
Kansas Geological Survey

Bibliography of Water-Quality Impacts of Sand and Gravel Mining

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Bibliography of Water Quality Impacts of Sand and Gravel Mining

Compiled by Margaret A. Townsend
Kansas Geological Survey

Introduction

This bibliography was compiled by the Kansas Geological Survey at the request of the Kansas Department of Health and Environment. The purpose of the compilation was to determine if water-quality issues concerning the impacts of potential contaminants on ground water as a result of sand and gravel mining were addressed in the scientific literature.

Several electronic databases were accessed to obtain the references compiled in this bibliography. The University of Kansas Webspirs website (<http://libsun1.lib.ukans.edu/cgi-bin/wespira.cgi>) was accessed in order to run searches on the GEOREF, NTIS, and UNCOVER databases. Multiple searches with different word combinations such as: dredging, sand, water quality, sand and gravel mining, sand and gravel extraction, ground-water quality and the like were used to obtain references. This bibliography is the summation of those searches and is as complete as was possible using those databases. The GEOREF and NTIS databases have citations from 1975 to present. The UNCOVER database has citations available from the 1980s to present.

These citations are from the various databases and the styles of the citations vary between databases. In general the citations are listed with Author, Title, Book Title or Journal, Publisher, Pages, and Descriptors. Some of the citations had abstracts associated with the reference. In these cases the abstract and other information are included with the citation.

Citations are listed alphabetically by first author. Those citations without an author are listed by Title beginning with page 19.

AUTHORS: Barnes, Robert P.
TITLE: Ground water quality protection, mining and mining facilities in Utah.
BOOK TITLE: In: Proceedings of the symposium on Water resources related to mining and energy; preparing for the future.
BOOK AUTHORS: Dworsky, Richard F. (editor)
SOURCE: American Water Resources Association Technical Publication Series TPS. 87-4; Pages 395-401. 1987.
PUBLISHER: American Water Resources Association. Bethesda, MD, USA. 1987.
PUBLICATION YEAR: 1987
DESCRIPTORS: engineering-geology; ground-water; methods-; mining-; mining-geology; open-pit-mining; solution-mining; surface-mining; surveys-; United-States; Utah-; water-quality

BOOK AUTHORS: Beauheim, Richard Louis
BOOK TITLE: The effects of dredging on groundwater-lake interactions at Lilly Lake, Wisconsin.
PUBLICATION YEAR: 1980
DESCRIPTORS: ammonia-ion; chemical-composition; chloride-ion; discharge-; dredging-; engineering-geology; environmental-geology; glacial-features; Great-Lakes-region; ground-water; hydrogeology-; kettles-; lakes-; Lilly-Lake; North-America; surveys-; United-States; Wisconsin-

AUTHORS: Bluemel, W.; Tamminga, P. G.
TITLE: Water permeability of dredged mud.
BOOK TITLE: In: Groundwater effects in geotechnical engineering--Les actions de l'eau souterraine en geotechnique.
BOOK AUTHORS: Hanrahan, E. T. (editor); Orr, T.L.L. (editor); Widdis, T.F. (editor)
SOURCE: Proceedings of the European Conference on Soil Mechanics and Foundation Engineering = Comptes Rendus du Congres Europeen de Mecanique des Sols et des Travaux de Fondations. 9, Vol. 2; Pages 545-548. 1987.
PUBLISHER: A. A. Balkema. Rotterdam, Netherlands. 1987.
PUBLICATION YEAR: 1987
DESCRIPTORS: Central-Europe; consolidation-; dredging-; engineering-geology; Europe-; Germany-; ground-water; hydrogeology-; laboratory-studies; materials,-properties; permeability-; settlement-; soil-mechanics; stability-; surveys-; West-Germany

AUTHORS: Bogardi, I.; Kelly, W.E.; Bardossy, A.; Stakhiv, E.Z.
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BOOK TITLE: In: Proceedings of the international conference on water pollution control in the Basin of the River Danube.
BOOK AUTHORS: Miloradov, Milorad (editor)
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PUBLISHER: Pergamon. Oxford-New York, International. 1990.
PUBLICATION YEAR: 1990
DESCRIPTORS: cost-; Danube-River; drainage-basins; dredging-; environmental-geology; Europe-; pollution-; risk-assessment; sedimentation-; surveys-; transport-; waste-disposal

