



**Savannah River
Remediation**

AECOM | BECHTEL | CH2M | BWXT

H Tank Farm Type I and Type II Tank Special Analysis

September 19, 2017

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SRR-CWDA-2017-00067



- The HTF Type I and Type II Tank Special Analysis (SA) is a forward looking SA to support real-time closure decisions by providing data on potential impacts of varied cleaning and closure approaches.
- The SA results can be used to optimize waste removal efforts, potentially decreasing cost and schedule associated with tank closures.
- Aspects of HTF make it a complicated system to evaluate impacts of parameter changes.

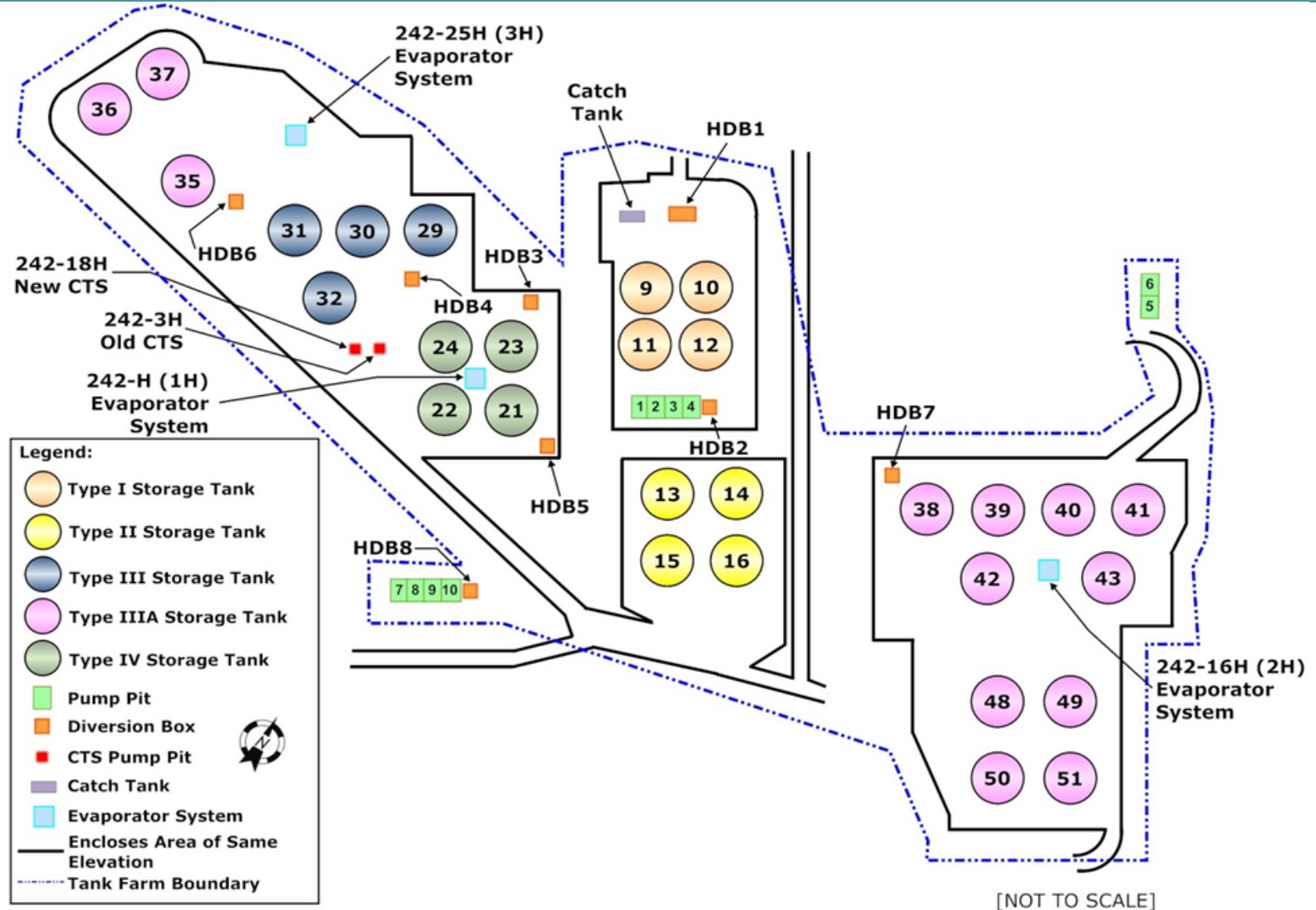
H-Area Tank Farm

We do the right thing.



