



KIEFER LANDFILL GROUNDWATER REMEDIATION STATUS

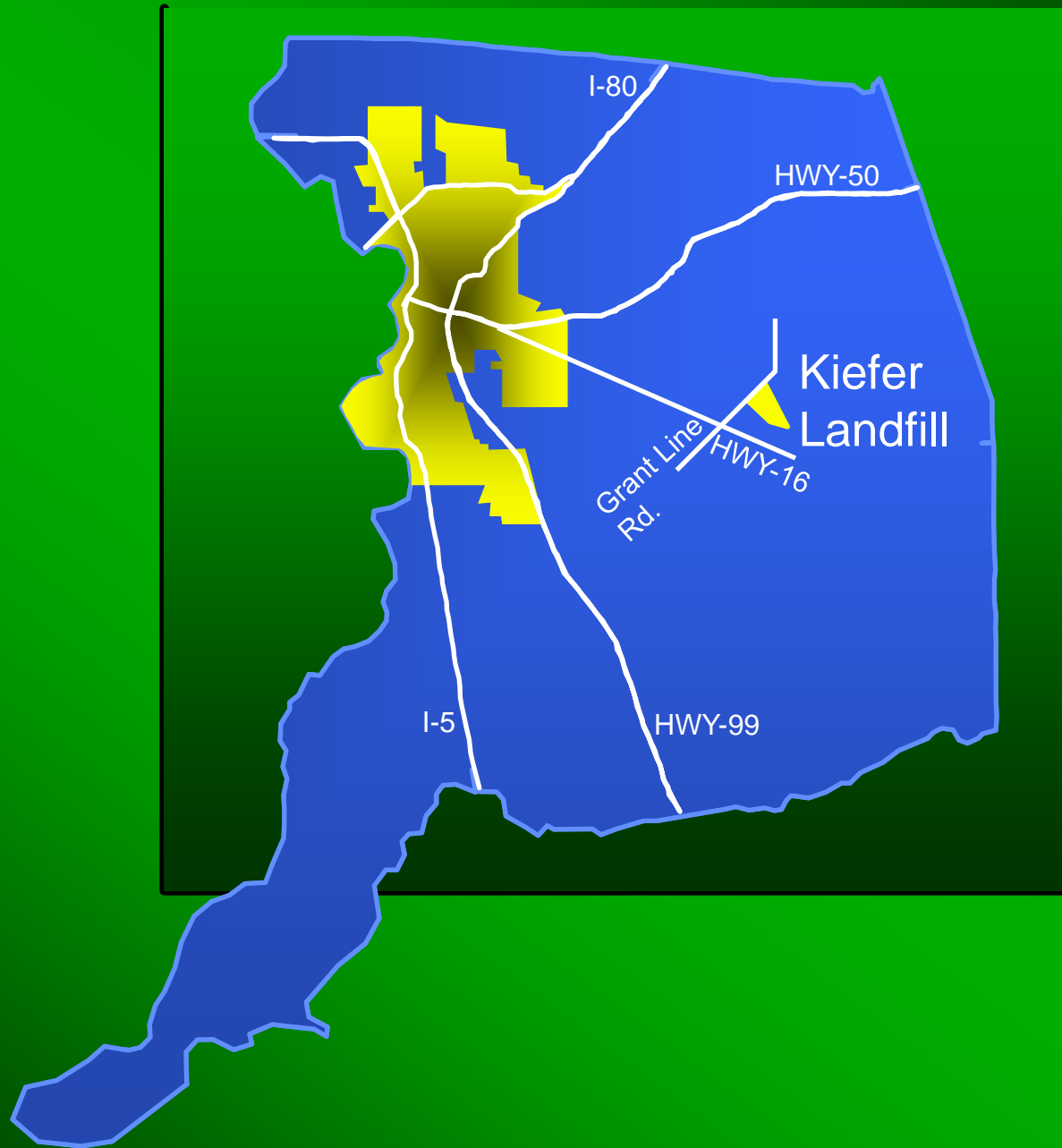
**Presented by:
County of Sacramento
Department of Waste Management and Recycling**

January 12, 2011

Purpose

Discussion Kiefer Landfill:

- ◆ Landfill Background
- ◆ Groundwater Contamination
- ◆ Groundwater Remediation



Kiefer Landfill History

- Prior to 1966 Sacramento was served by dozens of privately owned landfills.
- County opened KLF in 1967. Tip fee = \$1.25/ton
- Waste fill currently occupies 302 acres
- Waste fill will ultimately occupy 660 acres
- Groundwater contamination discovered in 1987

Kiefer Landfill in the Community Today

Regional Benefits:

- KLF provides competitively priced, environmentally responsible, local disposal for Sacramento
- KLF indirectly supports hundreds of local jobs
- KLF proximity helps conserve resources by reducing fuel consumption, e.g. City of Sacramento will save 1.7M miles per year.



