

Subject Index

A

- AAS. *See* Atomic absorption spectroscopy
- Absorbability, 11
- Acadia tansa*, 405
- Acenaphthene, 153(table, 154(fig)
- Acid digestion and analysis, 104, 144
- Acid precipitation, 20, 97
- Acid preservation: suspended sediments, 109(table)
- Acid rain, 20, 97
- Acidification, 97, 108
- Acute toxicology, 326, 329(table)
- Adsorbents, interaction between sediments and metal contaminants, 16
- Adsorption, 97
- Adsorption constants, 16
- Agency Sludge Task Force, EPA, 9
- Agricultural lands: municipal sludge disposal, 467-468
- Air contamination, 472
- Air elutriators, 123, 124(table)
- Air elutriators vs pipet analysis procedures: size distribution, 125(table)
- Air quality: landfilling impact, 148
- AKRIP: kriging computer programs, 60
- Aldehydes, 159
- Algae, 458
- Algal bioassays for estimates of available phosphorous, 71, 73(fig), 76(fig), 77-78, 79(fig)
- Alkaline wastes, 132
- Aluminum, 110
- Ammonia, 412
- Anaerobically digested sewage sludge, 98, 261-262
- Analytical Chemistry Committee(CMAC), 27
- Analytical methods
 - bibliography, 20-21
 - chemical and biological analyses of sediments, 18-20
 - chemicals in municipal sludge: risk assessment, 466-467
 - drilling fluids, 229-231
 - metals, 316
 - ocean disposal of sludge: risk assessment, 470
 - organic halides, 177, 182(tables)
 - pyrolysis, 229
 - quality control, 35-39
 - risk assessment, 466-467
 - sludge, 141
 - sludge disposal: risk assessment, 476
- Analytical methods and techniques, 104-105, 112, 139, 149, 152
- Analytical methods development
 - formaldehyde determination, 159
 - organic compounds, 184-187, 188(table)
- Analytical models, 478
- Analytical procedures: blanks, quality control, 36-37
- Analytical procedures: organic halides, 177, 182(tables)
- Analytical standards, quality control, computerization, 37-39
- Analytical techniques for inorganic constituents, 30(table)
- Anthropogenic pollution: sampling bed sediments, 114
- Antimony, 103
- Aquatic environment: hazards associated with marine disposal of sediments, 14, 81
- Aquatic life toxicity, 414
- Aquatic organisms: chemical contaminants, 403
- Aquatic sediments
 - metals extraction techniques, 81-82
 - phosphorous extraction techniques, 70-71
- Aquatic settlements: size distribution, 123
- Aquatic systems, 69
- Aquatic systems: sediment analysis 103, 184
- Aquatic systems: trace metals, 102
- Aquatic toxicology, 326
- Aqueous phase toxicity of cadmium, 17
- Aquifer microbiota, 312
- Aromatic hydrocarbon contaminants, 313, 418
- Arsenic, 103

Arthur Kill: toxic water content, 403
 ASTM Standards
 D-19:24:04, 265
 D-76T, draft no. 5, 190
 Atomic absorption spectroscopy (AAS), 110, 117, 144
 Automated data interpretations for PCB determinations, 211

B

Backflush-filtration, 104, 106, 112
 Bacteria in sediments, 312
 Bahco Microparticle Classifier: air elutriator, 123
 Baie des Chaleurs, sampling site for marine sediment reference material, 29
 Barite: catalytic/sorptive effects, 233, 239, 242
 Barite: use to trace drilling fluids in marine environments, 229
 Barium: sedimentary distribution, 229
 Batch centrifugation, 104, 108, 112
 BAP: *See* Bioavailable Particulate Phosphate
 BCSS-1, marine sediment reference material, 29(tables)
 Beckton sludge, metal concentrations, 94-100
 Bed sediment trace metal data, 115
 Beef extract sonication method: virus recovery from sludge, 268(table)
 Benchmark sediment bioassay, 397
 Benthic communities
 microbiota: biochemical characteristics, 312, 324
 organism sensitivity studies, 16-17
 oxygen demand, 438
 oxygen flux (BOF), 451, 456, 459
 oxygen production, 455
 photosynthesis, 451
 structure, 420, 423, 424(table), 432-433(fig)
 Benthos, 418, 427-430(table)
 Bentonite: catalytic/sorptive effects, 233, 239
 Benzdine, 4
 Beryllium, 103
 Bibliography, analytical methodology for chemical and biological analysis of sediments, 20-21
 Bibliography, formaldehyde determination, 164-166
 Bioaccumulation, 213, 418
 Bioassay methods, 392-393
 Bioassay procedures: use of dual culture diffusion apparatus (DCDA), 71
 Bioassays, 392-393, 395-397, 410-411, 419
 Bioassays: freshwater and saltwater, 16, 69, 334
 Bioavailability, 69, 213
 Bioavailable particulate phosphate (BAP), 70, 75, 76(table, fig)
 Biochemical analysis, 313-314, 316(table), 318(table), 320
 Biochemical characteristics, 324
 Biochemical ecology, 311
 Biochemical variables and sediment grain size, 320-321(tables)
 Biodegradation, 11
 Biological analysis
 bibliography, 20
 sampling and analytical methods, 18-20
 Biological effects: microcosm experiments, 431, 434-436
 Biological responses at microbial test sites, 305(tables)
 Biota: metal concentrations, 434-436
 Biota, ocean: toxicity of diesel additive, 223
 Biphenol contaminants, 313
 Biscayne Bay estuary study area, 312-313
 Black Rock Harbor, CT: locations of harbor channel dredging, 82, 83(fig)
 Black Rock Harbor, CT estuary: dredged material disposal site, 214
 Blanks: quality control for analytical procedures, 36-37
 Blue mussel, test organism, 214 *See also* Mussels: test organisms
 BOF measurements, 452-453(table), 459
 BOF model, 455
 BOF rates, 451
 Boonton, New Jersey reservoirs, 197(table)
 Burning sludge for disposal, 3
 Burying sludge for disposal, 3

C

Cadmium
 aqueous phase toxicity, 17
 criteria for method detection limits (MDL), 465
 detection in aquatic systems, 103
 in sewage, 93
 metal-particulate sediment phase distributions, 85, 86(fig), 89(fig)
 RPOC interactions, 16
 Calibration simulations, 458
 Canada: Ocean dumping control act and Fisheries act, 27, 29
 Canonical correlation: biochemistry and metal data, 322-324

