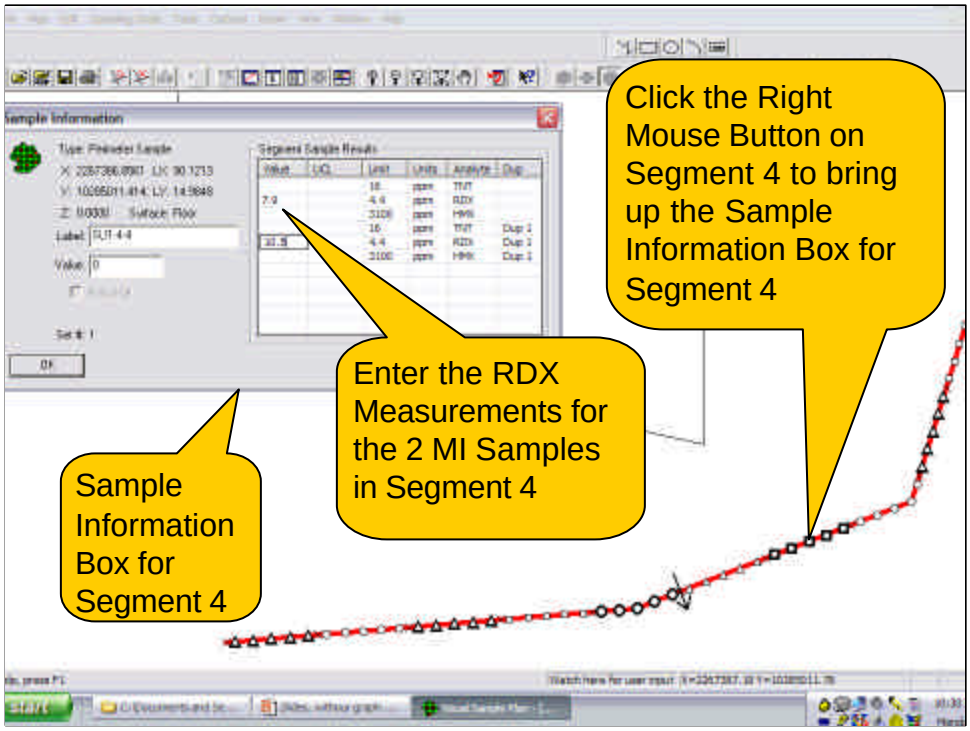
Click the Right Mouse Button on Segment 4 to bring up the Sample Information Box for Segment 4
Enter the RDX Measurements for the 2 MI Samples in Segment 4
Sample Information Box for Segment 4

Hypothetical Case Study (Continued)

- After the data for all segments have been entered into VSP, the UCLs are computed and compared to the RDX action limit (4.4 ppm) for each segment
- As shown on the next two slides, segments 2, 3, 4 and 7 were pushed outward because the UCL for those segments exceeded 4.4 ppm
  - 8 new segments were created that must now be sampled and tested against the action limit
- The following slide presents the RDX measurements, 99% UCLs and the decision (yes or no) whether the action limit for each segment was exceeded

