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Consolidated Interim Storage of Spent Nuclear Fuel

Environmental Report Pre-Application Meeting
Rockville, Maryland
16 June 2015

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Project Team Leaders

- Scott Kirk – Waste Control Specialists LLC
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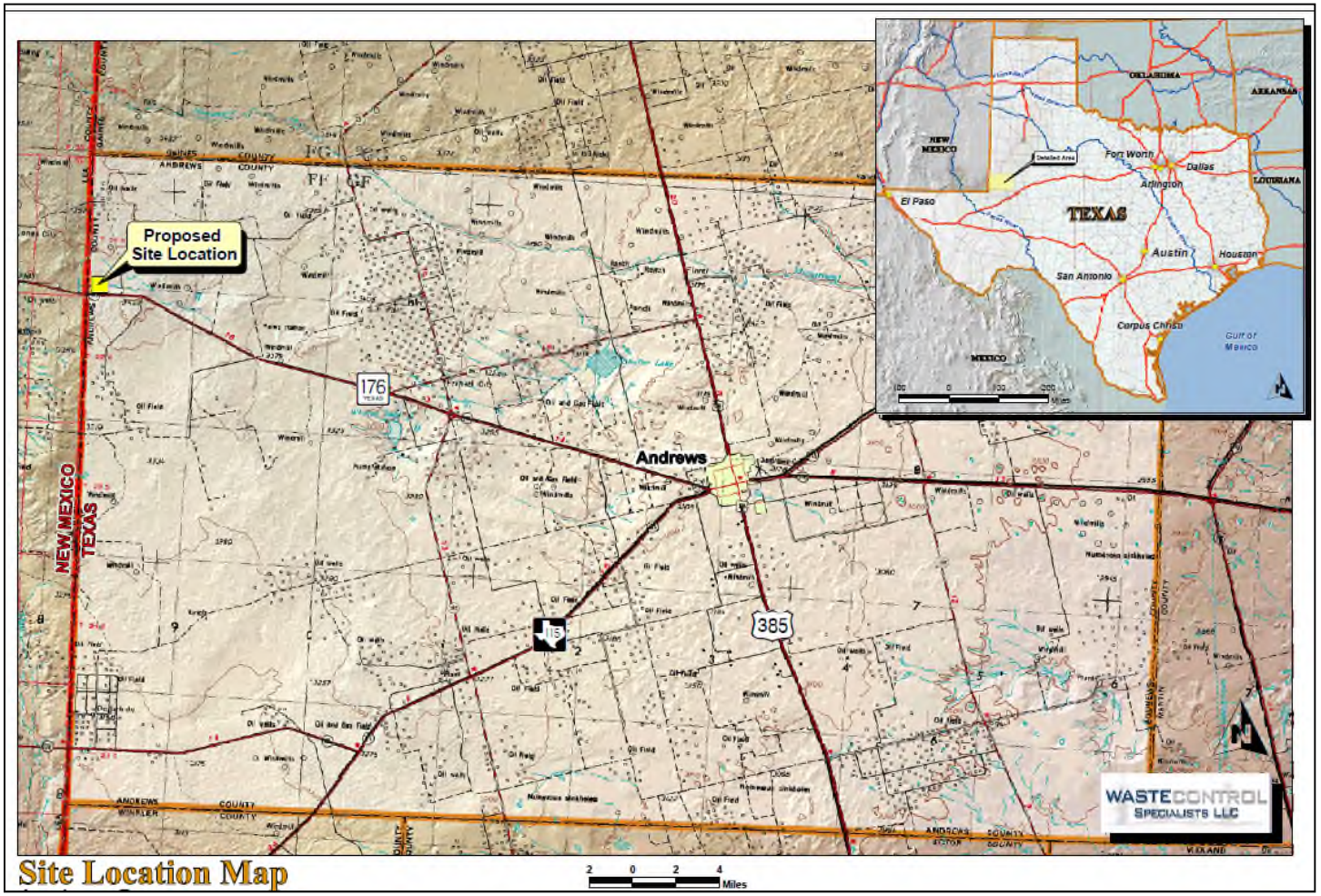
Site Overview



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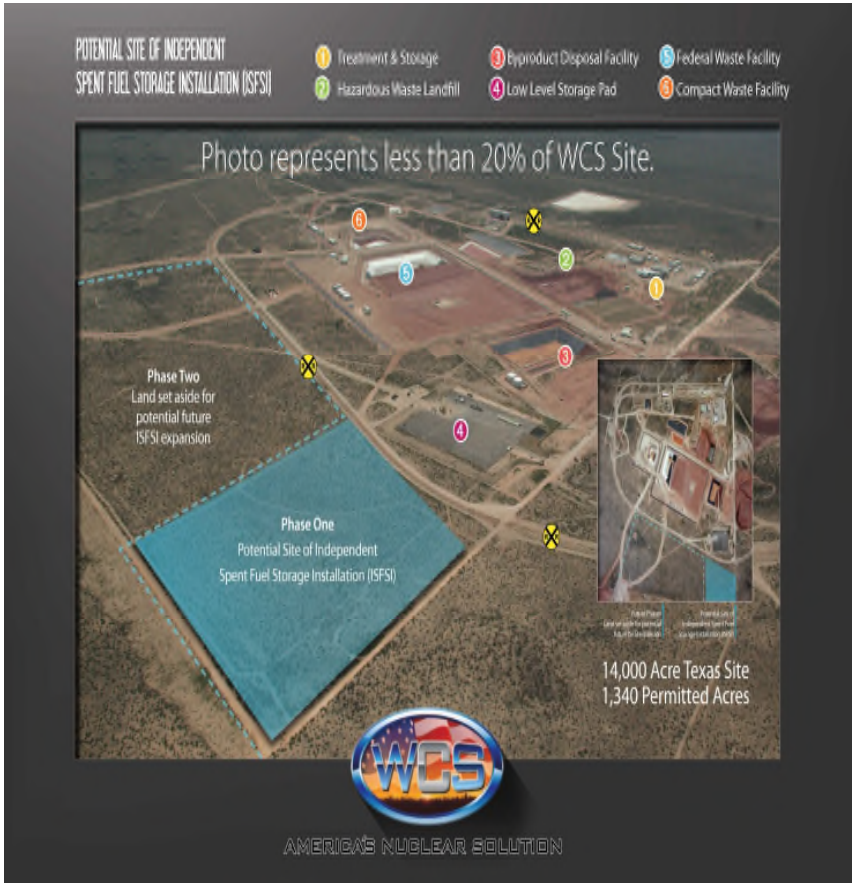
Site View