AUTHORS: Bosma, W.; Ho Len Fat, A.G.; Welter, C.C.
TITLE: Minerals and mining in Suriname.
SOURCE: Geologisch Mijnbouwkundige Dienst van Suriname Mededeling. 3; Pages 71-101. 1973.
PUBLISHER: Geologisch Mijnbouwkundige Dienst van Suriname. Paramaribo, Surinam. 1973.
PUBLICATION YEAR: 1973
DESCRIPTORS: alluvium-; aquifers-; bauxite-; chromite-; clastic-sediments; clays-; construction-materials; copper-; diamonds-; distribution-; economic-geology; gold-; granites-; gravel-; ground-water; igneous-rocks; industrial-minerals; iron-; manganese-; maps-; metals-; mineral-resources; nickel-; oxides-; pegmatite-; petroleum-; petroleum-exploration; placers-; plutonic-rocks; production-; reserves-; resources-; sand-; sediments-; South-America; Surinam-; tantalum-; tin-; water-quality; water-resources

Authors: Bromhead, J. C.; Beckwith, P.
Title: Environmental Dredging on the Birmingham Canals: Water Quality and sediment Treatment.
Journal: Journal of Water and Environmental Management August 01, vol.8, no.4, Pages 350-359. 1994.

AUTHORS: Carstea, Dumitru; Motta, Dominic; Metzger, Robert
TITLE: Sand and gravel resources in Prince George's County, M.D.; planning, protection, extraction and regulatory impacts.
BOOK TITLE: In: Proceedings; 1991 national symposium on mining.
BOOK AUTHORS: Graves, Donald H. (editor); De Vore, R. William (editor)
SOURCE: UKY Bulletin. 1991; Pages 27-36. 1991.
PUBLISHER: University of Kentucky, Office of Engineering Services. Lexington, KY, United States. 1991.
PUBLICATION YEAR: 1991
DESCRIPTORS: Brandywine-Formation; gravel-deposits; hydrology-; legislation-; Maryland-; mining-geology; Patuxent-Formation; planning-; pollution-; Prince-Georges-County-Maryland; sands-; United-States; water-quality

AUTHORS: Criss, R.E.; Davisson, M.L.
TITLE: Isotopic imaging of surface water/ groundwater interactions, Sacramento Valley, California.
SOURCE: Journal of Hydrology. 178; 1-4, Pages 205-222. 1996.
PUBLISHER: Elsevier. Amsterdam, Netherlands. 1996.
PUBLICATION YEAR: 1996
ABSTRACT: Groundwater isotope data across the Sacramento Valley, California establish two types of groundwater mining: (1) overdraft of ancient groundwater with limited recharge by surface waters, producing cones of depression; (2) ancient groundwater withdrawal followed by rapid recharge of irrigation water, reducing groundwater quality. The first type occurs in the Sacramento metropolitan area, where meteoric runoff is unnaturally high and 40 years of pumping have depressed water levels to 25 m below sea-level, inducing recharge from losing reaches of the Sacramento and American rivers. Lateral migration rates are quantified by the binary mixing between river water ($\delta^{18}O = -10.8$) and natural groundwater ($\delta^{18}O = -7.0$). The

second type of mining occurs in agricultural regions to the west, where (super 14) C ages indicate that irrigation waters constitute more than 80% of modern recharge. This recharge has several characteristics of evaporated irrigation water, including: (1) high delta (super 18) O values (to >-6.0) that define closed contour patterns; (2) elevated NO (sub 3) concentrations (to 100 ppm); (3) low (super 14) C ages of less than 500 years. Stable isotope contours, augmented by (super 14) C data, provide dynamic recharge patterns in this profoundly disturbed, giant alluvial aquifer. On a large scale (>100 km (super 2)), the lateral permeabilities of alluvial aquifers are essentially isotropic, whereas on a smaller scale (<25 km (super 2)), anisotropy is evident and isotope values can be geographically complex and seasonally transient. Groundwater flow patterns implied by the isotope data can differ substantially from steady-state models based on head measurements.

DESCRIPTORS: absolute-age; alluvium-aquifers; aquifers-; C-14; California-; carbon-; Cenozoic-; Central-California; D-H; dates-; deuterium-; evaporation-; ground-water; Holocene-; hydrogen-; hydrologic-cycle; hydrology-; irrigation-; isotope-ratios; isotopes-; levels-; movement-; O-18-O-16; oxygen-; Quaternary-; radioactive-isotopes; recharge-; runoff-; Sacramento-California; Sacramento-County-California; Sacramento-Valley; Solano-County-California; stable-isotopes; surface-water; United-States; upper-Holocene; Yolo-County-California

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AUTHORS: Davis, Wayne S.; Denbow, Thomas J.
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SOURCE: Journal - Water Pollution Control Federation. V.60; no.6, Pages 1077-1088. 1988.
PUBLISHER: Water Pollution Control Federation. Washington, DC, USA. 1988.
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Title: Students See Green Potential in Quarried Land.
Journal: Rock Products
March, Pages 35-36. 1997.

