



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
ENVIRONMENTAL
MANAGEMENT



Individual Permit Efficacy of Corrective Action

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ENVIRONMENTAL MANAGEMENT
SAFETY ♦ PERFORMANCE ♦ CLEANUP ♦ CLOSURE



- **Introduction**
- **Rain Gage locations**
- **Pajarito (PJ) Watershed Site Monitoring Area (SMA) (PJ-SMA-5 Study)**
 - Map
 - Background
 - Graph with exceedances
 - Precipitation summary table
- **Starmer/Upper Pajarito (STRM) Watershed (STRM-SMA-4.2 Study)**
 - Map
 - Background
 - Graph with exceedances
 - Precipitation summary table
- **Conclusion**
- **Next Steps**
- **Questions**





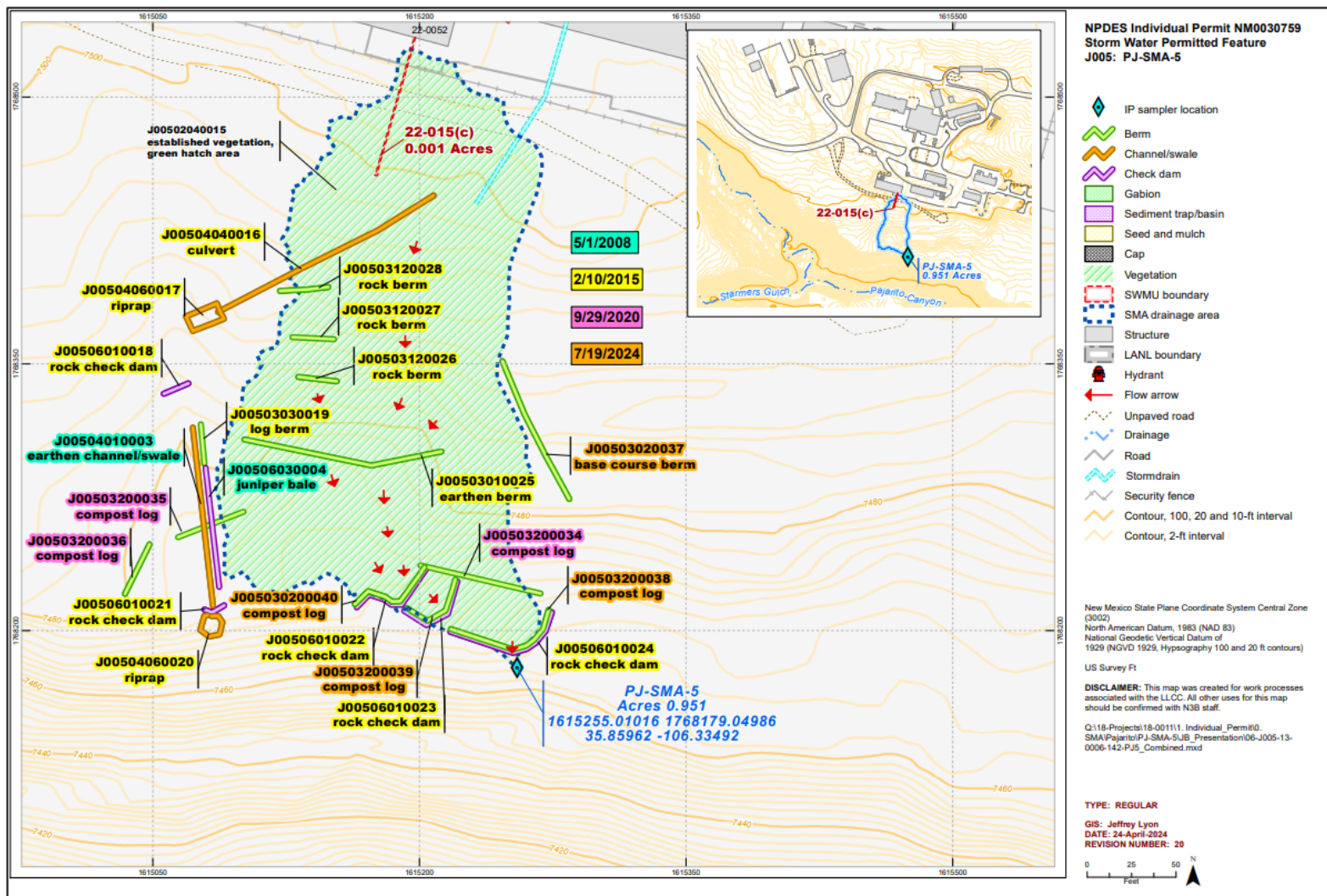
- Overall question: ***“Can we determine how effective corrective actions are at reducing pollutants of concern (POCs) in storm water samples with consideration to storm intensity?”***
- Line graphs for Site Monitoring Areas (SMAs) with multiple rounds of corrective actions and sample exceedances have been developed showing:
 - Contaminant exceedance Target Action Level (TAL) ratios for each sample, the TAL and sample results are notated in ug/L
 - Suspended Sediment Concentration (SSC) where available
 - Storm intensity when sample was collected (*30 min. max, total daily and three- day total*)
 - For the purposes of this presentation, only POCs with more than one data point have been included in this analysis.

