

Index

21st century policies 1091–8

acid mine drainage (AMD) 869–70, 893–5
acid rock drainage (ARD) 866–70, 879–80,
883–6, 890–5

acid/base neutralization curves 190

acidic flotation slurry 973

acidification 304–7, 331–3, 336–40, 367

acousto-optic tunable filters (AOTFs) 494–9

active groundwater recharge zone 676–81

AD *see* anaerobic digestion

additives, recycled plastics 831–2

Adobe Acrobat page description format
1083

adsorbed pollutant diffusion 645–6

adsorption

hazardous waste 1023–4, 1053, 1056

sewage sludge 285

aerobic composting 211–12

aerobic digestion 258

Agenda 21 1094

agglomeration 823–4

agreements, bilateral and multilateral 143–7

agricultural utilization

coal combustion waste 1003–15

composting application 767

sewage sludge 260–81

agricultural wastes 207–15, 735–56

animal manure utilization 737–55

industrial use 736

inorganic contamination 209–10

organic contamination 210–12

pathogen contamination 212–14

agrochemicals 217–38

groundwater concentrations 685–6

nitrogen 228–36

pesticides 217–28

air penetration 340–1

air pollution controls 790–5

air-tightness 876–9, 891–2

aircraft-borne instruments 462

alternative technologies 283, 284

aluminium utilization 1010–12

AMD *see* acid mine drainage

ammonia 740–1, 743–4

amorphous organic matter 637

anaerobic digestion (AD) 212–13, 257–8

analysis of variance (ANOVA) 566–70

analysis of waste *see* waste characterization
analytical techniques

see also technologies

CLP 455–6

immunoassays 505–37

sample characterization 586–93

waste identification 466

animal by-products

contamination 212–14

regulations 746–7

animal manure

Danish regulations 747–51

heavy metals 210

nitrogen supply 739–44

utilization 737–55

animals

antiserum production 506–7

organic contaminants 279

ANOVA *see* analysis of variance

anoxic conditions 313–15

anthropogenic metabolism 783–6

antibodies 506–8, 531–2

AOTFs *see* acousto-optic tunable filters

aquatic environment

life-cycle protection 889

mining waste disposal 867–73

mining waste pollution 330–49

protection strategies 874–95

aquifers

see also groundwater

contaminant susceptibility 683–7

dam case study 698

microbiology 687–90

mining waste dumps 369–79, 882

pollution susceptibility 673–91

water flow velocity 558–9

water quality risks 558

arable land 767

- ARD *see* acid rock drainage
 arsenic 893
 artificial antibodies 531–2
 asbestos waste 5
 Asia, coal combustion 388
 asphalt bleeding 1051
 assays
 see also bioassays; immunoassay
 technologies
 sensitivity 512–13
 validation 517
 ASTM *see* American Society For Testing and
 Materials
 atmospheric precipitation 551
 attenuation of contaminants 887–9
 auditing, quality assurance 611–12
 Australia 867, 869, 883–8
 Austria 786–8, 802
- bag house filters *see* electrostatic precipitators
 Baltic states 55
 ban on waste imports 137, 150–1
 base flow 681–3
 Basel Convention 133–69
 aims 133–5, 151–3
 bilateral and multilateral agreements
 143–7
 definitions and obligations 16, 18, 20–1,
 136–8
 disposal operations 157–8
 environmentally sound management 133,
 135, 137, 139–40
 hazardous waste 125–9, 155–7
 illegal traffic 136, 140–1
 legal and technical guidelines 141–2
 lists of waste 145–7, 158–68
 parties' trade obligations and rights
 149–51
 principles and provisions 135–6
 Protocol on Liability and Compensation 135,
 139
 technical assistance and training 142–3
 trade and environment 147–51
 transboundary movements 59–61, 133–8,
 151–2
 waste constituents 154–5
 waste streams 153–4
 BASF *see* thermolysis
 batteries recycling 854
 bedding selection materials 924, 926, 932
 bentonite 719
 benzo- α -pyrene 588–90
 bilateral agreements 143–7
 binding macro-constituents 980–5
 binding strength 198
 bioassays 301–2
 individual steps 543
 TCDD determination 539–50
 bioavailability
 definition 270
 heavy metals 272
 metals 270–7
 PAHs in soil 633–49
 biocides 251
 biodegradable waste 239, 760–2, 1040
 biodegradation
 pesticides 220, 225–8
 sludge contaminants 257–9
 biofertilizers 911–48
 biogas 753–4
 bioindicators 579–80
 biological sediment criteria 301–3
 biological treatments 1030
 biodegradable waste 760–2
 biowaste 746
 constraints in reclamation 913
 hazardous waste 1035–6, 1049, 1058,
 1061–2
 mining waste 896–8
 tests 899
 biomonitors 505–37
 bioreclamation
 biofertilizers 915–22
 manganese mine wastelands 922–42, 946
 bioremediation
 dredged sediments 311–12
 Nanji Island landfill 812
 SITE program 1073–4
 biosolids *see* sewage sludge
 biotic ligand model (BLM) 272–3
 biowaste
 biological treatments 746
 European Union 757–79
 blast furnaces 825–6
 BLM *see* biotic ligand model
 boron utilization 1006
 bottom ash 793–4, 1003
 boundary conditions 657–8, 660–1, 663
 bream sampling 584–5, 591, 594–6
 buffering capacity 333–40, 381

- cadmium
 - reactive metal transport 622–8
 - recycling 800–1
 - sewage sludge 274–5
- calcium
 - agricultural utilization 1010–13
 - leaching 361
 - reactive metal transport 622–8
- calcium carbonate
 - buffering capacity 336–9
 - desulfurization 405–6
- Canada
 - definitions 19–20
 - mining waste 320
 - sewage sludge disposal 263–7
- capacity development 1096–7
- capping
 - contaminated sediments 313–15
 - hazardous waste 719–31, 1051
- car recycling 840–61
- Caracas, Venezuela 689–90
- carbon
 - adsorption 1023–4, 1053, 1056
 - mineralization rates 940
- carbonates 336–40, 405–6
- Carboniferous strata 960–1
 - see also* Upper Silesia coal basin
- Catalonia 769–71, 775–6
- catalyst 851, 859–60
- catalytic quality assurance 603–6, 614
- cation exchange capacity (CEC) 336–7
- CCW *see* coal combustion waste
- CEC *see* cation exchange capacity
- cell culture 541–2
- cement factory processes 827–8, 839–40
- Central European states 762–8
- CERN laboratories 1082–3, 1085–6
- CHCs *see* chlorinated hydrocarbons
- chemical composition
 - farm animal faeces 739–40
 - mining waste 327–8
 - pore solution transformations 352–65
 - “pure” fly ash 397–403, 424, 431
 - thermal waste treatment 801–4
- chemical extraction sequences 197–8
- chemical numerical sediment criteria 303–4
- chemical pollution *see* agricultural wastes;
agrochemicals; pollution potential
- chemical properties
 - coal mine waste 929
 - manganese mine waste 928
 - PAHs 636–7
 - spoil 934–5, 939
- chemical transformations 257–9, 352–70
- chemical treatments 313–14, 1025–9, 1048–9,
1075–6
- chemicals
 - contaminants 698–9
 - monitoring 505
 - specimen banking 577–600
- chlorides
 - concentration 701
 - migration 704–6, 711–13
 - mining waste distribution 352–5
 - Smolnica coal mine dump 378
- chlorinated hydrocarbons (CHCs) 590–2
- chlorine 802–4
- chromatography 481, 505, 519, 521–30
- chromium 195–6, 620–1, 629–31
- CIL *see* Coal India Limited
- classification
 - compost quality 764
 - hazardous waste 145–7
 - inorganic wastes 159–1, 164–5, 168
 - metal wastes 158–9, 161–3
 - organic wastes 159–61, 165–8
 - soil exposure models 652–3
 - waste streams 153–4
- clay minerals 221–2
- cleanup procedures 539–50, 1019–66
 - see also* remediation; site remediation
- CLP *see* Superfund Contract Laboratory
Program
- co-digestion 751–3
- coal
 - energy source 387–90, 442
 - production and consumption 321–4
- coal combustion waste (CCW) 13–14,
387–449
 - see also* flue gas desulfurization solids; fly
ash
 - agricultural utilization 1003–15
 - bulk use 949–1002
 - disposal 391–4
 - generation 390–1, 442
 - hydraulic properties 412–17
 - pollution potential 394–420
 - pore structure 414–15
 - radionuclides 404
 - regulatory framework 392–3

