancho Seco FSAR, Appendix C [H.7-1], for the GTCC waste proposed for storage at the WCS CISF for storage in a NUHOMS® System. The GTCC waste stored in NAC systems is described in the applicable transportation cask SAR and Certificate of Compliance (CoC) listed by docket number in Table 1-1. GTCC waste for NAC systems are received from Maine Yankee (GTCC-Canister-MY), Connecticut Yankee (GTCC-Canister-CY), Yankee Rowe (GTCC-Canister-YR), and Zion (GTCC-Canister-ZN). For GTCC-Canister-MY, the GTCC waste is described in the NAC-UMS transportation cask SAR, Section 1.3.1.1.2 [H.7-2]. For GTCC-Canister-CY and GTCC-Canister-YR, the GTCC waste is described in the NAC-STC transportation cask SAR, Section 1.2.3.2 [H.7-3]. For GTCC-Canister-ZN, the GTCC waste is described in the NAC-MAGNATRAN SAR, Section 1.3.2 [H.7-4].

H.7.2.2 Airborne Radioactive Material Sources

The release of airborne radioactive material is not a credible event with the system designs and procedures to be used. The GTCC waste canisters are sealed and the exterior surfaces clean upon receipt and remain sealed inside the clean canister while at the WCS CISF.

H.7.3 Radiation Protection Design Features

H.7.3.1 Shielding

H.7.3.1.1 Radiation Shielding Design Features

Shielding design features of the Storage Overpacks and Transfer Casks are addressed in Section 9.3.3.3 and the referenced sections in the referenced Appendices for the applicable cask system listed in Table 9-4 of this SAR. The shielding design features for the GTCC waste canisters are similar to the SNF canisters for the associated storage system. The outer dimensions of the GTCC waste canisters are identical to those of the SNF canisters in the associated system. Drawings showing materials of construction and thickness for the GTCC waste canisters are provided in Section H.4.8 of this SAR.

H.7.3.1.2 Shielding Analysis

The shielding analysis for the NUHOMS® MP187 Cask System GTCC Canister is addressed in Section 7.3.1.2 of Appendix C of [H.7-1]. The evaluation concludes that the GTCC waste canister contribution to the dose rates around the transfer cask, Storage Overpack, and therefore the site boundary is less than that calculated for the design basis SNF under normal and accident conditions. Therefore, the shielding evaluations provided for the NUHOMS® MP187 Cask System with SNF canisters in Appendix A.9 are bounding and the site dose evaluations in Chapter 9 which assume all SNF canisters in the evaluation are bounding.

As detailed in Section 5.5.1.2 of the NAC-UMS Transport SAR [H.7-2], the dose rates due to Maine Yankee GTCC waste are bounded by the dose rates for canisterized design basis SNF, as presented in UMS Transport SAR Section 5.1.3. As detailed in Section 5.1.4.2 of the NAC-STC Transport SAR [H.7-3], the dose rates due to Yankee Rowe GTCC waste are bounded by the dose rates for canistered Yankee Class fuel. As detailed in Section 5.1.4.3 of the NAC-STC Transport SAR [H.7-3], the dose rates due to Connecticut Yankee GTCC waste are bounded by the dose rates for canistered Connecticut Yankee Class fuel. As detailed in Tables 5.1-3 and 5.1-7 of the NAC-MAGNATRAN Transport SAR [H.7-4], the dose rates due to Zion GTCC waste are bounded by the dose rates for design basis canisterized undamaged PWR fuel.

H.7.3.2 Ventilation

The Storage Overpack ventilation designs are identical to those for SNF canisters which have much higher heat loads as compared to the GTCC waste canisters.

H.7.3.3 Area Radiation and Airborne Radioactivity Monitoring Instrumentation

The same area radiation and airborne radioactivity monitoring instrumentation is applicable to GTCC waste storage and is addressed in Section 9.3.5.

H.7.4 Estimated Onsite Collective Dose Assessment

H.7.4.1 Operational and Site Dose Assessment

Receipt, transfer activities and storage of the GTCC waste canisters are bounded by the same activities with canisters containing SNF. As addressed in Section H.7.3.1.2, occupational and site dose evaluations include the storage of GTCC waste canister which are modeled as spent nuclear fuel canisters.

H.7.5 Health Physics Program

The organization, equipment, facilities and procedures of the radiation protection program are addressed in Section 9.5 and are applicable to the GTCC waste canister operations.

H.7.6 Estimated Offsite Collective Dose Assessment

H.7.6.1 Effluent and Environmental Monitoring Program

No effluents are released from the WCS CISF during operation. There are no gaseous or liquid wastes generated during storage of the GTCC waste canisters. Since no effluents are released from the WCS CISF no effluent monitoring program is required.

