

Pesticide levels in fish from Lake Apopka and the Lake Apopka North Shore

Rolland Fulton
Bureau of Water Resources
July 8, 2016

Lake Apopka North Shore Land Management Plan

- Adopted by SJRWMD Governing Board January 2013.
- Includes guidelines and goals for land management through 2022.
- “The Lake Apopka North Shore will be actively managed as marsh systems for the continued restoration of the water resources of Lake Apopka and for lake level fluctuation improvements within the lake.”



Toxicity threshold levels – ppb in whole fish (wet weight)

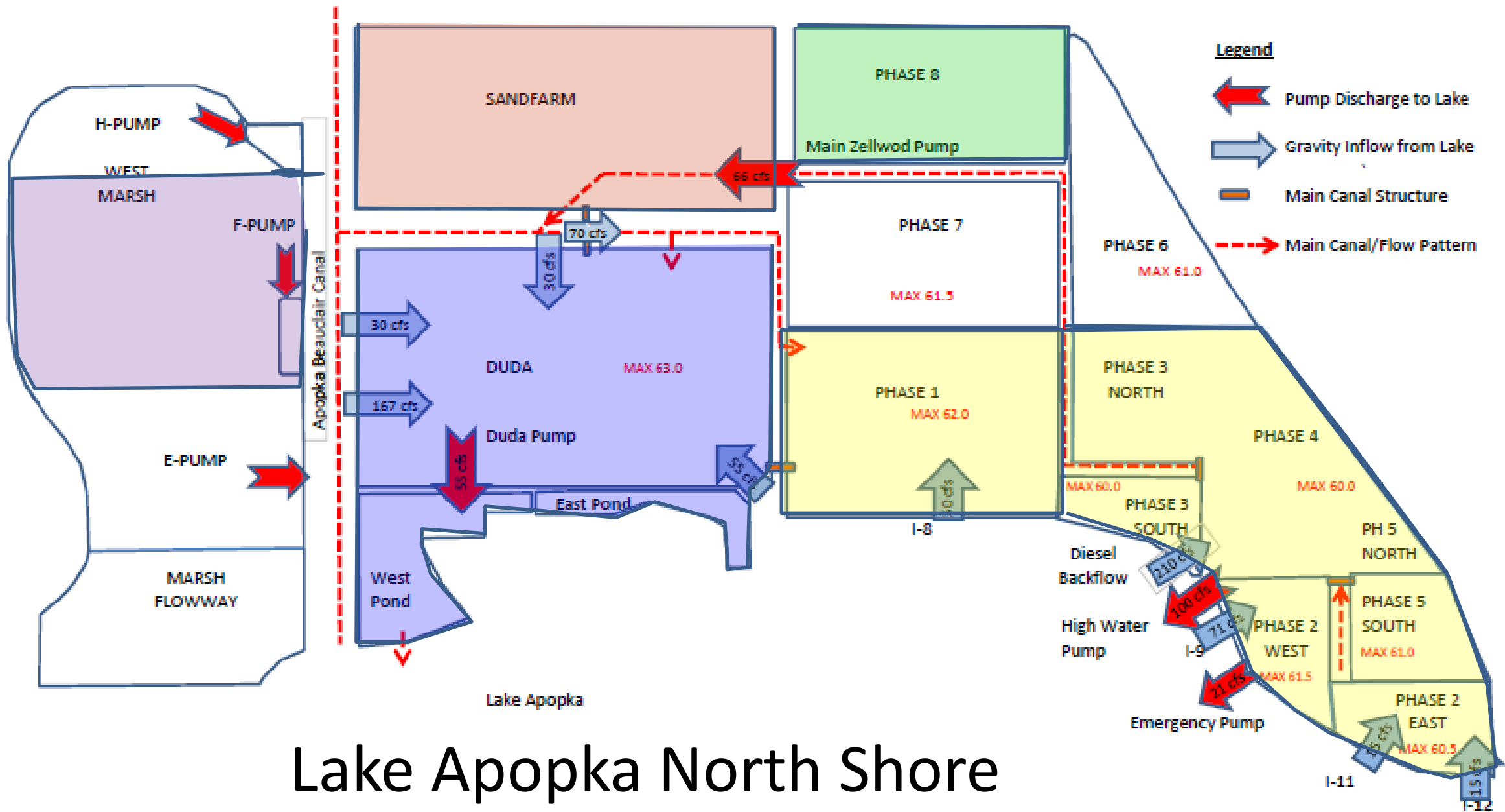
SJRWMD Toxicity Reference Values (TRVs) for ecological risk		
DDE	DDTr**	Toxaphene
1,500	1,500	5,000
FDOH screening values for human consumption (Kendra Goff, FDOH, July 28, 2009)		
	Total DDT	Toxaphene
	160	45

** DDTr indicates a calculated DDT equivalent which considers toxic effects of DDT, DDD, and DDE (Stickel et al., 1970)

SJRWMD Toxicity Reference Values (TRVs) for ecological risk — ppb in whole fish

Pesticide	TRV ($\mu\text{g}/\text{kg}$ wet wt)
4,4'-DDE	1,500
4,4'-DDTr*	1,500
Dieldrin	140
Toxaphene	5,000
cis-Nonachlor	550
gamma-Chlordane	1,000
Heptachlor	400
Heptachlor epoxide	100
Oxychlordane	50
trans-Nonachlor	450
alpha-Chlordane	1,000





Lake Apopka North Shore

Lake Apopka North Shore, fish pesticide samples 2014–15, exceedances of SJRWMD TRVs for ecological risk

Pesticide	Number of samples	Percent exceeding TRV
4,4'-DDE	349	4.6%
4,4'-DDTr*	349	0%
Dieldrin	349	0.3%
Toxaphene	349	0%
cis-Nonachlor	349	0%
gamma-Chlordane	349	0%
Heptachlor	349	0%
Heptachlor epoxide	349	0%
Oxychlordane	349	0%
trans-Nonachlor	349	0%
alpha-Chlordane	349	0%



Toxicity threshold levels – ppb in whole fish (wet weight)

SJRWMD Toxicity Reference Values (TRVs) for ecological risk		
DDE	DDTr**	Toxaphene
1,500	1,500	5,000
FDOH screening values for human consumption (Kendra Goff, FDOH, July 28, 2009)		
	Total DDT	Toxaphene
	160	45

** DDTr indicates a calculated DDT equivalent which considers toxic effects of DDT, DDD, and DDE (Stickel et al., 1970)

Lake Apopka North Shore, fish pesticide samples 2014–15, exceedances of FDOH screening values for human health

Phase/Area	Number of samples	Number exceeding DDT screen	Number exceeding Toxaphene screen
Unit 1, Phase 8	36	19	36
Unit 2, Phases 1-5	198	162	180
Duda	66	27	21
Sand Farm	9	3	3
West Marsh	40	39	40



Lake Apopka North Shore, fish pesticide samples 2014–15, percent exceedances of FDOH screening values for human health

Phase/Area	Number of samples	Exceeding DDT screen	Exceeding Toxaphene screen
Unit 1, Phase 8	36	53%	100%
Unit 2, Phases 1-5	198	82%	91%
Duda	66	41%	32%
Sand Farm	9	33%	33%
West Marsh	40	98%	100%
Totals	349	72%	80%



Fish pesticide samples, percent exceedances of FDOH screening values for human health

Phase/Area	Number of samples	Exceeding DDT screen	Exceeding Toxaphene screen
Lake Apopka North Shore 2014-2015	349	72%	80%
Lake Apopka 2004-2008, whole fish	91	12%	18%
Lake Apopka 2004-2008, fillets	83	1%	12%