- Coal India Limited (CIL) 922–3, 935, 941–2, 946
- coal mining waste
 - acid generation potential 332–3
 - bioreclamation 922–42, 946
 - buffering capacity 333–40
 - endogenous fire control 997–8
 - fly ash sealing 987–98
 - leaching behavior 352–65
 - reuse 323–5
 - sources 322–5
- combination technologies 1076
- combustion
 - see also* coal combustion waste
 - cement factories 827–8
 - coal 321–4, 387–90
 - energy recovery 1093
 - fluidized bed 1003–5, 1013–14
 - sustainability 790–5
 - urban waste plants 827
- commercial plastic recycling 821
- competitive ion exchange 622–6
- complete mineralization 799
- compliance tests 188–93
- composition of car components 843–6
- composting
 - aerobic 211–12
 - Central European states 762–8
 - costs 775–8, 779
 - environmental issues 96–7, 773–5
 - EU countries 757–81
 - food waste 761–2, 777–8
 - marketing conditions 764–8
 - Mediterranean countries 768–75
 - TEQ values 545
- computer modeling 651–71
 - see also* modeling
- computer resources 1081–9
- concentration treatment 800, 802–4
- condensation 1056
- condensed organic matter 637–8
- cone penetrometers 459, 555–8
- Conference of the Parties (COP) 133–5, 139–40, 145
- constituents of waste 25–7, 71, 154–5
- constraints in reclamation 912–13
- construction
 - mining waste dumps 875–83, 887, 990–1
 - waste plastic 821–2
- containment remedies 310, 313, 717–31
- contaminants
 - see also* heavy metals; metals; organic contaminants; pathogens
 - attenuation 887–9, 892
 - fly ash 966–77
 - groundwater 375–8
 - inorganic 209–10, 792, 1021
 - leaching 870–3, 880–3
 - loss pathways 300
 - migration 558–66, 704, 706–14
 - minimization 879–80
 - slurry:fly ash mixtures 973–7
 - transport 693–715, 870–3
 - treatments 1067–77
 - water:fly ash mixtures 967–70, 980–6
- contaminated sediments 297–318
 - chemical stabilization 313–14
 - geochemical concepts 298–300
 - geochemical engineering 312–13
 - integrated process studies 308–10
 - long-term metals mobility 307–8
 - redox processes 304–7
 - risk assessment 300–10
 - in situ* treatment 314
- contamination
 - groundwater 208–9
 - inorganic/heavy metals 209–10
 - mining waste disposal 866–904
 - organic 210–12
 - pathogens 212–14
 - wastewater 473
- controls
 - see also* quality assurance
 - air pollution 790–5
 - dust 1051
 - fire 996–8
 - mining waste leaching 355–9
 - organic wastes recycling 744–51
 - recycling 744–51
 - waste disposal 119–20
- convection in soil 655
- coolants recycling 854
- COP *see* Conference of the Parties
- copper contamination 620–1, 693–715
- cost accounting 1097
- cost benefit analysis 941
- costs
 - composting 775–9
 - site remediation 1046–65
 - treatment technologies 312

- critical protection areas (CPAs) 959–60
curtain walls 721–7
cyanide 893
- D-FGDS *see* dry flue gas desulfurization
solids
- Daewoo Engineering, Inc. 809, 812
- dam case study 693–715
- Darcy's Law
curtain walls 727
water flow in soil 654–5, 659–60
- data
remediation technologies 1038–9
treatment costs 1060–1
- databases 7, 9, 33–4, 47
see also lists of wastes; statistical data
- DCS *see* differential scanning calorimetry
- decision making
quality assurance 609–10
remediation technologies 1037–46
- deep mines, fly ash utilization 949–1002
- definitions 3–22
Basel Convention 18, 20–1, 136–8
bioavailability 270
EU legislation 8–16
harmonization need 21–2
hazardous waste 4–5, 10–11, 17, 19–21, 36, 67–73
international 16–18
landfill 92
national 19–21
OECD regulations 16–17
scrap metal 63–4
sewage sludge 239
solid waste 11, 36, 64–7
treatment 93
US Code of Federal Regulations 62–73
US legislation 4–6
waste management 91–3
- degradation 657, 662–3
- denitrification 230, 744
- Denmark 747–55
- dense mine water:fly ash mixtures
D-FGDS effects 979–86
dry mine workings 961–77
mining waste dump 878
preparation 958
radioactivity sinks 986–8
wet mine workings 977–9
- DEPMS *see* direct exposure mass spectrometry
- deposition process 829, 835–6
design optimization 610
destruction process 1025–31, 1045, 1048–9
desulfurization *see* flue gas desulfurization; flue gas desulfurization solids
- detoxification process 1025–31, 1045
- Deutsche Geuellschaft für Kunststoffrecycling (DKR) 816
- developed countries 91–115
see also EU and associated countries; *individual OECD countries*; OECD countries
- developing countries
coal-fired electricity generation 387–9
hazardous waste imports 145
import of industries 124, 129
waste disposal control options 118–24
waste generation 56–9
waste management issues 115–17
- dewatering
mining waste disposal 876–7
sewage sludge 285
Zelazny Most dam 699–700
- diatomaceous earth columns 468–71
- differential scanning calorimetry (DCS)
thermogram 478
- diffusion
PAHs 639, 642–6
soil water/soil air 655–6
- dioxin (TCDD) determination 539–50
- direct exposure mass spectrometry (DEPMS) 466–81
- Directives (EU)
biodegradable waste 760–2
biowaste 760
electricity promotion 746
landfills 745, 760
recycling animal manure 745–6
sewage sludge 745
waste 745
water recycling 745
- disassembly of cars 846–7, 856
- discharge of water 681–3, 876–7
- disinfection treatment 797
- dispersive transport 655–6
- disposal *see* waste disposal
- dissolution of carbonates 336–9

- dissolved organic carbon (DOC) 191, 220, 682–3
- distillation treatment 1024–6
- diuron 229
- DKR *see* Deutsche Geuellschaft für Kunststoffrecycling
- DOC *see* dissolved organic carbon
- domestic sources 245–6
 - see also* household wastes; municipal waste
- Draft European Standards PrEN 183–6
- drainage 366
 - see also* aquifers; groundwater; water
- dredged material 297–318
 - see also* contaminated sediments
 - remediation procedures 310–15
 - treatments 311–12
- dry flue gas desulfurization solids (D-FGDS) 405–20, 979–86
- dry mine workings, water:fly ash mixtures 961–77
- Duales System Deutschland (DSD) 816, 819–21
- dumps 92, 94, 992
 - see also* coal mining waste; landfills; mining waste
 - construction 875–83, 887, 990–1
 - fly ash sealing 987–98
 - immunoassay technologies 555
 - Smolnica coal mine dump 365–9, 372–8
 - tests 349–52
 - water balance 341–9
- dust control 1051
- Dutch Development Program for Treatment Processes for Contaminated Sediments (POSW) 310–11
- dynamic quality systems 601–16
- economics
 - car recycling 855–9
 - consequences 13, 106–7
 - future policies 1095
 - hazardous waste sites 1046–65
 - recycling plastic waste 829–34
 - SITE program 1070
- ecotoxicity 193
- ectomycorrhizal fungi 920–1
- education 1097
- effluent treatment plant (ETP) 923, 930–1, 935, 939–40
- effluents *see* sewage sludge
- eggs
 - herring gull 586–8, 591–3
 - pigeon 591, 597
- EIA *see* enzyme immunoassay technique
- EIAs *see* environmental impact assessments
- Elbe River specimen banking 584–5, 591, 594–5
- electricity generation
 - coal combustion 387–90
 - waste recycling 746, 751–4
- electroremediation 1075
- electrostatic precipitators (ESP) 791–2
- elemental composition 399–401, 408–9, 811
- ELISA *see* enzyme-linked immunosorbent assay
- emissions
 - incineration 791–3, 827
 - sulphur dioxide 1003–5
 - TEQ values 546
- EMIT *see* enzyme-multiplied immunoassay
- end-of-life cars
 - component composition 843–6
 - quantities 841–2
 - recycling 840–61
- endocrine disruptors 211, 249–51
- endogenous fire control 997–8
- energetic compounds 465
- energy
 - radiant 1049
 - renewable 746, 751–4
 - source 387–90
- energy recovery
 - combustion 1093
 - manure recycling 746, 751–4
 - plastic waste 827–9, 833
 - rubber waste 839–40
 - thermal waste treatment 797–8
- environment
 - evaluation scheme 177–81
 - immunoassay technologies 518–27
 - laws 148, 1096
 - websites 1081–9
- environmental impacts
 - coal combustion waste 393–4
 - developing countries 116
 - FGDS underground 977–9
 - fly ash in deep mines 957–61
 - mining waste 327, 349–79, 865–909
 - Nanji Island landfill 809
 - pore solution transformations 352–65