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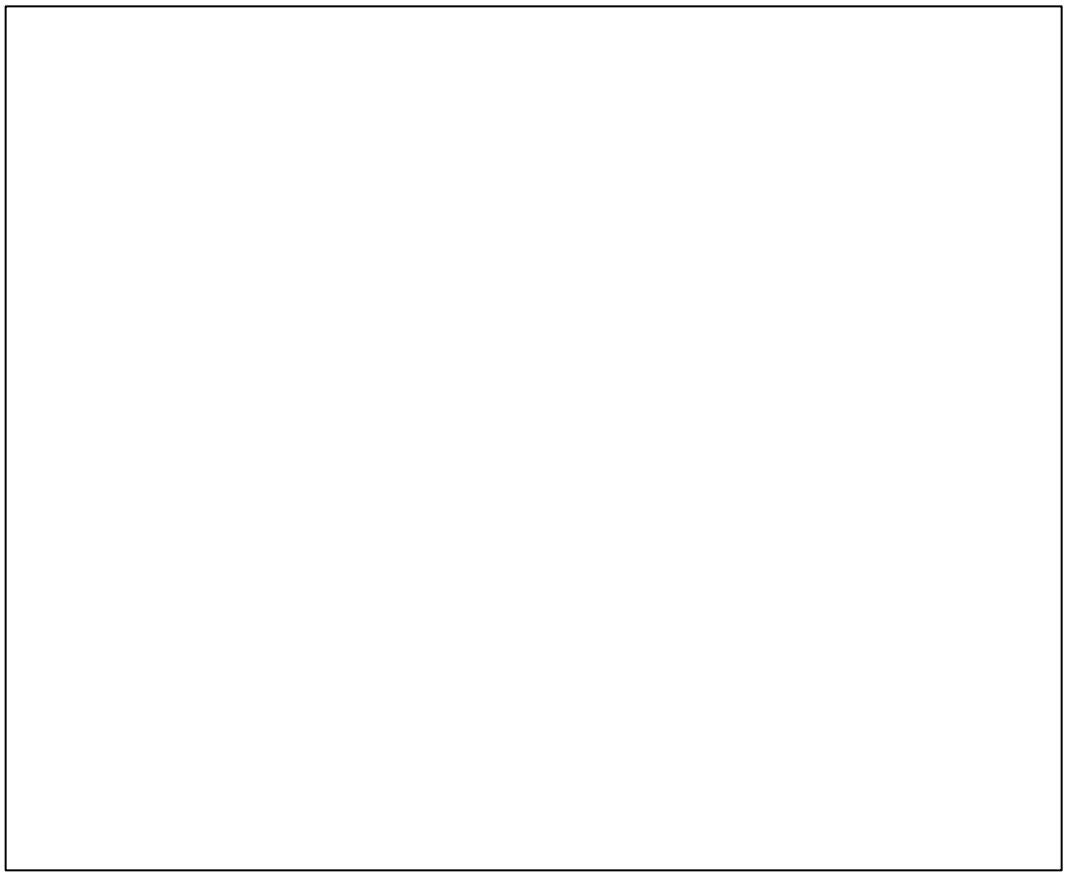

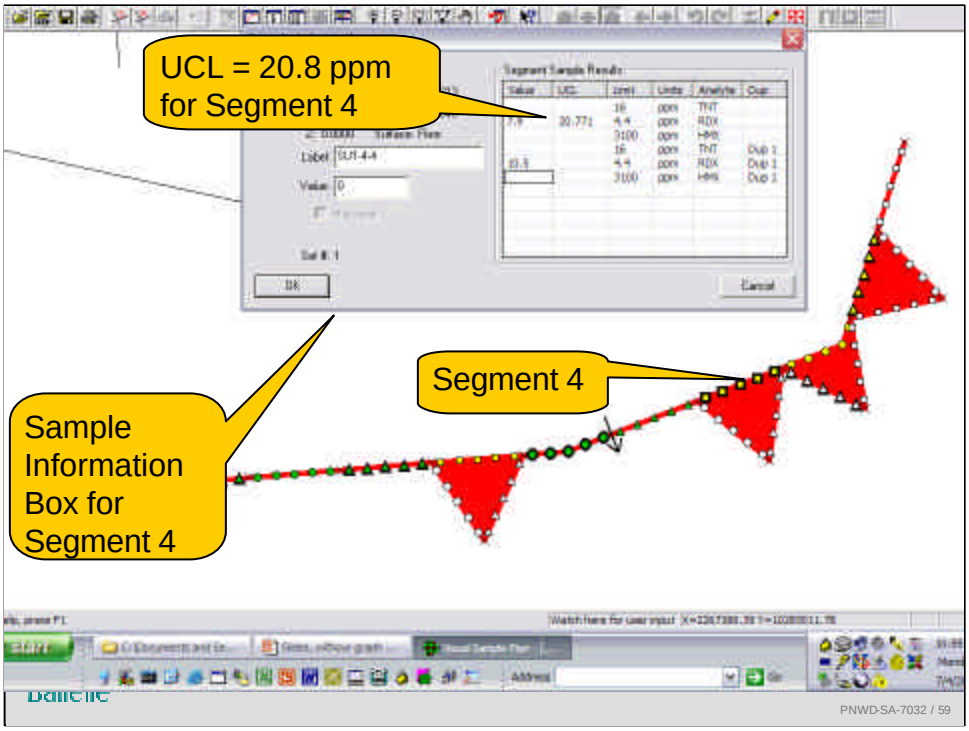
UCL = 20.8 ppm for Segment 4
Segment 4
Sample Information Box for Segment 4
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Hypothetical Case Study (Continued)