- Carbon turnover, 303
- Carbonates: marine sedimentary particulate matter, 81
- Carbonyl compounds, 159
- Carcinogenic chemicals, 465
- Carcinogens, human, 4
- Catalytic/sorptive effects of bentonite and barite, 233, 239, 242
- Centrifugation, 112
- Ceriodaphnia tests, 304, 305(table) 307-308
- Chemical analysis, 102, 120, 313-314
- Chemical and biological analysis of sediments: analytical methods, 18-20
 - bibliography, 20-21
- Chemical characterization of dredged materials, 81
- Chemical concentrations in sediment, 16
- Chemical contaminants from dredged materials, 213
- Chemical contaminants: Hudson/Raritan estuary sediments, 403, 405, 412
- Chemical derivatization: formaldehyde determination, 159-163, 168-171(tables, figs)
- Chemical interactions between sediment/contaminant, 14
- Chemical speciation and toxicity, 17
- Chemicals in municipal sludge, 465-466
- Chlorinated dibenzo-p-dioxins, 205(fig), 210(fig)
- Chlorinated dibenzofurans, 205(fig), 210(fig)
- Chlorinated hydrocarbons, 412, 418
- Chlorinated hydrocarbons: soxhlet extraction method, 201
- Chlorinated organics, 176
- Chlorophylla concentrations, 454(table)
- Chromatography, 148, 152, 159, 213, 225-231
- Chromium, 93, 103, 110
- Chromium: criteria for method detection limits (MDL), 465
- Chromium particulate phase distribution in Black Rock Harbor, 88(fig), 90(fig)
- Clams. *See* Soft shell clams
- Clark Fork River in southwest Montana: study site for microbial activity, 301
- Clean Water Act (Public Law 92-500)
 - compliance programs, 10, 13, 19
 - information programs, 14
- Climatic variability, 11
- CMAC. *See* Committee on Marine Analytical Chemistry, Canada, 27
- COD, 384-385, 390(table)
- Commencement Bay, WA: sediment bioassays, 395, 396(table)
- Committee on Marine Analytical Chemistry (CMAC), Canada, 27
- Complexation with organic substances: mechanism of metals association with particulate matter, 81
- Compliance monitoring regulations, 10-11, 13, 19
- Compositing, 392
- Computer kriging program (AKRIP), 60
- Computer program: data base management for quality assurance/quality control, 35
- Computer programs: for geostatistics application to kriging, 60
- Concomitant variables: models, 352-353
- Contaminant levels, risk assessment methodologies, 11
- Contaminant loading in sewage sludge, 97
- Contaminant movement to groundwater, 469, 474
- Contaminants: chemical, 405, 412
- Contaminants in dredged materials, 81, 94, 213, 221
- Contaminants: interaction with metals, 16
- Contaminated air, 472
- Contaminated drinking water: enteric viruses, risk assessment, 489, 491
- Contaminated drilling fluids, 223-226
- Contaminated sediments, 13
- Contaminated soil, 181-182
- Copper, 93, 103
- Copper: associated with oxidizable particulate matter in Black Rock Harbor, 86, 87(fig)
- Copper contamination: New York Harbor, 404
- Copper particulate phase distribution, 89(fig)
- Coprecipitation: mechanism of metals association with particulate matter, 81
- Coulometry, 176
- Covariate analysis, 334
 - Coxsackie virus: removal from sludge, 283
- Criteria, 466-467, 473, 478, 483
- Criteria to protect aquatic life, 465
- Criteria to protect humans or animals, 468
- Crystalline minerals: marine sedimentary particulate matter, 81
- Cupric oxide: analysis of drilling fluid additives, 229, 230(table)
- Cupric oxide oxidation, 233-237, 245, 249(table), 252-253
- Cyanide: criteria to protect aquatic life, 465
- Cyclic term variogram, 51(fig), 52, 53
- Cycles and sampling, 44

Cycling, geochemical: trace metals, 102
 Cytotoxicity with wastewater concentrates, 285

D

Daphnia assays, 307
 Daphnia magna, 406
 Data analysis
 microbial activity, 303
 phosphorous availability, 74, 75(table, fig)
 Data base management for quality assurance/quality control, 35-37
 Data interpretation
 automated, 211
 environmental virology, 259
 Data management system
 US EPA quality assurance/quality control methods, 35-37
 Data reduction, 315-316
 Data system for mysid toxicity testing, 363-374
 DATMAN data management system, 84
 Davyhulme sludge, metal concentrations, 94-100
 DCDA. *See* Dual culture diffusion apparatus
 Degradation from toxic contaminants in sediments, 13
 Depth-integrated isokinetic sampling, 104
 Derivatization, Chemical: formaldehyde determination, 162
 Dewatering suspended sediments: procedures, 103-104, 108, 112(table)
 Dibenzo-pdioxins, 205(fig), 210(fig)
 Dibenzofurans, 205(fig), 210(fig)
 Dibutyl phthalate, 154(fig, table), 155(fig)
 Diesel additive: toxicity to ocean biota, 223
 Diesel analysis, 223
 Diesel components: extraction techniques, 223-226
 Diesel contaminated drilling fluid, 223
 Diesel fuel added to water-based drilling fluids, 376
 Diffusion apparatus, 71
 Digested sewage sludge, 98, 261-262
 Digester sludge metal levels, 145(table)
 2, 4-dinitrophenylhydrazine (DNPH), 159
 Disease risk from enteric viruses, 493
 Disposal of dredged materials, 81, 214-215
 Disposal of sediments, 414
 Disposal of sewage, 415
 Disposal practices, 466, 472, 480
 Disposal, sludge, 9, 94, 149-150
 Disposal, sludge: political constraints, 3
 Dissolved organic carbon: sediment interaction, 14

Distillation procedure: isolation of diesel components from drilling fluids, 223
 Distribution and marketing of sludge, 480
 Dose-response analysis, mysids: appendix b: toxicity data, 354-361; appendix b: data program, 362-374
 Dose-response assessment, hazard identification, 4
 Dredge, 18
 Dredged material
 contaminants, 213, 221
 disposal sites, 215
 marine disposal, 81
 ocean disposal, 418, 431
 waste characterization, 214, 221
 Dredged sediment, 403, 419
 Dredging spoils, 19 *See also* SMUDS
 Dredging, harbor channel: Black Rock Harbor, Ct., 82, 83(fig)
 Drilling fluid
 acute toxicity to mysids: tests, 329, 330-331(tables)
 additives: cupric acid, 229, 230(table)
 contaminated, 223, 224(table), 225-226
 disposal, ocean, 387
 muds: offshore disposal, 326
 nonextractible organic polymers, 229
 toxicity, 334, 344(table), 350, 376
 Drilling methods: offshore oil and gas wells, 223
 Drilling muds. *See* SMUDS
 Drinking water contamination: risk assessment, 489, 491
 Dry ashing: sample preparation method, 144
 Dual culture diffusion apparatus (DCDA), 71
 Dumping, ocean: sludge disposal, 3, 213
 Duxbury Bay, Ma: seawater: suspended particulate phase tests, 378

E

Ecological impacts of toxic substances, 22
 Ecology, biochemical, 311
 Economic evaluations: sludge disposal/reuse options, 11
 Effluent impact, 301
 Effluent limitation guidelines, 334-337
 Effluents from wastewater plants, 2, 69
 Electron transport activity, 303
 Eleutriate ammonia concentration, 412, 413(fig)
 Eleutriate: comparison with whole sediment bioassay results with *Capitella capitata*, 394-395(table), 408(table)
 Eleutriate toxicity testing, 410, 412
 Eleutriation data, 123