- recycling benefits 751–5
- testing methods 349–52
- trade 147–51
- waste management options 96–7
- water:FA mixtures underground 961–79
- environmental monitoring 453–64, 481
 - see also* monitoring; remote monitoring
 - field technology 459–62, 481–2
 - policy and methods 453–9
- environmental protection 792, 798–9
- Environmental Protection Agency (EPA) 297, 454, 455
 - mining waste disposal 897–8
 - regulatory programs 457–8
 - treatment criteria 1034
 - vadose zones 552–3
 - web overview 1087
- environmental specimen banking (ESB) 577–600
 - bioindicators 579–80
 - CHCs 590–2
 - concept 580–2
 - Germany 580–97
 - PAHs 588–90
 - realization 582–93
 - trends 577–600
- environmental treaty *see* Basel Convention
- environmentally sound management (ESM) 133, 135, 137, 139–40, 152, 1095–6
- enzyme immunoassay technique (EIA) 508–9
- enzyme-linked immunosorbent assay (ELISA) 509–11
 - humic acid effect 516
 - PAHs 519–28
- enzyme-multiplied immunoassay (EMIT) 508–9
- EPA *see* Environmental Protection Agency
- equilibrium models 619–32
- equilibrium partitioning 654
- ESB *see* environmental specimen banking
- ESM *see* environmentally sound management
- ESP *see* electrostatic precipitators
- estrogens 211, 249–51, 277
- ETP *see* effluent treatment plant
- EU and associated countries
 - see also* Directives
 - biowaste separation 757–60
 - car recycling 841
 - CCW regulations 392
 - chemical substances 577–8
 - composting 757–81
 - definitions 8–16
 - glass recycling 99
 - hazardous waste 24–8, 48–9, 54
 - heavy metals in sludge 243
 - industrial waste 45–6
 - legislation 100–2, 263–7, 577–8
 - list of wastes 9–10, 17, 22, 33, 47, 54
 - mining waste 320, 896–7, 902
 - municipal waste 42–4, 109–10
 - organic waste recycling 744–7
 - packaging consumption and recycling 95, 98, 101
 - recyclable waste 40–1, 54
 - sewage sludge disposal 263–7
 - sludge utilization 259
 - soil contamination 261
 - waste generation 38–9, 48–55
 - waste management strategy 94–103
 - waste paper recycling 99
 - waste structure 52–3
- European standardization activity
 - leaching tests 186–95
 - testing levels and categories 181–2
 - waste analysis 195–6
 - waste sampling 182–6
- European Waste Catalogue (EWC) 7, 9, 47
- EUROSTAT questionnaire 34
- evaporation 349, 350
- EWC *see* European Waste Catalogue
- ex situ* treatments 1036, 1044
- excavation 812, 1055
- expenditure 103–5, 859
 - see also* costs
- explosives 468–73, 480–2, 1021
- exports of hazardous waste 137–8, 150, 152
- exposed surface minimization 875
- EXposure in SOil model (EXSOL) 658
- exposure soil models 651–3, 658
- extended markup language (XML) 1083
- extraction process 1048
- extrusion process 826
- FA *see* fly ash
- fabric filters *see* electrostatic precipitators
- facilities for waste management 92
- farm animal faeces 739–40
- FBC *see* fluidized bed combustion

- Federal Remediation Technologies Roundtable (FRTR) 1049, 1060
- feedstock recycling
 plastic waste 823–5, 832–3
 rubber waste 838–40
- fertility of soil 766–8
- fertilizers 217, 236–7
 agricultural waste 736
 biofertilizers 911–48
 manure utilization 737–43, 749–54
 nitrogen 234–5
- FGD *see* flue gas desulfurization
- FGDS *see* flue gas desulfurization solids
- fiberoptics
 monitors 487–9
 remote SERS sensing 492–4
- field studies
 fly ash pond screening 431–42
 mine wasteland reclamation 931–9
 monitoring technology 459–62, 481–2
- filling material 325
- filter residues 793–4
- financial responsibility 124
see also costs; economics
- fire control 996–8
- flocculation treatment 1025, 1027–8
- flood plains 314
- flotation slurry:fly ash mixtures 973–7
- flotation tailings dam case study 693–715
- flow charts 178, 180, 187
- flow paths 676–80
- flows of waste 857
- flue gas desulfurization (FGD)
 dry desulfurization 405, 407–9, 442
 fly ash composition impact 405–12, 442
 gypsum utilization 1010–13
 semi-dry desulfurization 405, 407–9, 442
- flue gas desulfurization solids (FGDS) 393, 396, 398, 402, 405–7
 admixture impact on fly ash 407–12
 dry solids 405–20, 979–86
 semi-dry solids 405–20, 985–6, 992–6
 underground utilization 977–9
 water:fly ash mixtures 979–86
- fluid recycling 845, 853–4
- fluidized bed combustion (FBC) 828–9, 1003–5, 1013–14
- fluorescence *see* laser-based synchronous fluorescence
- fly ash (FA)
see also dense mine water:fly ash mixtures
 agricultural utilization 1005–10
 bulk use 949–1002
 chemical composition 397–403, 408–9, 424, 431
 D-FGDS mixtures 980–5, 992–6
 deep mine workings impact 957–61
 elemental composition 399–401, 408–9
 FGD impact on composition 405–12
 fire control 996–8
 hydraulic conductivity 412–17
 MSEB ash pond, India 422–8
 particle size distribution 394–5
 penetration resistance 417–20
 petrographical and phase composition 394–8, 420–1, 424
 pollution potential 420–43
 pore solutions 434–42
 radioactivity 403
 Rybnik power plant, Poland 428–42
 SD-FGDS mixtures 985–6
 sealing agent 987–96
 slurry disposal 393, 422–3
 TEQ values 546
 thermal treatments 794
 trace metals 410, 411
 underground utilization 956–7, 966–77, 979–86
 weathering transformations 420–2
 wet mine workings 977–9
- fodder, waste utilization 736–7
- food waste utilization 735–56
see also agricultural waste utilization
 composting 761–2, 777–8
 separation 768–75
- forced oxidation FGD gypsum 1010–13
- forestry applications 281–2
- former USSR 55–6, 113, 117
- Fourier transform infrared (FTIR) spectrum 477–8
- France 50
- fresh wrought waste 330–1
- Freundlich equilibrium model 620–2
- FRTR *see* Federal Remediation Technologies Roundtable
- FTIR *see* Fourier transform infrared spectrum
- galvanic suppression 894
- gasification process 825, 839