Segment on Initial Provisional Boundary	RDX (ppm)	99% UCL	Exceed Action Limit?
1	0.5	1.4	No
2	2.1, 3.2	6.0	Yes
3	5.0	13.9	Yes
4	7.9, 10.5	20.8	Yes
5	1.4	3.9	NO
6	0.4, 0.9	1.5	No
7	2.1	5.8	Yes
8	0.9, 1.9	3.2	No
9	0.1	0.3	No
10	0.4, 0.1	0.6	No

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Hypothetical Case Study (Continued)

- The 8 new segments must now be sampled and tested using the segment's 99% UCL in the same way as was done for the original 10 segments along the initial provisional boundary
- The final boundary that results from this iterative process is shown on the next slide.
- It appears that the true mean RDX concentrations in surface soil may exceed the action limit of 4.4 ppm in two places along the initial provisional boundary.

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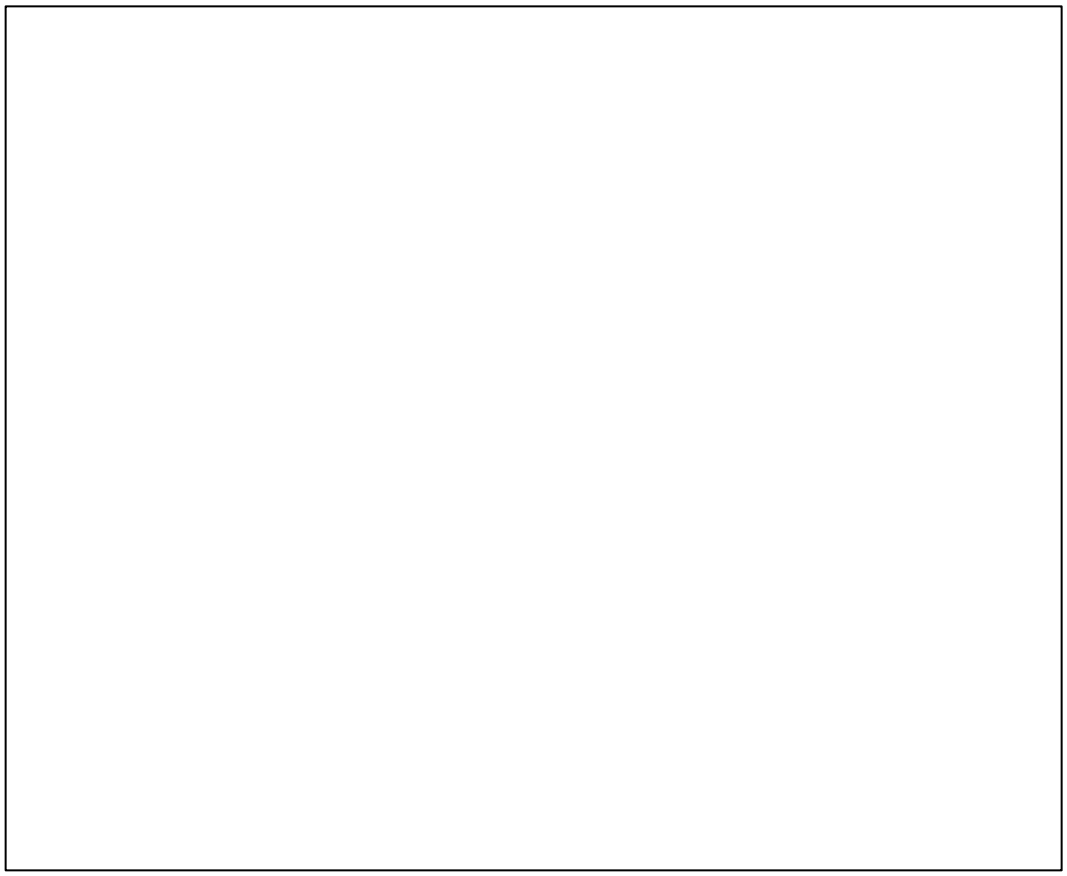

