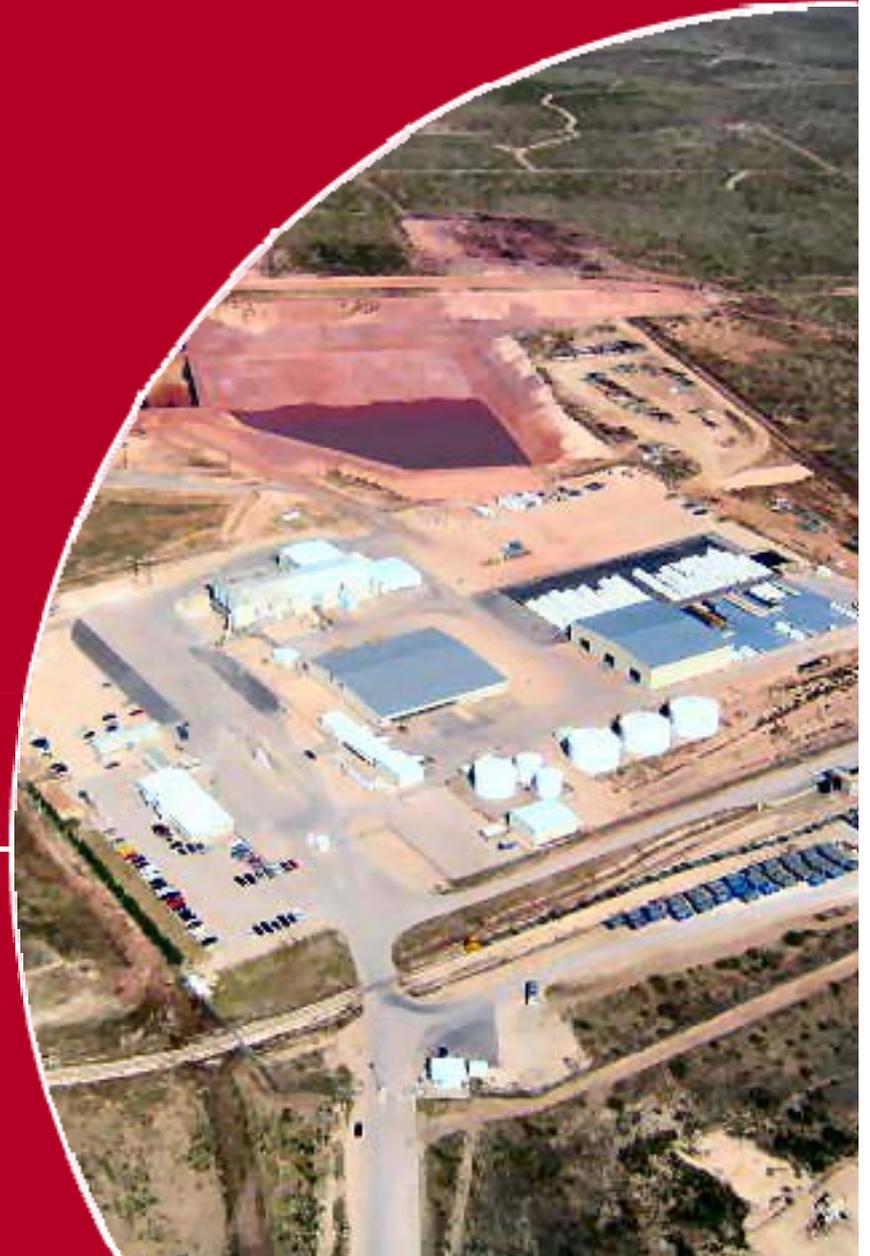


Studsvik

**Management of Class B and C
LLRW**



Studsvik Pedigree

60 years of Service to the Nuclear Market

- Studsvik founded in 1949
 - Began as a branch of the Swedish government to develop, build and operate nuclear power plants in Sweden.
 - Early years, specialized in nuclear research, specifically
 - uranium production and
 - fuels and materials technology
- Since those formative years
 - Has diversified its international holdings to become a full service nuclear company with over 1,200 employees and a presence in the US, UK, Germany, Sweden and Japan.

Studsvik's US Market Presence

- Memphis, TN: Acquired RACE, LLC in 2006
- **Erwin, TN: Began Operation in 1999**

Studsvik – Erwin, TN

In the Door Volume: ~300,000 ft³

Volume After Processing: ~ 60,000 ft³

Volume Saved: ~240,000 ft³

Volume Reduction Ratio: 5:1

Waste Streams Processed:

- *Resins Consisting of -*
 - *Bead and Powdered Resins; Charcoal; Sludge*
- *Aqueous Liquids*
- *Filter Cartridges (Inorganic and Organic)*
- *Organic Waste Streams*



Studsvik's US Market Presence

- Erwin, TN: Began Operation in 1999
- **Memphis, TN: Acquired RACE, LLC in 2006**

Studsvik – Memphis, TN

In the Door Volume: ~500M lbs

Waste Streams Processed:

- General Waste / DAW / Metals
- Large Components (Pressurizers, Turbines, etc)
- Aqueous / Organic Waste Streams
- Decommissioning / Demolition Rubble

Methodologies:

- BSFR (*Bulk Survey for Release*)
- Survey for Free-Release
- Waste Sorting / Volume Reduction



Other Venture:

THOR Treatment Technologies, LLC, a joint venture with URS/Washington to practice the THOR process within the US Government.