Kiefer Landfill Groundwater Contamination

- KLF sits atop the valley alluvium bearing three groundwater zones, Zone A, Zone B, Zone C
- >90% of contamination is in Zone A
- ~0% of contamination is in Zone C
- The regional drinking water is drawn from Zone C

Hydrogeology - Water Bearing Zones

Surface elevation ranges from 100 to 200 ft. MSL

- ▶ Zone A: top of zone is at 30 ft MSL
- ▶ Zone B: top of zone is at 0 to -50 ft. MSL
- ▶ Zone C: top of zone at -150 ft. to -200 ft. MSL

Kiefer Landfill Groundwater Contamination

- The contamination is volatile organics (VOC's)
- At the few most impacted areas:
 - 2010 Total VOC level in Zone A is <20 ppb
 - 2010 Total VOC level in Zone B is << 5ppb
- Drinking water standards for the individual VOC's most commonly detected are ~5 ppb

Kiefer Landfill Groundwater Contamination

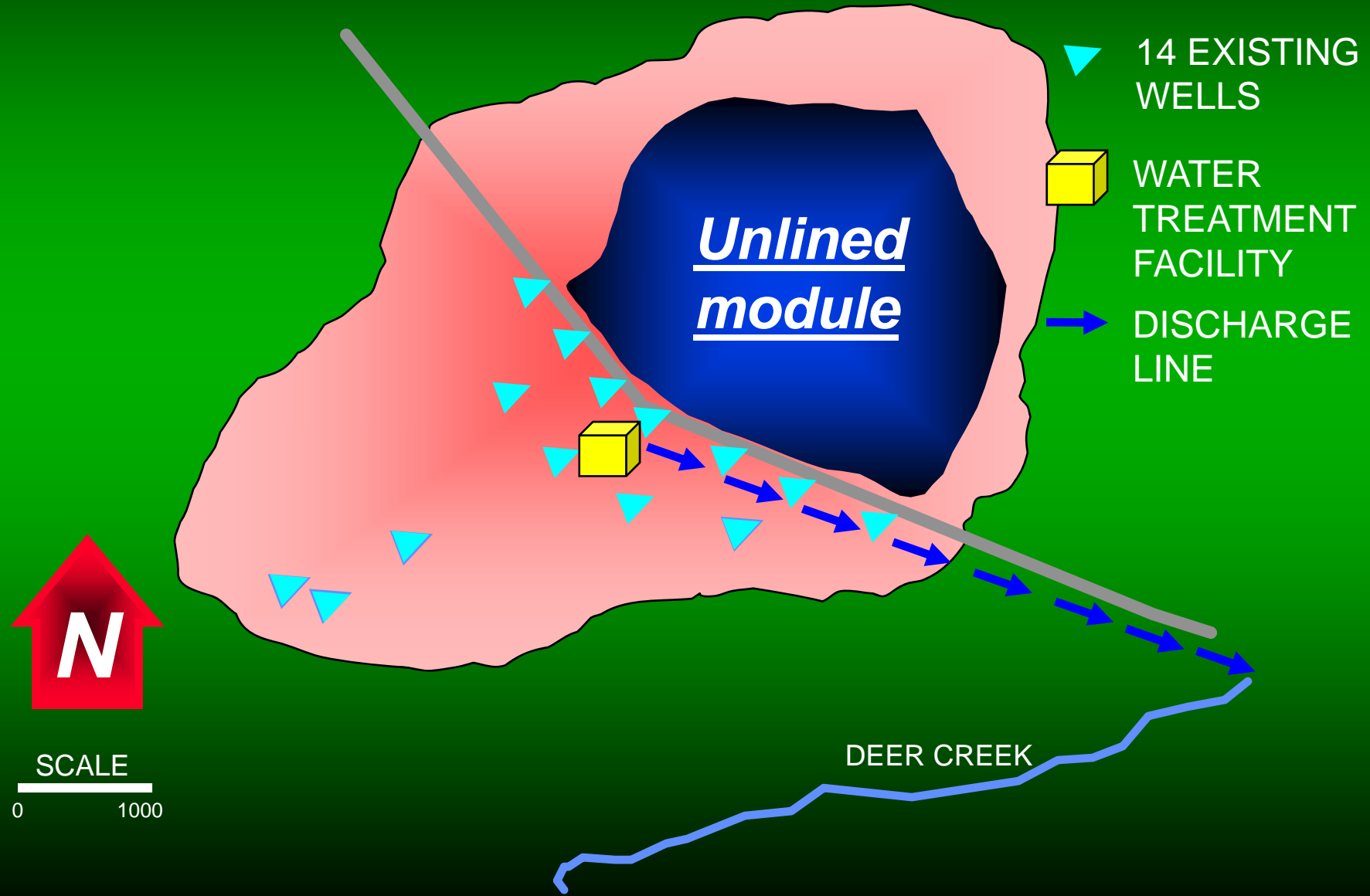
- Repeat, >90% of contamination is in Zone A
- Repeat, ~0% of contamination is in Zone C
- Repeat, drinking water is drawn from Zone C
- Contamination from KLF is drained from the groundwater (all zones) before leaving the property, “hydraulic control”

