

Update on the ORNL Central Gaseous Waste System

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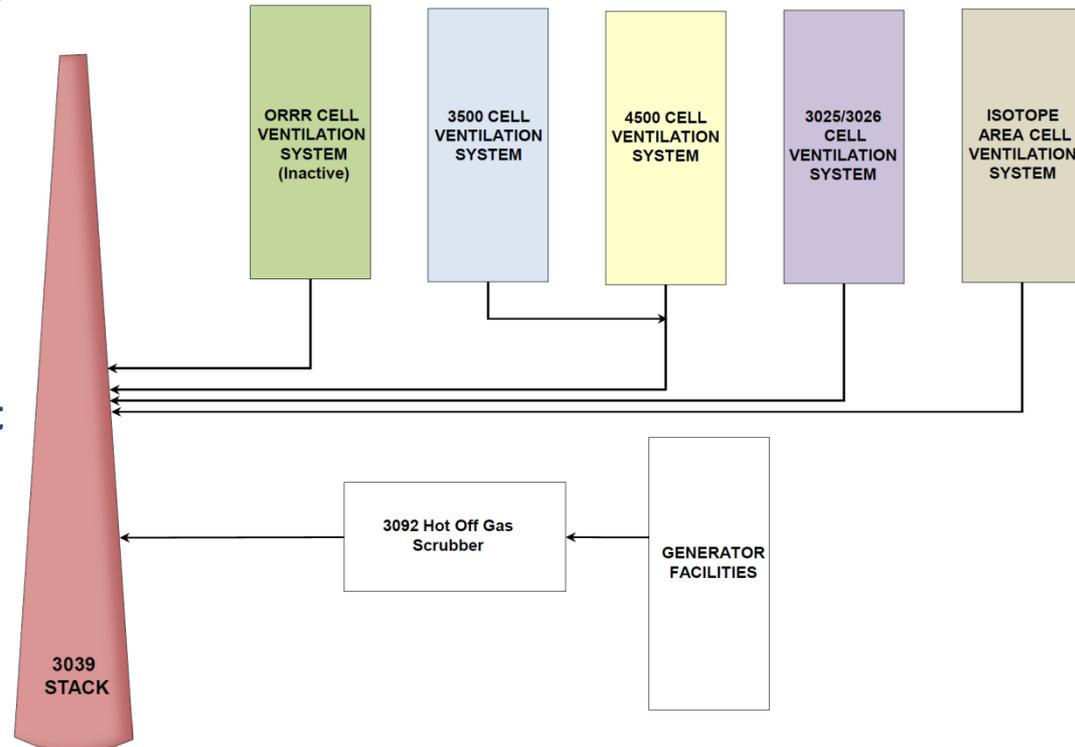
Update on the ORNL Central Gaseous Waste System

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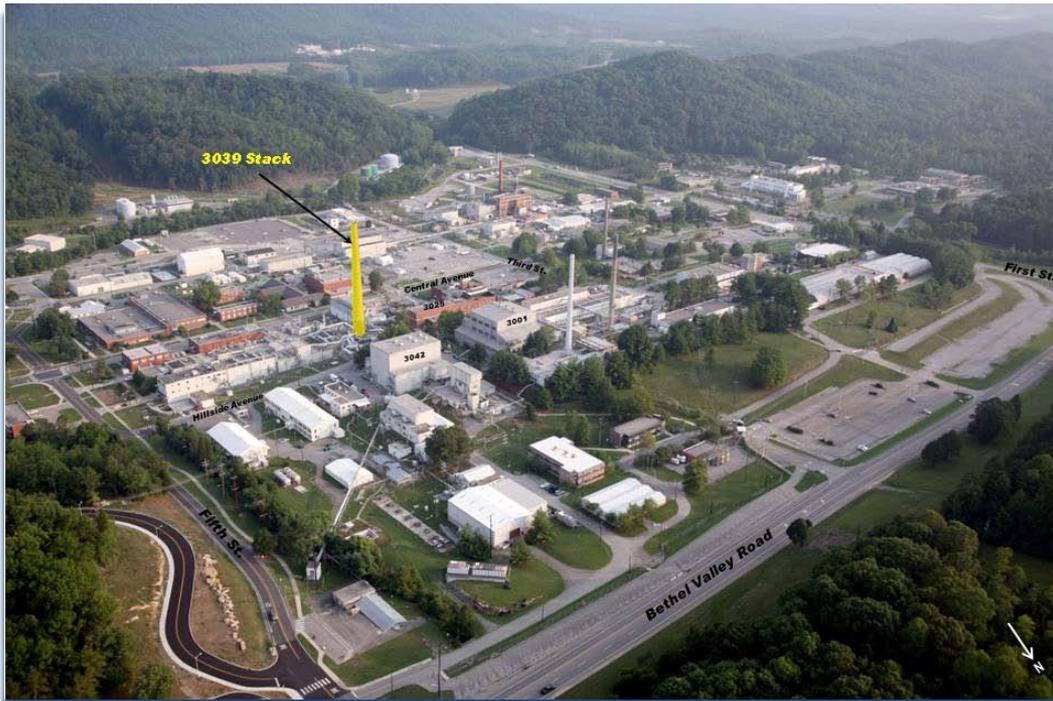