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Environmental Report

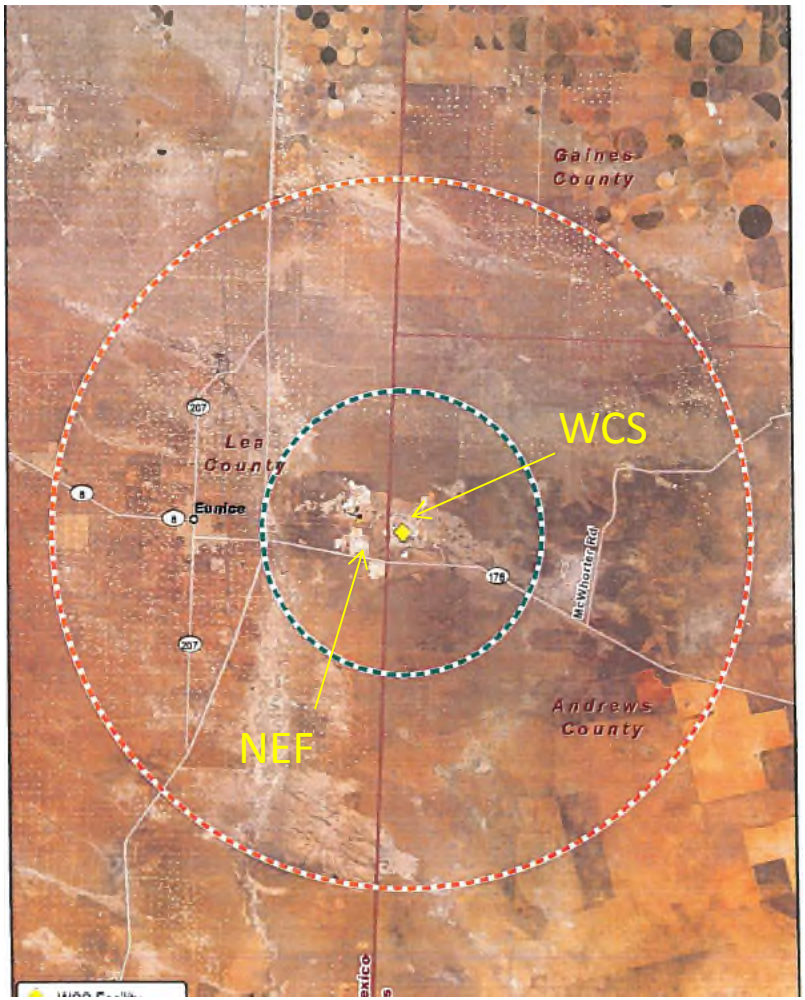
- Environmental Report will be prepared using NUREG-1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs.

- Previous environmental reviews include:
  - EIS for Private Fuel Storage (NUREG-1714) that addressed impacts of storing 40,000 MTUs
  - Generic EIS for the Continued Storage of SNF ("Waste Confidence Rule") (NUREG-2157)

- Incorporation by reference or use of the NEPA tiering process, as appropriate.

Environmental Report (Cont.)

- Environmental Impacts have been extensively analyzed in the region.
  - NRC EIS for National Enrichment Facility (NEF) (NUREG-1790)
  - TCEQ Environmental Assessments for the existing WCS facilities http://www.wcstexas.com/pdfs/licenses/R04100%20License%20Current.pdf



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NEPA Process

- WCS approach allows for addition of new SNF storage systems via license amendments as needed, but at the same time:
  - Ensures the cumulative environmental impacts are analyzed
  - Avoids segmentation of NEPA process

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Purpose and Need

- Safely and securely consolidate storage of SNF and reactor –related GTCC LLW in a Consolidated Interim Storage Facility (CISF)

- Accommodate complete decommissioning of multiple reactor sites

- Implement Blue Ribbon Commission's recommendations

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Proposed Action

- WCS is requesting authorization to:
  - Construct and operate a CISF in Andrews County, Texas.
  - Store up to 40,000 MTUs of SNF and reactor-related GTCC LLW.

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Public Support

- Tremendous support by state, regional and local communities:
  - Governor Perry's Letter
  - Andrews' County Resolution
  - Texas Radiation Advisory Board
- Consistent with recommendations of the Blue Ribbon Commission

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Eighty Percent of SNF at Stranded Sites

- Priority on currently licensed systems for shutdown sites:
  - **NAC International**
    - **Maine Yankee**
    - **Connecticut Yankee**
    - **Yankee Rowe**
    - **La Crosse**
    - **Zion**
    - Kewaunee*
  - **AREVA NUHOMS®**
    - **Rancho Seco**
    - SONGS Unit 1
    - Millstone Unit 1
    - Oyster Creek* (S/D scheduled 2019)

Indicates a "stranded" (ISFSI only) site as identified in the 2012 Final Report of the "Blue Ribbon Commission on America's Nuclear Future" (BRC)

Initial License Application will cover ~80% of SNF and GTCC at BRC "Stranded" Sites
Additional Systems and Sites will be added in Future Amendments, as appropriate

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No Action Alternative

- Decommissioned reactors would be required to continue storing SNF and reactor-related GTCC LLW on-site until another CISF or permanent repository is available.
- U.S. taxpayers would continue to incur costs to operate the reactor ISFSIs and to maintain physical security programs.
- Operating reactors would be required to construct new, or expand existing, ISFSIs.
- This would not be consistent with the Blue Ribbon Commission's recommendation and does not meet the need.

