LLRW Waste Streams Reviewed for Disposal at NNSS

Key Characteristics, Variation, and Management

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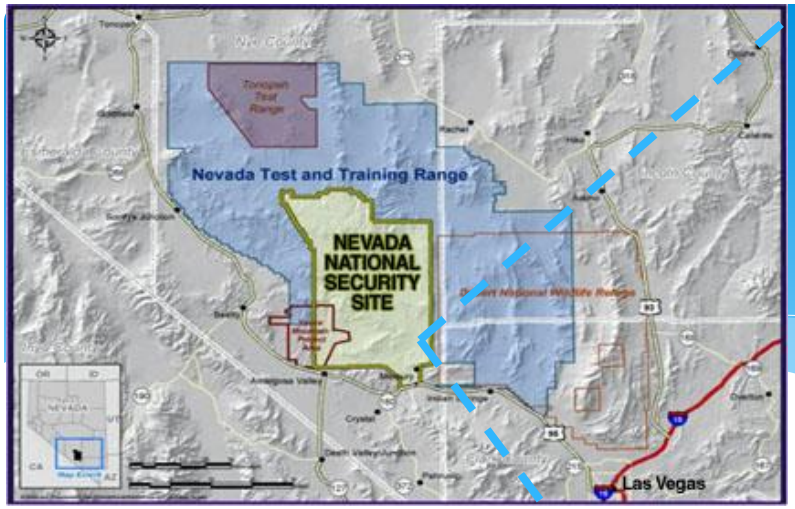
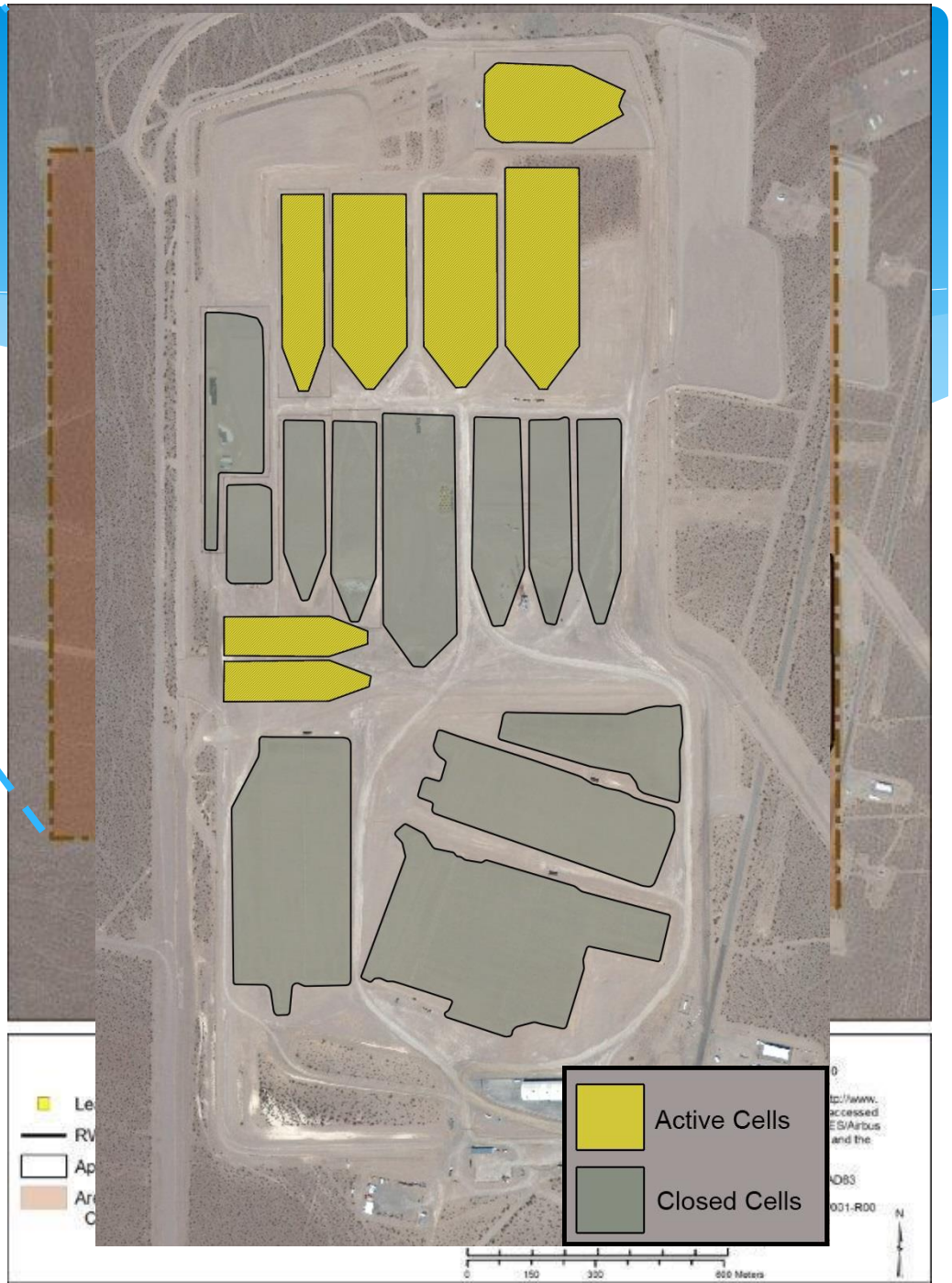
Presentation Outline