Two of the twenty analysis performed are being presented today: **PJ-SMA-5** & **STRM-SMA-4.2**





PJ-SMA-5 Map





Constituent	TAL	10/12/2012	9/3/2018	5/30/2021	7/26/2022	9/5/2024
Copper (ug/L)	4.35	75.5	651	549	141	292
SSC (mg/L)	n/a	n/a	800	n/a	n/a	3400

- Respective Rain Gage: RG-TA-06
- Controls Installed:
 - 5/1/2008 - earthen channel/swale, juniper bales (baseline controls)
 - 2/10/2015 - earthen berm, log berm, rock berms, culvert, riprap, and rock check dams
 - 9/29/2020 - compost logs
 - 7/19/2024 – base course berm and compost logs
- A sample from 2024 exceeded for copper. This SMA will enter corrective action after a second sample is collected or two years have passed.



Compost logs (2024) and rock check dams (2015)

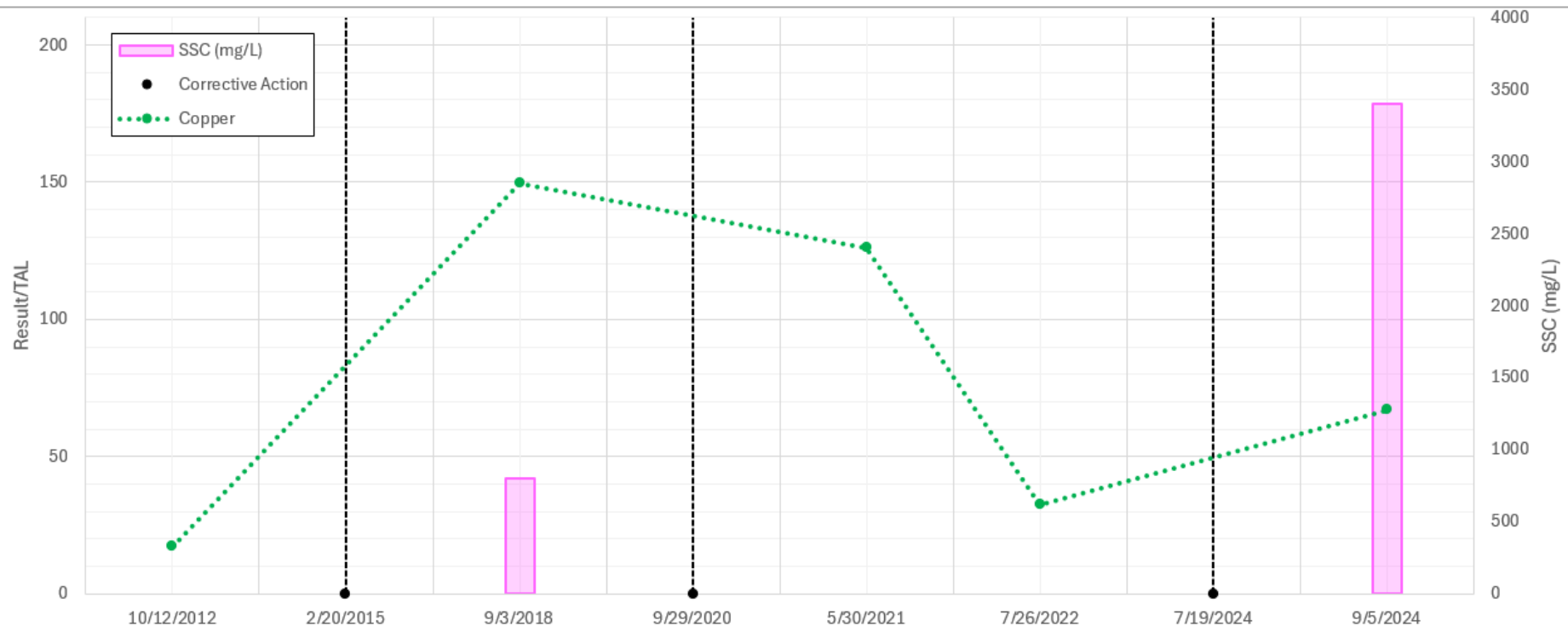


Base course berm (2024)