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Alternative Site Selection

- A NEPA-compliant site selection process is being used to evaluate alternative sites.
- Iterative scoring process developed to select the preferred site.
- Threshold factor, among other things, is strong host community support consistent with the Blue Ribbon Commission's recommendation.
- State policymakers support storage at away from reactor sites in Texas that are not near metropolitan areas.

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Blue Ribbon Commission

State and Community Support Are Important Site Selection Criteria

- "In practical terms, this means encouraging communities to volunteer to be considered to host a new nuclear waste management facility while also allowing for the waste management organization to approach communities that it believes can meet the siting requirements."

- "Of course, the first requirement in siting any facility centers on the ability to demonstrate adequate protection of public health and safety and the environment. Beyond this threshold criterion, finding sites where all affected units of government, including the host state or tribe, regional and local authorities, and the host community, are willing to support or at least accept a facility has proved exceptionally difficult. The erosion of trust in the federal government's nuclear waste management program has only made this challenge more difficult."

Region of Interest for Site Selection

- Selected seven States located in the arid southwestern U.S for screening.
  - Initial screening includes Texas, New Mexico, Colorado, Utah, Arizona, Nevada and California.
- Selected States that support locating a CISF within their borders.
- Selected Texas and New Mexico as the Region of Interest.

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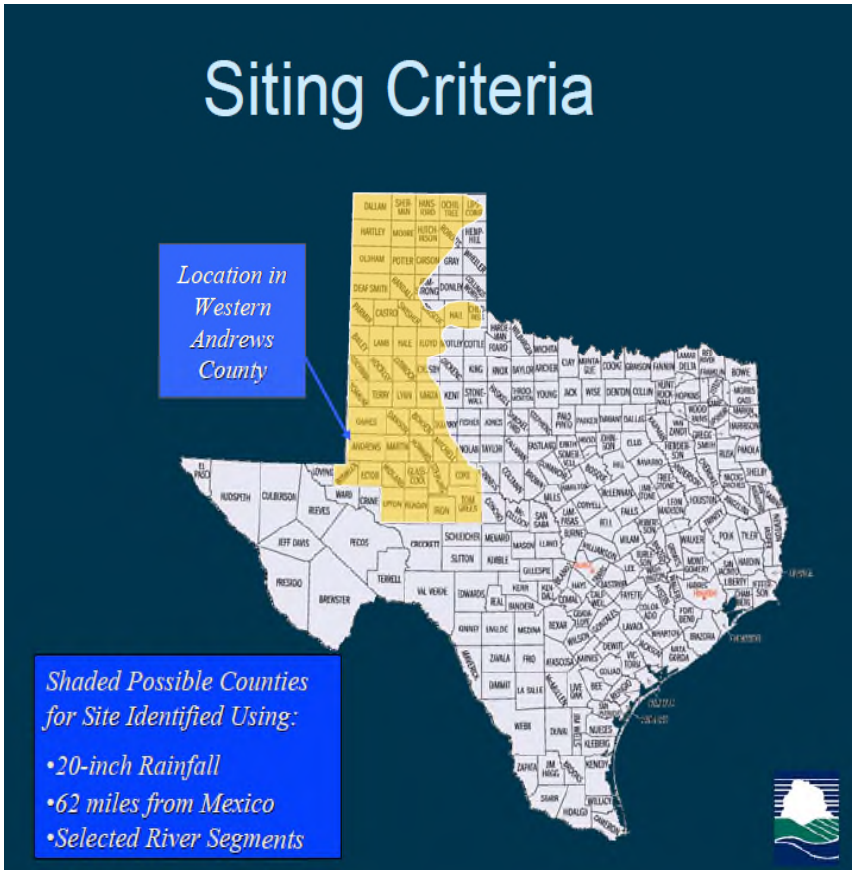
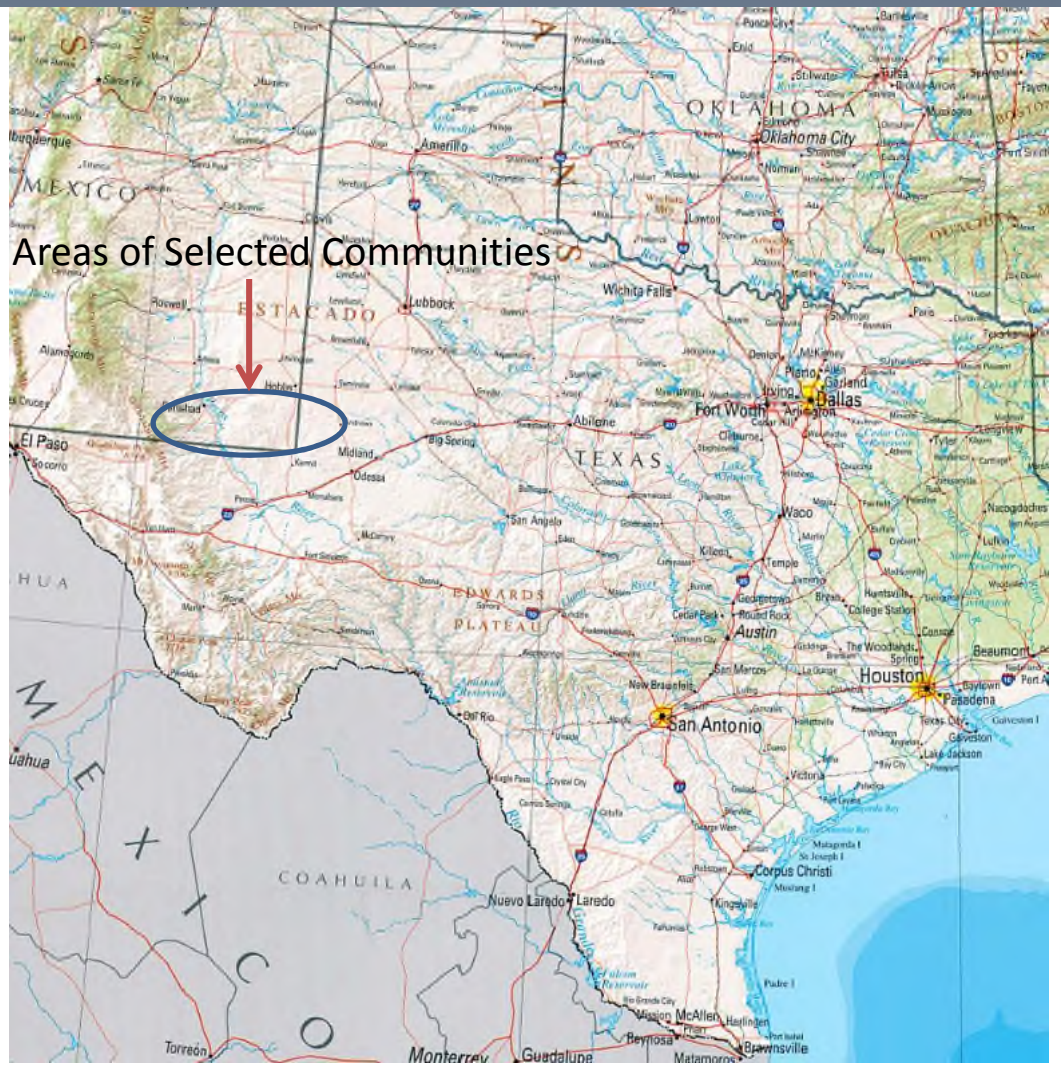
Criteria for Site Selection