AUTHORS: Doucette, Richard C.; Mathewson, Christopher C.
TITLE: The unpredictable impact of surface mining on ground-water quality.
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PUBLICATION YEAR: 1994
DESCRIPTORS: aquifers-; chloride-ion; confined-aquifers; dissolved-materials; drawdown-; ground-water; Gulf-Coastal-Plain; impacts-; levels-; manganese-; metals-; mining-; monitoring-; movement-; observation-wells; pollutants-; pollution-; saturation-; surface-mining; water-quality; wells-

AUTHOR(s): Edwards, S. C., Williams, T. P., Lester, J. N.
TITLE(s): The Success of Elutriate Tests in Extended Prediction of Water Quality After a Dredging Operation Under Freshwater and Saline Conditions.
Journal: Environmental monitoring and assessment. JUN 01 1995 v 36 n 2
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AUTHORS: Foerstner, Ulrich
TITLE: Contaminated sediments as carriers and sources of groundwater pollution.
BOOK TITLE: In: Groundwater contamination and control.
BOOK AUTHORS: Zoller, Uri (editor)
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BOOK TITLE: In: Contaminated soil '93; Fourth international KfK/TNO conference on Contaminated soil.
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TITLE(s): Revegetated Sand Mining Areas, Swamp Wallabies and Remote Sensing.
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AUTHORS: Hunt, David L.; Moody, Judith B.; Smith, Geoffrey W.
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Holdings: KU owns 1977-

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BOOK TITLE: In: Water for the Human Environment (edited by Chow, V. T., et
al.); Vol. 4, Special sessions; Water pollution.
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PUBLICATION YEAR: 1973
DESCRIPTORS: Canada-; diking-; distribution-; dredging-; engineering-
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pollution-; United-States; water-; waterways-

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January, Pages 48-50. 1990.

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groundwater basin, Victoria.
BOOK TITLE: In: Collected case studies in engineering geology, hydrogeology
and environmental geology.
BOOK AUTHORS: Knight, Michael J. (editor); Minty, E.J. (editor);
Smith, Robert. B.(editor)
COLLECTION TITLE: In the collection: Special publication, Geological Society,
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PUBLICATION YEAR: 1983
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Childers-Formation; discharge-; dredging-; drilling-; French-Island; ground-
water; histograms-; hydraulic-conductivity; hydrogeology-; hydrographs-; pump-

tests; salt-water-intrusion; statistical-analysis; surveys-; transmissivity-;
Tyabb-region; Victoria-Australia; water-quality; Western-Port-Basin

BOOK AUTHORS: Lakey, R.; Tickell, S.J.
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DESCRIPTORS: aquifers-; Australasia-; Australia-; drawdown-; dredging-;
ground-water; hydrodynamics-; hydrogeology-; Koo-Wee-Rup; salt-water-intrusion;
surveys-; Tyabb-; Victoria-Australia; Westernport-Basin-groundwater

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June, Pages 66-70. 1989.

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contaminant release at dredging sites.
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DESCRIPTORS: analysis-; Black-Rock-Harbor; Calumet-Harbor; chemical-
analysis; Connecticut-; dredging-; Duwamish-River; elutriate-test; Illinois-;
James-River; metals-; models-; pollutants-; pollution-; sediments-; toxic-
materials; United-States; Virginia-; Washington-; water-; water-quality

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JOURNAL: The professional geologist.
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AUTHORS: MacDonald, Anne
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BOOK TITLE: In: Hydraulic engineering; proceedings of the 1988 national conference.
BOOK AUTHORS: Abt Steven, R. (editor); Gessler, Johannes (editor)
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PUBLISHER: Am. Soc. Civ. Eng.. New York, NY, United States. 1988.
PUBLICATION YEAR: 1988
DESCRIPTORS: bedload-; channels-; Connecticut-; dredging-; engineering-geology; floods-; gravel-deposits; mining-; Naugatuck-River; sedimentation-; stream-transport; transport-; United-States; water-quality; waterways-; western-

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TITLE(s): Arthropods as indicators of the effects of fluoride pollution on the succession following sand mining.
Journal: The Journal of applied ecology.
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Title: Evaluating the effects of reclamation on surface water quality in the Montgomery Creek watershed.
Journal: International Journal of Surface Mining, Reclamation and Environment
Vol.9, no.4, Pages 155-160. 1995.