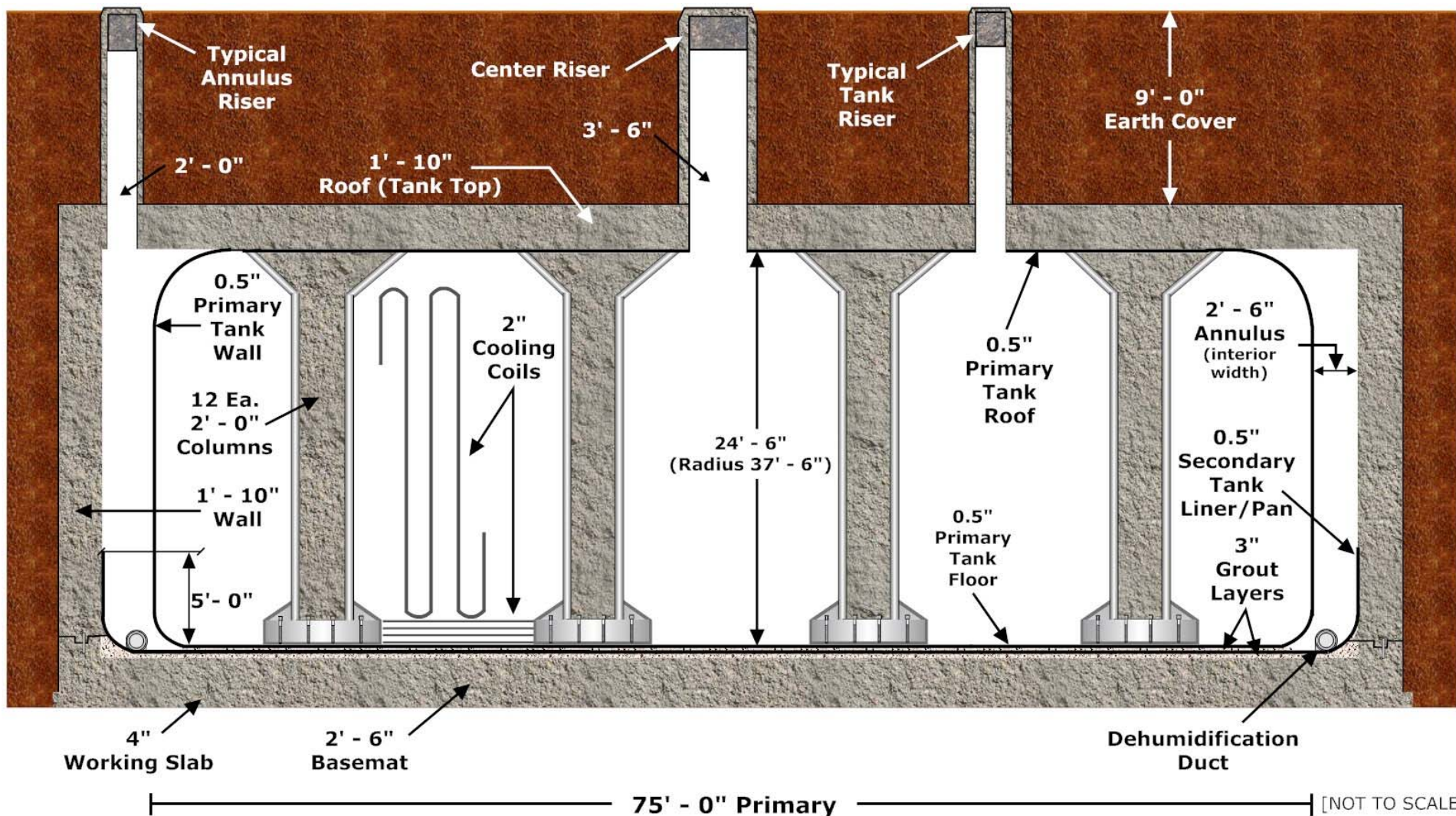
H-Area Tank Farm

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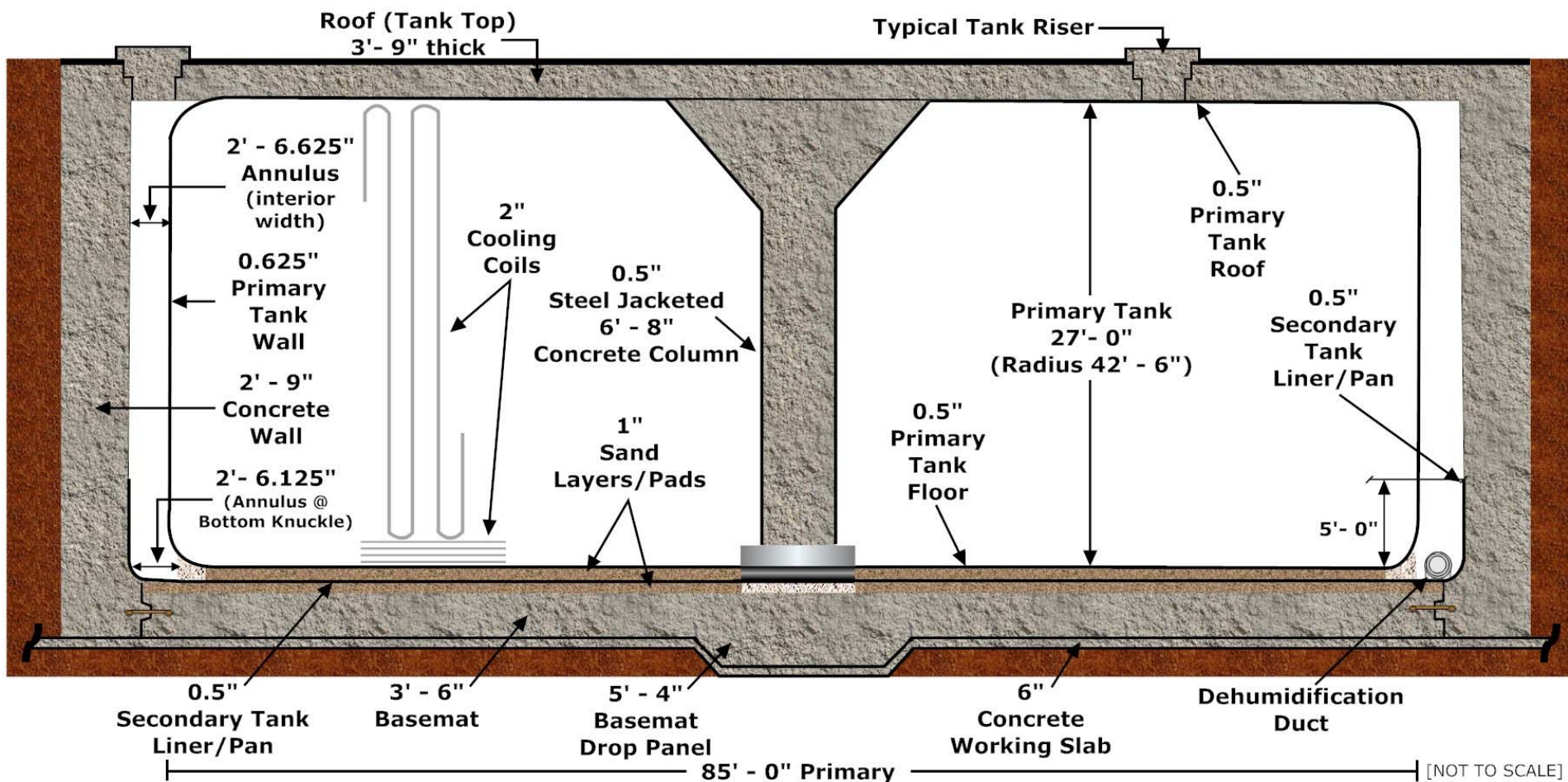
Type I Tank Design