- Selected 53 counties in Texas and 2 in New Mexico for further screening.
- Used criteria required in Texas for siting a LLRW facility.
- Criteria was adequate for selecting a site for permanent disposal of LLRW and are also appropriate for temporary storage of SNF and reactor-related GTCC LLW.



Selected Communities

- Screened counties in Texas based on community support.
  - Andrews and Loving Counties
- Include Eddy and Lea Counties in New Mexico.
  - Based on community support and previous studies conducted.



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First Phase Screening

Go: No Go Screening Criteria

- First Phase screening criteria include:
  - Community and political support
  - Seismology and geology
  - Rail access
  - Land size
  - Land availability

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Screening Matrix

Example from Phase One Screening

FIRST PHASE SCREENING MATRIX					
Location	Criterion 1 Political Support	Criterion 2 Seismology/Geology	Criterion 3 Rail Access	Criterion 4 Land Size	Criterion 5 Land Availability
Andrews County, TX	Go	Go	Go	Go	Go
Loving County, TX	Go	Go	Acceptable	Go	Acceptable
Lea County, NM	Go	Go	Go	Go	Go
Eddy County, NM	Go	Go	Go	Go	Go

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Second Phase Screening

- Second Phase screening criteria include:
  - Critical siting criteria (next slide).
  - Operational considerations
    - Availability of labor forces for both construction and operations,
    - Availability of utilities and water, and
    - Moderate climate and low storm intensity.
  - Environmental considerations
    - Existing and extensive site characterization data,
    - Lack of contamination,
    - Information regarding endangered species,
    - Environmental Justice considerations,
    - Existing environmental permits,
    - Supporting infrastructure to limit construction impacts,
    - Physical security attributes, and
    - Available disposal options for LLW generated.

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Site Scoring and Ranking

Example provided to illustrate site evaluation process.

SITE SELECTION SCORING SUMMARY								
Weight	Criteria		Weight %	Subcriteria	Andrews County	Lea County	Eddy County	Loving County
100	Critical Siting Criteria	State and Community Support	100	Advocates	10	7	7	5
			100	Incentives	10	10	10	10
			80	Cooperation in Permitting	10	10	10	10
		Seismology/Geology	100	Peak Ground	10	10	10	10
			80	Liquification	8	8	8	8
			100	Acceptable Weight Bearing	8	8	8	8
			50	Differential Settling	8	8	8	8
			30	Surveys Available	10	7	7	1
		Away from Large Population Centers	80	Population Exceeding 50,000	10	10	10	10
		Away from Water Bodies	100	Flood Plains	10	10	10	10
			100	Aquifers	10	10	10	10
			80	Rivers	10	10	10	10
			80	Lakes	10	10	10	10
		Rail Access	100	Proximity to Existing Rail Lines	10	8	7	1
				Existing Rail Spur	10	6	6	1
		Land Size	100	Future Expansion	10	10	10	10
			100	Buffer Zone	10	10	10	10
			80	Plant Layout	10	10	10	10
		Land Availablity	80	Available and No Purchase	10	10	5	1
		Moderate Climate	80	Moderate Climate	10	10	10	10
				Score	**157.4**	**147.5**	**142.5**	**124.5**

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Transportation

- Transportation by rail
- Approximately 3,000 canisters shipped over 20 years
- Add spur to existing rail loop.
- Transportation impacts evaluated for:
  - Maine Yankee to WCS;
  - San Onofre to WCS; and
  - WCS to Yucca Mountain.
- Transportation corridor runs from Monahans, Texas through Eunice, New Mexico.

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Methodology

- Transportation routes and population densities projected using TRAGIS.
- Dose calculations performed using RADTRAN.
- Public radiation doses calculated for normal and accident conditions.
  - Multiple studies have concluded that release of radioactivity from a transportation cask under accident conditions is not credible.
- Consistent with approaches used in NUREG 1714 and NUREG 2125.
- Multiple studies have also concluded that radiation doses during the transport of SNF to the public is very low.