- geochemical engineering 312–13
- geochemistry of sediments 298–300
 - see also* hydrogeochemistry
- German Association for Plastics Recycling *see* Deutsche Geuellschaft für Kunststoffrecycling
- Germany
 - cars recycling 840–61
 - environmental specimen banking 580–97
 - industrial agglomeration 585
 - plastics recycling 815–34
 - rubber recycling 834–40
 - waste generation 50
- glacitectonic landforms 696–8
- glass recycling 99–100, 103–6, 853
- global agreement *see* Basel Convention
- Google search 1084–7
- granular carbon columns 468–71
- green compost 765
- green pigment 473–5
- grinding process 836–7
- groundwater
 - see also* leaching
 - aquifer pollution susceptibility 683–7
 - base flow 681–3
 - collection 729–30
 - contamination 113–14, 208–9, 278, 375–8
 - curtain walls 726–7
 - fly ash disposal site 424–9, 443–4
 - infiltration through perimeter walls 725–9
 - interflow 681–2
 - monitoring 371–2, 521–3, 564–70
 - mounding 731
 - organic pollutant transport 651–71
 - pesticide contamination 218, 220–4
 - pollution 208, 673–83
 - protection systems 717–31, 959–60
 - pumping 727–9, 1050
 - quality 369–79
 - recharge dynamics 675–83, 704
 - remediation 1067–77
 - role 673–5
 - table 809–10
 - water flow velocity 558–9
 - Zelazny Most dam 693–717
- grouting 892
- Gulf War sample 471
- gypsum utilization 1010–13
- harmonization of data 54–5
- harmony rules 748
- Hasse Diagrams 665–6
- hazard factors, agricultural wastes 207–8
- hazardous waste (HW)
 - Basel Convention provisions 134–8, 143–4
 - biological treatments 1035–6, 1049, 1058, 1061–2
 - classification 145–7
 - definitions 4–5, 10–11, 17, 19–21, 36, 67–73
 - developing countries 57–9
 - EU categories 24–8
 - European countries 48–50, 54
 - exclusions 73–86
 - goals and criteria 1033–5
 - groundwater protection 717–31
 - identification 62–4
 - import ban 137, 150–1
 - lists A-C 146–7, 158–68
 - mining waste 319
 - OECD countries 37
 - site remediation technologies 1019–66
 - transboundary movements 59–61, 115, 125–9
 - treatments 1020–36
 - US Code of Federal Regulations 67–73
 - USA 37
- heat transport in soil 661–2
- heat treatments *see* thermal treatments
- heavy metals 209–10
 - bioavailability 272, 274–7
 - composting 757–9
 - environmental specimen banking 586–90
 - mining waste disposal 892
 - regulatory limits for soils 263–70
 - risk assessment in soils 270–4
 - sewage sludge 242–5, 264–5
 - sludge treatment 256–7
- herbicides 664–6
- herring gull eggs 586–8, 591–3
- heterogeneous-porous media 685–7
- high-performance immunoaffinity chromatography (HPIAC) 528–30
- high-performance liquid chromatography (HPLC) 519, 521–6
- high-volume mining waste disposal 865–909
 - aquatic environment protection 874–95
 - biological rehabilitation 896–8
 - contaminant models 870–3

- dump construction 875–83, 887, 990–1
- landscape formation and land use 895–6
- leaching behavior 867–73
- monitoring 898–900
- rehabilitation 874, 883–98
- underground disposal and reuse 900–3
- homogeneous soils 643–5
- horizontal standardization 199
- hormone steroids 277–8
- household wastes 155, 768–75
 - see also* municipal wastes
- HPIAC *see* high-performance immunoaffinity chromatography
- HPLC *see* high-performance liquid chromatography
- HS *see* humic substances
- HTML *see* hypertext markup language
- humans, organic contaminants 279
- humic acid 516
- humic substances 882
- HW *see* hazardous waste
- hydraulic conductivity
 - fly ash 412–17, 955
 - mining waste dumps 341–3, 379
 - Zelazny Most dam 703
- hydrodynamic fields 710
- hydrogenation (VEBA) process 824–6, 838–9
- hydrogeochemistry
 - fly ash 432, 955–6
 - quality of data 560–1
 - Smolnica mine dump 365–9
- hydrogeology
 - fly ash 412–20, 424, 431, 443–4, 955–6
 - mining waste dumps 371, 379–80
 - Zelazny Most dam 693–9
- hygienization treatments 254
- hypertext links 1086
- hypertext markup language (HTML) 1081–4

- identification of unknown waste 465–84
- IDIS *see* International Dismantling Information System
- illegal traffic 136, 140–1, 1096
- imaging spectroscopy 496–9
- immobilization treatments 311, 799–800, 1031–2, 1045
- immunoassay technologies 460–1, 505–37
 - commercial test kits 520–1
 - environmental applications 518–27
 - future techniques 528–32
 - mining waste dumps 555
 - optimization and validation 512–17
 - standardization 517–18
 - types 508–11
- immunogen synthesis 506
- imports of hazardous waste 137–8, 150–1
- in situ* monitoring 485–502
- in situ* treatments 1035–6, 1043, 1072
- inactive hazardous waste disposal 717–31
- incineration 801–4
 - emissions 791–3, 827
 - environmental impact 96–7
 - hazardous waste sites 1062, 1064
 - municipal waste 110, 790–5
 - sewage sludge 283–4
 - sustainability 790–5
- income and waste composition 57–8
- indexing, web overview 1085–6, 1089
- India
 - CCW utilization 949–53
 - fly ash pond 422–8
 - solid waste reclamation 911–12, 922–46
- industrial fodder 736–7
- industrial waste
 - EU and OECD countries 45–6
 - reclamation 911–48
 - sugar 911–12, 923, 930
 - utilization 736
- industries
 - agglomeration 585
 - landfills 693–715
 - organic pollutants 245, 249, 252
 - pollution control 122
- inert waste 5–6, 11–12
- infectious wastes 5
- infiltration
 - barriers 418
 - inactive hazardous waste 723–9
 - mining waste 346, 349–50, 380, 876–7
 - Zelazny Most dam 700, 707–14
- inflow 727–8
- information sources, WWW 1084–9
- injection moulding 826, 832
- inorganic analysis 586–8
- inorganic contaminants 209–10, 792, 1021
- inorganic wastes classification 159, 160–1, 164–5, 168
- integrated biotechnology 911–48
- integrated process studies 308–10

- integrated waste management policies
 - 1091–5
- interflow 681–2
- international
 - cooperation on transboundary movements 137–8, 143–4
 - definitions 16–18
 - regulations on transboundary movements 125–9
 - waste policies integration 1098
- International Dismantling Information System (IDIS) 844–5
- Internet overview 1081–9
- invasive monitoring 555–8, 899
- inverse modeling 663–4
- ion exchange
 - hazardous waste treatment 1027–9
 - reactive metal transport 622–6
- isochrones 676–80
- Italy, household waste 768–9, 771–5

- Japan, coal combustion waste 950–1
- Jury screening model 653–4

- keywords, web search 1084–6
- kilns *see* fluid bed combustion; rotary kilns
- kinetic models 625–31
- kinetic tests 351

- laboratory studies in reclamation 924, 926–34
- land *see* contaminated sites
- land reclamation *see* reclamation; site remediation
- land use 585, 895–6
- landfills
 - coal combustion waste 393
 - definition 92
 - environmental impact 96–7
 - EU states 112, 174
 - future policies 1094
 - hazardous waste sites 1051
 - industrial 693–715
 - municipal waste 111–12
 - sewage sludge 285–7
 - South Korea 807–13
- landforms
 - creation, mining waste 895–6
 - glacotectonic 696–8
- landscapes, pesticides sorption 220–1
- Langmuir equilibrium models 619–21

- laser-based synchronous fluorescence 486–90
- laser-induced fluorescence (LIF) 556–7
- Laziska power plant 964–5, 981, 983, 987–8
- LC *see* liquid chromatography
- leachability, fly ash 955, 970–3
- leachates
 - mine waters 961–6
 - mining waste dumps 366
 - monitoring 526–7
 - water:fly ash mixtures 961–73, 975–6, 992–6
- leaching
 - agricultural nitrogen losses 744
 - calcium and magnesium 361
 - characterization tests 186–8
 - compliance tests 188–93
 - contaminants 870–3, 880–3
 - controls 355–9
 - fly ash 422–43
 - generic pattern 175–6
 - long-term behavior 176–7, 179–80
 - metals 192
 - mining waste 330, 352–65, 867–73
 - nitrogen 232–6
 - pH tests 188–9
 - primary constituents 352–5
 - protocol 174
 - sulfates 360
 - sulfide decomposition 355–65
 - test validation 194–5
 - trace elements 363–5
 - water:fly ash mixtures 977–9
- lead retention 622
- legislation
 - see also* Directives (EU)
 - Basel Convention 141
 - car recycling 840–5
 - common needs 117–18
 - developed countries 93–4, 100–2
 - environment 1033–4
 - EU countries 6–16
 - mining waste 901–2
 - plastic recycling 815–16, 834
 - trade and environment 148
 - waste management 115–24
- LIF *see* laser-induced fluorescence
- life-cycle protection of aquatic environment 889
- lime in agriculture 1010, 1013–14

- limestones
 - see also* calcium carbonate
 - microbiology 687–9
 - thermal treatments 791, 795
- lindane degradation 230
- linear isotherms 622–3
- liquid chromatography (LC) 481
- liquid waste identification 475–80
- lists of waste 145–7
 - EU list 9–10, 17, 22, 33, 47, 54
 - list A 146, 158–61
 - list B 147, 161–8
 - list C 146–7
- LMGW *see* local monitoring of groundwater
- local monitoring of groundwater (LMGW) 566–70
- lysometric studies 345–7, 350, 355–9, 361