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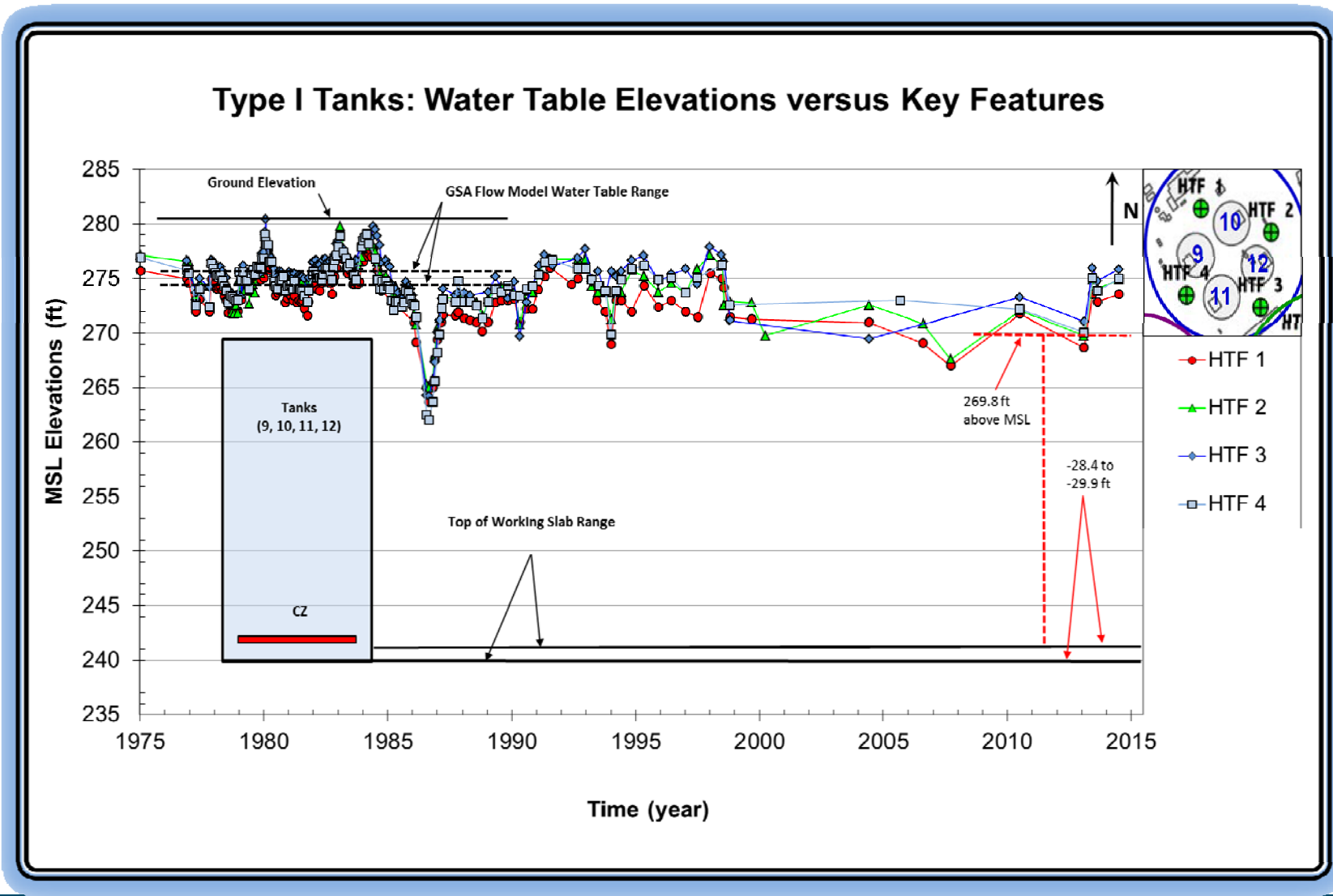


Type II Tank Design

We do the right thing.

