Useful Links

Chapter 1

Audiovisual Aids:

Why are we losing our groundwater?

https://www.youtube.com/watch?v=2cFOYvtJejw

Interactions between surface water and groundwater:
https://www.youtube.com/watch?v=5lK_fs3p7yc

35 Years of Superfund: Stringfellow Site Cleanup:
https://www.youtube.com/watch?v=v5WtiuzM6P4

Find National Priority List (NPL) sites (Superfund sites) by states or by names:
http://www.epa.gov/superfund/sites/

Quality of Our Nation's Groundwater:

https://www.youtube.com/watch?v=wuBuYLku5P4

Love Canal: An Environmental Disaster:

https://www.youtube.com/watch?v=3iSFgZ-SlaU

Love Canal: Photos, Videos, and Audio:

https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0201290)

Chapter 2

Audiovisual Aids:

Lists of 126 U.S. EPA priority pollutants:

https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf

Lists of emerging contaminants or contaminants of concern:
http://www.epa.gov/fedfac/documents/emerging_contaminants.htm

National Drinking Water Standard: https://www.epa.gov/ground-water-and-drinking-water

Hydrolysis of environmentally relevant compounds:
http://web.viu.ca/krogh/chem331/HYDROLYSIS%202006.pdf

A general review of organic chemistry: http://www.khanacademy.org/science/organic-chemistry/gen-chem-review

Information about Contaminants Found at Hazardous Waste Sites:
http://www.atsdr.cdc.gov/toxprofiles/index.asp

Natural Attenuation of Groundwater Contaminants: New Paradigms, Technologies, and Applications

https://www.coursera.org/learn/natural-attenuation-of-groundwater-contaminants/lecture/CYurz/other-abiotic-reactions-hydrolysis

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Chapter 3

Audiovisual Aids:

Soil Physical and Chemical Properties:
http://www.nrcs.usda.gov/wps/portal/nrcs/detail/nj/home/?cid=nrcs141p2_018993

Soil Basics and Properties: http://www.ctahr.hawaii.edu/mauisoil/a_comp01.aspx

Soil texture calculator:
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/nedc/training/soil/?cid=nrcs142p2_054167

Basic Hydrogeology Review:
http://www.ncwater.org/education_and_technical_assistance/ground_water/hydrogeology/

Unsaturated Zone Resources and Information: http://water.usgs.gov/ogw/unsaturated.html

EPA On-line Tools for Site Assessment Calculation:
http://www.epa.gov/athens/learn2model/part-two/onsite/toc_onsite.html

Water Resources and Groundwater Software made available by the USGS:
http://water.usgs.gov/software/lists/groundwater/#aquifer-tests

Groundwater Modeling Guidance: http://www.deq.state.mi.us/documents/deq-wd-gwguidance.pdf

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Chapter 4

Audiovisual Aids:

Code of Federal Regulation (Title 40): http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40tab_02.tpl

National Drinking Water Standards: http://water.epa.gov/drink/contaminants/index.cfm

Review of Engineering Economics (video): http://engineeringregistration.tamu.edu/tapedreviews/economics/

Chemical Engineering Cost Index: http://www.chemengonline.com/pci-home

Construction Cost Index: http://enr.construction.com/economics/

Marshall and Swift Equipment Cost Indices: http://www.marshallswift.com/default.aspx

Cancer Rick Calculation (USEPA): http://www.epa.gov/oswer/riskassessment/sghandbook/riskcalcs.htm

Integrated Risk Information System (IRIS): http://cfpub.epa.gov/ncea/iris/index.cfm?fuseaction=iris.showSubstanceList

European Union Environmental Law Training Package:

http://ec.europa.eu/environment/legal/law/training_package.htm

Canada Contaminated Sites Regulations:

http://www.bclaws.ca/civix/document/id/loo90/loo90/375_96_00

Canadian Federal Contaminated Sites Inventory:

http://www.tbs-sct.gc.ca/fcsi-rscf/home-accueil-eng.aspx

Soil Screening Guidance: https://www.epa.gov/superfund/superfund-soil-screening-guidance

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Chapter 5

Audiovisual Aids:

An example of Phase I assessment report: http://www.morgan-hill.ca.gov/DocumentCenter/Home/View/2833