Central Gaseous Waste System Background

- Provides containment ventilation, off-gas treatment, and discharge of gaseous waste from many ORNL Central Campus facilities
- The system consists of:
 - Cell Ventilation Systems (CVSs) – 5 branches
 - Hot Off-gas (HOG) treatment and discharge system
 - Associated collection and transfer piping, filter houses/pits, ductwork, and fans
 - 3039 Stack



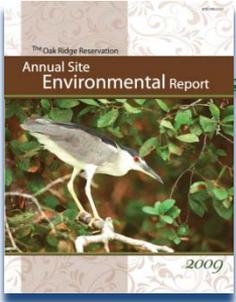
Central Gaseous Waste System Background (cont.)



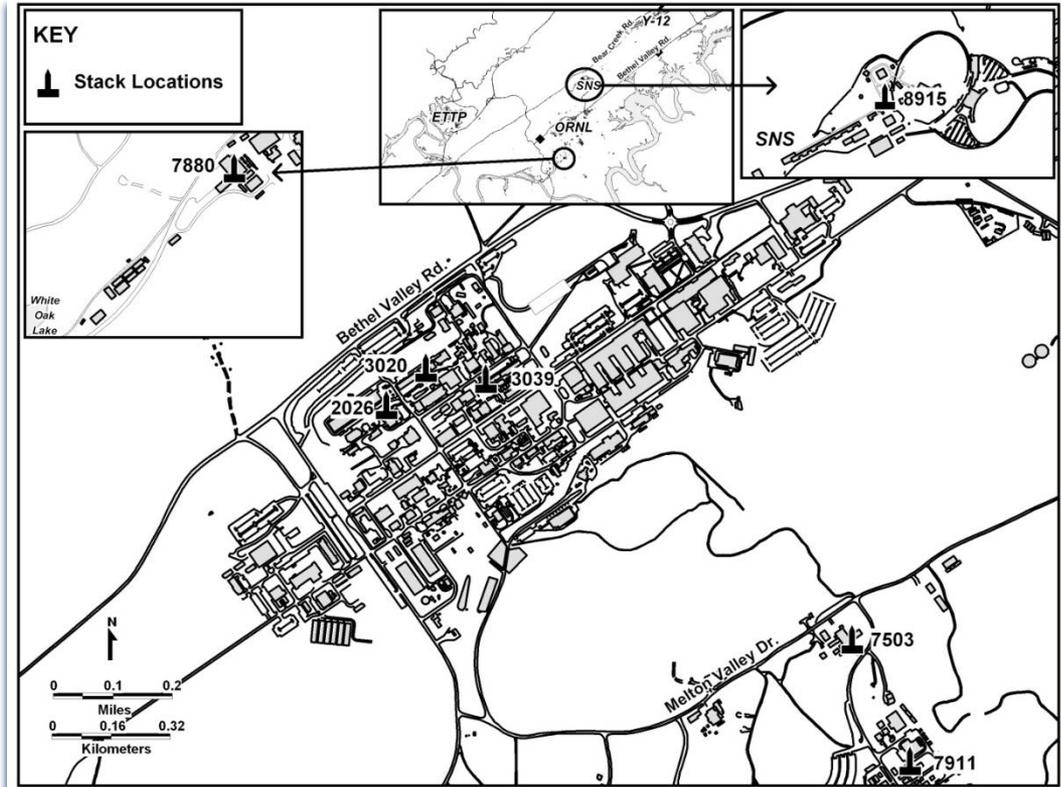
- DOE-EM facility operated by BJC subcontractor
- The system is designed to prevent environment, safety, and health (ES&H) risk associated with accidental release of airborne pollutants
- Risk has increased over the years as the CGWS and connected facilities have aged
- Recent and ongoing projects reduce near-term risk and decouple some facilities from the system
- Long-term strategy is to decouple all facilities and deactivate the entire system