Socioeconomic Impact Assessment

- Previous regional studies
- Define the Region of Interest for Socioeconomic Impact Assessment
- Highlights of demographic characteristics in ROI
- Other existing conditions data collected
- Environmental Justice in 4-mile radius
- Impacts analysis underway
- Historic and cultural resources overview

Previous Regional Studies

Other documents were reviewed in the development of the Environmental Report:

- NUREG-1790, Louisiana Energy Services National Enrichment Facility License Application – Environmental Report (Revision 5, 2005);

- Waste Control Specialists LLC, 2007. Socioeconomic Impacts of the Waste Control Specialists Proposed Low-Level Radioactive Waste Disposal Facility, Andrews County, Texas, March 16, 2007.

- Waste Control Specialists LLC, 2008. Socioeconomic Impacts of the Waste Control Specialists Radioactive Material Storage and Processing Facility, Andrews County, Texas for the Renewal of License No. R04971, July 3, 2008.

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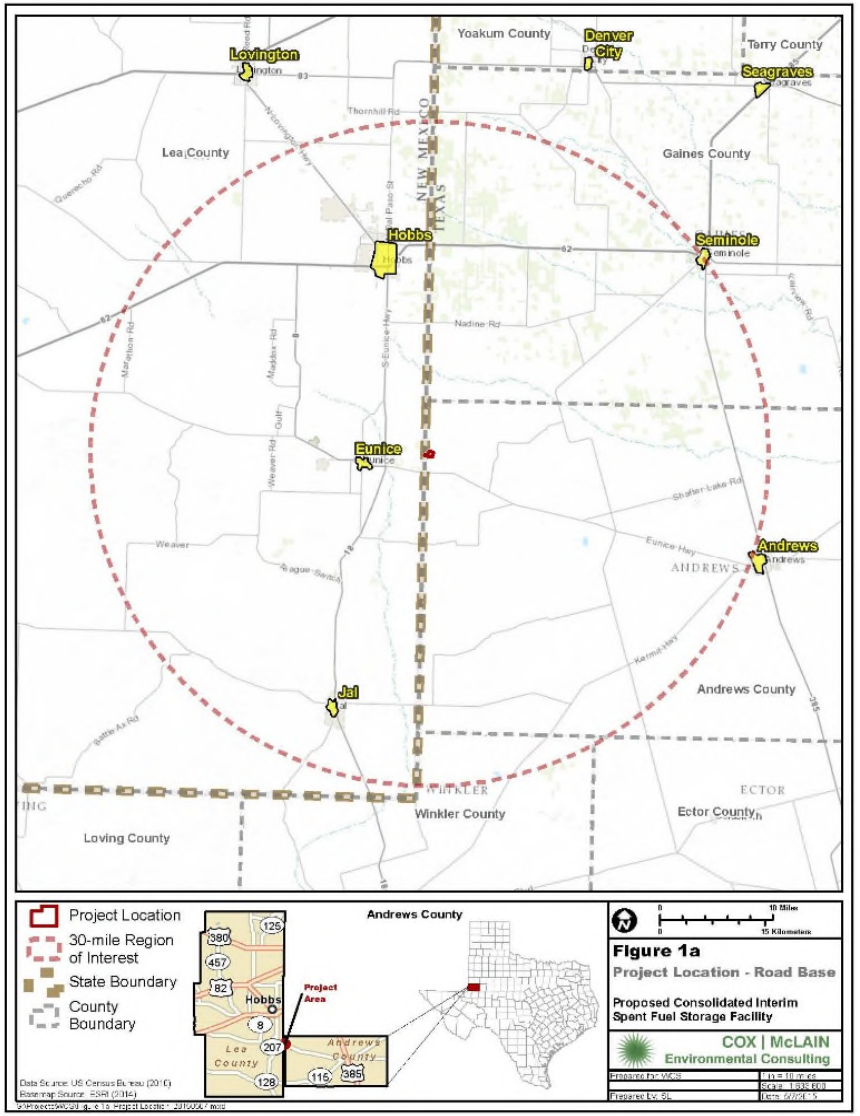
Region of Interest (Socioeconomics)

- 30-mile radius centered on the preferred site
- Encompasses nearby communities including Eunice NM and county seat/business center of Andrews TX
- Includes sample of surrounding population to evaluate potential impacts in host community



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Region of Interest is Growing

Table 1-2: Texas Water Board Population Projections for Texas Counties in the Region of Interest						
Year	Andrews	Gaines	Winkler	Ector	Texas Counties in the Region of Interest	Texas
2020	19,089	21,316	8,033	156,957	247,322	29,510,184
2030	22,847	25,746	8,817	177,157	274,737	33,628,653
2040	26,246	30,997	9,459	198,446	302,648	37,736,338
2050	30,111	36,654	10,147	220,268	330,815	41,928,264
2060	34,526	41,666	10,702	242,371	358,485	46,354,818
2070	39,574	46,886	11,181	264,646	386,459	51,040,173
Percent change 2020 - 2070	107.3%	120.0%	39.2%	68.6%	56.3%	73.0%

- Population is growing substantially in some Texas counties in the Region of Interest and minimally in others.

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Hispanic Population in ROI is Growing Fastest

Table 1-3: Projected Populations 2010-2050 by Race/Ethnicity for Andrews County					
Year	Total	Anglo	Black	Hispanic	Other
2010	14,786	7,083	199	7,195	309
2015	15,875	7,197	202	8,137	339
2020	16,987	7,288	208	9,118	373
2025	18,123	7,357	217	10,136	413
2030	19,224	7,398	220	11,155	451
2035	20,369	7,455	222	12,216	476
2040	21,482	7,464	214	13,305	499
2045	22,585	7,425	207	14,413	540
2050	23,676	7,364	199	15,548	565
Percent Change 2010-2050	60.1%	4%	0%	116.1%	82.8%