An example of Phase II assessment report: http://www.deq.state.or.us/lq/cu/nwr/BlueHeron/BlueHeronPaperPhaseIISiteAssessmentFinalReport.pdf

An example of Phase III assessment report: http://www.cskt.org/tr/docs/epa_final_elmo_phase_iii_esa.pdf

Cable tool drilling method (YouTube): http://www.youtube.com/watch?v=H6N0x8BnOKE

Geoprobe direct push system (YouTube): http://www.youtube.com/watch?v=s5b7SPtyhDA

Slug test (YouTube): https://www.youtube.com/watch?v=0EfVzrqm_CU

Slug test calculation (YouTube): https://www.youtube.com/watch?v=QmoemzEav5g

Soil hydraulic conductivity test in a soil column: https://www.youtube.com/watch?v=BqJqcTdf4FY

Pumping test: http://www.epa.gov/superfund/remedytech/tsp/download/sopaqu.pdf

Groundwater Sampling (YouTube): https://www.youtube.com/watch?v=7_5RcnaFn_w

Installing a monitoring well: https://www.youtube.com/watch?v=mQtgj_zH6TE

Drilling groundwater well on UIC campus: https://www.youtube.com/watch?v=fZuBFM7LrnQ

Aquifer tests: http://www.aqtesolv.com/aquifer-tests/aquifer-tests.htm

Vacuum lysimeter installation: https://www.youtube.com/watch?v=7Nn6PzfgN7U

Chapter 6

Audiovisual Aids:

Institutional Controls: http://www.epa.gov/superfund/policy/ic/guide/index.htm.

Federal Remediation Technologies Roundtable: http://www.frtr.gov (inactive); http://www.emsus.com/frtr/archives.htm

Contaminated Site Clean-Up Information: http://www.clu-in.org/

Defense Environmental Network and Information Exchange (DENIX): http://www.denix.osd.mil/

DoE Office of Environmental Management: http://energy.gov/em/office-environmental-management

Strategic Environmental Research and Development Program: http://www.serdp.org/

Office of Solid Wastes and Emergency Response (OSWER): http://www2.epa.gov/aboutepa/about-office-solid-waste-and-emergency-response-oswer

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Chapter 7

Audiovisual Aids:

Residual Saturation: www.clu-in.org/conf/itrc/iuLNAPL/030513_residual.pdf

SURF-US and SURF-UK: www.sustainableremediation.org; www.claire.co.uk/surfuk

USEPA Green Remediation: www.clu-in.org/greenremediation

NICOLE (Network for Industrially Contaminated Lands in Europe): www.nicole.org

EPA National Library Catalog (Search for Superfund Record of Decision): http://cfpub.epa.gov/ols/

Camp Lejeune Military Res. (US Navy): http://www.epa.gov/region4/superfund/sites/fedfacs/camplejnc.html; https://frtr.gov/costperformance/profile.cfm?ID=150&CaseID=150

Matrix diffusion: https://www.eosremediation.com/portfolio-items/controlling-matrix-diffusion-of-chlorinated-solvents/

Chapter 8

Audiovisual Aids:

Green Remediation: Soil Vapor Extraction and Air Sparging: http://cluin.org/greenremediation

Case Studies on Soil Vapor Extraction and Air Sparging: http://clu-in.org/

Soil vapor extraction system case study: http://www.epa.gov/region5/cleanup/rcra/solutia/pdfs/100_Soil_Vapor_Extraction_System_Design.pdf

Engineering and Design-Soil Vapor Extraction and Bioventing: http://www.lwrri.lsu.edu/downloads/JohnPardue_Class/basdoc.pdf

Vapor Phase Remediation Equipment – Soil Vapor Extraction Systems (SVE): http://www.geotechenv.com/soil_vapor_extraction_systems.html

SVE Animation: https://www.youtube.com/watch?v=3A9RIA3QbuI

SVE Design: https://www.youtube.com/watch?v=z_g8wVSwJl8

To download HyperVentilate (a software guidance system created for vapor extraction applications): http://webapp1.dlib.indiana.edu/virtual_disk_library/index.cgi/1248910

Chapter 9

Audiovisual Aids:

