Illinois EPA Study of Pharmaceuticals in Drinking Water

- Looking at raw and finished drinking water at the plant before entering the distribution system
- Chicago, Aurora, Elgin, Rock Island, East St. Louis
- Rationale for selection:
  - Chicago is highest population served by surface water
  - Other surface water supplies are relatively close to wastewater discharges

Illinois EPA Study of Pharmaceuticals in Drinking Water Cont'd

- Substances being analyzed: Acetaminophen, Amoxicillin, Antipyrine, Aspirin®, Azithromycin, Bacitracin, Bezafibrate, Caffeine, Caffeine metabolites/Parazanthine, Caffeine metabolites/Theobromine, Caffeine metabolites/Theophylline, Carbadox, Carbamazephine, Chloramphenicol, Chlortetracycline, Ciprofloxacin, Clofibric acid, Cotinine, DEET, Diclofenac, Dilantin®, Diltiazem, Doxycylcine,

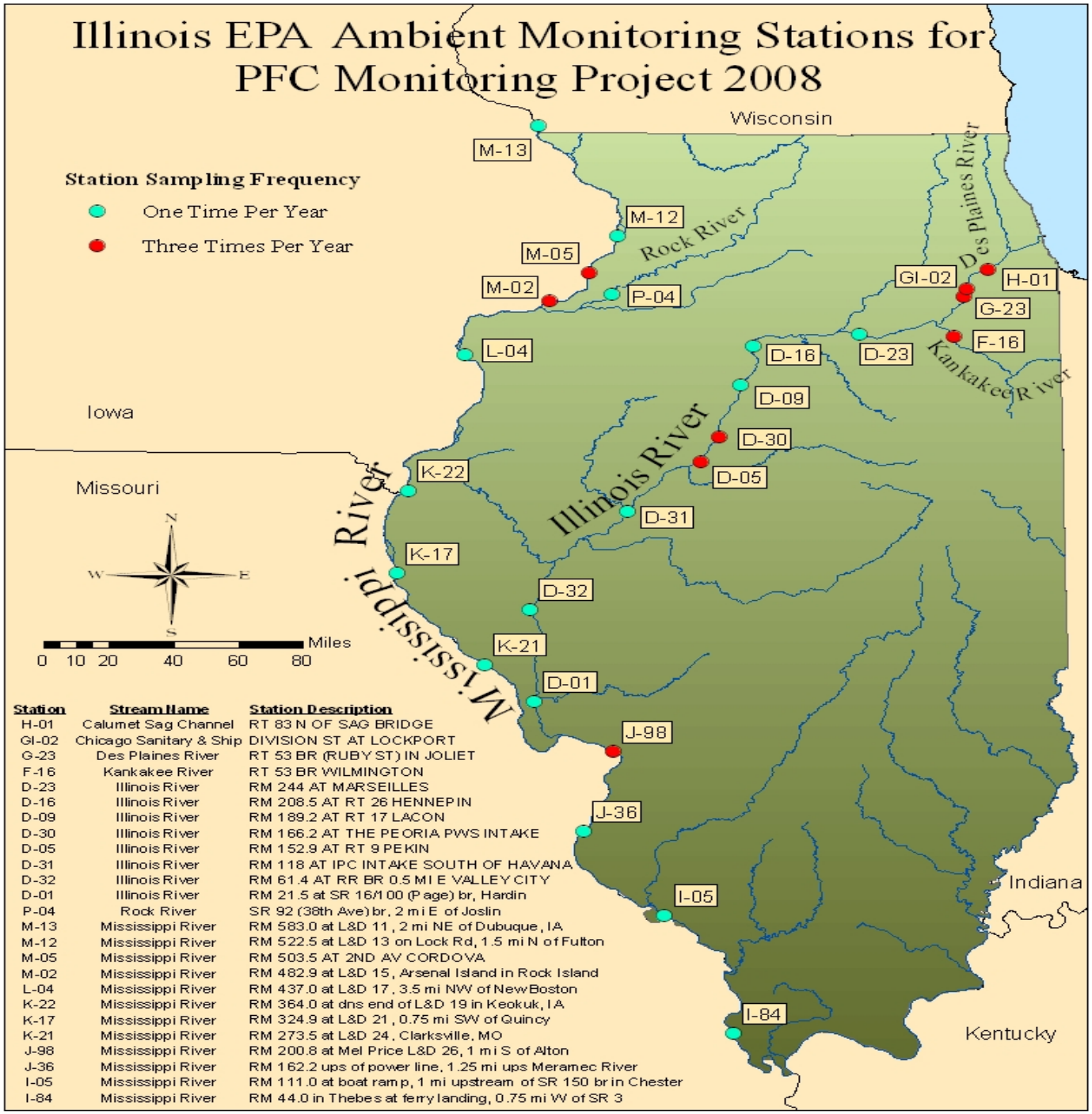
Illinois EPA Study of Pharmaceuticals in Drinking Water Cont'd

