Technical Oversight Committee:

Phosphorus load reduction methodology: Consistency with the operational design envelope for the STAs.

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Background – TOC Recommendation

- "1. Continue to develop and implement strategies to operate the STAs within their design range. That should include review of baseline hydrologic data sets used for STA design and updating to reflect current regional water management."
- Methodology developed
- Continuing to update data sets
- investigating regional water management
  - Corps volunteered to lead WCAs and ENP
  - District has lead on evaluating Lake releases

STA Operational Design Envelope

- Goal: to help keep the STAs from being overloaded with inflow volumes and nutrients
- Quantified the “operational design envelope” for inflow volume and phosphorus loads that were anticipated for each STA
- Recommends a method for utilizing the resulting information to assist in tactical operational decisions.

Key Assumptions

- Actual runoff is accurately simulated by SFWMM
- Actual TP loads are accurately estimated
- All STAs are in full flow-through mode, otherwise some STAs will be receiving more inflow than anticipated

Original Design - Long-term Averages

Table 1. Initial Design Assumptions for the STAs (excludes BMP replacement water)

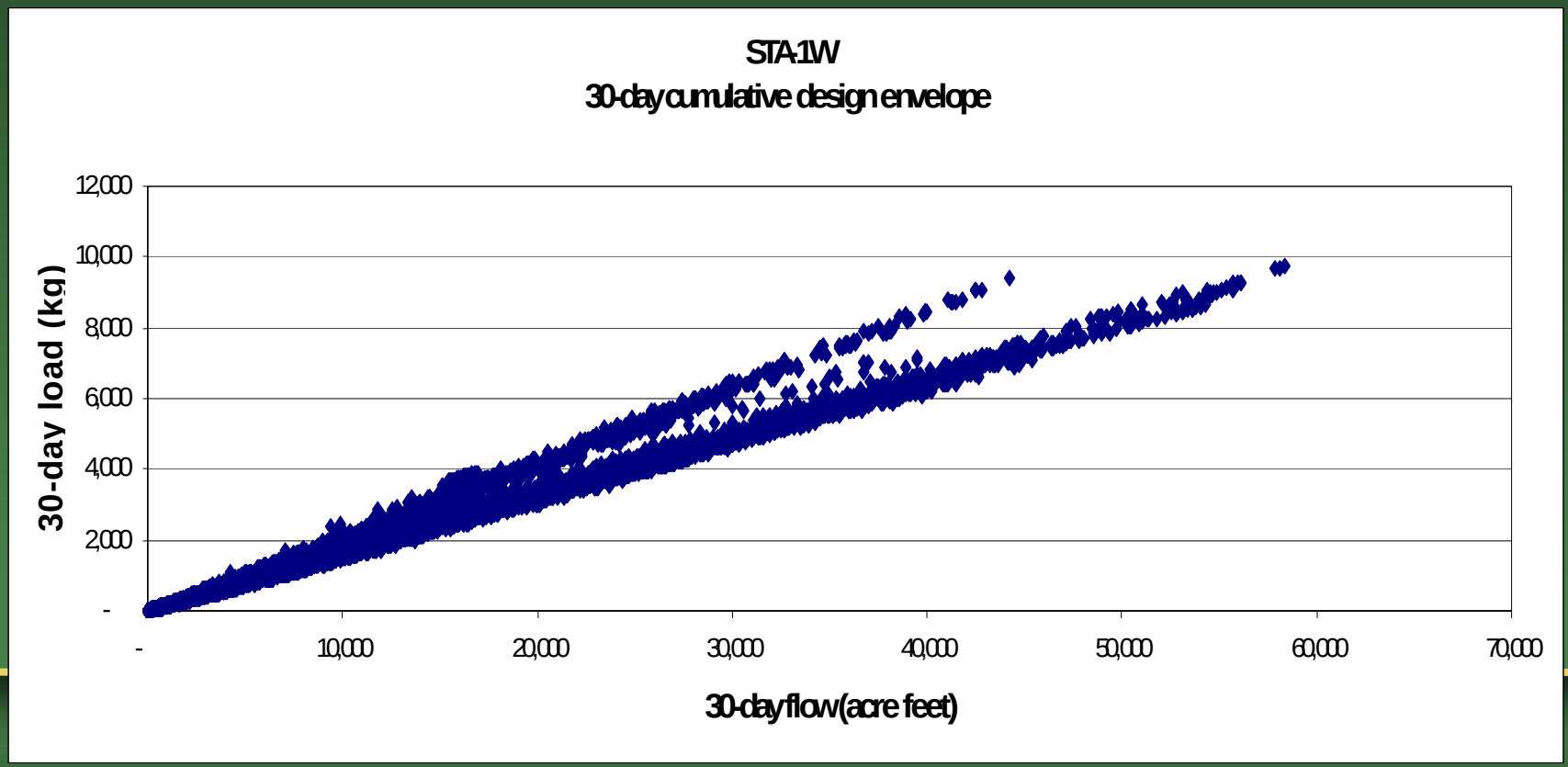
STA	10-yr Average Annual Flow (acre feet/yr)	10-yr Average Annual Phosphorus Load (kg/yr)
STA-1E	124,876	29,442
STA-1W	142,853	37,701
STA-2	174,641	33,764
STA-3/4	604,753	87,200
STA-5	87,000	28,000
STA-6 Section 1	18,034	4,388