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BOOK TITLE: In: Proceedings of the Fifth national symposium on aquifer restoration and ground water monitoring.
BOOK AUTHORS: Anonymous
SOURCE: Pages 43-48. 1985.
PUBLISHER: Natl. Water Well Assoc.. Worthington, OH, United States. 1985.
PUBLICATION YEAR: 1985
DESCRIPTORS: aquifers-; Biscayne-Aquifer; carbonate-rocks; clastic-sediments; discharge-; drinking-water; environmental-geology; Florida-; Floridan-Aquifer; gravel-; ground-water; irrigation-; karst-hydrogeology; legislation-; limestone-; mining-; monitoring-; policy-; pollution-; sand-; sedimentary-rocks; sediments-; strip-mining; surface-mining; surveys-; United-States; waste-disposal; water-quality

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Title: Geochemical processes controlling selenium in ground water after mining, Powder River Basin, Wyoming, U.S.A.
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Journal: Bulletin of Faculty of Engineering, the Universi
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groundwater plume and in downstream surface waters in the
Coeur d'Alene Mining District, Idaho, U.S.A.
JOURNAL: Applied geochemistry : journal of the internati
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Holdings: KU owns 1990-

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TITLE(s): Hydrogeochemical effects of groundwater mining of the Sierra de
Crevillente Aquifer (Alicante, Spain).
JOURNAL: Environmental geology
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Holdings: KU owns 1993-

Author: Reavell, P. E.
Title: The effect of dredging on light penetration in the Boro River,
Okavango Delta, Botswana, from 1972-1975.
Journal: Water SA
April, Vol.23, No.2, Pages 109-114. 1997.

AUTHOR(S): Rosner, U.
TITLE(s): Effects of historical mining activities on surface water and
groundwater - an example from northwest Arizona.
JOURNAL: Environmental geology
MAR 01 1998 v 33 n 4
Page: 224

BOOK AUTHORS: Roth, Tracy L.
BOOK TITLE: Agricultural chemical transport to shallow groundwater in a
tile- drained, flood-irrigated field.
PUBLICATION YEAR: 1996
DEGREE GRANTED: Master's
DEGREE GRANTING INSTITUTION: New Mexico Institute of Mining and Technology.
Socorro, NM, United States. Pages: 166.
ABSTRACT: The Las Nutrias Groundwater Project was initiated in 1991 to
address the impacts to shallow groundwater quality associated with agricultural
practices typical of New Mexico. The field site is located on a commercial farm
in the middle Rio Grande Valley and is characterized by alluvial floodplain
soils with moderate drainage capabilities. A tile drain system is installed 4-6
ft below ground surface. Data collected over at least one growing season from

this system is being used to validate a 2-dimensional, variably saturated water flow and solute transport model. The current study focuses on the mass loss of nitrogen fertilizers to the shallow groundwater as well as the development of a conceptual model to describe nutrient transport in the unsaturated zone. In order to achieve the above objectives, extensive soil samples and tile drain groundwater samples were taken during a time period from August 1993 to May 1995. The soil samples were taken prior to the 1994 and 1995 growing seasons and were located along a transect going 38 m North and South from an instrumented tile drain line at varying depths down to the capillary fringe. These samples were analyzed for nitrate-nitrogen concentration to determine the mass loss of nitrate-nitrogen from the soil profile during the 1994 growing season. Tile drain line water samples were taken to accommodate water input events; water samples were also taken approximately twice per month from monitoring wells and piezometers located around the field site. The soil sampling results revealed that an excessive amount (164 mg/l mean nitrate-nitrogen concentration) of soil water nitrate-nitrogen existed within the soil profile prior to the 1994 growing season. Twenty percent of this amount existed just prior to the 1995 growing season. During the 1994 irrigation season (1 March-31 October), water input events caused rapid transport of nitrate-nitrogen to the tile drain line, indicating the occurrence of preferential flow mechanisms. Electrical conductivity and chloride concentration measurements showed a similar response. Many times, the EPA maximum contaminant level of 10 mg/l nitrate-nitrogen was exceeded. From the tile flow and nitrate concentration measurements and from estimates of evapotranspiration, a nitrate-nitrogen mass loss from the soil to the shallow groundwater of approximately 30-50% was estimated to have occurred during the 1994 growing season.

DESCRIPTORS: agriculture-; agrochemicals-; fertilizers-; ground-water; irrigation-; Las-Nutrias-Groundwater-Project; New-Mexico; nitrate-ion; nitrogen-; nutrients-; pollutants-; pollution-; Rio-Grande-Valley; soil-profiles; soil-sampling; soils-; solute-transport; theoretical-models; transport-; United-States; unsaturated-zone; water-quality

AUTHORS: Rutledge, A.T.

TITLE: Comparisons of ground-water quality in selected land use areas, Central Florida.

BOOK TITLE: In: Selected papers in the hydrologic sciences, 1988-92.