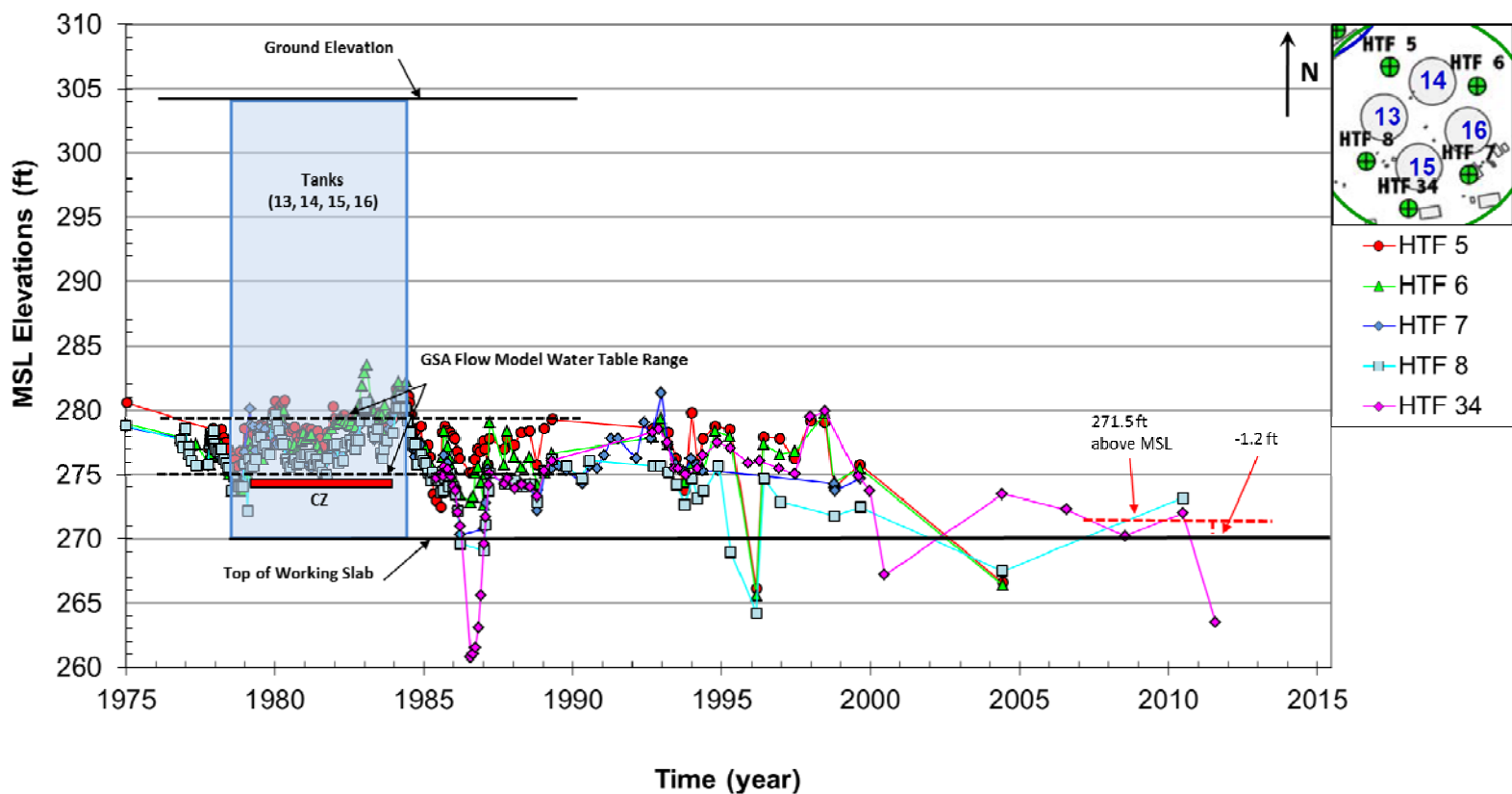


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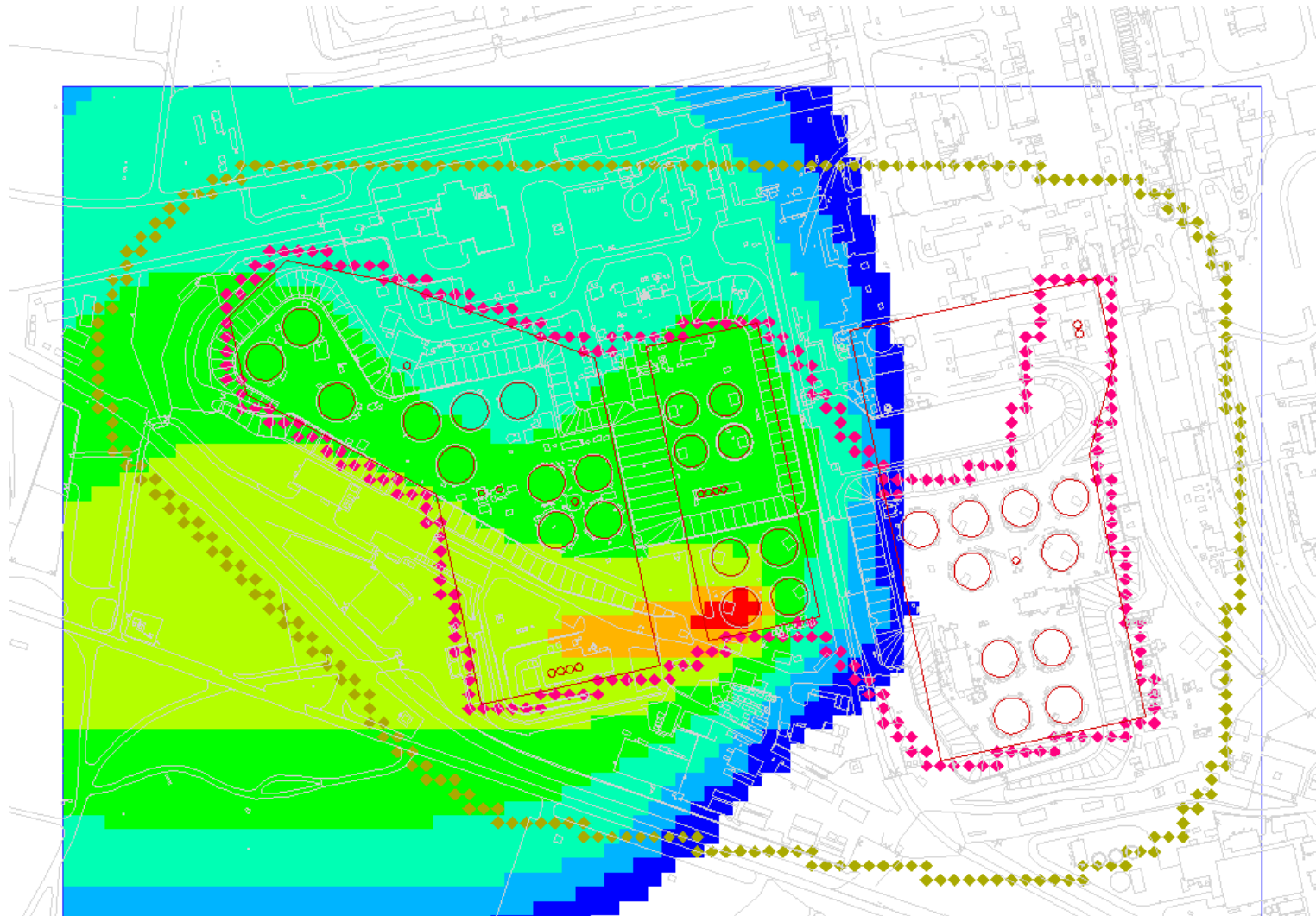
We do the right thing.

Type II Tanks: Water Table Elevations versus Key Features



Example of HTF Groundwater Flow

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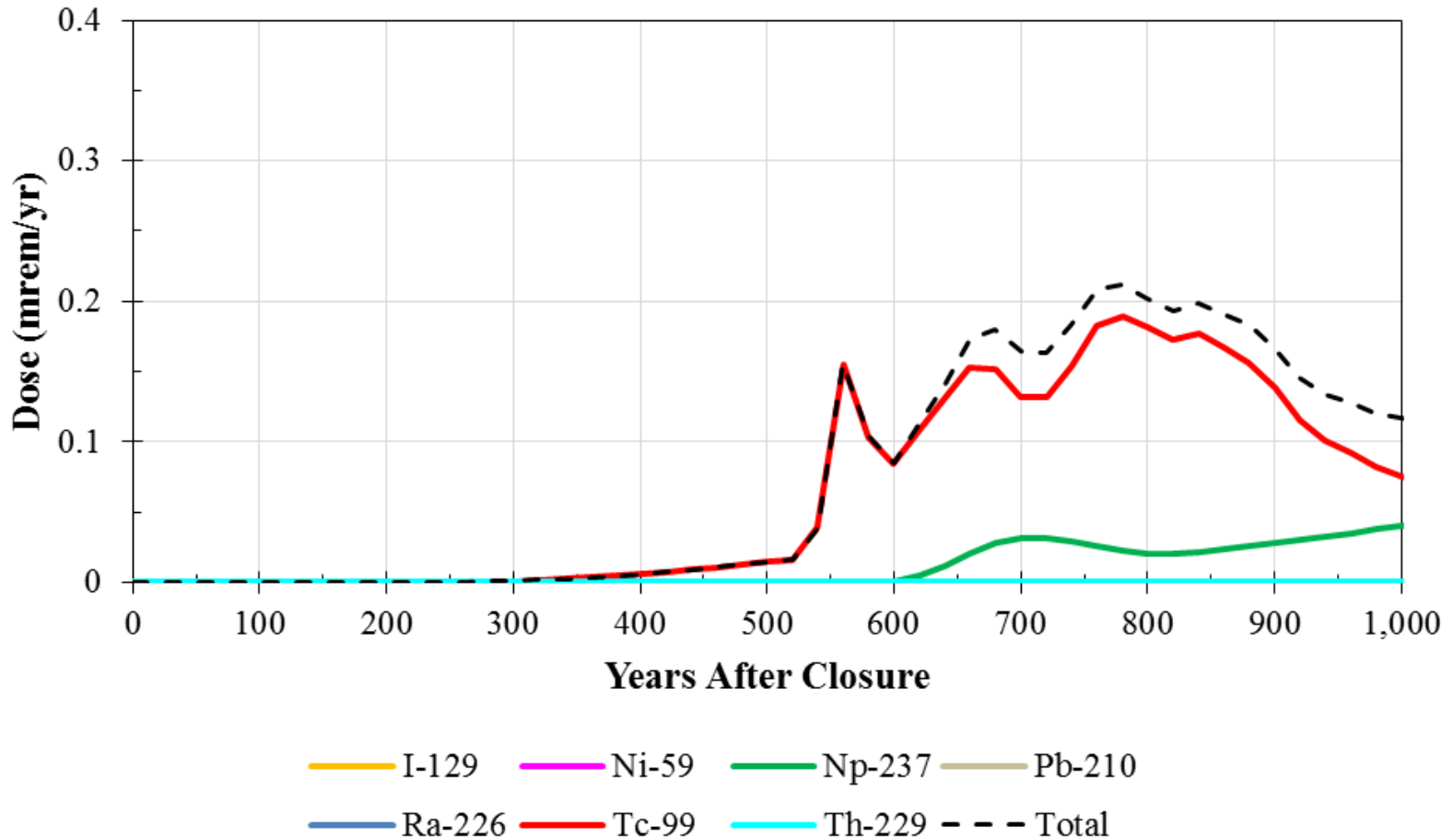
We do the right thing.

- The HTF Performance Assessment (PA) was completed before characterization and closure of any tanks in H Area.
- PA used assigned residual inventories for modeling and common input parameters for grout properties and contaminant release.
- Once characterization was complete on Tanks 12 and 16, SAs were performed to determine impacts of actual residual inventories.