From Conceptual Design (Burns and McDonnell 1994)

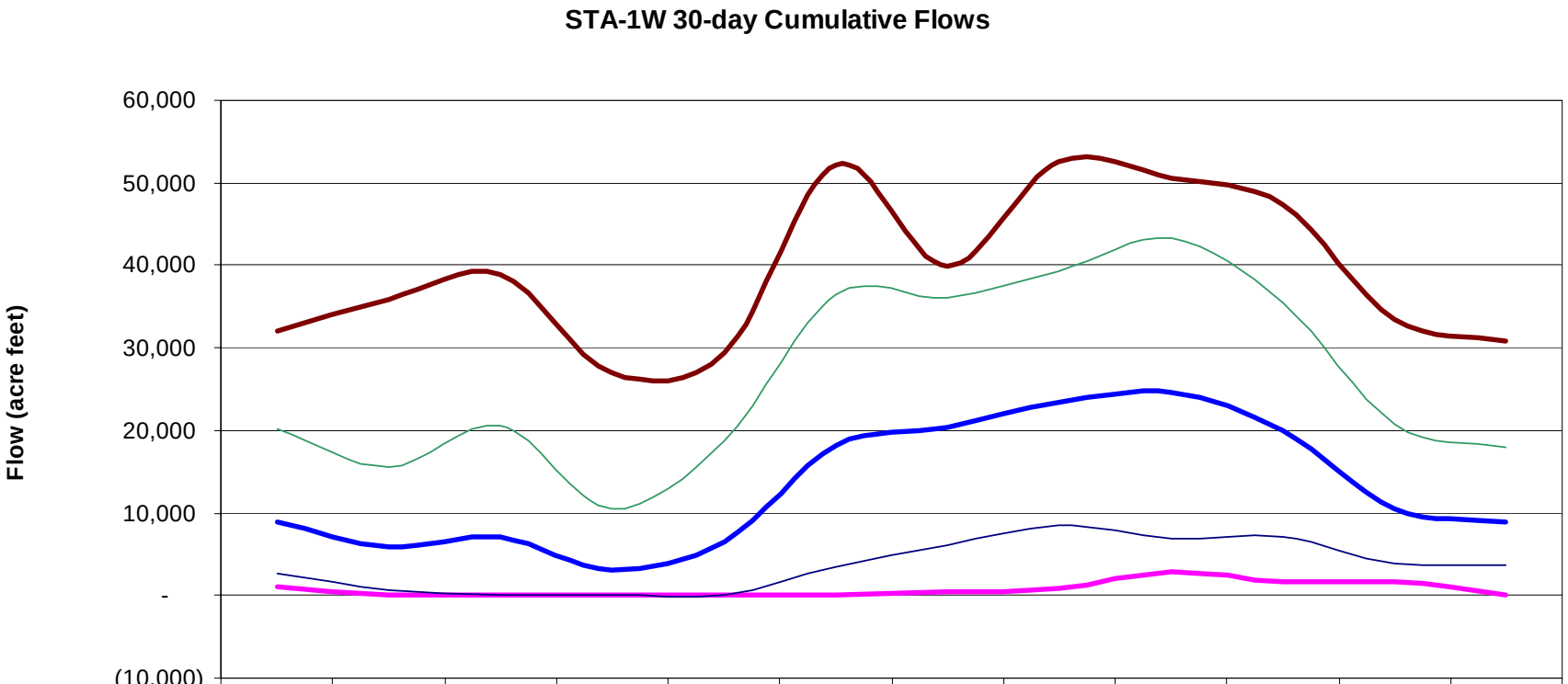
- no seasonal characteristic of the inflows
- limited ability for operational guidance