ORNL Radiological Air Emissions

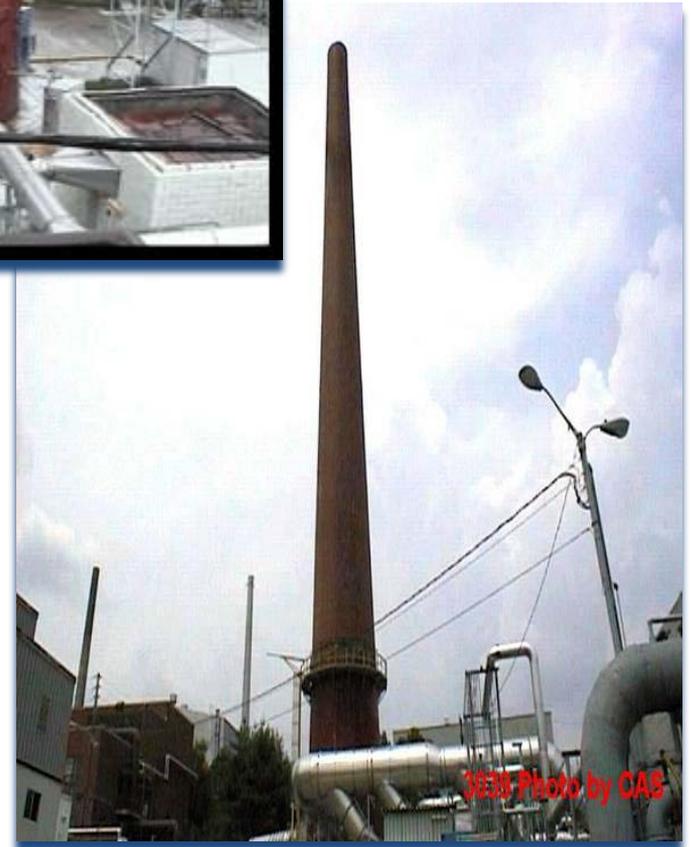


- The 3039 stack system is a radiological emission point source at ORNL regulated under the Clean Air Act
- During 2009, calculated radiation dose to the maximally exposed off-site individual from all radiological airborne release points at ORNL was 0.3 mrem.
 - Well below the NESHAP standard of 10 mrem
 - Less than 0.10 % of the 310 mrem that the average individual receives from natural sources of radiation.
 - Contribution from the 3039 stack was 0.01 mrem



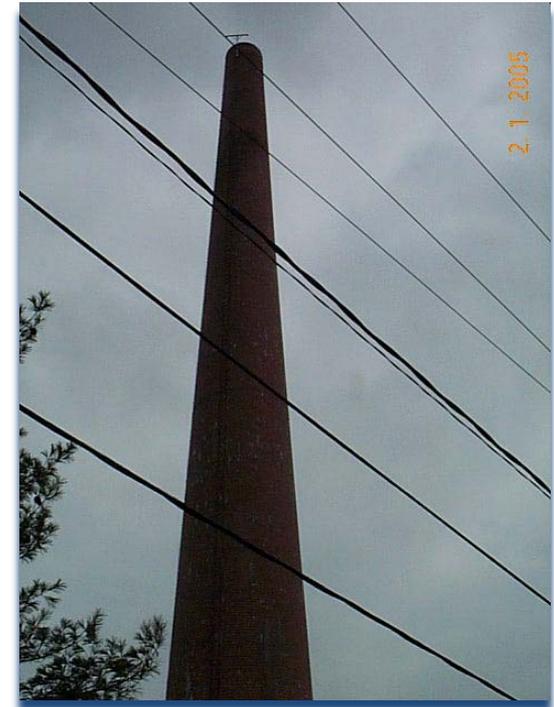
3039 Stack

- Constructed in 1950
- Operates continuously
- Discharges a total gas volume of approximately 126,000 cfm or 66 billion ft³/yr
- 250-ft high, radial brick chimney lined with acid-resistant brick
- Air emissions monitoring systems located at the 50-ft level