- Desire was to have a tool to evaluate potential impacts of cleaning and closure decisions on the modeling results before the decisions need to be made ... thus the Type I and II tank SA was born.
- Prior to evaluating various HTF and individual tank sensitivity cases, the assigned residual inventories for tanks were updated to reflect lessons learned from already characterized tanks.

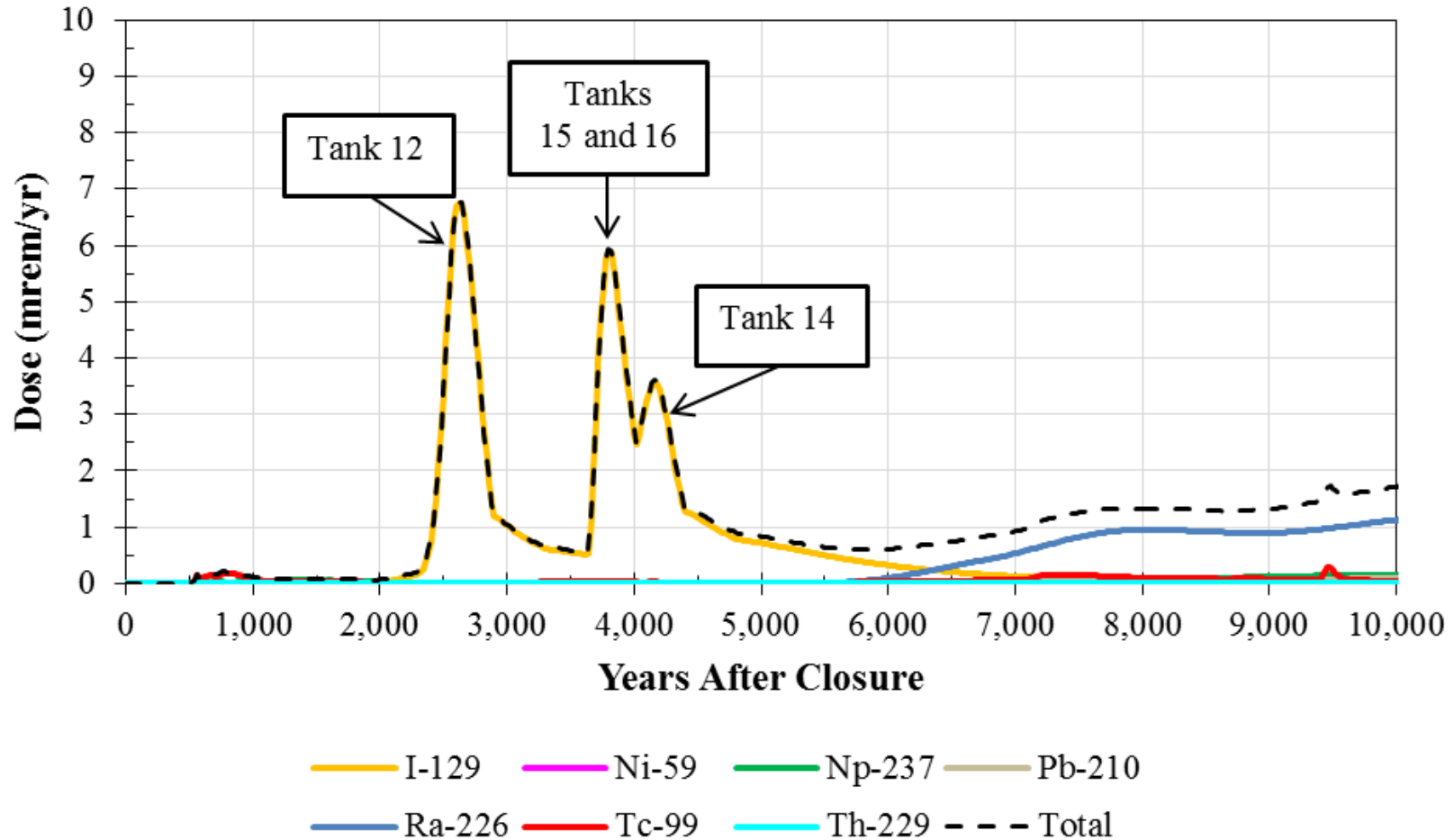
100-Meter MOP Peak Groundwater Pathway Peak Dose within 1K-Years, All HTF Sources

We do the right thing.



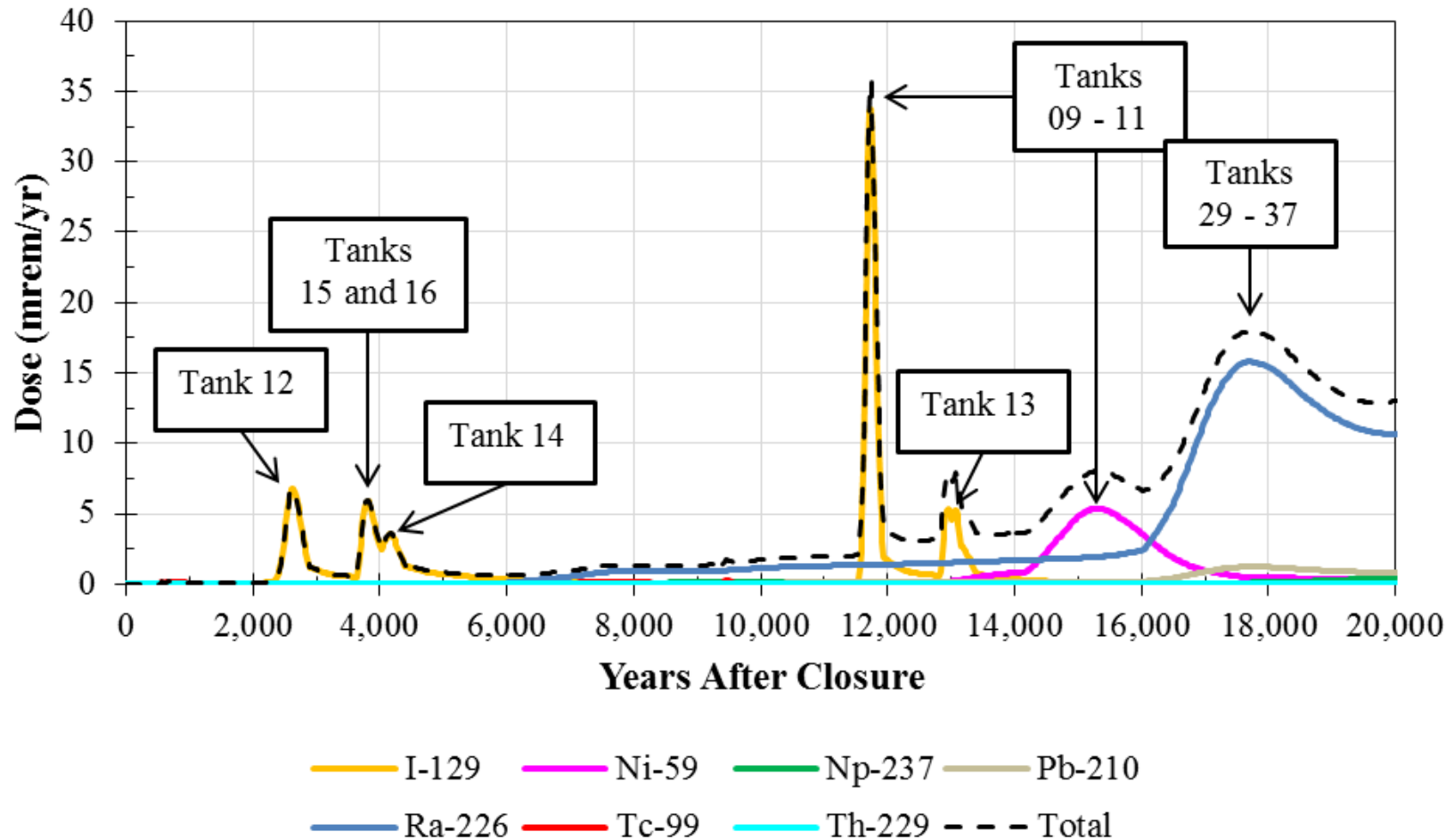
Dose in 1,000 years is from ancillary equipment