- macro-components release 359–63
- macro-compounds leaching 352
- Maczki Bor waste dump 992
- magnesium 361, 1012
- magnesium carbonate 336–40
- Maharashtra, India 422–8
- manganese mine wastelands 922–41
- Manganese Ore India Limited (MOIL) 922–6, 935, 941–2, 946
- manure utilization 737–55
- markets
 - car recycling 858–9
 - compost 764–8
 - recycled plastic waste 829–34
 - rubber waste 840
- mass migration of contaminants 704, 706–14
- mass spectrometry (MS) 466–81
- mass transfer of PAHs 639–48
- mass transport models 633–49
- materials consumption 783–90
- mathematical transport models 639–46
 - see also* modeling
- matrix effects in immunoassays 513–14
- maximum mounding 731
- mean concentration 802–4
- mechanical recycling
 - plastic waste 826–7, 832–3
 - rubber waste 836–8
- mechanical spreading of compost 766
- mechanistic mass transport models 633–49
- Mediterranean countries 768–75

- mercury
 - herring gull eggs 586–7
 - thermal waste treatment 802–4
- metals
 - see also* heavy metals; trace elements; and *individual metals*
 - aquatic toxicity 198
 - bioavailability in soils 274–7
 - car recycling 846, 851, 858–9
 - fly ash 410
 - leaching behavior 192, 361
 - mobility 197–6, 307–8
 - non-ferrous metals recycling 846, 851, 858–9
 - pore solutions 437–40
 - precious 851, 859–60
 - reactive metal transport 619–32
 - risk assessment for soils 270–4
 - scrap 63–4
 - soil concentrations 261–2
 - soil transport modeling 619–32
 - speciation 270, 273
 - tolerant microbial systems 890–1
 - wastes classification 158–9, 161–3
- meteorological conditions 431
- microbiology
 - aquifers 687–90
 - degradation 220, 225–8
 - organic contaminants 278
 - sewage sludge 253–5
 - sulfate-reducing bacteria 890–1
 - Thiobacillus ferrooxidans* 355, 358
- migration
 - see also* transport
 - contaminants 711–13
 - groundwater velocities 562, 566
- mine waters
 - see also* dense mine water; fly ash mixtures; groundwater
 - characteristics 960–1
 - fly ash utilization 957–99
 - radioactivity sinks 986–8
- mineral material micropores 638–9
- mineralization treatments 799
- mineralogy of wastes 326, 421
- minerals output 321–2
- mining waste 319–85
 - see also* coal mining waste; high-volume mining waste disposal
 - acid generation 331–3, 367

- biofertilizers 916
- bioreclamation 920–42, 946
- buffering capacity 333–40, 381
- disposal 865–909
- dump construction 875–83, 887, 990–1
- endogenous fire control 997–8
- environmental impact 327
- fly ash sealing of dumps 987–98
- groundwater quality 369–79
- leaching 352–5, 363–5
- macro-components release 359–63
- pollution potential 327, 330–49
- pore solutions formation 365–9
- reclamation constraints 912–13
- sources and composition 319–22, 325–9
- sulfide decomposition 355–65
- vadose and saturated zones 551–77
- water balance 345–9
- water flow 341–5
- MIPs *see* molecular imprinted polymers
- modeling
 - biotic ligand model 272–3
 - contaminants 704–7, 870–3
 - equilibrium models 619–32
 - exposure soil models 651–3, 658
 - inverse models 663–4
 - Jury screening model 653–4
 - kinetic models 625–31
 - mass transport 633–49
 - pollutants 651–71
 - reactive metal transport 619–32
 - SNAPS model 659–63
 - Zelazny Most dam flow 702–13
- modern anthropogenic metabolism 783–6
- MOIL *see* Manganese Ore India Limited
- molecular imprinted polymers (MIPs) 531
- monitoring 114–15, 453–64
 - see also* remote monitoring
 - chemicals 505
 - field technology 459–62, 481–2
 - groundwater 371–2, 521–3, 564–70
 - in situ* waste characterization 485–502
 - invasive 555–8, 899
 - leaching water 526–7
 - mining waste disposal 898–900
 - non-invasive 554–5
 - organic contaminants 279–80
 - performance-based system 457–9, 481
 - reference method 453–7
 - soils 523–6
 - SWMUs 558–66
 - thermal waste treatment 801–4
 - vadose and saturated zones 551–77
 - waste disposal 601–16
 - water quality 560–1
- monoclonal antiserum production 507–8
- monolinuron degradation 229
- motor vehicles recycling 821, 840–61
- mounding 731, 811
- MRM *see* multireaction models
- MS *see* mass spectrometry
- MSW *see* Municipal Solid Waste; municipal solid waste
- multianalyte immunoassays 530–1
- multichannel sensing 498
- multilateral agreements 143–7
- multireaction models (MRM) 619, 623–6
- multispectral imaging and sensing systems 494–9
- municipal wastes 109–12
 - see also* sewage sludge; wastewater composition vs. income 57–8
 - vs. consumption per capita 42–3
 - developing countries 56
 - EU 42–4, 109–11, 757–60
 - incineration 790–5
 - landfills 111–12, 807–13
 - OECD countries 36–7, 42–3, 109–11
- munitions residues 468–71
- mycorrhizal fungi 916–22
- NAG *see* net acid generation
- Nagpur, manganese mine wastelands 922
- Nanji Island (South Korea) landfills 807–13
- NAPLs *see* non-aqueous phase liquids
- national definitions 19–21
- National Environmental Engineering Research Institute (NEERI) 922–3, 935, 941–2, 946
- national policies
 - animal manure recycling 747–51
 - integration 1098
- natural organic matter, PAHs 637–8
- NEERI *see* National Environmental Engineering Research Institute
- neural networks 570–1
- neutralization treatment 1027–8
- New Zealand 263–7
- nitrate leaching 744
- nitrification 234

- nitrogen 228–36
 - average soil input 231
 - leaching in soils 232–6
 - manure utilization 737–40, 742–4, 748–9
 - mineralization rates 940
- nitrogen fixation
 - biofertilizers 917, 922
 - mining waste 928–30, 932–4
- nitrogen oxides 795
- nitrogen tetrahydride 740–1
- nomenclature *see* definitions; terminology
- non-aqueous phase liquids (NAPLs) 1033, 1072
- non-energetic compounds 465
- non-ferrous metals recycling 846, 851, 858–9
- non-hazardous waste 11–12, 77–81
 - disposal 112
 - mining waste 319, 379
- non-invasive monitoring 554–5
- non-urban waste 817
- nutrient status 914–15

- odor identification 468
- OECD countries 35–47
 - coal combustion waste generation 390–1
 - definitions of waste 16–17
 - Environmental Compendium 34
 - hazardous waste 37, 125–8
 - industrial waste 45–6
 - municipal waste 36–7, 42–3, 109–11
 - recyclable waste 40–1
 - trade approach 149
 - transboundary movements 145
 - waste generation 38–9
 - waste paper and glass recycling 99–100
- oil recycling 853
- open dumps 92, 94
- operating fluids recycling 845, 853–4
- Opole power plant 981, 987–8, 992
- organic contaminants 245–53
 - behavior in soils 268
 - composting 762–4
 - concentrations 247–8
 - hazardous waste sites 1021
 - monitoring requirements 279–80
 - persistent 210–12
 - sludge-amended soils 277–80
 - sludge treatment 257–9
 - transport to groundwater 651–71
 - xenobiotic organic compounds 210–11, 442
- organic fertility 766–8
- organic matrices 299
- organic solvents 513–15
- organic wastes 735–56, 894–5
 - classification 159–61, 165–8
 - Danish regulations 747–51
 - Danish utilization 751–5
 - recycling controls 744–51
 - separation 757–60, 768–75
 - spoil nutrient status 914–15
 - treatments 1046
- organization quality assurance 601–3, 614
- origins 33–88
- outflow 727
- overflow water 700, 707–10
- overland discharge 681

- “P-principles” 95
- packaging waste 95, 98, 101, 819–20
- PACs *see* polycyclic aromatic compounds
- page description format (PDF) 1083
- PAHs *see* polycyclic aromatic hydrocarbons
- paper mills 931
- paper recycling 99–100, 103–6
- particle size distribution 394–5
- particulate pollutants 639–46
- passive groundwater recharge zone 676–81
- pathogens
 - contamination 212–14
 - sewage sludge 253–5, 280
- pathways protection 1034
- PCBs *see* polychlorinated biphenyls
- PCDDs *see* polychlorinated dibenzo-*p*-dioxins
- PCDFs *see* polychlorinated dibenzofurans
- PDEs *see* potentially dangerous elements
- PDF *see* page description format
- PE *see* polyethylene
- penetration resistance 417–20
- penetrometers 555–8
- perception of threat 103
- performance-based monitoring 457–9, 481
- perimeter slurry walls 719–27
- persistent organic contamination 210–12
- pesticides 217–28
 - groundwater migration 218, 220–4
 - microbiological degradation 220, 225–8
 - pollutant transport 663–6
 - recovery and retardation 224
- petrographical composition of fly ash 394–7

pH

- see also* acidification
- coal mining waste 362
- fly ash 421, 441–2
- Smolnica coal mine dump 376
- tests 188–9