* Nevada National Security Site Area 5
* Waste Profile Review Process
* Key Waste Stream Characteristics and Variation
* Management Steps Taken to Address Concerns



NNSS Area 5
Radioactive Waste Management Site

- Secure location on withdrawn land
- Depth to groundwater 770 feet
- Burial depth 24 feet below ground surface
- Infiltration of precipitation below plant root zone ceased 10 to 15 thousand years ago
- 740 acre area
- ~1 to 1.5 million cubic feet of LLRW waste accepted per year



NNSS Waste Profile Reviews

* NNSS accepts LLRW, Mixed LLRW, and classified waste from over 25 different sites within the DOE Complex
* NDEP Participates in Waste Profile review per Agreement with DOE
* Profiles reviewed against site Waste Acceptance Criteria (WAC)
  * Trigger isotope activity criteria for waste to meet DOE Order 435.1 Performance Objectives
  * Exceedances may trigger additional analysis

NNSS LLRW – "Key Characteristics"

* Radionuclide Half-Life - ($t_{1/2}$) - Years
* Activity Levels Compared to Waste Acceptance Criteria – (Bq/m^3)
* Plutonium Equivalent Grams (PE-g) – (g/m^3)

OTHERS

* Fissile content
* DOT Shipping Container Requirements

Key Characteristic Variation NNSS LLRW Profiles

CHARACTERISTIC	Radionuclide Half-Life (years)	Ratio of Waste Isotope Activity Level to WAC Thresholds (unitless)	Plutonium Equivalent Grams (g/m^3)
NNSS LLRW RANGE	5 to 7 x 10^8	10^{-9} to 2 x 10^6	2.1 to 3 x 10^6

Takeaways

- Key Characteristics varying between 6 and 17 orders of magnitude between different waste streams and isotopes
- Existing definition of LLRW does not distinguish between these wastes
- Should these different waste streams be managed differently? Is there a defined process or flowchart for making that decision?

Management Steps

* Special Analysis
* Burial Depth
* Transportation
  * Routing to minimize travel through population centers
  * Outreach and Exercises with local responders and PIOs
  * Security
* Conditions in Waste Profile approvals

In the absence of a more specific LLRW definition framework

* can appear ad hoc, reactive, or rationalized
* substantial time to review and brief stakeholders

Potential Categorization Scheme

Characteristic	Location	Potential Hazards	Control Options Criteria
Half-Life Activity Fissile Content Pe-g Surface Dose Leachability	Where? (Transport?) (Disposal?)	Long Term Protection Radiation Exposure Nuclear Criticality Security etc.…	What control options should be evaluated? What criteria should be examined?

Conclusion

* Current sparse definition of LLRW not sufficiently descriptive of broad spectrum of wastes received at NNSS
* Management decisions made one waste stream at a time can appear ad hoc and subjective
* More standardized sub-categories tied directly to potential current and future risks may help facilitate public discussion and understanding