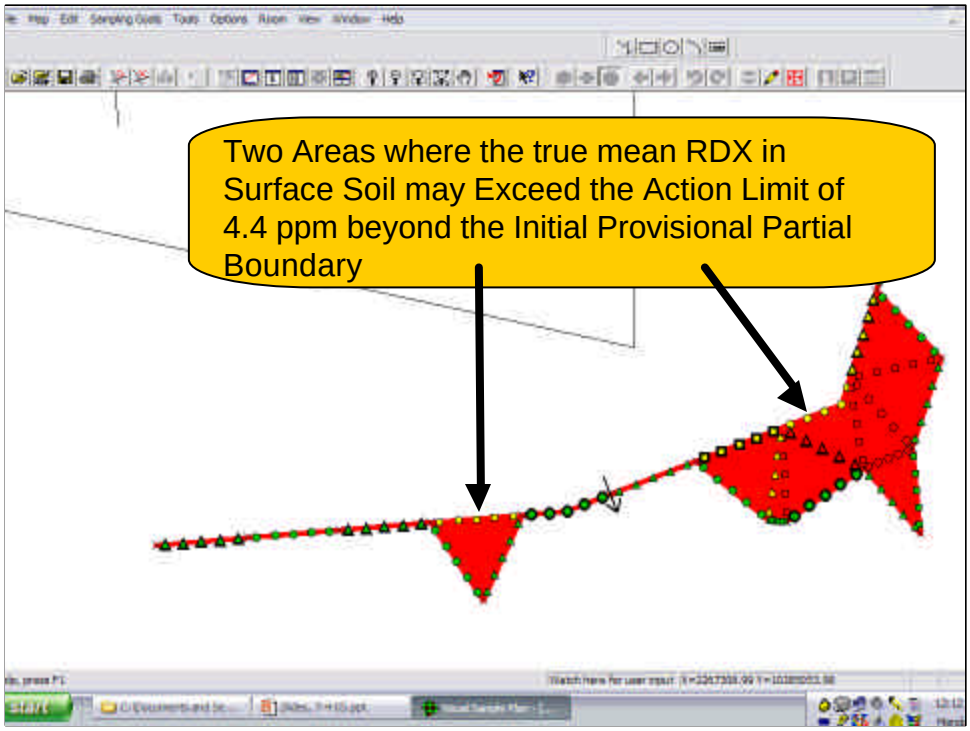
Two Areas where the true mean RDX in Surface Soil may Exceed the Action Limit of 4.4 ppm beyond the Initial Provisional Partial Boundary

Hypothetical Case Study (Continued)

- VSP automatically prepares a summary report for the project
- View the report by clicking the **Report View** button on the VSP tool bar, as shown in the next slide.
- Some information contained in the report:
  - A table that summarizes the boundary design (number and length of segments, length of boundary, minimum size hot spot of concern, number of soil increments per MI sample, number of segments with 2 MI samples, whether contamination extends beyond the original boundary, etc)
  - **Map View** of the site showing the final boundary after data have been entered into VSP and the UCL tests applied
  - Listing of all measurements for all segments
  - Formulas and assumptions used to compute the UCLs
- The report can be copied and pasted into project documents