Table 1-7: Projected Populations 2010-2050 by Race/Ethnicity for Texas					
Year	Total	Anglo	Black	Hispanic	Other
2010	25,145,561	11,397,345	2,886,825	9,460,921	1,400,470
2015	26,947,116	11,585,146	3,083,970	10,659,352	1,618,648
2020	28,813,282	11,723,184	3,274,738	11,963,951	1,851,409
2025	30,734,321	11,796,414	3,454,116	13,384,050	2,099,741
2030	32,680,217	11,792,588	3,616,745	14,900,906	2,369,978
2035	34,616,890	11,717,771	3,757,614	16,475,644	2,665,861
2040	36,550,595	11,593,202	3,876,830	18,095,574	2,984,989
2045	38,499,538	11,434,587	3,977,772	19,769,879	3,317,300
2050	40,502,749	11,265,371	4,065,757	21,516,362	3,655,259
Percent Change 2010-2050	61.1%	-1.2%	40.8%	127.4%	161%

- Hispanic population is expected to grow substantially in Andrews County and Texas between 2010 and 2050 (projections not available by race in NM)

Other Data Collected for 30-mile Region of Interest

- Data collected for cities and counties in the ROI and presented in the Socioeconomic Impact Assessment:
  - Age distribution
  - Educational attainment
  - Health characteristics and vital statistics
  - Housing characteristics
  - Limited English proficiency
  - Race and ethnicity by census tract
  - Median household Income

Other Data Collected for 30-mile Region of Interest

- Income and employment data
  - Employment by industry sector (all counties in ROI):
    - educational services, health care, social assistance (18.1%);
    - agriculture, forestry, fishing, hunting, and mining (16.4%);
    - retail trade (10.1%)
  - Employment status by race
  - Labor force participation
  - Travel time to work
  - In-migration and out-migration

- Agricultural production

- Fiscal, governmental, and community services

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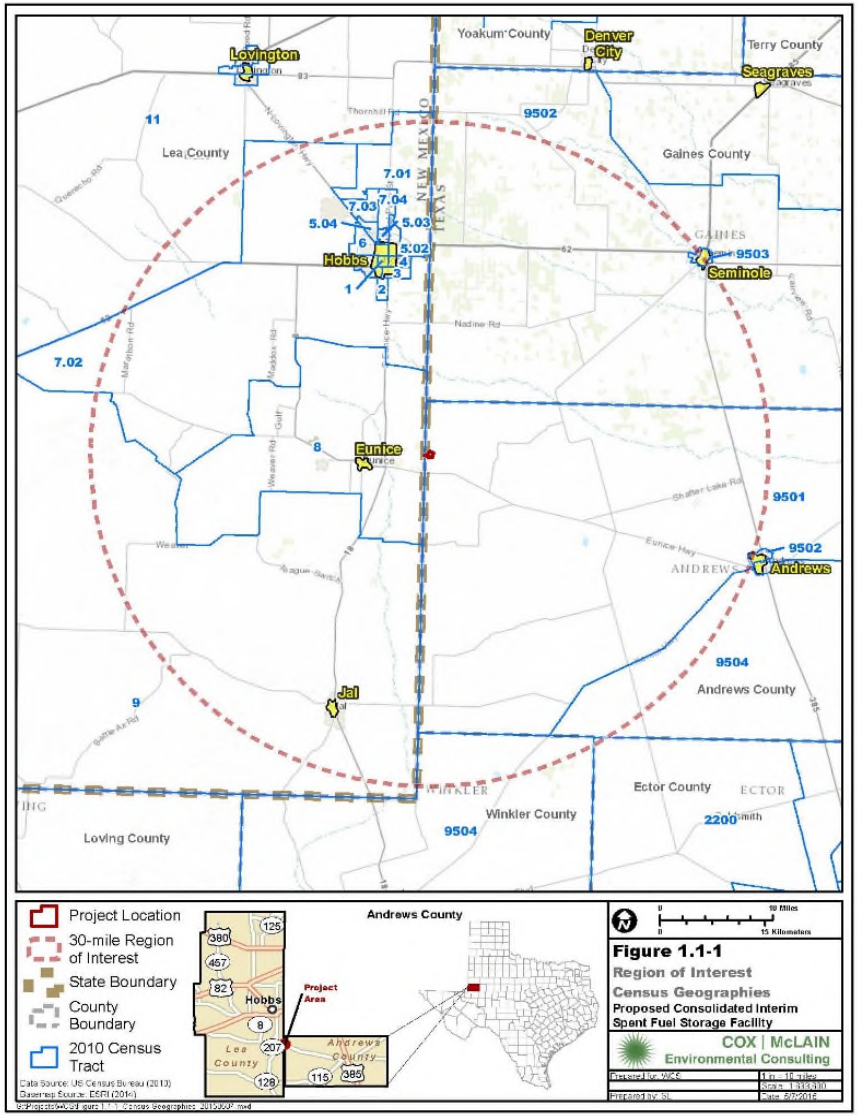
U.S. Census Bureau Geographies in ROI

- Census tracts are large in rural areas
- Census tracts are small in cities
- One census tract represents approximately half of Andrews County