Strontium-90 Release from 3039 Stack in 2002

- Spots of radiological contamination from the release were discovered in the ORNL Central Campus area
 - Source of contamination was a High Efficiency Particulate Air (HEPA) filter change at Building 3038 completed on June 26-27, 2002
 - Operational Emergency declared
 - Resulted in Type B investigation
 - Total release calculated to be less than 2 millicuries (mCi) of Strontium-90
 - Resulted in minimal on-site and off-site dose comparable to natural background
 - Cost for decontamination/clean-up activities was approximately \$1 Million
 - Impacts to ongoing DOE SC mission activities at ORNL were minimized because event occurred at beginning of 4 day holiday
 - Corrective actions have been taken to prevent recurrence



Reducing the CGWS

Progress to date

- Prior to 2009, over 20 facilities have been isolated from the 3039 stack and no longer require service
- ARRA funded projects will isolate, characterize, and/or demolish additional facilities
 - Bldgs 3026C&D and 3140 (**isolation complete**)
 - Bldgs 3503, 3508, 3550, 3119, and Bldg 3098
 - D&D of Bldg 3098 disconnects the Bulk Shielding Reactor from the CGWS
 - Part of the 34 Buildings D&D Project
 - Bldg 3038 Hot Cell D&D Project
 - 4500 Area Isolation Project
 - Isotopes Area Characterization Project
- CD-2/3 Package preparation to support future projects
 - Isotopes Area D&D