BOOK AUTHORS: Subitzky, Seymour (editor)

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PUBLISHER: U. S. Geological Survey. Reston, VA, United States. 1992.

PUBLICATION YEAR: 1992

DESCRIPTORS: agriculture-; Bartow-Florida; Central-Florida; Florida-; ground-water; hydrochemistry-; land-use; Marion-County-Florida; mining-; Ocala-National-Forest; Orange-County-Florida; Polk-County-Florida; statistical-analysis; United-States; USGS-; water-quality; Windermere-Florida

REPORT NUMBER: W 2340

AUTHORS: Rutledge, A. T.; German, E. R.

TITLE: Statistical comparisons of ground-water quality underlying different land uses in Central Florida.

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SOURCE: Abstracts of Papers - American Chemical Society, National Meeting. 196; Pages ENVR 13. 1988.

PUBLISHER: American Chemical Society. Washington, DC, USA. 1988.

PUBLICATION YEAR: 1988

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TITLE(s): Mining Law - Gravel Extraction - Is Local Control Over Small Gravel Mining The Best Road for Regulation? River Springs Commissioners, 899 P.2d 1329 (Wyo. 1995).
JOURNAL: Land and water law review.
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Holdings: KU owns -

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AUTHORS: Seeley, John B.; Senden, Tim J.
TITLE: Alluvial gold in Kalimantan, Indonesia; a colloidal origin?.
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BOOK AUTHORS: van Leeuwen, Theo M. (editor); Hedenquist, J.W. (editor); James, L.P. (editor); Dow, J.A.S. (editor)
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PUBLISHER: Elsevier. Amsterdam-New York, International. 1994.
PUBLICATION YEAR: 1994
ABSTRACT: Extensive placer gold deposits occur in Quaternary palaeochannels in the Ampalit and Cempaga Buang drainage basins near Kasongan, Central Kalimantan, Indonesia. Broad interfluvial Pleistocene terraces surrounding the drainages also contain significant amounts of placer gold. The "channel" and "terrace" gold deposits together cover an area in excess of 180 km (super 2) . Exploration for gold at Ampalit followed traditional alluvial methods, and assumed that mechanical and gravitational factors were the principal mechanisms affecting gold accumulation and concentration. Gold was considered to be physically reworked from terraces and redeposited in the present drainage channels or underlying, laterally displaced, palaeochannels. However, a comparison of gold grains from the Ampalit drainage channel and adjacent terraces indicates that gold grains in the drainage channels are possibly of colloidal origin and not mechanically transported to their present domain. The morphology of gold grains from the Ampalit drainage is compared with grains from adjacent terraces, using scanning electron microscopy and atomic force microscopy. The latter procedure allows for nondestructive analysis to give true three dimensional surface topography down to nanometre resolution. Evidence from force microscopy supports a colloidal origin for gold aggregates. The average purity of gold produced from the Ampalit dredging operation is 970 fine (970/1000) and the majority of examined gold grains extracted from beneath the drainage channel have a purity of 998 fine. This

unusually high degree of purity suggests a selective dissolution/aggregation mechanism. We propose that gold is transported downward and laterally in groundwater percolating through the terrace sands and gravels to the current drainage as a humic acid-stabilised colloid. As the pregnant groundwater migrates toward the present drainage channels, it encounters a steep chemical gradient and the colloid aggregates. The aggregation process occurs near clay zones within palaeochannel sands and gravels beneath the present river sediments. Here the colloidal aggregates form small grains (usually <1 mm) of extremely high purity. Today, the inherently unstable gold deposits at Ampalit are in a state of both aggregation and dissolution. Identification of low energy zones, location of point bar lags in palaeo and recent drainage channels, and the extrapolation of areas of low energy are not solely valid as exploration guides for gold accumulation in this environment. Exploration methods that also recognise ground water migration and composition, and the geochemical controls of dissolution and aggregation, will improve the ability to identify ore accumulations, thus contributing to improved economics of mining these deposits.

DESCRIPTORS: alluvium-; Ampalit-Deposit; Asia-; Borneo-; Cempaga-Buang-Deposit; Cenozoic-; clastic-sediments; colloidal-materials; Dahor-Formation; discoveries-; Far-East; gold-ores; history-; Indonesia-; Kalimantan-Indonesia; Malay-Archipelago; metal-ores; Quaternary-; sediments-

AUTHORS: Shope, Steven B.
TITLE: Potential impacts of below water table sand and gravel mining operations on ground water quantity.
BOOK TITLE: In: Proceedings of the FOCUS conference on Eastern regional ground water issues.
BOOK AUTHORS: Anonymous
SOURCE: Ground Water Management. 3; Pages 361-372. 1990.
PUBLISHER: Water Well Journal Pub. Co.. Dublin, OH, United States. 1990.
PUBLICATION YEAR: 1990
DESCRIPTORS: aquifers-; effects-; environmental-geology; ground-water; hydrogeology-; land-use; mining-; monitoring-; New-Hampshire; United-States; water-quality; water-table