Studsvik US Market Experience

- Markets Served

- Nuclear Utilities (Operating and Decommissioning)

- Institutions, Industrial, and Commercial

- Westinghouse

- Areva

- Honeywell

- Parr

- US Government - DOE

- Columbus Closure Project

- Portsmouth

- West Valley

- Ashtabula

- Brookhaven

- Paducah

- Los Alamos

Recent changes in LLW disposal in the US

- **June 30, 2008 – Barnwell Closed**
- **36 States foreclosed from disposal for Class B/C LLW**
- **Evaluating the Alternatives for Class B/C LLW–**
 - On-site storage
 - Reduce production of B and C LLW through system management, short loading
 - Downblending/dispersion
 - Long-term storage of volume reduced and stabilized Class B/C LLW at licensed storage facility

Concentration Averaging (Downblending/Dilution)

- **Downblending/Dilution impacts safety**
 - Downblending/Dilution has a negative impact on human and environmental safety
 - B/C waste produces 90% of LLW radioactivity hazard
 - Downblending/Dilution reduces stabilization and isolation requirements for B/C LLW
 - Higher level Isotopes would no longer be required to be isolated from biosphere for 300 years
 - Downblending/Dilution will increase radiation exposure to workers engaged in operational cycle

Concentration Averaging (Downblending/Dilution)

- Downblending/Dilution reverses longstanding regulatory standards
 - The International Atomic Energy Agency (IAEA), Nuclear Regulatory Commission, Environmental Protection Agency, Department of Energy and state agencies have policies that strictly prohibit use of dilution to change a waste's classification for the purpose of disposal
 - IAEA principles—Safety Series III prefers concentration and containment over dilution and dispersion
 - NRC approval of intentional mixing to meet Waste Acceptance Criteria (WAC) as long as classification of waste [10 CFR 61.55] is not altered [NUREG-1757]
 - Conference on Radiation Control Program Directors and State Agencies' long-standing opposition to use of dilution to change waste classifications
 - NRC reaffirmed Branch Technical Position (BTP) and the factors of 10 do not allow intentional mixing solely to lower waste classification [NRC letter to ALARON dated 10/16/2006]

Concentration Averaging (Downblending/Dilution)

- Downblending/Dilution is prohibited by States with disposal sites
 - Texas statutes and regulations prohibit dilution to change waste classification or disposal requirements and mixed/diluted waste shall be subject to the disposal requirements as if it had not been diluted [30 TAC Sec. 336.229]
 - Utah regulators have expressed significant concerns with downblended/diluted waste
 - Consider Governor's prohibition on disposal of B and C LLW in Utah

Studsvik LLW Management Plan

- Waste is processed through Studsvik's THOR™ process
 - Significant (~5:1) volume reduction
 - Chemical form is changed (organics removed) resulting in extremely stable waste form (“Reformed Residue”)
 - Radiological identity of Reformed Residue can no longer be attributed to discrete generators and becomes attributable to Studsvik
- Studsvik accepts financial responsibility for disposal of the Reformed Residue
- Class A LLW is shipped for disposal
- Class B and C LLW is containerized and stored at a licensed storage facility until a final disposition path is available

Studsvik Plan: Regulatory Issues

- **Studsvik license amendment**

- State of Tennessee approved Studsvik request to amend its attribution model
- Attribution model now consistent with Interstate Agreement for the Uniform Application of Manifesting Procedures
- Under amended attribution model, Studsvik becomes attributable generator of waste at the point waste is mixed for processing through THOR process

- **Storing Studsvik B & C Material**

- Where: WCS, Andrews TX
- WCS operates in TX under a license issued by the State of TX
- Under interim storage provisions of WCS license, B and C LLRW may be stored until final disposition path becomes available
 - Subject to TX financial assurance requirements
- WCS LLW disposal license granted for Texas Compact generators

Studsvik Plan: Disposal Liability Cost Management for Class B and C Waste

- A Waste Management Fund (WMF) has been created by Studsvik to manage disposal liability costs
 - Managed by a third party Escrow Agent
 - \$3,146/ft³ of Reformed Residue is deposited into the WMF
- Studsvik provides “Financial Assurance” and issues to Texas an Irrevocable Standby Letter of Credit (~\$400k) for every container placed in storage at WCS

Studsvik