We do the right thing.



100-Meter MOP Peak Groundwater Pathway Peak Dose within 20K-Years, All HTF Sources

We do the right thing.

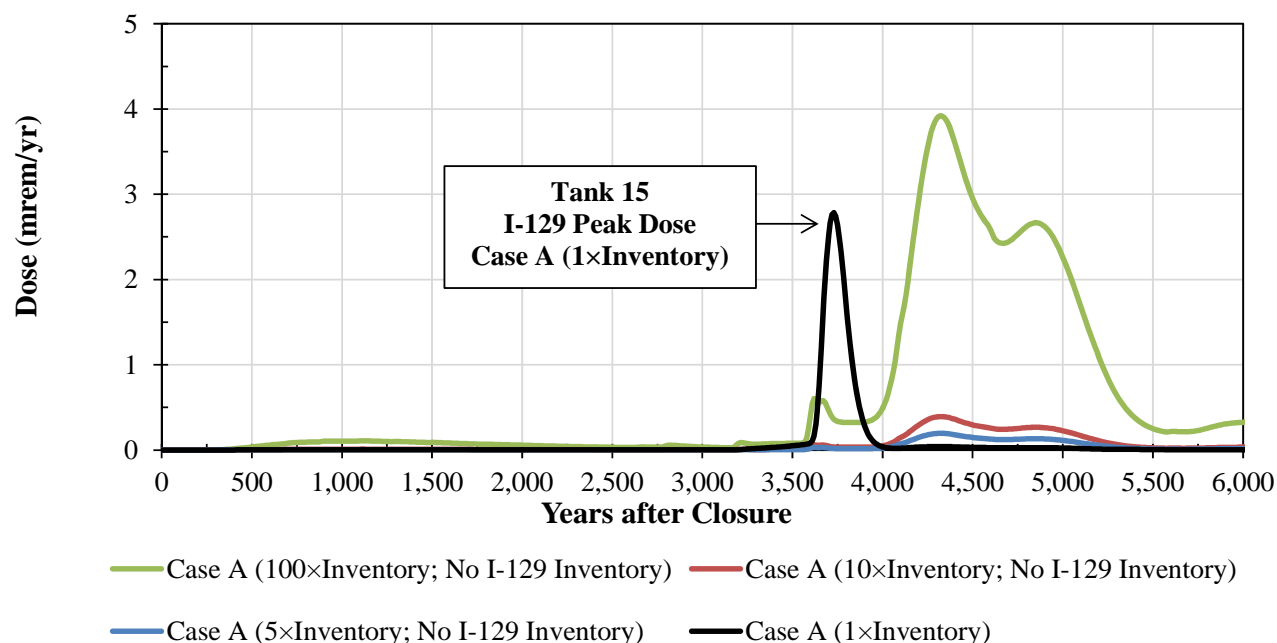


We do the right thing.

- **HTF Sensitivity Analysis Modeling**
 - HTF Alternate Configurations (Cases A through E),
 - Waste tank inventory variability,
 - Iodine solubility variability,
 - Soil K_d variability (Pu and I),
 - Chemical transition time variability, and
 - Cementitious materials hydraulic performance variability.
- **Individual Tank Sensitivity Analysis Modeling**

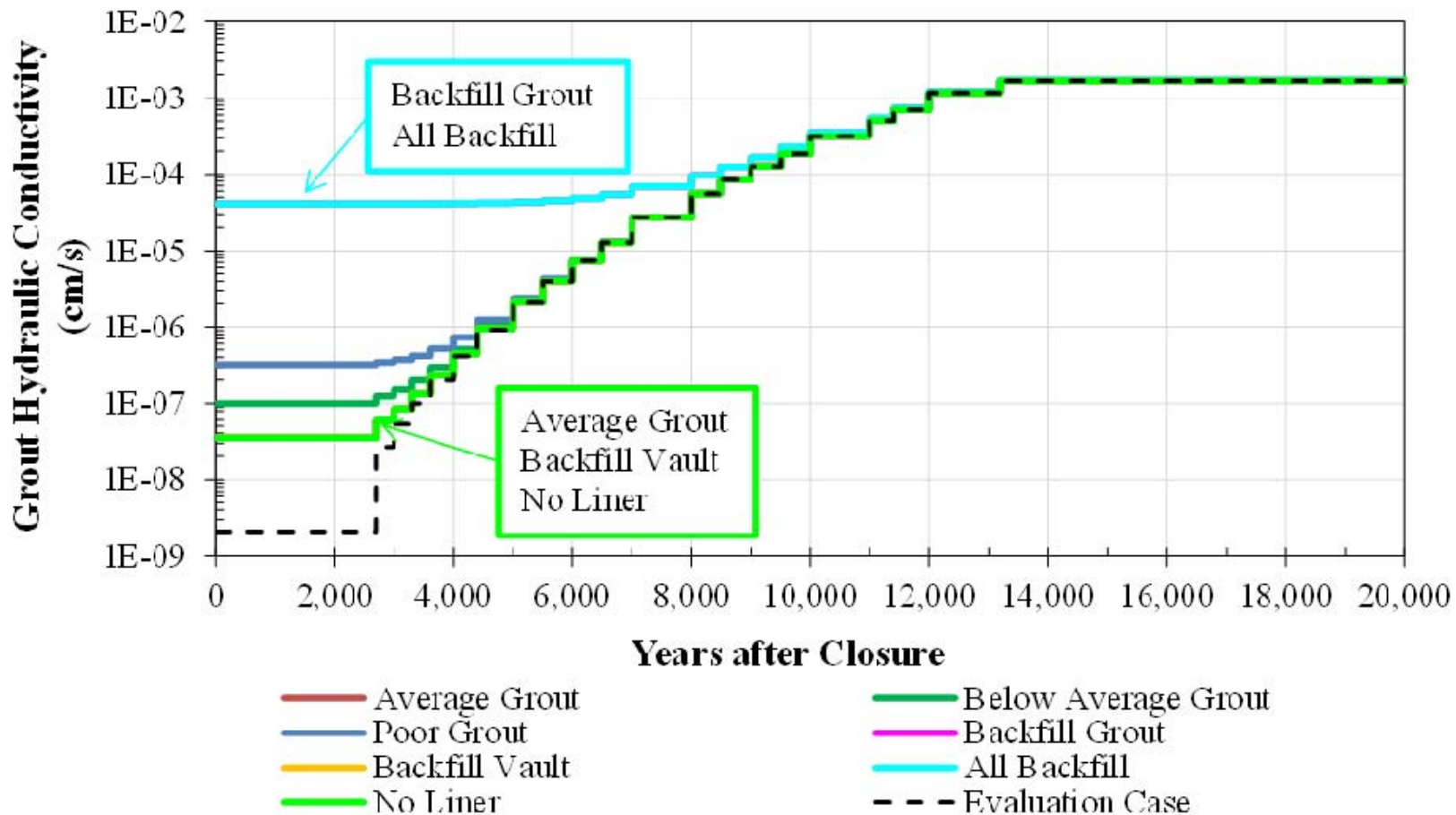
We do the right thing.