AUTHOR(s): Spadaro, P. A., Templeton, D. W., Hartman, G.L.
TITLE(s): Predicting water quality during dredging and disposal of contaminated sediments from the Sitcum Waterway in Commencement Bay, Washington, USA.
Journal: Water science and technology.
1993 v 28 n 8 / 9
Page: 237
Holdings: KU owns 1981-

BOOK AUTHORS: Spruill, Timothy B.
BOOK TITLE: Assessment of water resources in lead-zinc mined areas in Cherokee County, Kansas, and adjacent areas.
SOURCE: U.S. Geological Survey Water-Supply Paper. 1987.
PUBLISHER: U.S. Geological Survey. Reston, VA, United States. Pages: 68.
PUBLICATION YEAR: 1987
ABSTRACT: Discontinuities and perforations in the confining shale west of the Pennsylvanian-Mississippian contact in Cherokee County, Kans., and adjacent areas were produced by lead-zinc mining and have created a potential

contamination hazard to water supplies. The principal effects of abandoned mines on ground-water quality are lowered pH and increased concentrations of sulfate and trace metals of water in the mines. Similar effects on streamwater quality were observed in Short and Tar creeks in Kansas.

DESCRIPTORS: abandoned-mines; Cherokee-County-Kansas; clastic-rocks; dissolved-materials; economic-geology; environmental-geology; geochemistry-; ground-water; hydrology-; Kansas-; lead-zinc-deposits; levels-; metal-ores; metals-; mines-; pH-; pollution-; potentiometric-surface; recharge-; sedimentary-rocks; shale-; Short-Creek; southeastern-Kansas; sulfate-ion; surface-water; surveys-; Tar-Creek; trace-elements; trace-metals; United-States; USGS-; water-quality; water-resources

REPORT NUMBER: W 2268

AUTHORS: Stern, Virginia A.
TITLE: Gravel mining and ground water vulnerability; minimizing the risks to groundwater quality.
BOOK TITLE: In: Proceedings from the technical sessions of the regional conference on Nonpoint source pollution; the unfinished agenda for the protection of our water quality.
BOOK AUTHORS: Anonymous
SOURCE: Report - Washington State University, Water Research Center. Pages 381-389. 1991.
PUBLISHER: Washington State University, Washington Water Research Center. Pullman, WA, United States. 1991.
PUBLICATION YEAR: 1991
DESCRIPTORS: clastic-sediments; controls-; effects-; gravel-; ground-water; hydrogeology-; mining-; production-; quarries-; sediments-; United-States; Washington-; water-quality
REPORT NUMBER: 78

AUTHORS: Thorpe, H.R.
TITLE: Alluvial gold dredging; a case study of effects on groundwater turbidity.
SOURCE: Institution of Mining and Metallurgy, Transactions, Section B: Applied Earth Science. 106; Pages 24-30. 1997.
PUBLISHER: Institution of Mining and Metallurgy. London, UK. 1997.
PUBLICATION YEAR: 1997
DESCRIPTORS: alluvial-fans; Australasia-; dredging-; effects-; gold-ores; Grey-River; ground-water; mathematical-models; metal-ores; mining-; mining-geology; New-Zealand; South-Island; suspended-materials; turbidity-; water-quality

AUTHORS: Thompson, D. R.
TITLE: Surface and subsurface mining; policy implications.
BOOK TITLE: In: Public policy on ground water quality protection; proceedings of a national conference at Virginia Polytechnic Institute and State University.
BOOK AUTHORS: Kerns, W.R. (editor)
SOURCE: Pages 22-29. 1977.
PUBLISHER: Va. Polytech. Inst. and State Univ.. Blacksburg, Va., USA. 1977.
PUBLICATION YEAR: 1977

DESCRIPTORS: acid-mine-drainage; environmental-geology; evaluation-;
ground-water; legislation-; mining-geology; Pennsylvania-; policy-; pollution-;
United-States; water-; water-quality

AUTHORS: Tinlin, R. M.; Meyer, C. F.; Kleinecke, D. C.
TITLE: Monitoring Groundwater Quality.
SOURCE: Mining Engineering. 25; 8, Pages 32. 1973.
PUBLISHER: Society for Mining, Metallurgy, and Exploration. Littleton,
CO, United States. 1973.
PUBLICATION YEAR: 1973
DESCRIPTORS: environmental-geology; ground-water; mining-geology;
monitoring-; pollution-; United-States

Authors: Twigg, Laurie E.; Fox, Barry J.; Jia, Luo
Title: The modifies primary succession following sand mining: A validation
of the use of chronosequence analysis.
Journal: Australian Journal of Ecology
December 01, vol.14, no.4, Pages 441-447. 1989.