Kiefer Landfill Groundwater Contamination

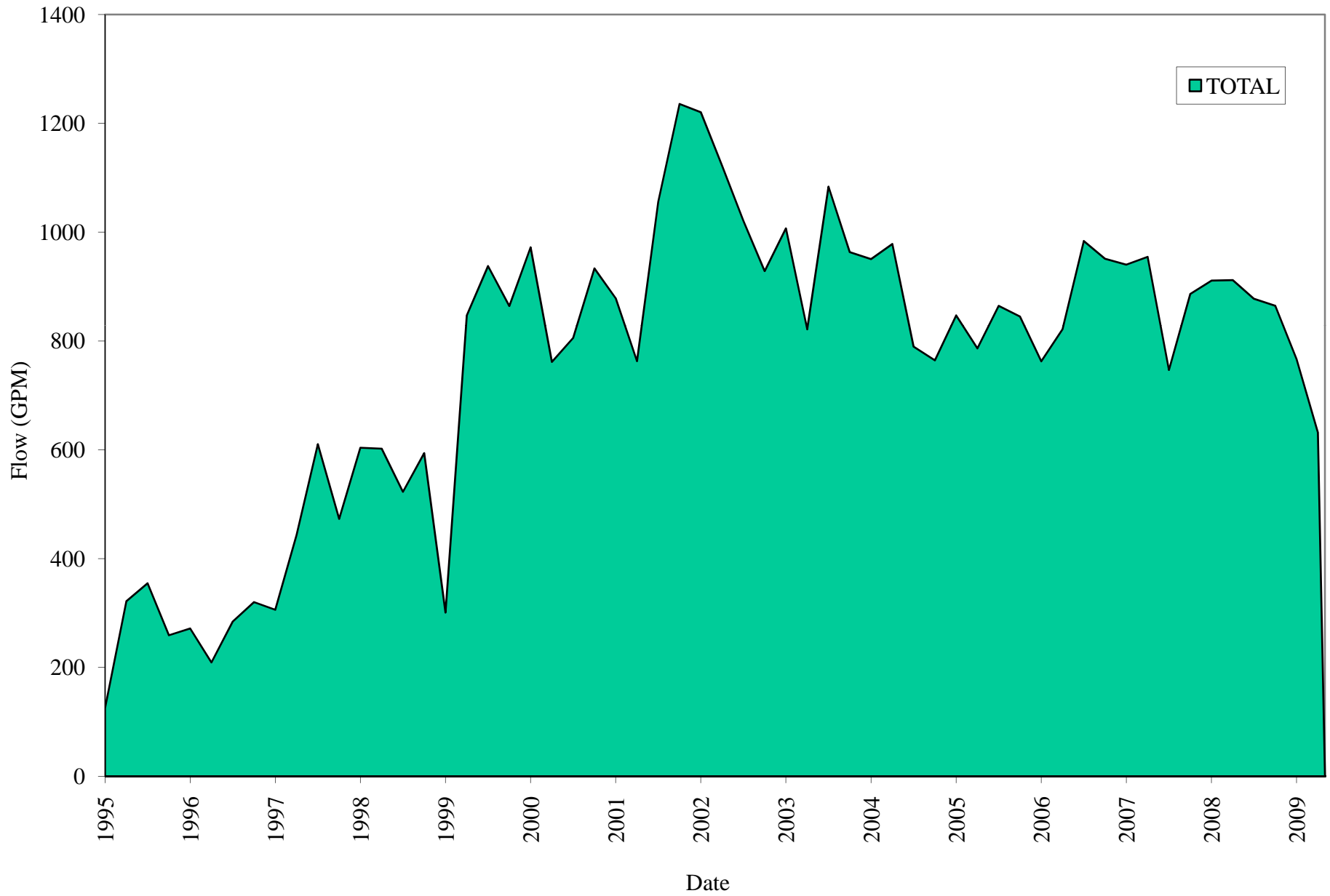
Estimated Progress:

- Total VOC's in Zone A in 1995 = ~663 lbs.
Total VOC's in Zone A in 2009 = ~118 lbs.
- Total VOC's in Zone B in 1995 = ~54 lbs.
Total VOC's in Zone B in 2009 = ~23 lbs.

GROUNDWATER EXTRACTION WELLS



Kiefer Landfill Ground Water Extraction and Treatment System
Record Flows, Total All Extraction Wells



Kiefer Landfill Groundwater Remediation

- Treated groundwater is discharged to Deer Creek
- County has been investigating effectiveness of individual wells to achieve greater contaminant removal without pumping more water
- County will apply biological remediation techniques in 2011 to breakdown the chemicals
- Remediation program will continue until Regional Water Board approves modification

Conclusion:

- 💧 KLF is under hydraulic control. No drinking water wells have been impacted.
- 💧 Total VOC concentration in the plume has significantly decreased in recent years
- 💧 Remediation program is long term