H.7.6.2 Analysis of Multiple Contributions

As addressed in Section H.7.3.1.2, dose rates from the canisterized GTCC waste are bounded by the dose rates from canisters containing SNF in the same system. Therefore, by assuming that the Storage Overpacks contain a SNF canister, the onsite and offsite direct and scattered dose rates are bounding when some of the Storage Overpacks contain GTCC waste canisters.

It is therefore concluded that the radiation exposure due to storage of the GTCC waste canisters adjacent to the SNF storage do not exceed the regulatory requirements of 10 CFR Part 72 and 40 CFR Part 190.

H.7.6.3 Estimated Dose Equivalents

Since no airborne effluents are postulated to emanate from the WCS CISF, the direct and air scattered radiation exposures addressed in previous sections comprises the total radiation exposure to the public. No estimation of effluent dose equivalents is necessary.

H.7.6.4 Liquid Release

No radioactive liquids are released from the WCS CISF.

H.7.7 References

H.7-1 "Rancho Seco Independent Spent Fuel Storage Installation Safety Analysis Report," NRC Docket No. 72-11, Revision 4.

H.7-2 NAC International, "Safety Analysis Report for the UMS® Universal Transport Cask," Revision 2, CoC 9270 Revision 4, USNRC Docket Number 71-9270.

H.7-3 NAC International, "NAC-STC, NAC Storage Transport Cask Safety Analysis Report," Revision 17, CoC 9235 Revision 13, USNRC Docket Number 71-9235.

H.7-4 NAC International, "Safety Analysis Report for the MAGNATRAN Transport Cask," Revisions 12A, 14A, 15A, and 16A, USNRC Docket Number 71-9356.

APPENDIX H.8
ANALYSIS OF DESIGN
CANISTERIZED GTCC WASTE

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H.8 ANALYSIS OF DESIGN

In previous sections of this SAR, the features of the WCS CISF which are important to safety have been identified and addressed. The purpose of this section is to present the engineering evaluations for normal and off-normal operating conditions, and to establish and qualify the system for a range of credible and hypothetical accidents.

H.8.1 Normal and Off-Normal Operations

The normal and off-normal WCS CISF operations for dead weight, operational loads, and live loads are listed in Table 1-2 and addressed in Chapter 3 of this SAR. The various GTCC waste canisters are comparable to the SNF canisters in the following parameters:

- The nominal thickness of the various GTCC waste canister shells and cover plates are equal to, or greater than the thickness specified for the SNF canisters for the associated Cask System listed in Table 1-1 of this SAR.
- The material properties specified for the various GTCC waste canister shell assemblies have identical chemical and physical properties as the material specified for the SNF canisters for the associated Cask System listed in Table 1-1 of this SAR.
- The required thickness of the welds in the various GTCC waste canister shells is equal to or greater than the nominal thickness specified for the SNF canisters for the associated Cask System listed in Table 1-1 of this SAR.

In addition, the GTCC waste specified for the various GTCC waste canisters are comprised of large pieces of steel and not SNF. The contents remain intact under all possible loading conditions as they are inherently much more rigid than the SNF assemblies.

The GTCC waste canisters contain insignificant heat load. Internal pressures are therefore not anticipated to be significantly greater than the helium backfill pressures. In addition, temperature variations in the GTCC waste canister shell assemblies are small. Since the heat load is small and the material temperatures are only be slightly greater than ambient, the temperature variations at any point in the shells are approximately equal to the variation in ambient temperature. These small temperature cycles do not result in damage to, or failure of, the various GTCC waste canister shell assemblies.

H.8.2 Accident Analyses for the WCS CISF

The accident conditions for cask drop, canister leakage, earthquake, and fire are listed in Table 1-2 of this SAR. The various GTCC waste canisters are comparable to the SNF canisters for the associated Cask System listed in Table 1-1 of this SAR for the parameters provided in Section H.8.1 above. Accident pressurization is not considered a credible event due to the very low heat load of the GTCC waste canisters.

H.8.2.1 Accidental GTCC Canister/Cask Drop

Section 5.2.2 of the Technical Specifications [H.8-1] addresses required inspections following a cask drop.

H.8.2.2 GTCC Canister Leakage

The various GTCC canister shells are designed with pressure retaining features to prevent leakage of contaminated materials. There are no credible conditions that can breach the canister shell or fail the welds at each end of the canisters. The GTCC waste closure lid welds are multi-pass closure welds and are the same as closure welds for canisters loaded with SNF. Performance of a multi-pass closure weld on GTCC waste canisters ensures no leakage path through the closure lid to shell weld. Some of the canisters also include a redundant closure lid with multi pass welds providing an additional barrier to leakage at the ends.

H.8.2.3 Accident Pressurization

The various GTCC canisters contain insignificant heat loads. In addition, temperature variations in the various GTCC shell assemblies are small. Since the heat load is small and the material temperatures are only slightly greater than ambient, the temperature variations at any point in the shell are approximately equal to the variation in ambient temperature. These small temperature cycles do not result in damage to, or failure of, the GTCC shell assemblies.