Design of STA Enhancements

- Utilized dynamic model (DMSTA)
- Can quantify seasonal characteristics

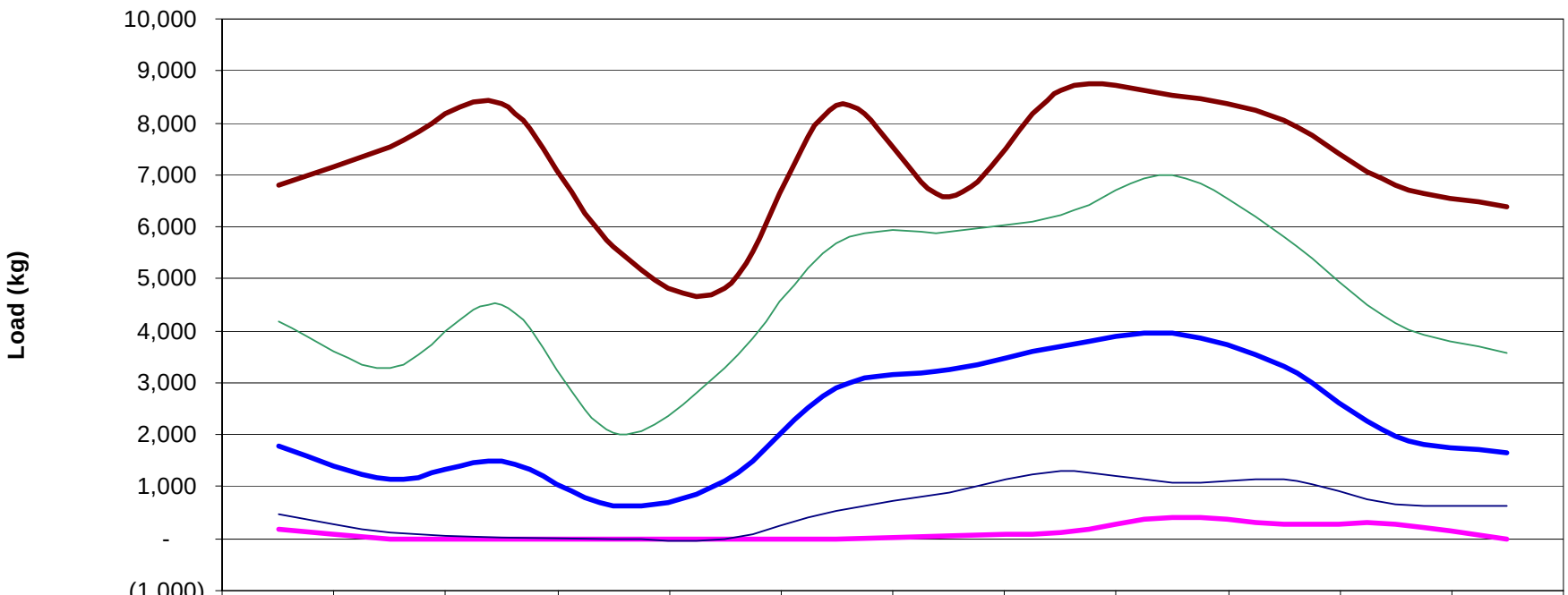


STA-1W 30-day Design Envelope - Inflows



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
30-day min	1,055	-	-	-	-	-	382	942	2,877	1,584	1,604	-
10%	2,666	611	134	-	-	3,500	6,087	8,422	6,837	7,157	3,936	3,582
30-day ave	8,825	5,864	7,167	3,164	6,589	18,084	20,426	23,343	24,598	20,030	10,488	8,909
90%	20,249	15,494	20,569	10,471	18,791	36,379	36,104	39,224	43,328	35,437	20,697	17,995
30-day max	31,946	35,933	38,949	27,025	29,365	52,192	39,789	52,587	50,458	47,426	33,430	30,854

STA-1W 30-day Design Envelope - Loads



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
30-day min	192	-	-	-	-	-	52	129	391	274	275	-
10%	456	105	22	-	-	526	899	1,290	1,087	1,143	677	620
30-day ave	1,769	1,155	1,493	645	1,095	2,909	3,243	3,712	3,965	3,303	1,972	1,664
90%	4,192	3,286	4,514	2,035	3,285	5,697	5,898	6,222	6,987	5,824	4,162	3,586
30-day max	6,793	7,551	8,374	5,627	4,832	8,327	6,577	8,616	8,523	8,047	6,805	6,379

Analysis

- Developed cumulative flows and loads
  - Monthly – allows seasonal evaluation
  - Annual
  - Triennial
- Quantified minimum, 10%, average, 90% and maximum values for each month

Application

- Can provide operational guidance to help keep the STAs from being overloaded with inflow volumes and nutrients
- Actual STA-3/4 example – Lake releases
  - March – 31-yr average = 46,759 acre-ft
  - 39.4% of total area yields 18,420 AF = 300 cfs
- Just one factor, but provides quantitative tool
- Also can be used to assess performance against design