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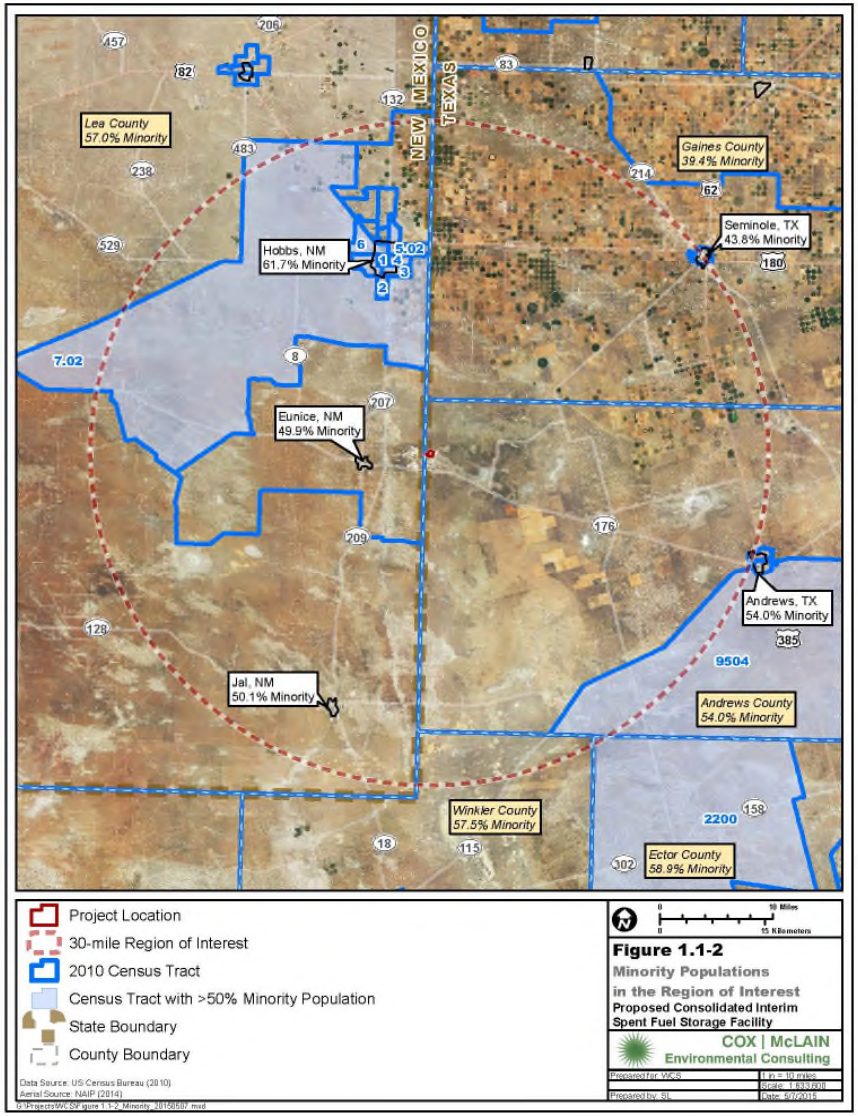
Minority Populations (2010) in ROI

- Census tracts with >50% minority persons (all non-White including Hispanic) shown in blue
- Total minority percentages:
  - Eunice 49.9%
  - Hobbs 61.7%
  - Jal 50.1%
  - Andrews 54.0%
  - Seminole 43.8%
  - Ector Co. 58.9%
  - Lea Co. 57.0%



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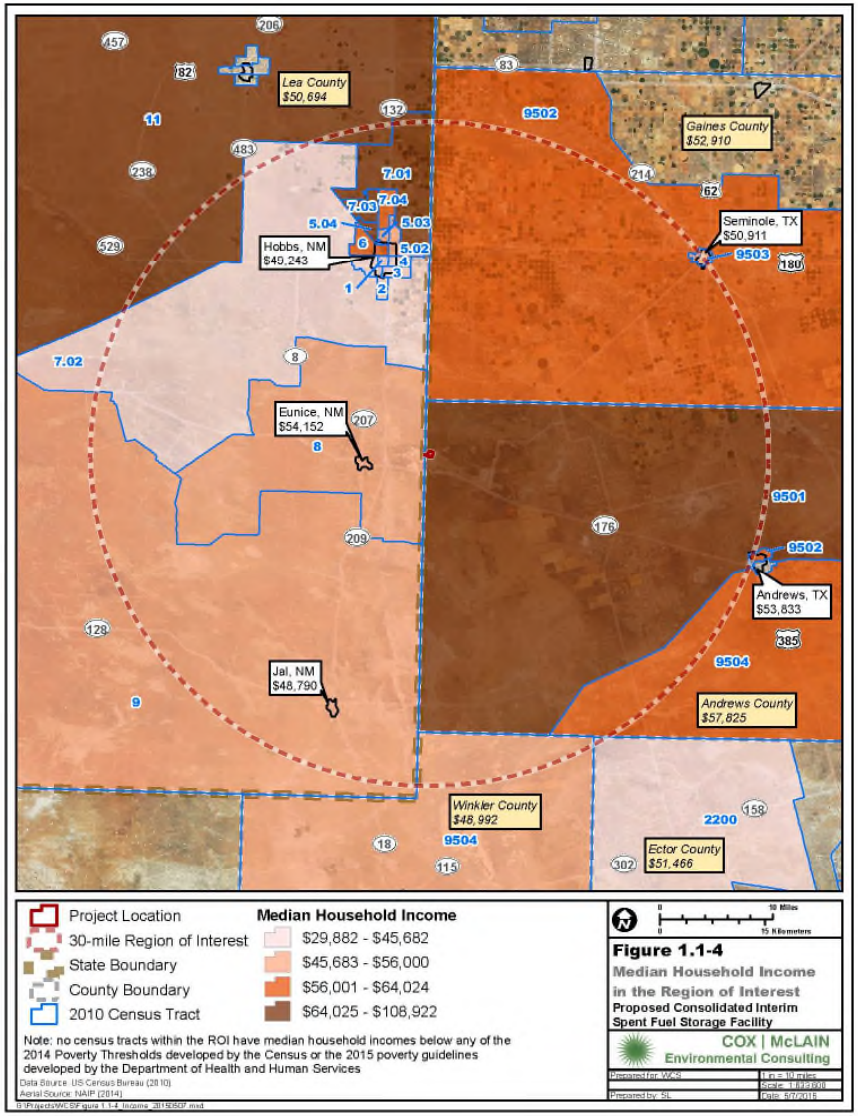
Median Household Income (ACS 2009-2013) in ROI

- No census tracts had median household income below Census or 2015 DHHS poverty guidelines ($24,250 for family of four)