AUTHORS: Verruijt, A.; Elprama, R.; van Tol, A.F.
TITLE: The development of a fresh water lens below a deposit of
polluted spoil.
BOOK TITLE: In: Groundwater effects in geotechnical engineering--Les actions
de l'eau souterraine en geotechnique.
BOOK AUTHORS: Hanrahan, E.T. (editor); Orr, T.L.L. (editor); Widdis,
T.F. (ed.)
SOURCE: Proceedings of the European Conference on Soil Mechanics and
Foundation Engineering = Comptes Rendus du Congres Europeen
de Mecanique des Sols et des Travaux de Fondations. 9,
Vol. 1; Pages 347-350. 1987.
PUBLISHER: A.A. Balkema. Rotterdam, Netherlands. 1987.
PUBLICATION YEAR: 1987
DESCRIPTORS: controls-; dredging-; engineering-geology; environmental-
geology; Europe-; feasibility-studies; fines-; ground-water; harbors-;
hydrogeology-; Netherlands-; pollution-; Rotterdam-; surveys-; waste-disposal;
waterways-; Western-Europe

AUTHOR(s): Viswanathan, M.N.
TITLE(s): Mineral sand mining and its effect on groundwater quality.
Journal: Water science and technology.
1990 v 22 n 6
Page: 95
Holdings: KU owns 1981-

AUTHORS: Viswanathan, M. N.
TITLE: Mineral sand mining and its effect on groundwater quality.
BOOK TITLE: In: Contaminants in the subsurface environment; proceedings of
the International symposium on Processes governing the movement
and fate of contaminants in the subsurface environment.
BOOK AUTHORS: McCarthy, P.L. (editor); Roberts, P.V. (editor)
SOURCE: Water Science and Technology. 22; 6, Pages 95-100. 1990.
PUBLISHER: Pergamon. Oxford-New York, International. 1990.

PUBLICATION YEAR: 1990

DESCRIPTORS: aquifers-; Australasia-; Australia-; biodegradation-; coastal-environment; environmental-geology; ground-water; iron-; metals-; mining-; New-South-Wales-Australia; pollution-; sands-; solution-mining; sulfates-; surveys-; Tomago-sandbeds; unconfined-aquifers; water-quality; water-treatment

AUTHOR(S): Walker, H. Jesse
TITLE(s): Environmental Impact of River Dredging in Arctic Alaska (1981-89).
JOURNAL: Arctic.
JUN 01 1994 v 47 n 2
Page: 176

Author: Weaver, Bronwyn
Title: The importance of a baseline.
Journal: Pit & Quarry
April, Page 43. 1995.

AUTHORS: Werner, Sanford L.; Fergusson, Jack S., Jr.
TITLE: Report on seawater intrusion from future dredging operations, Los Angeles Harbor 2020 Project, California.
BOOK TITLE: In: Diversity in engineering geology and groundwater resources.
BOOK AUTHORS: Parsons, Jim (chairperson); Bieber, Dave (chairperson); Kretsinger, Vicki (chairperson); Garcia, Susan (chairperson)
SOURCE: Annual Meeting - Association of Engineering Geologists. 38, Program; Pages 66. 1995.
PUBLISHER: Association of Engineering Geologists. [location varies], United States. 1995.
PUBLICATION YEAR: 1995
DESCRIPTORS: aquifers-; California-; dredging-; future-; ground-water; Los-Angeles-California; Los-Angeles-County-California; Los-Angeles-Harbor-2020-Project; salt-water-intrusion; Southern-California; United-States

BOOK AUTHORS: Wilson, John L.; Linderfelt, William R.
BOOK TITLE: Groundwater quality in pumping wells located near surface water bodies.
SOURCE: Technical Completion Report. 1991.
PUBLISHER: New Mexico Water Resources Research Institute, in cooperation with Geoscience Dept. and Geophysical Research Center, New Mexico Institute of Mining and Technology. Las Cruces, NM, United States. Pages: 137. 1991.
PUBLICATION YEAR: 1991
DESCRIPTORS: capture-zones; controls-; ground-water; infiltration-; pumping-; three-dimensional-models; water-quality
REPORT NUMBER: 261

Author: Witkowsky, Daniel S.
Title: Implementing pollution prevention.
Journal: Pit & Quarry
May, Pages 18-19. 1996.