Enrofloxacin, Erythromycin, Fluoxetine/Prozac®, Gemfribozil, Ibuprofen, Lasalocid, Oxytetracycline, Levothyrozine/Synthroid®, Lincomycin, Monensin, Naproxen, Narasin, Nicotine, Norfloxacin, Oleandomycin, Oxytetracycline, Penicillin G, Penicillin V, Prednisone, Roxithromycin, Salinomycin, Simvastatin, Sulfachloropyridazine, Sulfadiazine,

Illinois EPA Study of Pharmaceuticals in Drinking Water Cont'd

Sulfadimethoxine, Sulfamerazine, Sulfamethizole, Sulfamethoxazole, Sulfathiazole, Triclosan, Trimethoprim, Tylosin, Virginiamycin M1,

- Analytical results expected this week; toxicological evaluation by IEPA and IDPH.



Station	Stream Name	Station Description
H-01	Calumet Sag Channel	RT 83 N OF SAG BRIDGE
GI-02	Chicago Sanitary & Ship	DIVISION ST AT LOCKPORT
G-23	Des Plaines River	RT 53 BR (RUBY ST) IN JOLIET
F-16	Kankakee River	RT 53 BR WILMINGTON
D-23	Illinois River	RM 244 AT MARSEILLES
D-16	Illinois River	RM 208.5 AT RT 26 HENNEPIN
D-09	Illinois River	RM 189.2 AT RT 17 LACON
D-30	Illinois River	RM 166.2 AT THE PEORIA PWS INTAKE
D-05	Illinois River	RM 152.9 AT RT 9 PEKIN
D-31	Illinois River	RM 118 AT IPC INTAKE SOUTH OF HAVANA
D-32	Illinois River	RM 61.4 AT RR BR 0.5 MI E VALLEY CITY
D-01	Illinois River	RM 21.5 at SR 16/100 (Page) br, Hardin
P-04	Rock River	SR 92 (38th Ave) br, 2 mi E of Joslin
M-13	Mississippi River	RM 583.0 at L&D 11, 2 mi NE of Dubuque, IA
M-12	Mississippi River	RM 522.5 at L&D 13 on Lock Rd, 1.5 mi N of Fulton
M-05	Mississippi River	RM 503.5 AT 2ND AV CORDOVA
M-02	Mississippi River	RM 482.9 at L&D 15, Arsenal Island in Rock Island
L-04	Mississippi River	RM 437.0 at L&D 17, 3.5 mi NW of New Boston
K-22	Mississippi River	RM 364.0 at dns end of L&D 19 in Keokuk, IA
K-17	Mississippi River	RM 324.9 at L&D 21, 0.75 mi SW of Quincy
K-21	Mississippi River	RM 273.5 at L&D 24, Clarksville, MO
J-98	Mississippi River	RM 200.8 at Mel Price L&D 26, 1 mi S of Alton
J-36	Mississippi River	RM 162.2 ups of power line, 1.25 mi ups Meramec River
I-05	Mississippi River	RM 111.0 at boat ramp, 1 mi upstream of SR 150 br in Chester
I-84	Mississippi River	RM 44.0 in Thebes at ferry landing, 0.75 mi W of SR 3

Potential Approaches for Developing "MCLs" for Pharmaceuticals

- Prescribed dose approach
  - Prescribed dose as LOEL for side effects
  - UF = 1,3, or 10 for:
    - · LOEL to NOEL
    - · Extrapolation to chronic exposure
    - · Human Variability
    - · Extrapolation from animal to humans
  - Convert "reference dose" to "MCL"
    MCL = (FRD x BW/1R) X RSC

Potential Approaches for Developing "MCLs" for Pharmaceuticals Cont'd

- Maximum recommended therapeutic dose approach
  - Same approach as above
  - Only human data in MRTD database, 1309 chemicals
- Evaluate additive effects with either approach