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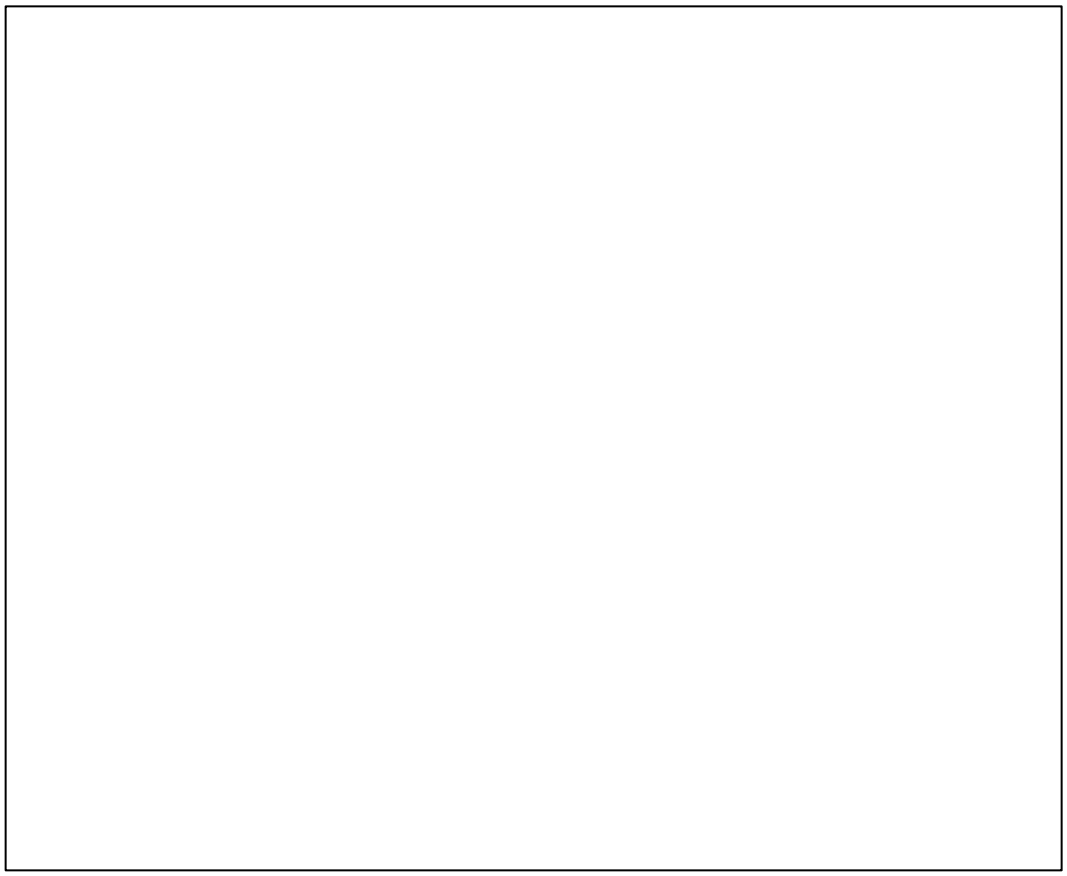

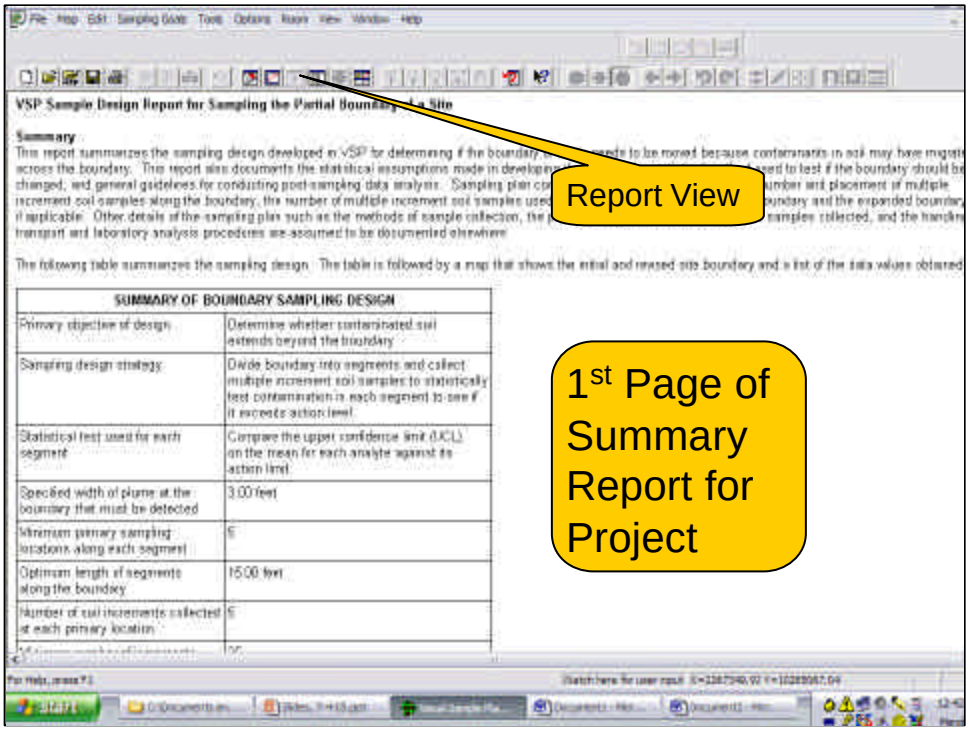
Report View
1st Page of Summary Report for Project
SUMMARY OF BOUNDARY SAMPLING DESIGN
Primary objective of design
Determine whether contaminated soil extends beyond the boundary
Sampling design strategy
Divide boundary into segments and collect multiple increment soil samples to statistically test contamination in each segment to see if it exceeds action level
Statistical test used for each segment
Compare the upper confidence limit (UCL) on the mean for each analyte against its action limit
Specified width of plume at the boundary that must be detected
3.00 feet
Minimum primary sampling locations along each segment
5
Optimum length of segments along the boundary
15.00 feet
Number of soil increments collected at each primary location
5