PHAHs *see* polyhalogenated aromatic hydrocarbons

phase composition of fly ash 394–8, 420–1, 424

phase separation 1054

phosphorus 918

physical properties

- mine waste 928–9
- PAHs 636–7
- soils 1008, 1011–12
- spoil 934–5, 939

physical treatments 1035, 1048, 1075–6

see also separation processes

phytoreclamation 913–22

phytotechnology 1074–5

pigeon eggs 591, 597

planning

- projects QA 610–12
- waste sampling 183–5

plants

- fly ash utilization 1005–7
- growth performance 935, 941–5
- heavy metals bioavailability 272, 276–7
- mine waste revegetation 926–8
- organic contaminants 278
- revegetation 282, 925, 941–6
- survival rates 935, 941–5
- water uptake 661

plastic waste

- car recycling 843–5, 851–3
- origin and quantities 816–17
- recovery 817–21
- recycling 815–34
- reduction 825–6
- treatments 822–3

Poland

- see also* Upper Silesia coal basin
- coal combustion waste 950–1, 953–5
- definitions 20
- fly ash utilization 428–42, 949–1002
- mining waste disposal 866, 901–2
- Smolnica coal mine dump 365–9, 372–8
- Zelazny Most dam 693–715

policies

- see also* protocols; waste management
- 21st century 1091–8
- animal manure recycling 747–51
- environmental monitoring 453–9

pollutants

- see also* contaminants; and individual substances
- bioavailability of PAHs 633–49
- diffusion 642–6
- organic 245–53, 651–68
- sewage sludge 240–55
- source control 244–5, 252–3
- transport 651–71

polluter-pays-principle 13, 1096

pollution

- aquifer susceptibility 673–91
- control 93–4, 122
- controls 790–5, 996–8
- groundwater 208–9, 218, 220–4
- soils 633–49

pollution potential 173–205

see also leaching

- acidification 336–40
- buffering capacity 333–6
- coal combustion waste 394–420
- European standardization activity 181–96
- evaluation 673–91
- fly ash 420–43
- geophysical parameters 340–9
- horizontal standardization 199
- metal mobility evaluation 197–8
- mining waste 327, 330–49
- risk assessment 175–81

polychlorinated biphenyls (PCBs) 251

polychlorinated dibenzo-*p*-dioxins (PCDDs)

- fly ash 402–3, 410–12
- herring gull eggs 591, 593

polychlorinated dibenzofurans (PCDFs),

- fly ash 402–3, 410–12

polychloroalkyl oxalates 475–80

polychlorodihydroxyalkyl oxalates 475–80

polyclonal antiserum production 506–7

polycyclic aromatic compounds (PACs) 490

polycyclic aromatic hydrocarbons (PAHs)
633–49

- ambient air concentrations 250, 252–3
- bioavailability in soils 633–49
- ELISA 519–28
- environmental specimen banking 588–90

- fly ash 397, 402, 410
- leachates 526–8
- recovery from soil 523–6
- sewage sludge 249
- polyethylene (PE) 830–1
- polyhalogenated aromatic hydrocarbons (PHAHs) 539
- ponds of fly ash 422–42
- pore solutions
 - chemical transformations 359–63, 370
 - fly ash pond 433–42
 - mining waste 352–65, 380
 - Smolnica dump profile 365–9
- pores
 - pollutant diffusion 645–6
 - structure 414–15
- porosities of rocks 673–87
- POSW *see* Dutch Development Program for Treatment Processes for Contaminated Sediments
- potassium 1005–6, 1009, 1012
- potentially dangerous elements (PDEs) 276
- potentially toxic elements (PTEs) 242, 244
 - see also* heavy metals; toxicity
- power plants 428–42, 949–1002
 - see also* coal combustion waste; fly ash
- precious metals 851, 859–60
- precipitation
 - hazardous waste treatment 1025, 1027–8
 - mining waste dump 347
 - vadose zones 551
- precipitators 791–2
- prediction of contaminant transport 693–714
- pressmud 923, 930, 935, 940
- preventive sealing 987–96
- processing *see* recycling; sludge treatment; treatments
- product stewardship 1095
- profitability 855–8, 859
 - see also* costs; economics
- projects
 - auditing 611–12
 - planning 610–12
 - quality assurance 606–15
- Protocol on Liability and Compensation 135, 139
- protocols
 - leaching 174
 - monitoring 454
 - trade and environment 148
- Przechlebnie waste dump 992
- PTEs *see* potentially toxic elements
- public opinion 900
- public participation 1097
- pumping
 - groundwater 727–9
 - hazardous waste sites 1050, 1054, 1062, 1064–5
- pure particulate pollutants 639–46
- pure water:fly ash mixtures 966–73
- pyrite oxidation 355–9
- pyrolysis treatment 838
- quality assurance (QA) 601–16
 - see also* sludge quality
 - catalytic 603–6, 614
 - composting 762–8
 - environmental specimen banking 585–6
 - groundwater monitoring 566–70
 - organization (institutional) 601–3
 - rules of engagement 612–14
 - technical (project) 606–14
 - variance analysis 566–70
- quality control *see* quality assurance
- Quaternary strata 696–8
- radiant energy 1049
- radioactivity
 - fly ash 403, 988
 - water:fly ash mixtures 986–7
- radionuclides 404
- Raman monitors 485–6, 490–2
- ranking
 - nomenclature 666–8
 - pollutant transport 664–6
- RCRA *see* Resource Conservation and Recovery Act
- reactive metal transport 619–31
- reactive solutes retention 619–31
- reclamation 282, 911–48
 - see also* bioreclamation
 - field studies 931–9
 - laboratory studies 924, 926–34
 - Nanji Island landfill 809–12
 - phytoreclamation 913–22
 - rubber waste 836
 - sewage sludge applications 282
- recombinant antibodies 508
- recovery 5–6, 15–16
 - car recycling 849–55

- energy 827–9, 833, 839–40, 1093
- future policies 1095
- operations 23–4
- PAHs in soil 523–6
- plastic waste 817–22
- resources 552–3, 812
- rubber waste 836–40
- recycling 12–15, 36
 - see also* recovery; reuse; treatments; utilization
 - animal manure 744–51
 - end-of-life cars 840–61
 - enforcement 103–7
 - environmental impact 96–7
 - EU 40–1, 54
 - future policies 1092–3, 1095
 - OECD countries 40–1
 - organic wastes 735–56
 - packaging waste 95, 98, 101
 - plastic waste 815–34
 - public awareness 106
 - rubber waste 834–40
 - thermal waste treatment 800–1
- redox reactions 304–7, 1028–9
 - see also* acidification
- reference method of monitoring 453–7
- regulations
 - see also* legislation
 - coal combustion waste 392–3
 - developing countries 115–16
 - heavy metal limits 263–70
 - mining waste 901–2
 - organic wastes 744–5
 - sludge quality 243
 - transboundary movements 125–9
 - waste control strategies 120–1, 123
- rehabilitation of mining waste 874, 883–98
 - see also* reclamation; remediation; utilization
- release macro-constituents, fly ash 980–5
- remediation
 - see also* revegetation; site remediation
 - contaminated sites 113–14, 283–4
 - costs 1046–65
 - dredged material 299–300, 310–15
 - groundwater and soil 1067–77
 - hazardous waste sites 1019–66
 - Nanji Island landfill 809–12
 - soils 1067–77
 - technology suitability 1043
- remolding treatment 836
- remote monitoring 485–502
 - field technologies 459–62, 481–2
 - laser-based synchronous fluorescence 486–90
 - multispectral imaging and sensing systems 494–9
 - Raman and SERS monitors 490–6
- renewable energy 746, 751–4
- Resource Conservation and Recovery Act (RCRA) 4–6, 455, 552–3
- resources
 - recovery 552–3, 812
 - World Wide Web 1083–4
- restoration *see* remediation
- retention of reactive metals 619–31
- Retkow well field, Poland 712–13
- retrospective baseline data 577–600
- reuse 15
 - coal mining waste 323–5
 - enforcement 103–7
 - high-volume mining waste 900–3
- revegetation 282, 925, 941–6
- rhizospheric microbial population 934–8
- risk assessment
 - aquatic environment 868
 - contaminated sediments 300–10
 - metal mobility evaluation 197–6
 - metals in soils 270–4
 - mining waste disposal 866–904
 - testing procedures 175–81
- river mouths 297–8
- rocks
 - aquifer properties 683–7
 - infiltration barriers 418
 - mining waste 319, 323, 326, 341
- rolling stock recycling 841–3
- root development 932–3
- rotary kilns
 - hazardous waste treatment 1030–1
 - recycling plastic waste 828–9
 - thermal treatments 794–5
- Rothmund–Kornfield binary ion exchange 623–6
- rubber waste recycling 834–40
- Rudna River, Poland 694–6
- Rybnik power plant 428–42, 955–96
- saline water
 - fly ash utilization 977–9
 - migration 700–2, 704–6, 711–13