- Emissions sampling, 469
 - Entamoeba histolytica: sludge, 483
 - Enteric viruses, 258(table), 273, 274(table)
 - Enteric viruses in sludge, 483(table), 491, 493
 - Enterovirus recovery: standards development, 266
 - Enterovirus removal from sludge, 283
 - Enteroviruses in waterborne disease outbreaks, 260, 262-263
 - Environment Canada and Fisheries and Oceans Canada, 27
 - Environmental contaminants
 - disposal of sludge in seawater, 94
 - Environmental degradation from toxic contaminants in sediments, 13
 - Environmental hazards
 - disposal of sludge contaminants in seawater, 15, 94
 - marine disposal of dredged sediments, 81
 - Environmental impact: ocean disposal of drilling fluids, 387
 - Environmental impacts of landfilling, 148
 - Environmental protection, 466
 - Environmental quality for public health protection: regulations, 10
 - Environmental samples: organic halides, 176
 - Environmental sampling, 265-272
 - Environmental toxicity, 307-308
 - Environmental virology, 260
 - Enzyme immunoassay, 275, 277(table)
 - Enzymes, microbial, 303, 308
 - EPA method: virus recovery from sludge, 268(table)
 - Equilibrium distribution in water, 201
 - Equilibrium Partitioning Approach (EP) for development of sediment criteria, 17
 - Equilibrium partitioning model, 186(fig), 201
 - Estuaries, 312
 - Estuarine pollution
 - effects, 14, 29, 324
 - rotoviruses, 283
 - Estuarine systems: aquatic life toxicity, 405, 412, 414-415
 - Estuary sediments, 403, 405, 412
 - Ethylan, 213, 220
 - Eutrofication, 69
 - Experimental procedure: harbor dredging, 82-83
 - Exponential model of semivariogram, 64
 - Exposure assessment: hazard identification, 4-5
 - Exposure routes: sediment bioassays, 394-395
 - Extractable organic halides, 177
 - Extraction and retort recovery data, 226(table)
 - Extraction equipment for trace metal associations, 84, 130
 - Extraction of organics from sediment materials, 189, 201
 - Extraction Procedure Toxicity Characteristic (EPTC) (40CFR 261.24): leaching test, 129, 133(table)
 - Extraction procedures, 190-192
 - Extraction procedures
 - bioavailable particulate phosphorous, 70-71, 75-78
 - metals and aquatic particulate matter, 82
 - soxhlet, 224-225, 226(table)
 - Extraction, selective: trace metals, 81
 - Extraction techniques: diesel components, 223-226
- F**
- Fatty acids: phospholipids (PLFA), 312, 313-314
 - Federal Water Pollution Control Act (FWPCA), 1972, 2
 - Fertilizer: sludge reuse, 480
 - Field verification study, 16, 81, 82
 - Filter samples, 194-196
 - Filtration methods for concentration of suspended sediment, 104-110
 - Finger printing, 223
 - Fish: PCB contamination, 404-405
 - Fish, pollution effects, 14
 - Fisheries Act, Canada, 27
 - Fisheries and Oceans, Canada, 27
 - Flame atomic absorption spectroscopy, 104, 110, 117, 144
 - Fluidized bed furnace incineration, 469
 - Forests, effect of acid precipitation, 20
 - Formaldehyde determination, 159-175
 - Freshwater and salt water bioassays, 16, 69
 - Fugacity measurement, 16
- G**
- Galactosidase, 307
 - Gas chromatography, 213, 225(table), 226, 229-231
 - Gas chromatography/mass spectrometry (GC/MS), 152
 - Gaussian model of semivariogram, 64
 - GC/MS chromatograms, 216-217(figs)
 - GC/MS counts: mytilus, 220(table)
 - Geochemical characteristics, 324
 - Geochemical cycling: trace metals, 102
 - Geochemical effects on inorganic contaminants, 477
 - Geochemical equilibrium models, 469

- Geochemical processes on sedimentary metals, 81
- Geostatistics: application of kriging, 60
- Giardia lamblia*: parasitic protozoans in sludge, 483
- Grain size, 394
- Grain-size chemistry, 114
- Grain-size distributions, 117
- Grain-size effects on sediment-metal chemistry, 115
- Grain-size separations, 114, 121
- Grass shrimp, 405, 413(fig)
- Grass shrimp: test animal for mud toxicity, 376
- Great Lakes: bioavailable particulate phosphorous, 69
- Ground-water contamination, 257-264, 469, 476-478, 489
- Ground-water: landfilling impact, 148
- Ground-water pollution effects, 14
- Homogenizing, 392
- Hudson river toxicity testing, 410
- Hudson/Raritan estuary: New York Harbor area, 403
- Human carcinogens: toxicity studies, 4
- Human enteric viruses in sewage and water, 258, 274(table), 282, 483(table)
- Human exposure routes: sludge pathogens, 484-485
- Human health: risk assessment, 480
- Hydrocarbon additives to drilling fluids, toxicity testing, 378-389
- Hydrocarbon petroleum additives to drilling fluids, 387
- Hydrocarbon pesticides, chlorinated, 313, 412, 418
- Hydrocarbons, chlorinated: Soxhlet extraction method, 201
- Hydrous metal oxides: marine sedimentary particulate matter, 81

H

- Halides, total organic, 176-177
- Hampton roads, Va, Port, 418
- Harbor dredging: sample procedure, 82-83
- Harbor sediments, 408
- Hazard identification, 4
- Hazardous and solid waste amendments of 1984, 129
- Hazardous waste, 2-4, 129
- Hazardous waste characteristics, 129
- Hazardous waste testing procedures, 20-24
- Hazards to aquatic environment marine disposal of dredged sediments, 81-82
- Health-based criteria, 476
- Health Effects Research Laboratory, EPA, Cincinnati, Ohio, 2
- Health protection regulations, 10
- Health risk assessments, 4
- Heavy metal concentrations: New York Harbor, 404, 409(table)
- Heavy metals distribution in sewage sludge, 93
- Heavy metals partitioning in digested sewage sludge, 98-99(figure)
- Heavy metals: sludge testing, 141
- Hepatitis waterborne disease, 262
- Heterogeneities and sampling, 44
- Hexavalent chromium, 465
- High molecular weight organic compounds, 23
- High performance liquid chromatography, 159
- High pressure decomposition vessels: sample preparation method, 144

I

- Impact assessments, 307-308
- Impacts of toxic substances, 22
- Immunofluorescence: virus detection tests, 282, 286
- Incineration: sludge disposal, 469, 480
- Industrial sewage treatment plants, New Jersey, 141
- Industrial solid waste, 130
- Infectious dose: drinking water: risk assessment, 490-491
- Information development
 - Clean Water Act regulations, 14
 - pollution in estuaries, effects on aquatic life, 14
- In-line filtration method, 105-106, 108, 112
- Inorganic contaminants, 477
- Inorganic constituents: analytical techniques, 30(table)
- Inorganic halides, 176-177
- In-situ measurement method: SOD rate, 442-444
- In-stream filtration sampler, 187
- Intra and interlaboratory and variability, 328, 346-347
- Ion exchange: mechanism of metals association with particulate matter, 81
- Iron, 93
- Iron oxides: sediment interactions, 16, 86-87
- Isomer groups, 206(figure), 210(figure)