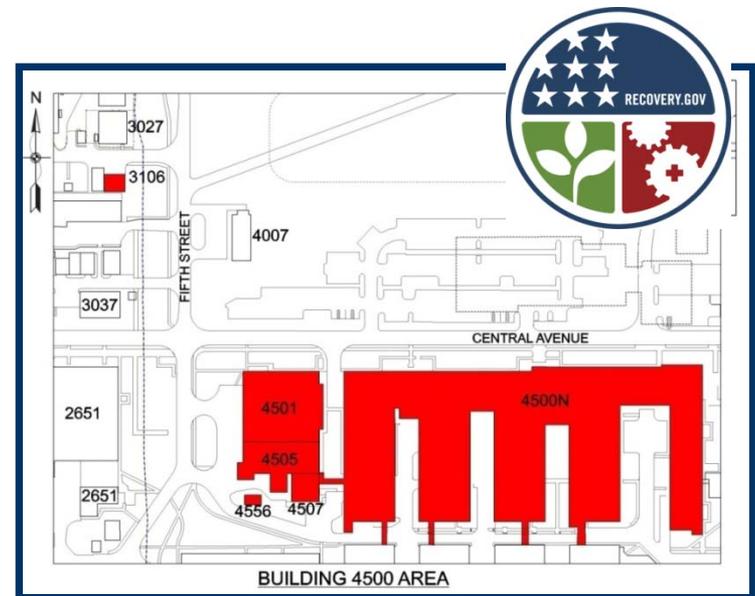
3026 C&D Hot Cell concrete structures



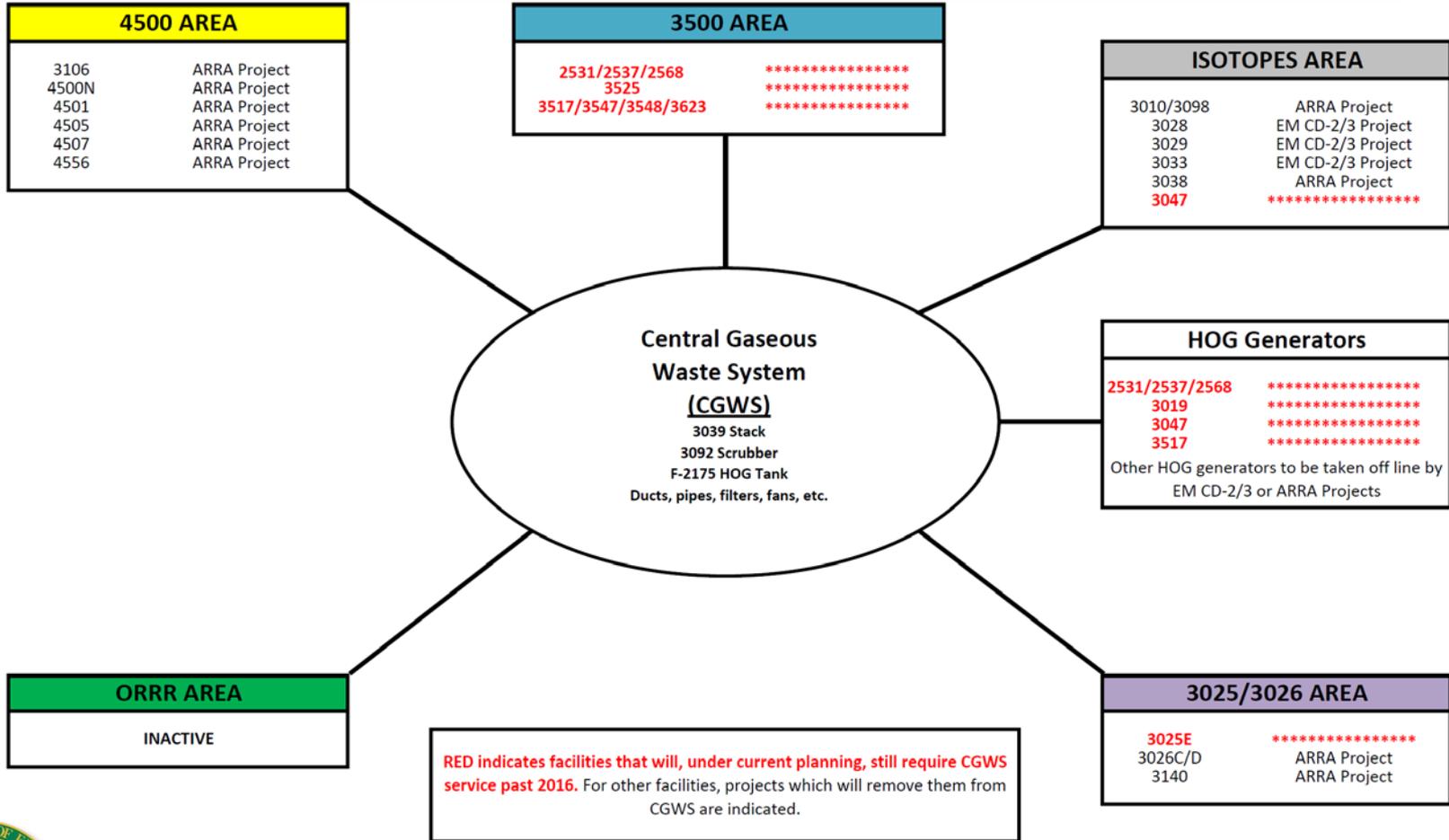
Reducing the CGWS

4500 Area Isolation Project

- ARRA-funded project
- Will deactivate 4500 Area cell ventilation branch (one of five) in the CGWS
- Will remove several facilities from the central Hot Off-Gas System
- Scope **does not include** demolition of Bldgs 4500N, 4501, 4505, or 4507.
- Scope includes:
 - Replacement of existing ventilation systems for Bldgs 4501, 4505, and a portion of 4500N with local systems;
 - Stabilization of hot cells in Bldg 4507 and refitting with local ventilation;
 - Stabilization of two filter pits, 3106 and 4556;
 - Cutting and capping hundreds of feet of off-gas piping; and
 - Stabilization of hundreds of feet of decaying contaminated ductwork.



Reducing the CGWS Plan Summary



Facilities requiring Long-term CGWS Service

- Three of the five CVS branches and the HOG system contain facilities that require long-term service