- sampling 182–6
 - bioassay materials 540–1
 - environmental specimen banking 582–3
 - field technology 459
 - immunoassay technologies 514–17
 - planning 183–5
 - role 187
 - standardization guidelines 583–6
 - thermal waste treatment 801
 - vadose and saturated zones 560–4
- sanitary landfills 1094
- sapling inoculation 930–1
- SARA *see* Superfund Amendments and Reauthorization Act
- saturated zones
 - contaminant loads 879–80
 - monitoring 551–77
- scientific information 1086–7
- scrap fractions recycling 848–50
- scrap metal 63–4
- scrubbing treatment 1004–5
- SD-FGDS *see* semi-dry flue gas desulfurization solids
- sealing agents 987–99
- search engines 1084–9
- second-order mobile-immobile model (SOMIM) 630–1
- second-order two-site model (SOTS) 625, 628–30
- secondary raw materials 12–15, 73–6, 93
- sedimentation treatment 1025, 1027–8
- sediments
 - see also* contaminated sediments
 - quality criteria 300–4
 - TEQ values 545
 - toxicity tests 301–3, 537–50
- selection matrices 1050–9
- selenium utilization 1007
- semi-dry flue gas desulfurization solids (SD-FGDS) 405–20, 985–6, 992–6
- sensing *see* monitoring; remote monitoring
- sensors in waste dumps 554–8
- Seoul, South Korea 807–13
- separation processes
 - biowaste 757–60
 - car recycling 848–9
 - food waste 768–75
 - hazardous wastes 1021–5, 1035, 1044
 - plastic waste 822–3
- SERS monitors *see* surface-enhanced Raman scattering monitors
- sewage sludge 239–95
 - see also* sludge quality; sludge treatment
 - definition 239
 - generation 239–40
 - TEQ values 544
- sewage sludge applications 259–87
 - adsorbent use 285
 - agriculture 260–82
 - contaminated site remediation 283–4
 - forestry and silviculture 281–2
 - heavy metals in soils 261–77
 - incineration and alternative technologies 282–3
 - landfilling 285–7
 - organic contaminants 277–80
 - pathogens 280
 - soil protection 260–1
- sewage water microbiology 689–90
- shredding process 846–9, 850, 852, 856
- silicates 397
- silviculture 281–2
- Simulation model Network Atmosphere–Plant–Soil (SNAPS) 659–63
- SITE *see* Superfund Innovative Technology Evaluation
- site remediation 1032–3
 - hazardous waste 1019–66
 - Nanji Island landfill 809–12
 - processes and costs 1048–9
 - sewage sludge application 283–4
- sites
 - factors affecting costs 1061–5
 - groundwater contamination 113–14
 - selection for disposal 867–70, 874–5
- sludge quality 240–55
 - heavy metals 242–5
 - organic pollutants 245–53
 - pathogens 253–5, 280
- sludge treatment 240–1, 255–61
 - advanced hygienization 254
 - heavy metals content 256–7
 - organic contaminants transformation 257–9
 - technologies 255–60
- slurry
 - fly ash mixtures 393, 422–3, 957, 973–7
 - manure utilization 739–40
- slurry walls 719–27, 1051
- Smolnica coal mine dump 365–9, 372–8

- SNAPS *see* Simulation model Network
 Atmosphere–Plant–Soil
 socio-economic impact 935–41
 software
 contaminant leaching 870–3
 fly ash utilization 996
 groundwater flow 702–3, 873
 soil exposure models 651–3, 658
 soil organic matter 637–8
 soil vapor extraction (SVE) 1055, 1061–3, 1070–1
 soils
 air and water diffusion 655–6
 bioavailability of metals 270–7
 convective transport 655
 equilibrium partitioning 654
 heavy metals 261–77
 hydraulic conductivity 413
 immunoassays 523–6
 microbial population/activity 269, 1009
 nitrogen 231–6
 organic contaminants 268, 277–80
 PAH bioavailability 633–49
 pesticides sorption 219–22
 physical properties 1008, 1011–12
 pollutant diffusion 642–5
 protection strategy 745–6
 reactive metal transport 619–31
 regulatory limits 263–70
 remediation 1067–77
 sewage sludge applications 260–1
 subsoil acidity amelioration 1010–11
 TEQ values 545
 washing 1024, 1048, 1055
 waste–soil interactions 177–8
 solid waste
 see also waste disposal; waste management
 definitions 11, 36, 64–7
 exclusions 73–7
 indentification 465–84
 non-hazardous 77–81
 pollution potential 173–205
 quality assurance 601–16
 reclamation in India 911–12, 922–46
 terminology 91–3
 testing and evaluation flowchart 178
 US Code of Federal Regulations 62–7
 solid waste management units (SWMUs)
 552–3, 558–66
 solidification
 contaminated sediments 311–14
 hazardous waste 1031–2, 1049–50
 leachable mixtures 970–3
 Nanji Island landfill 812
 solutes 619–31, 662
 solution of pollutants 639–46
 SOMIM *see* second-order mobile–immobile models
 sorption of pesticides 219–22
 SOTS *see* second-order two-site model
 sources *see* waste generation
 South Korea 807–13
 Spain 769–71, 775–6
 spare part recycling 854, 860
 specimen banking 577–600
 see also environmental specimen banking
 spectrometry 466–81, 486–9
 spectroscopy 496–9
 spoil
 see also dumps; mining waste
 nutrient status 914–15
 physico-chemical properties 934–5, 939
 spore inoculation 934–8
 SRB *see* sulfate-reducing bacteria
 stabilization 311–14, 1051
 standardization 181–99
 composting standards 773–5
 horizontal 199
 immunoassay technologies 517–18
 leaching tests 186–95
 sampling 182–6, 583–6
 waste analysis 174–5, 195–6
 statistical data 33–5
 EU waste management strategy 102–3
 harmonization 54–5
 incompleteness 33, 35–6, 55
 steady-state pumping 727–9
 steel
 barriers 894
 recycling 848, 851, 856–8
 stripping treatment 1021–3, 1053
 sugar industry waste 911–12, 923, 930
 sulfate-reducing bacteria (SRB) 890–1
 sulfates
 fly ash 397
 leaching 360
 mining waste 334
 reduction 305
 Smolnica coal mine dump 377

- sulfides
 - coal mining waste 332–3, 357, 359
 - mining waste 334–5, 380, 866, 880–3, 890
 - oxidation 304–6, 331–2
 - soluble constituents leaching 355–65
- sulfur dioxide 795, 1003–5
- Superfund Amendments and Reauthorization Act (SARA) 1067
- Superfund Contract Laboratory Program (CLP) 455–6
- Superfund Innovative Technology Evaluation (SITE) 1033–4, 1046–7, 1067–77
- supervised neural networks 570–1
- surface-enhanced Raman scattering (SERS) monitors 490–6
- surface runoff 345–8
- surface sealing 987–99
- sustainable treatments 783–805
- SVE *see* soil vapor extraction
- SWMUs *see* solid waste management units
- synchronous luminescence spectrometry 486–9
- Syncrude recycling product 824, 826, 839