J

- Jordan River at Salt Lake City, Ut: study site for microbial activity, 301

K

- Kriging, 50, 64-65 models, 66-67(figs), 68(table)
- Kriging computer programs (AKRIP), 60
 - universal kriging, 66
- Kriging techniques
 - error estimation, 60
 - semivariogram, development, 60

L

- Laboratory evaluation, 336-344, 346(table), 350
- Laboratory measurement: SOD rate, 444-445
- Laboratory methods evaluation, 135
- Laboratory observations versus field data, 16
- Laboratory procedures, 394
- Laboratory: USEPA QA/QC procedures, 35
- Laboratory variations, inter- and intra-, 346-347(tables)
- Lake sediments: monitoring, 59
- Lake Washington: cupric oxide oxidation, 245
- Lakes and rivers: eutricification, 69
- Land applications of sewage sludges, 259, 273, 288, 466-467, 480
- Land applications of sludge-bound mutagens, 290
- Landfill environmental impact, 148
- Landfill simulator program, 148
- Landfilling sludge: contamination, 475-476(figs)
- Landfills, 273, 466, 468-469, 472
- Leachable organic halides (LOX), 177, 178(fig), 182
- Leachate pathways, 476
- Leachates, 472
- Leachates: formaldehyde determination in environmental samples, 170-175(tables, figs)
- Leaching: analytical methods, 139, 153, 159
- Leaching: priority pollutant compounds, 158
- Leaching procedure (TCLP). *See* Toxicity Characteristic Leaching Procedure
- Leaching tests, 129-130, 133(table)
- Leaching tests: laboratory methods
 - evaluation, 135
 - flow diagrams, 134-135(figs)
 - ranking, 134(table)
- Lead, 93, 103
- Lead particulate distribution in Black Rock Harbor, 88(fig), 90(fig)
- Lignin, 228, 236, 246, 249-252(tables)
- Lignite, 229, 237, 250(table)
- Lignosulfonate, 229, 237, 240(figs), 249(table), 251(fig)

- Lignosulfonate fresh water mud: toxicity test material, 376
- Lipid phosphate analysis, 313-314
- Lipids, 312, 313-314
- Liquid chromatography, 159
- Liquid phase bioassays, 411(fig)
- Literature search: formaldehyde determination, 164-166(table)
- Long-term variogram, 50, 52, 53(fig)

M

- Mammalian test tube studies, 4
- Manganese, 93
- Manganese oxides
 - sediment extractions, 81
 - sediment interactions, 16
- MANOVA: multivariate analysis of variance, microcosm data, 424(table), 431
- Marine Analytical Chemistry Program, National Research Council (NRC) of Canada, 27
- Marine
 - communities: impact of sewage sludge, 98
 - disposal of sediments, 81
 - dredged materials: waste characterization procedure, 214, 221
 - pollution, 391
 - resources management, 27
 - sampling sediment, 392-393
 - sediment bioassays, 395
 - sediment reference materials, 29
 - sediment toxicity tests, 391-402
 - sedimentary particulates, 81
 - system testing, 405
- Marine Protection, Research, and Sanctuaries (Ocean Dumping) Act (Public Law 92-532), 213, 273
- Mass spectrometric data: automated and nonautomated procedures, 209, 212(table)
 - See also* GC/MS
- Marketing sludge for disposal, 3
- Mathematical normalization: grain size effect, 115-117, 127
- Maximum likelihood estimation, 334
- Maximum permissible contaminant levels
 - risk assessment for reuse/disposal regulation development, 11
- MDL. *See* Method detection limits
- Measurement: BOF, 452-453, 459
- Measurement methods, 22
- Measurement methods, SOD rates, 442(table)
- Menidia menidia*, 405
- Mercenaria mercenaria*, 405

- Mercury, 103, 465
- MESS-1, marine sediment reference material, 29(tables)
- Metal concentrations, 324
- Metal concentrations in biota: from microcosms, 434(table), 435-436
- Metal concentrations in sediments, 86, 94-100, 116(table)
- Metal contaminants in sewage sludge, 16, 93
- Metal levels in digester sludge, 145(table)
- Metal oxides, 81
- Metal-particle interactions, 82
- Metal-particulate matter associations
 - Black Rock Harbor dredged material physical characteristics, 84(table), 85, 87, 88-89(figs)
- Metal quantitation, 104
- Metal variability, 115
- Metals
 - affinities for different particulate surfaces, 81-82
 - analysis, 318
 - and sediment grain size, 318-319(tables)
 - associated with particulate matter, 81
 - contamination: laboratory and literature studies correlated with environmental observations, 16
 - effects on microorganisms, 312
 - in API separator sludge: analysis, 137(table)
 - in primary settling tank sludge, 145(table)
 - microcosms, 418
 - sediment interactions, 16
 - toxic, 313
- Method detection limits (MDL), 465
- Methodologies: sludge disposal/recovery
 - ground-water pathway, 477, 479
 - landfill, 474-476
 - risk assessment, 2
 - sediment bioassays, 397
 - sludge analysis, New Jersey State, 141
 - trace metals analysis, 103, 114-117
 - vapor pathway, 477-479
- Methods development, 23
- Methods evaluation, 347-348
- Methods needed
 - estimating leachate from whole sludge, 469
 - ranking chemicals for reuse/disposal, 467
 - sludge concentrations determination, 468, 470
- Miami River sediment collection and microbiota, 313
- Microbial activity analysis: study sites, 301, 306-307(figs)
- Microbial activity tests, 301, 303
- Microbial and mammalian test tube studies, 4
- Microbial community structure, 312, 324
- Microbial enzymes, 307
- Microbial lipids, 312
- Microcosm experiments: biological effects, 431, 434-436
- Microcosms, 418, 420-422, 424(table), 427-430(table), 431
- Microcoulometry, 176
- Microparticle classifier, 123
- Migration of contamination from landfills, 474, 476
- Mineral lattices: mechanism of metals association with particulate matter, 81
- Mineral oil drilling fluid additive, 375
- Minerals, crystalline, 81
 - Mining effluents: microbial activity assays, 300
- Miramichi estuary, sampling site for marine sediment reference materials, 29
- Model calibration data, 455
- Model calibration: SOD rate, 446-447
- Model components: general sampling theory:
 - variography, 44-47
- Model: waste codisposal, 130
- Modeling, 451, 467, 469, 478
- Modeling, WLA, 452
- Models, 438-440
- Models: statistical methods for toxicity testing, 336-339, 352-353
- Monitoring, 59
- Monitoring of streams, variographic experiment, 44-47, 48-51(figs), 52-54(figs), 55-58
- Monitoring programs: bed sediment sampling, 114-115
- Morbidity and mortality for enteric pathogens, 491(table)
- Mud additives, 229, 237
- Muds: offshore disposal, 326
- Muds: toxicity testing, 334, 376
- Multiple hearth incineration, 469
- Multivariate statistical analysis (MANOVA), 431
- Municipal effluents: microbial activity assays, 301
- Municipal sludge chemicals, 466
- Municipal sludge disposal, 467, 473, 480
- Municipal sludges, 9, 19, 149
 - See also SMUDS
- Municipal treatment plant effluents, 69
- Municipal wastewater sludge, 285, 288, 292
- Municipal wastewater treatment, 9
- Mussels: test organisms, 214-215, 219(table), 220
- Mutagenic response: sewage sludge, 292
- Mutagenicity