Summary

- This training has been an introduction to how to use the VSP Range Sustainability module
  - to determine if explosives constituents in surface soil may have migrated beyond the provisional boundary of an active training range, and if so,
  - to estimate the location of a new provisional boundary that is expected to identify the area where true mean concentrations may exceed action limits
- Not all features in VSP-RS module have been illustrated in this training
  - Please refer to the VSP RS user's guide, the user's guide for the entire VSP software package, and the VSP Quick-Start Guide for further information on the use of VSP
  - Download these guides from http://dqo.pnl.gov/vsp

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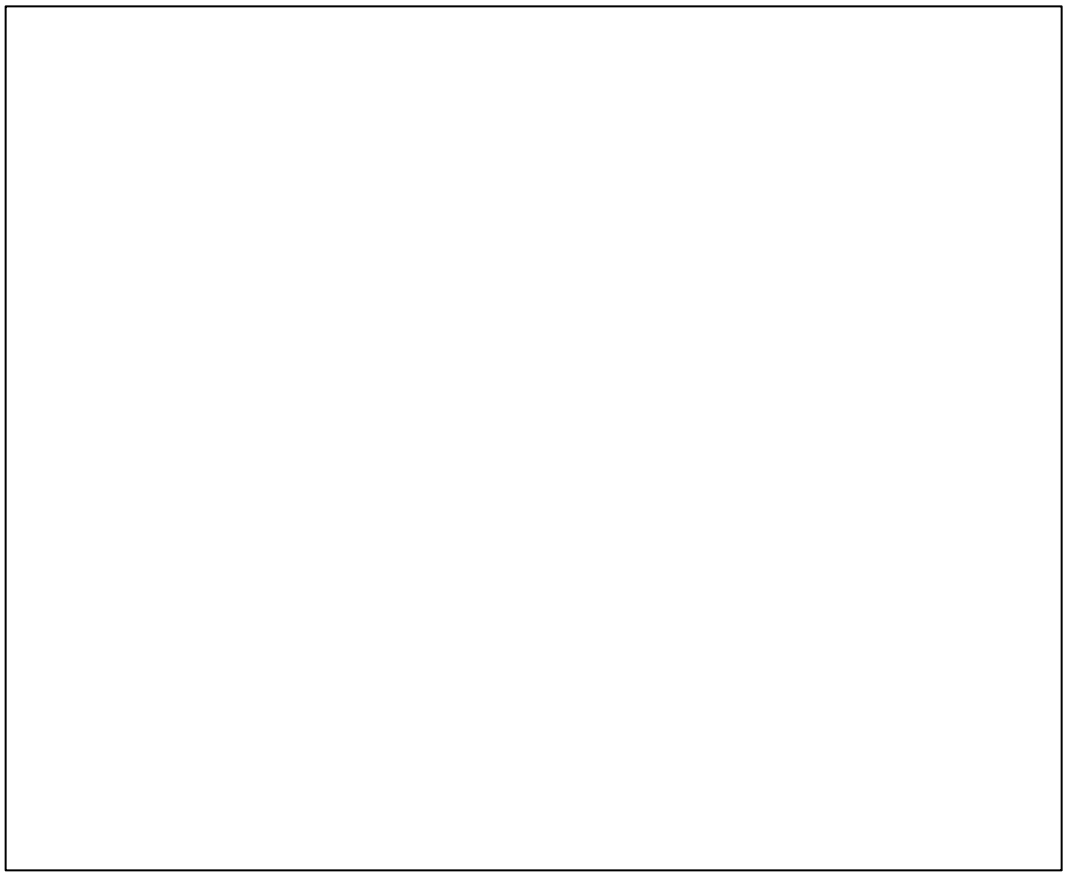
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