Defense Environmental Restoration Program: http://www.denix.osd.mil/derp/

Hill Air Force Base Superfund Site-Bioventing: https://clu-in.org/PRODUCTS/BIFPROFS/hillafb.htm

Bioslurry Reactor at the French Ltd. Superfund Site: http://clu-in.org/products/costperf/BIOREM/French.htm

Phytoremediation at Naval Air Station: http://toxics.usgs.gov/topics/rem_act/carswell.html

Environmental Biotechnology: https://slideplayer.com/slide/4730406/

Chernobyl Bioremediation Project: https://prezi.com/sjt60d78rc4b/chernobyl-a-case-study-in-bioremediation/

Chapter 10

Audiovisual Aids:

Thermal Treatment *In Situ*: http://www.clu-in.org/techfocus/default.focus/sec/Thermal_Treatment%3A_In_Situ/cat/Overview/

Green Remediation Thermal Technologies: http://www.cluin.org/greenremediation/docs/GR_factsheet_IST.pdf

Thermal enhancement case studies: http://epa.gov/tio/download/remed/thermal.pdf

Steam Injection at Rainbow Disposal Company, Inc. site: http://nepis.epa.gov/EPA/html/DLwait.htm?url=/Exe/ZyPDF.cgi?Dockey=10002411.PDF

Design of In Situ Thermal Remediation (USACE): http://www.clu-in.org/download/techfocus/thermal/EM_1110-1-4015.pdf

Electrical resistance heating: http://www.thermalrs.com/istr-erh-tch-remediation-technology/erh-in-situ-technology.php

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Chapter 11

Audiovisual Aids:

Vineland Chemical Co. Soil Washing System:
http://www.epa.gov/region2/superfund/npl/0200209c.pdf

In Situ Flushing Site Profiles: http://www.clu-in.org/techfocus/default.focus/sec/in_situ_flushing/cat/Application/

In Situ Flushing: Technical Status report: http://www.clu-in.org/techfocus/default.focus/sec/in_situ_flushing/cat/Application/

ENVIT: Innovative Soil Washing Plant: https://www.youtube.com/watch?v=r50LNFog-Hc

SRS 15T Portable Soil Washing System: https://www.youtube.com/watch?v=jmVHfNSUDFc

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Chapter 12

Audiovisual Aids:

Redox chemistry review: https://www.youtube.com/watch?v=QHAAC55aV_M

Design details of PRBs: http://prtl.uhcl.edu/portal/page/portal/HOMEPAGE

Case Study at Fry Canyon, Utah: http://www.epa.gov/radiation/docs/cleanup/402-c-00-001.pdf

GeoSierra's Permeable Reactive Barriers for Groundwater Remediation
https://www.youtube.com/watch?v=OkiNIK1z4ck

ZVI PRB construction, Concord, CA
https://www.youtube.com/watch?v=15J9yq-gEkk

Slurry supported soil-bentonite (SB) wall construction:

https://www.geo-solutions.com/technical-resources/

Chapter 13

Audiovisual Aids:

Integrated Groundwater Modeling Center: https://igwmc.mines.edu/

U.S. EPA Center for Subsurface Modeling Support: http://www.epa.gov/water-research/methods-models-tools-and-database-water-research

USGS Groundwater Software: http://water.usgs.gov/softwater/lists/grounwater

BIOSCREEN model: http://www.epa.gov/ada/bioscreen.html

Solving Laplace equation in MS Excel for two-dimensional solution: https://nirmaljoshi.wordpress.com/2012/05/26/solving-laplace-equation-in-ms-excel-for-two-dimensional-solution/

Numerical Computation: https://www.youtube.com/watch?v=ncBPUw2dEuE

Use of Excel (Liner Programing):

https://www.youtube.com/watch?v=EGwTIFwyErU

Use of Excel to solve numerical problems: https://www.youtube.com/watch?v=VlNb-NTNs4o

Solving partial differential equations in Excel: https://www.youtube.com/watch?v=gpIAVh9VGdE

Spreadsheet for 2-well capture type curve: https://www.youtube.com/watch?v=kENk1FWmyDY

Spreadsheet for 1-well capture type curve: https://www.youtube.com/watch?v=kENk1FWmyDY

Spreadsheet for permeameter: https://www.youtube.com/watch?v=VlNb-NTNs4o

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