- toxicity studies, 4
- wastewater sludge, 288, 293-294(table), 296-297(figs)
- Mya arenaria*. See soft-shell clams
- Mysidopsis bahia. See Mysids
- Mysid toxicity data: appendix a: tables, 354-361; appendix b: data system for dose-response models, 362-374
- Mysids, 326, 334, 348, 375, 405
- Mytilus edulus test organism. See Mussels

N

- NASQUAN program of U.S.Geological Survey (USGS), 103
- National Pollutant Discharge Elimination System (NPDES): permit limitation, 451
- Naphthalene, 155(table), 157(fig)
- Nereis virens*. See sand worms
- New Brunswick, sampling site for marine sediment reference material, 29
- New Jersey
 - reservoirs, 197
 - sewage treatment plants, 141
 - sludge management practices, 141, 144
- New Source Performance Standards/Best Available Economically Available (NSPS/BAT) Effluent Limitations Guidelines for the offshore segment of the oil and gas industry, 334
- New York/New Jersey harbor, 403
- Nickel, 93
- Nitric acid digestion: sample preparation method, 144
- Nitric acid/hydrogen peroxide digestion: sample preparation method, 144
- Nitrocellulose enzyme immunoassay, 275, 277(table)
- Non benthic organisms, sensitivity studies, 16-17
- Nonlinear estimation, 334
- Nonpolar organics
 - contaminants, 14
 - sediment interactions, 16
 - trace organic chemicals in aquatic environments, 187
- NPDES: National Pollutant Discharge Elimination System: permit limitation, 451

O

- Ocean biota: toxicity of diesel additive, 223
- Ocean disposal of drilling fluids, 223, 376
- Ocean disposal of sludges, 466, 470,473, 480

- Ocean dumping, 3, 213, 387, 418, 431
 - Ocean Dumping Control Act(ODCA) and Fisheries act, Canada, 27, 29
- ODCA. See Ocean Dumping Control Act.
- Offshore disposal of drilling fluids, 326
- Offshore drilling, 229
- Offshore drilling: toxicity testing, 334
- Offshore oil and gas industry: toxicity testing of drilling fluids, 334-353
- Offshore oil and gas wells: drilling methods, 223
- Organic characterization study: drilling additives, 230(table)
- Organic compounds: high molecular weight, analytical procedures needed, 23
- Organic compounds in sewage sludge: partial list, 289(table), 295-297(figs)
- Organic contaminants, 14
- Organic contaminants, Miami River, Bayou Chico, Bayou Grande, 313
- Organic content of sediments, 394
- Organic halides: analytic procedures, 176-177, 181, 182(table)
- Organic halides in environmental samples, 176
- Organic polymers in drilling fluids: nonextractable, 229
- Organic substances: marine sedimentary particulate matter, 81
- Organics: extraction from sediment materials, 201
- Orthophosphate, 69
- Oxidation, 235-237, 451
- Oxidation products, 246, 247(table), 252(table)
- Oxidizable particulate matter, sedimentary, 86-87
- Oxygen demand, 438-442, 451
- Oxygen flux, 455

P

- Paleomonetes pugio*. See Grass shrimp
- Parasitic protozoans in sludge, 483
- Pathogens in sludge: human exposure, 481, 484-485
- Particle size distribution, digested sewage sludges, 95, 96(table), 97(fig), 117, 132
- Particle size fractionation of sewage sludge by sieving, 100
- Particulate matter, sedimentary, 81
- Particulate phase bioassays, 410
- Particulate phase distribution:
 - chromium, 88-90

- phosphate, 70, 75-76
- sediments, 85-86, 89
- Partitioning: sediment criteria, 17
- Pasaic River: toxicity testing, 410
- PCB concentrations: automated and nonautomated data, 211(table), 218(table)
- PCB screening: sonicator method, 21
- PCBs in fish, 404-405
- Pensacola Bay estuary study area, 312-313
- Performance standards, 334-337
- Periodic Sediment Criteria Technical Steering Committee, 16
- Periodic variogram, 54(fig)
- Pesticides, 412
- Pesticides: chlorinated hydrocarbons, 313
- Petroleum hydrocarbons: contribution to toxicity, 326, 331-332
- PGC/MS, 230, 233
- PGC/MS ion chromatograms, 240-241
- Phase distribution: sediments, 85-86, 89
- Phenolics: analytical methods for screening, 21
- Phosphate, bioavailable particulate (BAP), 70, 75, 76(table, fig)
- Phospholipids: fatty acids (PLFA), 312, 312-313
- Phosphorous
 - availability: data analysis, 74-75
 - BAP extraction, 69-71, 74-78
- Phosphorous bioassays, 70-71
- Phosphorous in Great Lakes Region: estimation methods, 72(table)
- Photosynthesis, 451, 458
- Physical methods: leaching procedures, 139
- Physical separation: grain size effect, 115, 127
- Pipet analysis procedures versus air elutriation: size distribution comparison, 123, 125(table)
- Plankton, pollution effects on health and welfare, 14
- Planktonic algal photosynthesis, 458
- Plant effluent, 2
- Plant life, effects of pollution, 14
- Plant uptake of sludge-applied chemicals, 468
- PLFA. *See* Phospholipids
- Polar organic contaminants: sediment interactions, 14
- Polio virus detection, 279
- Polio virus in drinking water: risk assessment, 491, 493(table)
- Polio virus removal from sludge, 285
- Political constraints: sludge disposal, 3
- Pollutant risk hazards: EPA regulations
 - identification for reuse and disposal options, 10
- Pollutants, 148, 149(tables)
- Pollutants: toxic priority list, 13
- Pollution
 - estuarine, 311, 324
 - control: water, 2
 - effects in estuaries, 14
 - impacts, 311
 - rotoviruses: estuaries, 283
 - water, 114-115, 311, 324
 - waterways, 391, 418
- Polychlorinated biphenol contaminants, 313
- Polychlorinated biphenyls 27-30, 31(table), 205(fig), 213
- Polychlorinated compounds: by level of chlorination, 204-212
- Polycyclic aromatic hydrocarbon, (PAH): sediment reference materials, 27-31, 32-33(tables)
- Polymer formulation: drilling muds, 237, 242, 248
- Polymeric concentration of flocculation, 229
- Polynuclear aromatic hydrocarbons, (PAH) 213, 313, 418
- Precipitation, 20, 97
- Preservation techniques for volatile organic compounds, 21
- Preservation techniques: samples, 108
- Pressure filtration, 130
- Principal component analysis, 324
- Priority pollutant data, 152-158
- Priority pollutant list, 102
- Probit analysis: toxicity tests, 334-339, 340-341(tables), 344-345(tables)
- Programming: data base management system for quality control analytical methodology, 36-43
- Protease activity, Skeleton Creek, 304
- Protection of public health: regulations, 10
- Protozoans, 483
- Public health, 257-264
- Public health significance: pathogens in sludge, 484-486
- Pyranograph, 454
- Pyrene, 155, 156(table), 157(figs)
- Pyrolysis conditions, 238, 240-241(figs)
- Pyrolysis gas chromatography (PGC), 229-231, 252
- Pyrolysis products of individual polymers by PGC/MS, 230(table), 233-235, 239, 242-243
- Public health: regulations for protection, 10