3500 AREA

- Bldgs 2531/2537/2568
- Bldgs 3525
- Bldgs 3517/3547/3548/3623

ISOTOPES AREA

- Bldg 3047

3025/3026 AREA

- Bldg 3025E

HOG System

- 2531/2537/2568
- 3019
- 3047
- 3517

3525 Interior



3517 Interior

3047



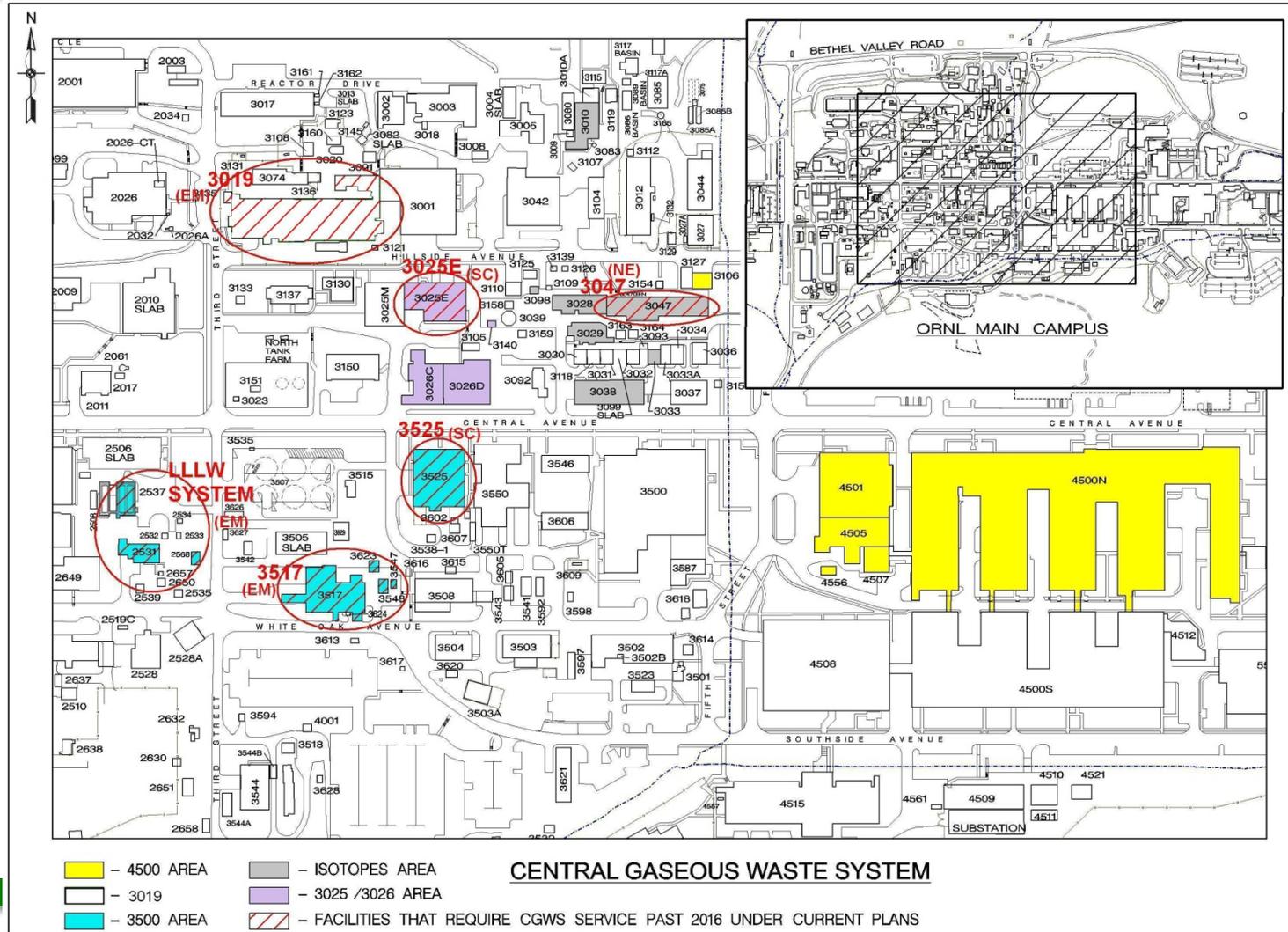
3025E



3019



Facilities Requiring Long-term CGWS Service (cont.)



FIGURE_ORNL_CENTRAL_GASEOUS_WASTE.DGN



Path forward for CGWS Deactivation and 3039 Stack Demolition

- Most of the remaining facilities requiring CGWS service are slated for eventual demolition
- Options and steps for removing remaining facilities from CGWS service include:
 - Installing local ventilation
 - Legacy material removal
 - Stabilization of hot cells and ventilation systems
 - Relocating operations and personnel
 - Completing missions that require CGWS service (Bldg. 3019)
- 3039 stack demolition will occur after all facilities are removed from CGWS service



2. 1. 2005

Near-term Maintenance of 3039 Stack

- Past inspections identified items requiring maintenance and repairs and signs of deterioration
 - Exterior mortar joints are leaching
- Inspection and repair scheduled in early FY 2011
 - Stack exterior inspection and repair
 - Stack interior inspection
 - Determine the cause of leaching to outer column
 - Ascertain overall stack condition