H.8.2.4 Earthquake

A seismic event is not expected to negatively impact the GTCC waste canisters. The GTCC waste canisters are comparable to the previously analyzed SNF canisters for the associated Cask System listed in Table 1-1 of this SAR.

Evaluations of the effects and consequences of the earthquake event for the Storage Overpacks are addressed in Chapter 12 and the referenced Appendices for the applicable cask system listed in Table 12-1.

H.8.2.5 Fire

The evaluations are presented in Chapter 12 and the referenced Appendices for the applicable cask system listed in Table 12-1.

H.8.3 References

H.8-1 Proposed SNM-1050, WCS Consolidated Interim Storage Facility Technical Specifications, Amendment 0.

APPENDIX H.9
CONDUCT OF OPERATIONS
CANISTERIZED GTCC WASTE

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H.9 CONDUCT OF OPERATIONS

The organization and general plans for operating the WCS CISF are not altered or modified by the addition of the GTCC waste canisters. The external characteristics of the various GTCC waste canisters are functionally identical to those of the SNF canisters for the associated Cask System listed in Table 1-1 of this SAR. Existing procedures, qualifications and training used for the SNF receipt, transfer and storage operations are used to the extent possible for the GTCC waste canisters.

The VP Operations is responsible for the overall operation and maintenance of the WCS CISF and for ensuring the safe storage of the canisterized SNF and GTCC waste.

Administrative programs such as radiation protection, environmental monitoring, emergency preparedness, quality assurance, and training need not be modified for the receipt, transfer and storage of the GTCC waste canisters.

H.9.1 Organizational Structure

Organizational structure is not altered by receiving, transferring and storing the GTCC waste canisters.

H.9.2 Pre-Operational Testing and Operation

Functional tests of receipt operations, transfer operations, and storage and retrieval for the canisterized SNF are the same as for the various GTCC waste canisters for the associated Cask System listed in Table 1-1 of this SAR. Therefore, functional tests of equipment, transfer operations, and Storage Overpack loading and retrieval are performed as part of preparation for the canisters containing SNF of the same system and new or additional pre-operational testing and operation steps are not required for GTCC waste canisters.

H.9.3 Training Program

The various GTCC waste canisters are functionally identical to the SNF canisters for the associated Cask System listed in Table 1-1 of this SAR. The training program addressed in Section 13.3 of this SAR is applicable to the GTCC waste canister operations.

H.9.4 Normal Operations

The preparation, review, approval, and adherence to procedures described in Section 13.4 of this SAR cover the GTCC waste canister operations.

H.9.5 Emergency Planning

The Emergency Plan covers receipt, transfer and storage of the various GTCC waste canisters at the WCS CISF. See Section 13.5 of this SAR for emergency planning details.

H.9.6 Decommissioning Plan

The WCS CISF Decommissioning Plan covers receipt, transfer and storage of the various GTCC waste canisters at the WCS CISF. See Section 13.6 of this SAR for discussion of the Decommissioning Plan for the WCS CISF.

APPENDIX H.10
OPERATING CONTROLS AND LIMITS
CANISTERIZED GTCC WASTE

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H.10 OPERATING CONTROLS AND LIMITS

H.10.1 Proposed Operating Controls and Limits

The WCS CISF storage system is unaffected by the storage of canisterized GTCC waste.

Controls and limits on the GTCC waste canisters are applied to provide assurance that the WCS CISF uses the same controls and limits as those for the canisters containing SNF. Operating controls and limits are addressed in the Technical Specifications [H.10-1] and Chapter 14. Use of the organizational and administrative systems and procedures, record keeping, review, audit, and reporting requirements coupled with the requirements of this SAR ensures that the operations involved in the storage of canisterized GTCC waste at the WCS CISF are performed in a safe manner. This includes the verification of the GTCC waste canisters prior to and during placement into the storage overpacks.

H.10.2 Development of Operating Controls and Limits

The bases for the operating controls and limits specified in Chapter 14 are applicable to GTCC waste canister handling and storage at the WCS CISF to maintain the public health and safety. The Technical Specifications and/or SAR for canisterized spent nuclear fue1 storage are unaffected by the presence of canisterized GTCC waste.

H.10.3 References

H.10-1 Proposed SNM-1050, WCS Consolidated Interim Storage Facility Technical Specifications, Amendment 0.

APPENDIX H.11
QUALITY ASSURANCE
CANISTERIZED GTCC WASTE

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H.11 QUALITY ASSURANCE

The Quality Assurance Program Description is not altered or modified by the GTCC waste canisters. Section 1.4.4.3 of this SAR includes discussion and the reference to the Quality Assurance Program Description.