Q

- Qualitative analysis, 213
- Quality assurance, 132-133, 189-190, 201

Quality assurance/quality control
 computer program, 35
 verification, 23
 Quality control procedures: samplong and analytical methodology, 21, 35-39
 Quality control: sediment bioassay testing, 392-393
 Quality criteria development, 17(fig)

R

Radiation, 454
 Random sampling, 44
 RCRA. *See* Resource Conservation and Recovery Act
 RCRA regulations, 21-22
 Reactive Particulate Organic Carbon (RPOC): sediment interactions, 16
 Reconnaissance studies: trace metal investigations, 117, 122
 Recovery data, leaching compounds: priority pollutants, 158(fig)
 Recovery experiments: lignin oxidation products, 236
 Recovery of viruses from sludge, 259
 Recreation, pollution effects, 14
 Reference materials development
 analytic methodologies to aid in determination of trace elements, 27-28
 development of analytic methodologies for analyses of seawater, marine sediments, and tissues, 28
 development of Canadian expertise in marine analytical chemistry, 28
 intercalibration exercises involving analyses of seawater, marine sediments, and tissues, 28
 Reference materials released
 marine sediments for determination of polychlorinated biphenyls (CS-1, HS-1, and HS-2); trace elements and other inorganic constituents (BCSS-1 and MESS-1), 28, 29(tables)
 trace elements, open ocean, deep seawater, (NASS-1); coastal seawater (CASS-1); river water (SLRS-1); and lipid-extracted and dried tissue(TORT-1); and set of 51 specially synthesized and purified polychlorinated biphenyl congeners (CLB-1), 28
 Reference materials under development
 West Coast sediment for trace elements; PCB congener; sediments for polycyclic aromatic hydrocarbons; fish liver oil for polychlorinated biphenyls; lipid-free powdered fish liver tissue for

trace elements; powdered fish muscle tissue for trace elements, 28
 Reference values, EPA vs interlaboratory study, metals, 146(table)
 Refinery effluents: microbial activity assays, 301
 Regression equations: SOD estimation methods, 446
 Regulations
 public health protection, 10
 sludge management, 9-13
 Regulatory criteria, 472
 Regulatory options for sediment criteria, 16, 18
 Regulatory program: stream impact assessments, 302-304
 Reporting schedules, SQAR, 142(table)
 Reproducibility of analytical procedure for quality control, 36
 Reproducibility of test results, 267, 302, 398
 Reservoirs, 184, 197
 Residue recovery data, 225, 226(table)
 Residues, 2
 Resins, XAD, 187-188
 Resource Conservation and Recovery Act (RCRA), 19, 21-22, 129, 149
 Resource management, 27
 Resource recovery, 473
 Respiration rate bioassays, 394
 Retort distillation, 225, 226
 Rheproxymius abronius: benchmark sediment bioassay, 397-398
 Risk assessment, 2-5, 9, 22, 466-474
 Risk assessment
 contaminants, 474(table)
 disposal, 480
 enteric viruses in contaminated drinking water, 489
 methodologies, 3, 11
 pathogens in sludge, 482(table), 484
 poliovirus, 491, 493(table)
 political constraints, 2
 Risk characterization, hazard assessment, 4, 13
 Risk management, 3, 4-13
 Risk: viral infection, 257-264
 River/reservoir/treatment plant systems, 190, 191(fig)
 River water, 102
 Rivers, 69, 184
 Rockaway River/Boonton Reservoir Watershed, 190, 191(fig)
 Rotavirus pollution of estuarine waters, 283
 Rotoviruses in sewage, 282
 Rotoviruses: removal in sludge treatment plants, 285(table)

Round robin studies: virus recovery from sludge, 266-268, 269(table)
 Round robin studies: virus recovery: summary and discussion, 269-270(tables)
 RPOC interactions: Reactive Particulate Organic Carbon, 16
 Ruggedness evaluation: TCLP, 138(table)
 RUMM: Routinely used measurement methods, 22

S

Salmonella in sludge, 483
 Saltwater bioassays, 16, 69
 Saltwater test organisms. *See* Mysids
 Sample analysis, New Jersey, 143-144(tables)
 Sample collection and processing, 105
 Sample collection: experimental procedure for harbor dredging, 82-83
 Sample collection: sediment for microbial tests, 302
 Sample preparation and analysis: experimental procedure for harbor dredging, 83
 Sample preparation methods, 24, 29, 144
 Sample preservation, 108, 112
 Sample sites: grain size effect 118(fig, table)
 Samples
 Boonton, New Jersey reservoirs, 197(table)
 chemical composition, 120
 chromatograms of filter samples, 194-196(figs)
 grain size distribution, 120
 ranges of chemical and physical parameters, 19-120(tables)
 Swatara Creek, 126(table)
 Sampling
 and analytical methods, 18-24, 44, 72
 anthropogenic pollution, 114
 bed sediments, 114-115
 marine sediments, 392-393
 methods, 467
 methods and procedures, 103-105, 112, 193
 models, variographic experiments, 44-58
 of sediments: computer kriging program, 60
 priority pollutant content, 152
 procedures: benthic communities, 313
 rotavirus removal, 265-272, 284(table)
 sediment criteria development, 15
 sediment for phosphorous bioassay, 72
 sites for marine sediment reference materials, 29
 sites in Great Lakes Region, 73(fig)
 soxhlet extraction, 192