PJ-SMA-5 Efficacy of Corrective Action Graph

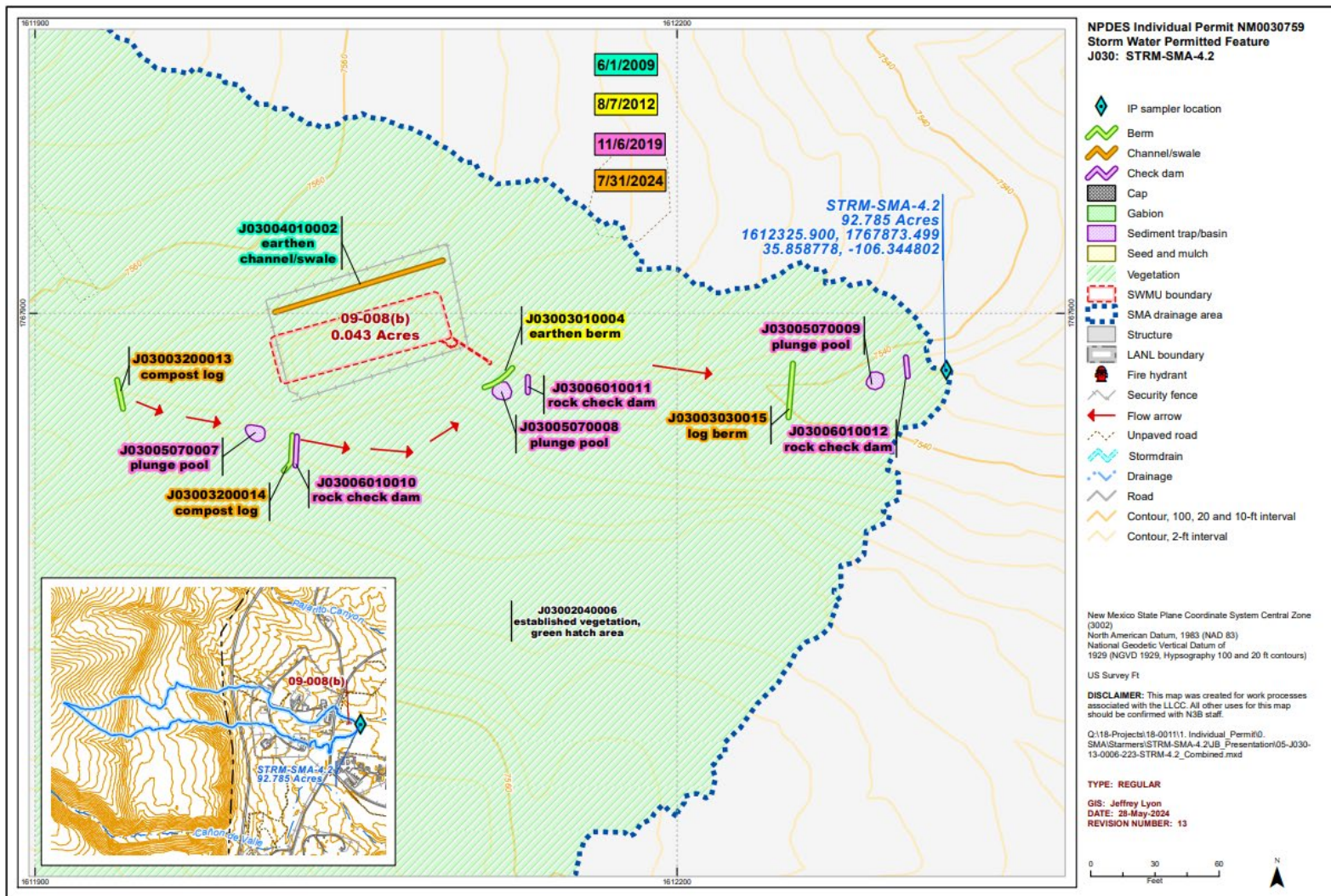


Date	10/12/2012	2/20/2015	9/3/2018	9/29/2020	5/30/2021	7/26/2022	7/19/2024	9/5/2024
30 Min. Max (in)	0.53	n/a	0.37	n/a	0.43	0.09	n/a	0.6
Total Daily (in)	1.02	n/a	0.4	n/a	0.6	0.27	n/a	1.34
Three-day Total (in)	1.02	n/a	0.58	n/a	0.77	0.39	n/a	1.37
Corrective Actions	n/a	Earthen berm, log berms, rock check dams	n/a	Small compost logs	n/a	n/a	Base course berm, large compost logs	n/a





STRM-SMA-4.2 Map





Constituent	TAL	7/29/2017	9/27/2017	7/27/2021	7/4/2022
Aluminum [F] (ug/L)	750	2190	1980	569	779
Copper (ug/L)	4.35	8.81	5.26	4.57	4.67
Silver (ug/L)	0.41	0.52	0.3	0.57	0.45
SSC (mg/L)	n/a	n/a	300	300	135

- Respective Rain Gage: RG-240
- Controls Installed:
 - 6/1/2009 - earthen channel/swale (baseline controls)
 - 8/7/2012 - earthen berm
 - 11/6/2019 - plunge pools, rock check dams
 - 7/31/2024 – log berm, compost logs
- Sampler was moved after 2012; therefore, only samples after 2012 were included in this analysis.
- This SMA will enter corrective action for a 2023 TAL exceedance for a POC that was previously not monitored after a second sample is collected or two years have passed.



Coir log (2024), rock check dam and plunge pool (2019)