- tailings, Zelazny Most dam 693–715
- TCDD *see* dioxin
- technical assistance 142–3
- technical guidelines 141–2
- technical quality assurance 606–14
- technologies
 - see also* immunoassay technologies
 - alternative 283–4
 - combination 1076
 - decision making 1037–46
 - field monitoring 459–62, 481–2
 - hazardous waste site remediation 1019–66
 - innovative 1068–71, 1073–6
 - integrated biotechnology 911–48
 - mining waste rehabilitation 890–5
 - phytotechnology 1074–5
 - sediment remediation 310
 - sludge treatment 255–60
- temperatures 226, 347
- TEQ *see* toxicity equivalent
- terbutylazine migration 223
- terminology 3–22
 - see also* definitions
 - EU 6–8
 - ranking 666–8
 - US 3–6
 - waste management 91–3
- Terra-Kleen Response Group 1071
- terrorism threat 481–2
- tests
 - biological treatments 899
 - cleanup 539–50
 - commercial immunochemicals 520–1
 - leaching 173–6, 186–95
 - metal mobility 197–8
 - mining waste dumps 349–52
 - risk assessment 175–81
 - sediment toxicity 301–3, 537–50
 - unknown waste identification 465–84
 - waste characterization 181–2
- textile waste 166
- thallium 893
- thermal treatments
 - electrostatic precipitators 791–2
 - goals 795–801
 - hazardous waste 1030–1, 1048–9, 1058–9, 1061, 1063
 - sewage sludge 254, 256, 258
 - sustainability 783–806
- thermolysis treatment 825
- Thiobacillus ferrooxidans* 331, 355, 358
- tire recycling 835–6, 860
- titration experiments 307–8
- TNL *see* tritium naught lines
- TNT *see* trinitrotoluene
- toxic trade *see* transboundary movements
- toxicity
 - see also* detoxification process
 - chemicals 5
 - ecotoxicity 193
 - equivalent determination 541–2, 544–8
 - metals 198, 921
 - PTEs 242, 244
 - reduction 1094–5
 - tests 301–3, 537–50
- toxins *see* pollutants
- trace elements 196
 - coal mining waste 329
 - fly ash 410–11
 - leaching from mining waste 363–5
 - mine water 963
 - pore solutions 436–40
 - soils 261
- trade, environmental impact 147–51
- training 143

- transboundary movements
 - bilateral and multilateral agreements 143–4
 - control 1096
 - hazardous waste 59–61, 133–8, 151–2
 - institutionalization 134
 - international regulations 125–9
 - prohibition 137, 145, 150–1
- transfer coefficients variance 801–4
- transmissivity 703
- transport
 - contaminants 693, 715
 - discharge 681–3
 - equation derivation 656–7
 - heat in soil 661–2
 - organic pollutants 651–71
 - PAHs in soil 635–6, 639–48
 - solutes in soil 662
- transportation of waste 96–7, 870–3
- treatments
 - see also* biological treatments; chemical treatments; incineration; remediation; separation processes; sludge treatment
 - car recycling 849–55
 - definition 93
 - desulfurization 405–9, 442
 - dredged sediments 311–12
 - future facilities 1095–6
 - goals and criteria 1033–5
 - hazardous waste 1020–36
 - immobilization 311, 799–800, 1031–2, 1045
 - physical treatment 1035, 1048, 1075–6
 - plastic waste 822–7
- triazine herbicides 664–6
- trinitrotoluene (TNT) 471
- tritium 685–6
- tritium naught line (TNL) 677–8
- UK
 - see also* EU and associated countries
 - coal combustion waste 950–1
 - waste generation 50
- underground utilization 900–3, 956–7, 966–77, 979–86
- uniform resource locators (URLs) 1088–9
- unknown solid waste identification 465–84
- Upper Jurassic limestones 687–9
- Upper Silesia coal basin (USCB), Poland 325–6, 329, 332, 336
 - fly ash utilization 955–96
 - mining waste disposal 866
- urban industrial agglomeration 585
- urban waste 817, 827
- URLs *see* uniform resource locators
- USA
 - see also* Environmental Protection Agency
 - coal combustion waste 949–51
 - Code of Federal Regulations 62–86
 - environmental monitoring 453–4
 - hazardous waste generation 37
 - legislation (RCRA) 4–6, 455, 552–3
 - mining waste 319–20, 886–95, 902
 - sewage sludge disposal 263–7
 - waste definitions 4–6
- USCB *see* Upper Silesia coal basin
- USSR *see* former USSR
- utilization
 - agricultural waste 735–56
 - coal combustion waste 391, 444–5, 1003–15
 - fly ash 949–1002
 - sewage sludge 260–81
 - underground 900–3, 956–7, 966–77, 979–86
- vadose zones 342–5, 551–77
- VAM *see* vesicular arbuscular mycorrhizae
- variance 801–4
- variance analysis 566–70
- VEBA *see* hydrogenation
- velocities
 - aquifer water flow 558–9
 - groundwater recharge 676–80
- Venezuela 689–90
- Venice, composting 777–8
- vesicular arbuscular mycorrhizae (VAM) fungi
 - bioreclamation 916–22
 - mine wasteland reclamation 928–30, 932–4
 - spore inoculation 934–8
- virgin material 6
- virtual library indexes 1085–6, 1089
- viscous oil 475–80
- volatile organic compounds (VOCs) 1032–3, 1070, 1072
- volume
 - mining waste 865–6
 - reduction of CCW 949–1002
 - thermal treatment 795–6

- waste characterization; characterization of
 - waste 145–7, 174, 181–3, 186, 195, 199
 - see also* definitions; identification
 - CCW 1003–5
 - constituents classification 154–5
 - flow chart 187
 - in situ* monitoring 485–502
 - mining waste dumps 371
 - quality assurance 601–16
 - tests 186–8
 - three-tier hierarchy 181–2
- waste disposal 15–16, 22–3, 107–10
 - see also* sewage sludge applications; transboundary movements; utilization
 - Basel Convention 157–8
 - coal combustion 391–4
 - control options 118–24
 - definitions 5, 15
 - developing countries 115–18
 - efficiency 108–10
 - environmentally sound 133, 135, 137, 139–40, 152
 - financial responsibility 124
 - fly ash 422–8
 - future policies 1095–6
 - groundwater protection designs 717–31
 - groundwater quality 424–9, 443–4, 564–6
 - hazardous waste 126
 - methods 122–3
 - mining waste 865–909
 - QA monitoring 601–16
 - regulatory strategies 120–1
 - sewage sludge 259–60
- waste flows 857
- waste generation
 - coal combustion 390–1
 - developing countries 56–9
 - EU 38–9, 47–55
 - former USSR 55–6
 - OECD countries 38–9
 - sewage sludge 239–40
 - USA 37
- waste identification 465–84
- waste management 91–132
 - definitions 91–3
 - developed countries 91–115
 - developing countries 115–17
 - environmental impact 96–7
 - EU states 94–103
 - expenditure 103–5
 - former USSR 117
 - future policies 1091–8
 - implementation options 107–12
 - legislation 115–24
 - “P-principles” 95
 - prerequisites 93
 - quality assurance 601–16
 - recycling enforcement 103–7
 - statistics 102–3
- waste metal 158–9, 161–3
- waste paper recycling 99–100, 103–6
- waste prevention 95, 1094–5
- waste reduction 825–6, 1092
- waste–soil interactions 177–8
- waste streams 153–4
- waste structure 52–3
- wastewater 69
 - see also* sewage sludge
- water
 - see also* dense mine water: fly ash mixtures; groundwater; mine waters
 - exchange rate 349
 - infiltration 707–14
 - migration 698, 700–6, 711–13
 - quality 560–1
- water balance
 - curtain wall 723–7
 - mining waste dumps 345–9
- water cycle dynamics 675–81
- water flow
 - mining waste dumps 341–5
 - pollutant transport 654–5, 659–61
 - soil 654–5, 659–60
 - vadose zones 341–5
 - velocity in aquifers 558–9
- water resources 867–95
- water table 375, 809–10
- water-tightness 876–9, 891–2
- water treatments 722, 790–5
- water uptake 661
- WCL *see* Western Coalfields Limited
- weathering transformations 420–2
- websites 1087
- Western Coalfields Limited (WCL) 923–5, 931
- wet desulfurization 406
- wet mine workings 977–9

- World Wide Web (WWW) 1081–9
 - concept 1082–3
 - search engines 1084–9
 - worms 1085, 1089
- WWW *see* World Wide Web
- X-ray fluorescence (XRF) 461
- xenobiotic organic compounds 210–11, 442
- XML *see* extended markup language
- XRF *see* X-ray fluorescence
- Zelazny Most dam case study 693–715
 - flow models 702–13
 - groundwater contamination 699–702
 - hydrogeology 693–9
- zinc 275–6, 624–6