theory: behavior of spatially distributed variables, 59
 theory: variography, 44-58
 to locate ore bodies, 114
 variability: kriging, 59
 water quality, 114-115
 Sand Island Wastewater Treatment Plant (SIWTP), Honolulu, HI, 273, 274(fig)
 Sand worms: test animals for toxicity testing, 377, 405
 Sandy Hook Bay toxicity testing, 410
 Sanitary waste codisposal model, 130
 Science Advisory Board (SAB), EPA, 14
 Scioto river: model input data, 452(table), 461-462
 Seafood contamination, 465
 Seawater analysis, 28
 Seawater sludge disposal, 94
 Sediment
 analysis, 103, 114
 bacteria, 303
 bioassays, 392, 394, 396-397(tables)
 bioassays: uses, 398-399
 characterization, 213, 394
 chemical concentrations, 16
 chemistry, 315
 contaminant interactions: cadmium concentrations, 85
 contaminant levels: observed effects compared to laboratory and field data, 13, 16-17
 criteria development, 13-15, 17(fig)
 criteria for regulatory purposes, 16
 disposal, 414
 extraction: method development and quality assurance, 189-190, 201
 grain size, 316, 317-319(tables)
 iron oxides, 86-87
 materials: extraction of trace organics, 189(table), 201
 metal concentrations, 317, 324
 monitoring, 59
 organic carbon, 14
 oxygen demand (SOD), 438-442
 phase distribution, 85-89
 reference materials, 29
 samples, 82-83, 122, 126(table), 421
 samples: lipid extraction, 312-313
 suspended, 102, 105-106
 toxic contaminants, 13
 toxicity, 3, 99, 404, 411(table)
 trace metal investigations, 115, 117
 Sedimentary
 community structure, 311
 distribution of barium, 229
 grain size distribution, 123

- particulate matter, 81
- Sediments, 27, 59, 81
- Sediments
 - chemical and biological analysis, 18-20
 - in waterways, 403
 - marine disposal hazards, 81
 - oxygen demand (SOD), 450
 - phosphorous extraction techniques, 70-71
 - sampling, 18
- Sediments, Municipal sludges, Drilling muds, and dredged Spoils See SMUDS
- Selective extraction, 81
- Selenium, 103
- Semivariogram, 46
 - development using kriging techniques computer program, 60, 61-63, (figs)
 - models, 63-64
 - relative semivariogram, 47
- Semivolatile organic compounds: precision data, 138(table)
- Sensitivity analyses: risk assessment methodology, 11
- Sensitivity studies, benthic and nonbenthic organisms, 16-17
- Separation of sediment: particle size ranges, 117, 122-123
- Separation procedures: sieving of sewage sludge, 94-95
- Settling centrifugation, 104, 108, 112
- Settling tank sludge: metal levels, 145(table)
- Settling times: particles of different densities, 121(table), 122
- Sewage, 288
- Sewage-amended soils, 265-272
- Sewage disposal, 415
- Sewage sludge
 - contaminant loading, 97
 - digested sewage sludge, physical separation experimental procedure: sieving, 94, 95(fig)
 - disposal: risk assessment, 472
 - distribution of heavy metals, 93
 - impact on marine communities, 98
 - organic compounds: partial list, 289(table), 295-297(figs)
 - particle size fractionation by sieving, 100
 - samples: characteristics, 288(table)
- Sewage sludges, 265-273, 282
- Sewage treatment: metal versus particle size distributions, 97
- Sewage treatment plant residues, 2, 69
- Sewage treatment plants, New Jersey: parameters required for analysis, 141, 142(tables)
- Shellfish, pollution effects, 14
- Shorelines, pollution effects, 14
- Short-term toxicity tests, 300
- Short-term variogram, 50, 51(fig), 52
- Sieving, particle size fractionation of sewage sludge, 93-100
- Silver, 103, 465
- Site-specific factors, 11
- Skeleton Creek near Enid, OK: study site for microbial activity test, 301
- Skunk River suspended sediment site, 105-106
- Sky radiation, 454
- Sludge, 260-264, 276, 465, 472
- Sludge
 - anaerobically digested, 261-262
 - analysis, 18
 - analysis methods, 137(table)
 - concentrations: criteria, 468
 - disposal, 2-3, 9-11, 150(table)
 - enterovirus removal, 283
 - fertilizer, 480
 - freshwater dumping, 288
 - landfills, 148-149, 273, 288, 474, 476, 480
 - management, 2, 9, 141, 144
 - ocean dumping, 288
 - policy: EPA, 10
 - sampling, 144
 - seawater mixing, 93
 - virus removal, 283
- Sludge Quality Assurance Regulations (SQAR) reporting schedules, 142(table)
- Sludge samples, New Jersey, 144
- Sludge-seawater mixing, 93
- Sludge, sewage: contaminant loading, 97
- Sludge Task Force, USEPA, 2, 9
- Sludge testing for heavy metals and toxic organic compounds, New Jersey, annual costs, 141, 143(tables)
- Sludge treatment, 257
- Sludge treatment plants, New Jersey, 141-147
- Sludge virus removal, 283
- Sludges, 18, 148-149
- Smectic clays, 233
- SMUDS (Sediments, Municipal sludges, Drilling muds, and dredged Spoils) methodology, 18-24, 375-390
- Snapper Creek: sediment collections and microbiota, 313
- SOD estimation methods, 446
- SOD literature values, 445-446
- SOD models, 440, 447
- SOD rates, measurement, 442-444
- SOD: sediment oxygen demand, 438-442
- Sodium chloride, 4

- Soft-shell clams: test animals for mud toxicity, 377
- Soil conditions: effect on toxicity of pollutants, 11, 20
- Soil, contaminated: extractable organic halides, 181-182
- Soil: effect of land application on sludge-bound mutagens, 290
- Soil sample handling: extractable organic halides, 179
- Soil variability, 11
- Soils, 176
- Solar irradiance, 460-461
- Solid wastes, industrial, 130
- Sonication, 224-225
- Sonication method: enterovirus recovery from sludge, 268
- Sonicator method: PCB screening, 21
- Soxhlet extraction chromatograms, 199
- Soxhlet extraction method, 190, 192, 198
- Soxhlet extraction method: chlorinated hydrocarbons, 201
- Spacially distributed variables, theory of behavior: kriging, 59
- Speciation: chemical, and toxicity, 17
- Spectroscopy, atomic absorption, 104, 110, 117, 144
- Spherical model of semivariogram, 63
- Spike recovery tests to measure accuracy of analytical procedure for quality control, 36
- Spiked soil samples: extractable organic halides, 179, 180
- Spiking: priority pollutant compounds, 158
- Spoils, dredged sediment, 19
See also SMUDS
- Stack emission rates, 469
- Standard laboratory procedures, 394
- Standard methods: bioassay testing, 392-394, 398-399
- Standard methods: trace organic analysis, 184-187, 188
- Standard practices for sampling and analytical procedures, 22-23
- Standardized methods, 468
- Standards development: virus recovery, 265-267
- Standards for analytical methodologies: quality control: data base management system, 36-39
- State sludge programs, 10
- Statistical analysis: data reduction, 315, 316
- Statistical analysis: drilling fluid tests, 327
- Statistical analyses: microcosms, 422, 431
- Statistical methods for toxicity testing, 4, 336-339, 350, 375-390
- Statistical procedures for sediment criteria development, 15
- Stokes Law equation: grain size separation, 121-122
- Storage tanks, underground, 19
- STORET data for environmental contaminants, 15
- Stratified random sampling, 44
- Stream monitoring, 44
- Stream oxygen balance, 450
- Stream surveys at microbial activity test sites, 302-303, 304
- Stream toxicity, 307
- Superfund, 19
- Superfund program: organic methodology, 21
- Surface water: land filling impact, 148
- Suspended particulate phase bioassays, 410
- Suspended sediment, 103-105, 187-188
- Suspended sediment concentration techniques: chemical concentrations, for four sample sizes, 107
- Suspended sediment concentrations, 110, 111