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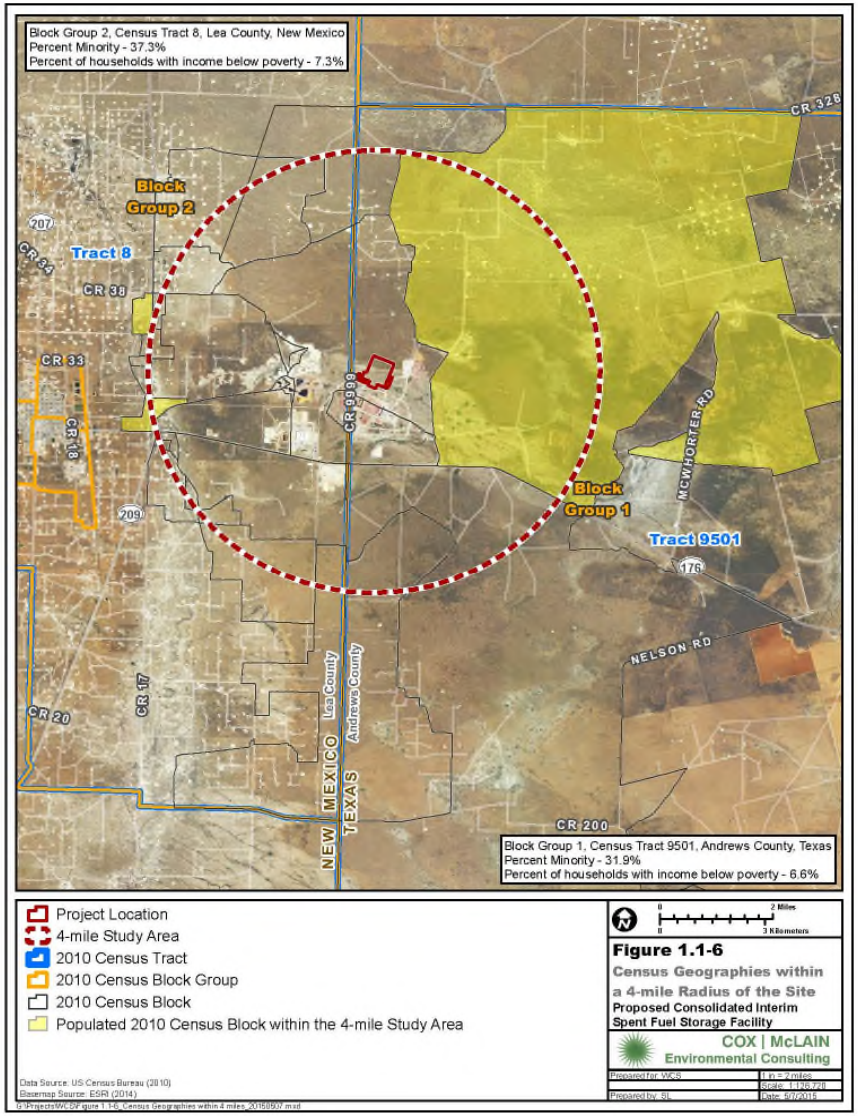
Environmental Justice

- 4-mile study area, populated Block Groups in yellow
  - Lea Co Tract 8 BG 2: 37.3% minority
  - Andrews Co. Tract 9501 BG 1: 31.9% minority
- Minorities < 50%
- Minorities do not exceed 20% more than reference population
- Block groups had median household incomes above DHHS poverty guideline
- No EJ Communities of Concern



Impacts in the Region of Interest

- Socioeconomic impact analysis underway
  - Ability of community to support CISF operations
- Economic impact analysis underway:
  - Apply regional multipliers from IMPLAN for economic region consisting of Gaines Co., TX; Andrews Co., TX; and Lea Co., NM
  - Estimate direct, indirect, and final economic and employment impacts in the region
  - Benefit/cost discussion

Historic and Cultural Resources

- Coordination letter submitted to Texas Historical Commission recommending no additional historic structures survey needed;
- Archeological survey conducted under Texas Antiquities Code permit week of May 18, 2015 (previous surveys were completed 20 years prior);
- Courtesy coordination letter to be submitted to NMSHPO although no work would take place in NM.

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Other Impacts

- Land use
- Geology and soil
- Water resources
- Ecology
- Meteorology, climatology and air quality
- Noise
- Visual and scenic resources
- Public and occupational health
- Waste disposal

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Land Use

- Primary regional land uses are:
  - Oil and gas production
  - Mining
  - Waste disposal
  - Nuclear facilities
- Secondary regional land uses are:
  - Ranching

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Ecology

- Ecology has been extensively evaluated:
  - WCS – 1996, 1997, 2004, 2006, 2007, and 2008
  - URENCO – 2003, 2004
- Online ecological resource databases have been consulted to update these previous studies

Public and Occupational Health

- Background radiation has been carefully benchmarked
- The major source of chemical exposure is volatile organics from oil and gas production
- WCS has an excellent, low occupational injury rate
- Health effects studies show no exceptional health issues for the Region of Interest

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Waste Disposal

- Minimal wastes, both radiological and chemical, are expected

- Nearby facilities both on and offsite can handle all wastes that might be produced at the CISF:
  - Low Level Radioactive Waste
  - Solid Industrial Waste

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Cumulative Impacts

- Cumulative impacts assessed from all sources of radiation present in the Region-of-Interest.
- No significant impacts from non-radiological hazards.
- Cumulative effects expected to be insignificant when compared to federal and state limits.
- Socioeconomic impacts significantly favorable and offset any negative impacts.
- Favorable environmental impacts expected from consolidated interim storage by removing SNF from operating reactors and decommissioned reactors located near population centers and coastal areas.

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Conclusions

- Clear purpose and need to support the Proposed Action and license a CISF in Andrews County, Texas.
- A full alternative analysis.
- Strong community support is an important part of the Alternative Site Selection process.
- Environmental impacts have been extensively analyzed in the region.
- Transportation impacts evaluated for transporting 3,000 canisters over 20 years.
- No environmental justice communities identified within 4 miles of the proposed CISF.
- No significant cumulative impacts expected.