- Following examples for Tank 15 used to illustrate sensitivity analysis results presented.
- Each Type I and II tank to be closed included the same analyses.



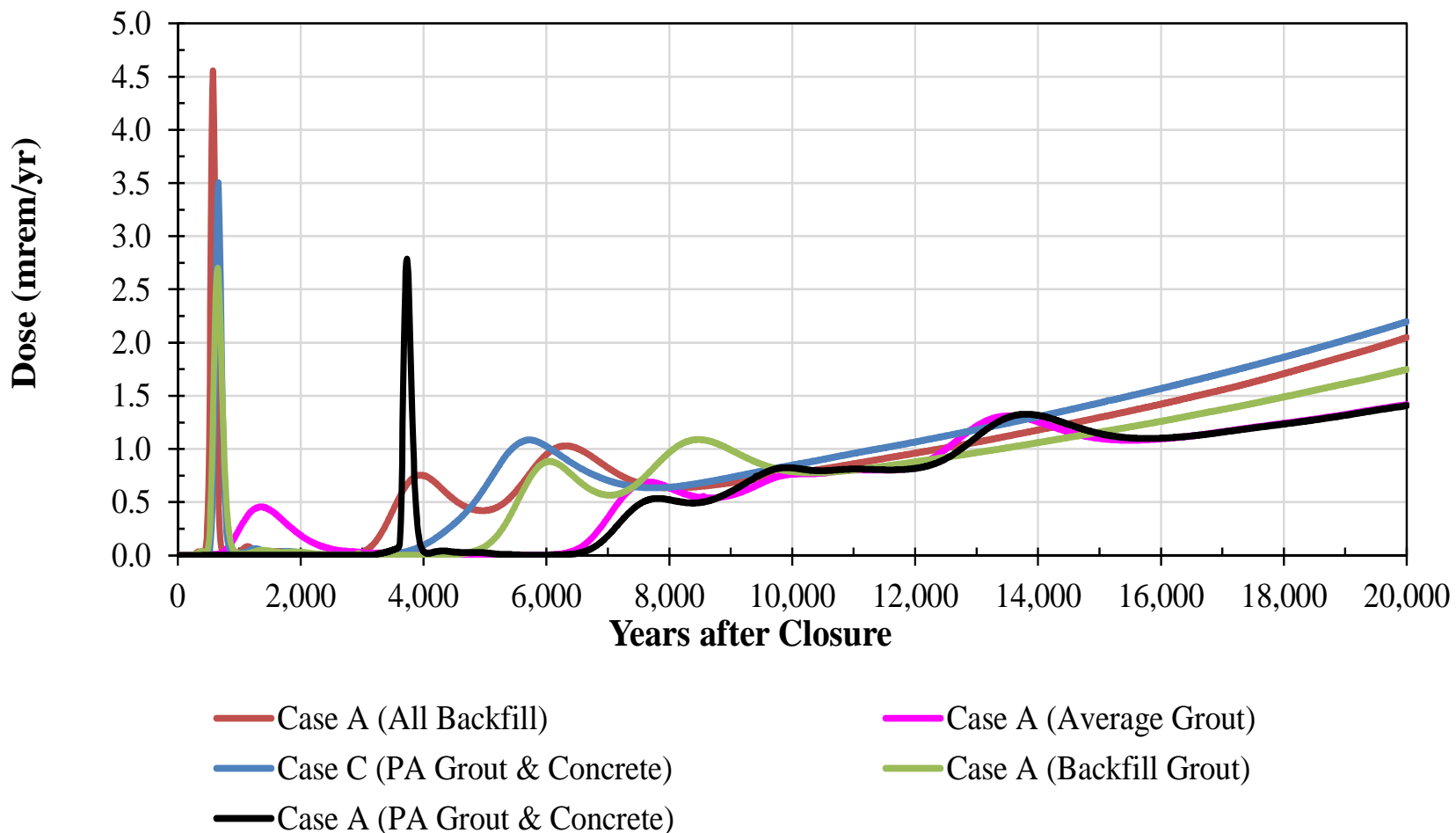
Tank 15 Cementitious Material Hydraulic Sensitivity