, 112
- Susquehanna River suspended sediment site, 105-106, 110
- Suwanee Creek suspended sediment site, 105-106, 110
- Swatara Creek, Pa.: sediment samples, 126
- Syringe diffusion method K_{oc}
- Systematic sampling, 44

T

- Tanks, underground storage, 19
- TCLP. *See* Toxicity Characteristic Leaching Procedure
- Teratogenicity: toxicity studies, 4
- Test animals, 405-406
- Test methods
 - development: acute toxicity tests, 327-328
 - drilling fluid toxicity, 336-339, 350, 375-390
 - evaluation, 347-348
 - leaching procedures, 139
 - probit analysis, 334-337
- Test organisms. *See* Mussels
- Test parameters, 302
- Test procedures for chemical contaminants and toxicity, 405
- Test results: reproducibility, 267
- Testing, short-term, 22, 24

- Testing: toxicity, 465
 - Tests, acute toxicity, 329(table)
 - Tests, microbial: toxicant impact assessments, 307
 - Thallium, 103
 - Thermal treatment: human enteric viruses, 274
 - TMDL. *See* Total maximum daily loads
 - Total maximum daily loads, 450
 - Total organic halides, 176-177
 - Toxic
 - chemicals in sediments, 397
 - contaminants in sediments, 13
 - ecological impacts, 2, 22-23
 - marine sediment reference materials, 29
 - metals, 313
 - organic compounds, 184-203
 - pollutants, 466
 - trace elements, 29
 - trace metals, 81
 - Toxicant impact assessments, 307
 - Toxicity
 - cadmium, 17
 - contaminated sediments, 398, 403-404, 418, 432
 - data: mysids, 336, 340-341(tables), 354-361
 - diesel additive to ocean biota, 223
 - drilling fluids, 336-339, 350, 375-390
 - drilling fluids to mysids: tests, 326, 329, 330-331(tables)
 - drilling muds, 375-390
 - mud additives, 229
 - responses: sediment bioassays, 395
 - streams, 307
 - studies for teratogenicity and mutagenicity, 4
 - testing, 15, 21, 24, 403, 410, 418-437, 465
 - mysids, 336, 340-341(tables), 354-361
 - reproducibility of results, 328
 - test methods, 391-417
 - Toxicity Characteristic Leaching Procedure (TCLP), 129, 133(table), 136
 - Trace elements, development of marine sediment reference materials, 28-30
 - Trace metal particulate matter associations, 82
 - Trace metals, 102-103, 112
 - Trace metals analysis, 114-117
 - Trace metals: geochemical cycling, 102
 - Trace metals in marine environment, 81-83
 - Trace metals in sewage sludge, 146(table)
 - Trace organic compounds: standard methods for analysis, 184-187, 188(table)
 - Trace organics: extraction from sediment materials, 189, 201
 - Tracer oxidation products, 237
 - Tracer pyrolysis products, 244, 246(fig)
 - Transport pathways, 469
 - Treatment plant effluents, 69
 - Treatment plant system: river/reservoir, 190, 191(fig)
 - Treatment requirements for municipal wastewater, 9
 - Trends and sampling, 44
- U**
- Underground storage tanks, 19
 - Uniformity of results for virus recovery procedure, 267
 - Universal kriging, computer model, 60-68
 - U.S. Geological Survey (USGS), NASQAN program, 103
 - USGS. *See* U.S. Geological Survey
- V**
- Validation, 467-469
 - Validation priorities for quality assurance, 23
 - Vapor loss, 472, 477-478
 - Variability
 - behavior theory of kriging, 59
 - climate and soils, 11
 - intra and interlaboratory, 328, 346-347, 350
 - metal, 115
 - priority pollutant compounds, 158
 - Variograms, 50-55
 - Variance components analysis, 349(table)
 - Variography: sampling theory, 44-58
 - Verification, 16, 81-82
 - Viral infection: risk, 257-264
 - Virological assessment
 - raw sewage sludge, 276(table)
 - thermally treated sludge cake, 276(table)
 - Virology, environmental, 260
 - Virus
 - content, 282
 - detection, 277, 282, 286
 - detection: polio, 279
 - in-sludge: round robin test, 267
 - in-sludge
 - standard methods development, 271-272(tables)
 - levels in sludge, 263(table), 265-272
 - recovery and assay methods: sludge, 259, 261, 265, 275
 - recovery: standard methods
 - round robin studies, 265-272
 - standards development: recovery from sludges, 266-267, 268(tables)

Viruses: human enteric, resistance to standard sludge treatment processes, 258(table), 273
 Viruses: in drinking water, 489, 491
 Volatile organic compounds, 21
 Volatilization, 11

W

Waste
 alkalinity test, 132
 characterization studies, 214, 221
 disposal, sludge: burning, burying, spreading, marketing, dumping, 3
 hazardous, 129-130
 management, 149
 sanitary: codisposal model, 130
 Waste generation criterion: standardization, 19
 Wasteload allocations (WLAs), 452
 Wastewater
 land disposal, 259
 planning: effluents, 2, 69, 148
 procedures: EPA 600 series methods, 21
 sludge, 285, 288, 465
 sludge treatment processes, 259-260, 283, 285
 treatment, 415
 treatment discharges, 35
 treatment planning, 2, 9, 69
 Water-based drilling fluids, 229, 376
 Water
 equilibrium distribution, 201
 pollution, 311, 324

 pollution assessment: bioassay procedures, 23
 pollution control, 2, 14, 391, 403, 415
 Water quality
 conditions for sediment bioassay, 394
 criteria, 13
 management, 404, 413-414
 modeling, 438-440
 trends, 114-115, 127
 wasteload allocation studies, 450-462
 Water treatment, 282
 Waterborne enteric virus infections, 260, 262-263
 Waterway sediments: toxicity, 404, 407-408(table)
 Wet air oxidation system, 274
 Whitewood Creek at Deadwood, SD: study site for microbial activity, 301
 Wildlife, effects of pollution, 14
 WLA: Wasteload allocation, 452
 WLA modeling, 452
 Wood dust leachate: formaldehyde determination, 172-173(tables, figs)
 Worst case scenarios: human exposure to sludge pathogens, 486-488

X-Z

XAD resins, 187, 188(fig)
 Zimbrow wet air oxidation system, 274
 Zinc, 16-17, 103, 404
 Zooplankton, 418, 422, 424-425(tables), 426(fig)