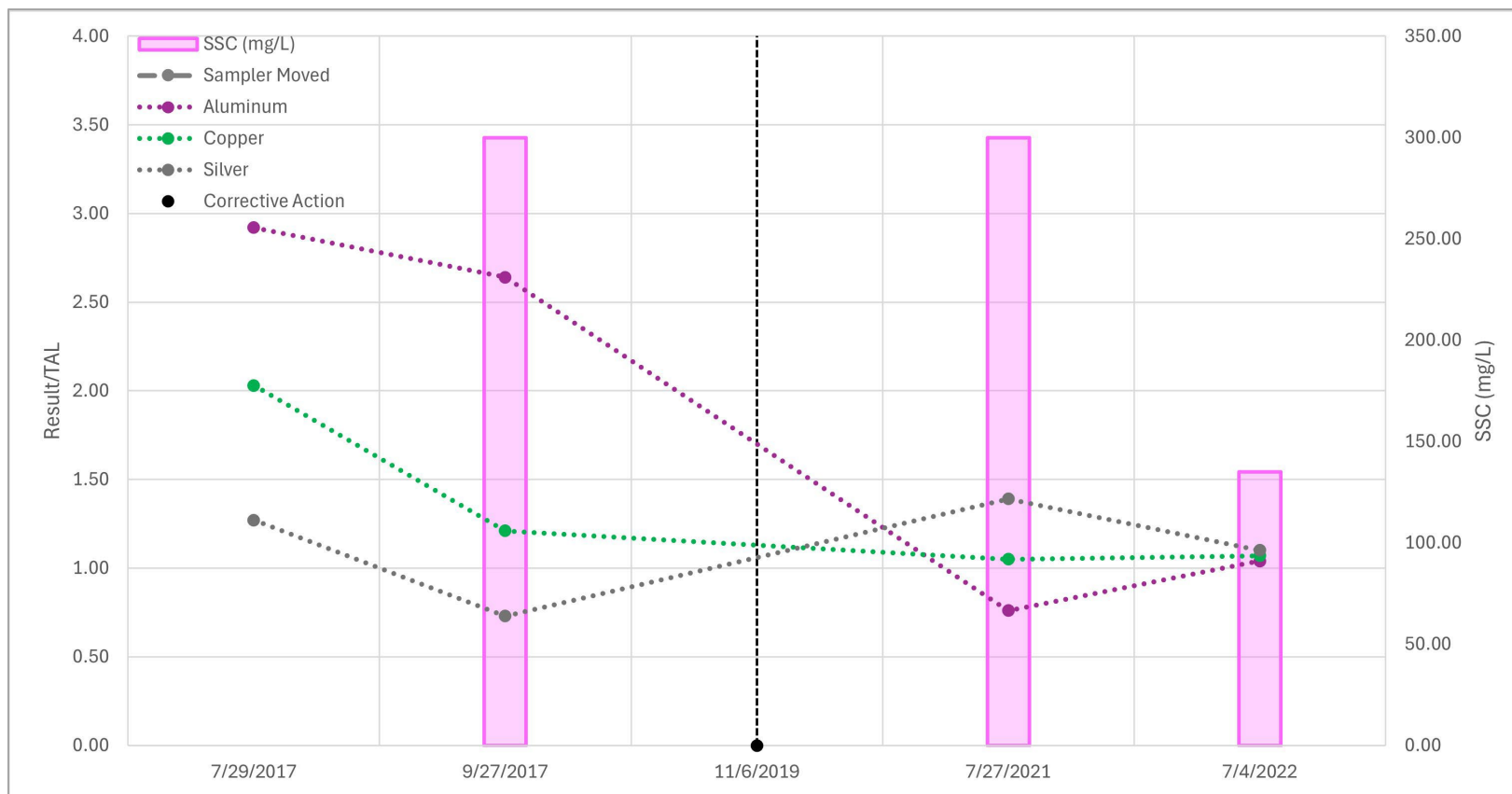


Coir log (2024)





STRM-SMA-4.2 Efficacy of Corrective Action Graph



Date	7/29/2017	9/27/2017	11/6/2019	7/27/2021	7/4/2022
30 Min. Max (in)	0.29	0.18		0.31	0.21
Total Daily (in)	0.54	1.71		0.37	0.53
Three-day Total (in)	0.97	2.34		0.61	0.87
Corrective Action / Site Change	n/a	n/a	Plunge pools, rock check dams	n/a	n/a





Conclusions

- Given the many site-specific parameters, evaluating the efficacy of corrective actions is complex.
- This analysis for PJ-SMA-5 appears to show SSC and storm intensity as drivers of the magnitude for exceedances.
- This analysis for STRM-SMA-4.2 appears to show that smaller controls are effective at reducing POCs exceedances, but there may be a lower limit to still be reached.

Trends help in planning future installations of control measures, such as:

- Small exceedances with high SSC – Enhanced controls that focus on runoff, sediment and erosion controls.
 - (i.e., PJ-SMA-9 - rock check dams, coir logs installed 2024, STRM-SMA-4.2 - plunge pools, rock check dams installed 2019)
- Large exceedances driven by Solid Waste Management Unit/Area of Concern soil data results – no exposure controls
 - (i.e., S-SMA-2 - Shotcrete cap over SWMU installed 2024)
- Large exceedances driven by precipitation/high SSC – retention controls focused on preventing runoff and sediment migration.
 - (i.e., 2M-SMA-2 - sediment basin extension completed in 2024)





- Include any co-located sites to highlight differences/similarities between sites that are close to each other (i.e., LA-SMA-1/LA-SMA-1.25, PJ-SMA-11/PJ-SMA-11.1).
- Include any construction activities ongoing in background, to show additional context of why samples might be exceeding.
- Include sites where controls have been effective for preventing exceedances, to compare/contrast to sites with multiple exceedances.

Any questions or comments?