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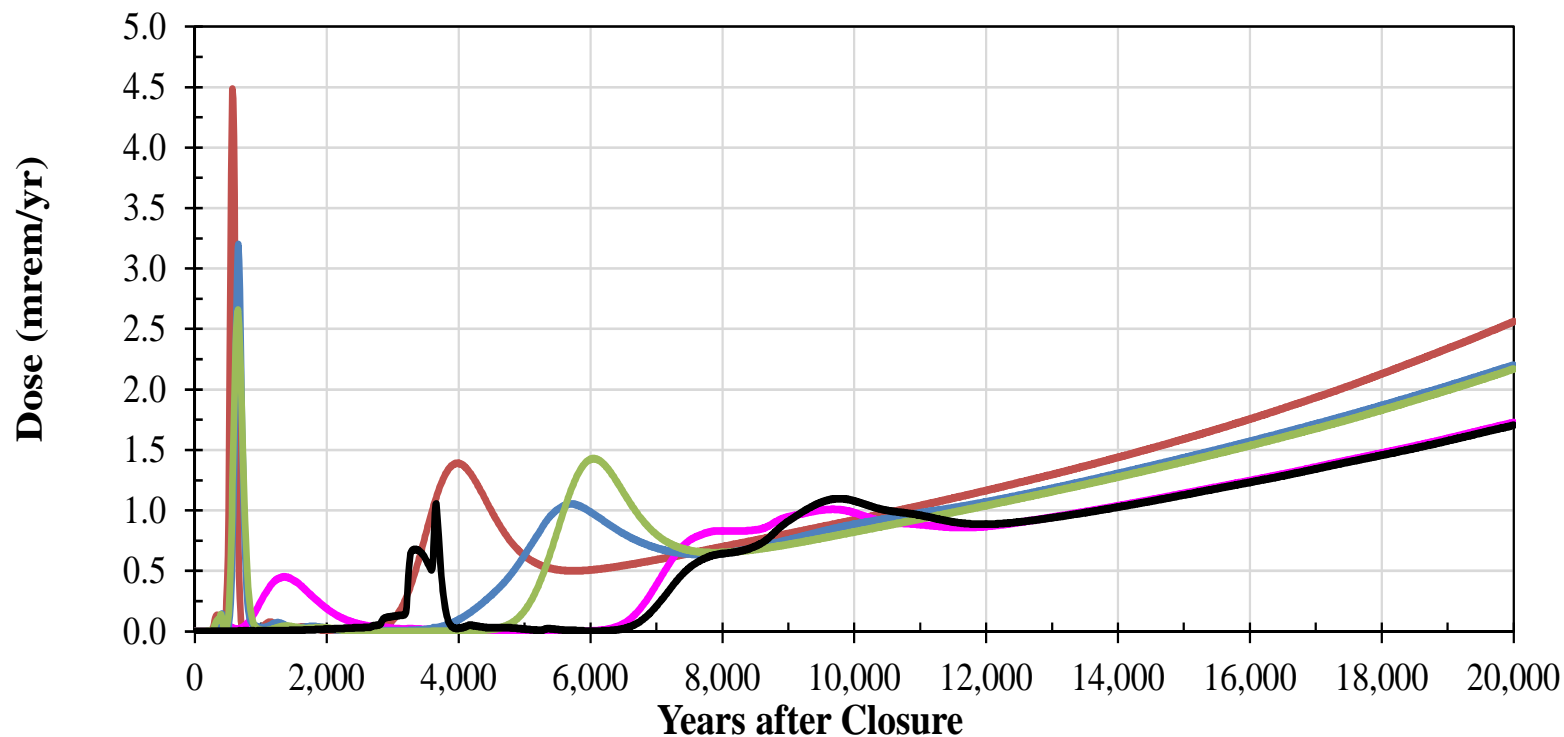
Tank 15 Cementitious Material Hydraulic Sensitivity

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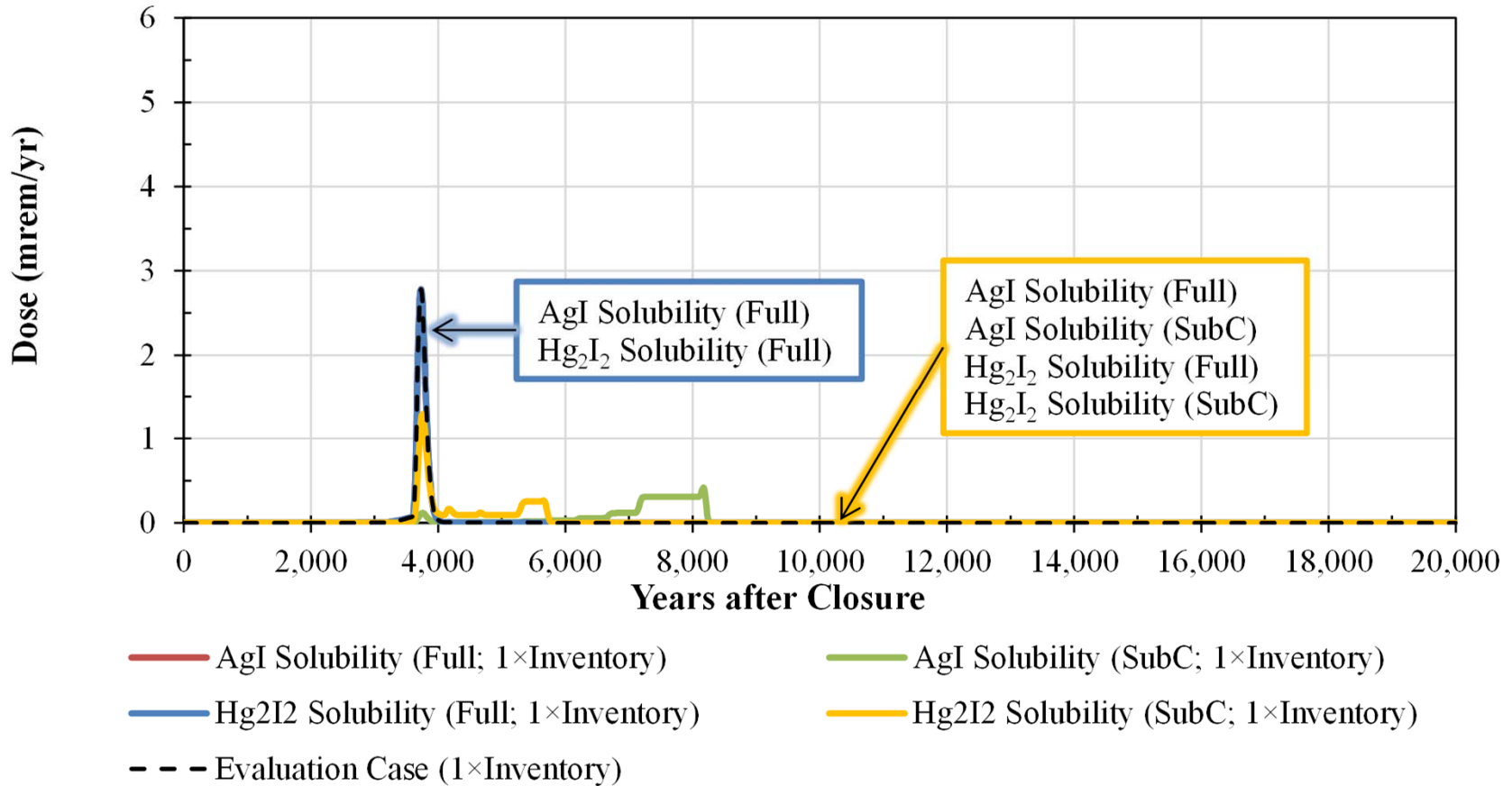
Tank 15 Cementitious Material Chemistry Sensitivity

We do the right thing.



- Case A (All Backfill; OR_III)
- Case C (PA Grout & Concrete; OR_III)
- Case A (PA Grout & Concrete; OR_III)
- Case A (Average Grout; OR_III)
- Case A (Backfill Grout; OR_III)

We do the right thing.



We do the right thing.

- **HTF GoldSim Model Update**
 - A set of updates were implemented in the GoldSim model for use in the Type I and II Tank SA.
 - Extensive benchmarking (multiple tanks, multiple configurations) performed.

- **HTF GoldSim Model used in the SA for:**
 - HTF Sensitivity Analysis,
 - Individual Tank Sensitivity Analysis, and
 - HTF Uncertainty Analysis.

We do the right thing.

- Type I and II Tank SA was approved June 2017.
- SA is available to support tank cleaning and closure decisions for the remaining Type I and II tanks in HTF.
- DOE letter states *DOE-SR hereby approves the Special Analysis and authorizes the use of this Special Analysis to make risk informed decisions to optimize waste removal efforts, potentially decreasing cost and schedule associated with closing the remaining Type I and II Tanks in HTF.*