AUTHORS: Yehdegho, B., Rozanski, K.; Zojer, H.; Stichler, W.
TITLE: Interaction of dredging lakes with the adjacent groundwater field; an isotope study.
SOURCE: Journal of Hydrology. 192; 1-4, Pages 247-270. 1997.
PUBLISHER: Elsevier. Amsterdam, Netherlands. 1997.
PUBLICATION YEAR: 1997
ABSTRACT: The paper presents the results of a study aimed at determining the water balance of small dredging lakes located in the temperate climatic zone (southern Austria) and their impact on the adjacent groundwater field using heavy stable isotopes of water, deuterium and oxygen-18. The isotope method of determining water balance of groundwater-controlled lakes was examined in some detail using the field data collected during this study. The calculations performed for different sets of input data revealed that the approach recommended in the literature, i.e. the use of oxygen-18 data, the air-based temperatures and the mean isotopic composition of evaporation flux calculated from the annual mean isotopic composition of precipitation assuming isotope equilibrium at the ground-level temperature, may lead to groundwater inflow rates which are underestimated by as much as 40%. The isotope-mass balance calculations performed independently for deuterium and oxygen-18 data can be reconciled within the overall uncertainty of the method, when the surface water temperature of a lake (with relative humidity adjusted accordingly) is used instead of ground-level air temperature, and the isotopic composition of the evaporation flux is adequately averaged, taking into account the seasonal variability of this flux for the given lake system. The sensitivity analysis of the isotope-mass balance calculations performed for the studied lake system suggests that the critical parameter for the overall accuracy of the method is the isotopic composition of the lake water and, to a lesser extent, of the subsurface inflow, in cases where the isotope enrichment of lake water is relatively small. In the studied case this enrichment reached only about 20% of the isotopic composition of the input. In general, the use of isotope-mass balance for determining subsurface inflow and outflow rates to dredging lakes would require a rather extensive monitoring of isotope and hydrological parameters of the studied system, performed on a monthly basis for at least one full hydrological year. The isotope and geochemical data gathered in the present study were used to derive mixing proportions of lake water with the downgradient groundwater field. The plume of the lake water could be traced up to about 4km from the lakes, along the general direction of groundwater flow.
DESCRIPTORS: annual-variations; artificial-lakes; Austria-; case-studies; Central-Europe; D-H; deuterium-; dredging-lakes; Europe-; geochemical-indicators; geochemistry-; ground-water; hydrochemistry-; hydrogen-; hydrologic-cycle; hydrology-; isotope-ratios; isotopes-; lakes-; land-use; limnology-; mass-balance; monthly-variations; O-18-O-16; oxygen-; recreation-; seasonal-variations; sensitivity-analysis; stable-isotopes; temperate-environment; water-balance

BOOK AUTHORS: Yu, Y. K.
BOOK TITLE: Groundwater pollution potential of confined land disposal of dredged material.
PUBLICATION YEAR: 1979
DESCRIPTORS: Alabama-; case-studies; dredging-; ground-water; Michigan-; New-Jersey; pollutants-; pollution-; Texas-; toxic-materials; United-States; waste-disposal; water-; water-quality

Titles of Articles Only, No Author Listed in Citation

TITLE(s): Aggregate Mining in River Systems.
JOURNAL: California geology.
APR 01 1989 v 42 n 4
Page: 85
Holdings: KU owns 1971-1994

TITLE(s): Groundwater monitoring.
JOURNAL: Mining environmental management.
JUL 01 1998 v 6 n 4
Page: 13
Not owned at KU or KU Med Ctr

TITLE(s): Understanding the Water Quality of Pit Lakes.
ABSTRACT: As deep-pit metal mining increases across western North America, concerns are being raised about the environmental impact of these mines on water resources once the mines close and fill with groundwater. Glenn Miller and colleagues examine the unique processes involved in pit lake water quality that make prediction a complex task.
JOURNAL: Environmental science & technology
MAR 01 1996 v 30 n 3
Page: 118A
Holdings: KU owns 1967-

TITLE: Buffalo River Dredging Demonstration. Final rept.
CORPORATE SOURCE: Performer: Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.
REPORT DATE/PAGINATION: Feb 96. 333p.
NTIS PRICE CODES: PC A16/MF A03
MINOR DESCRIPTORS: Metals-; Water-flow; Toxic-hazards; Polyelectrolytes-; Toxicity-; New-york; Slurries-; Flow-rate; Contaminants-; Rivers-; Pumps-; Water-quality; Channels-Waterways; Earth-handling-equipment; Flocculation-.
MAJOR DESCRIPTORS: *Sediment-transport; *Water-pollution; *Suspended-sediments; *Dredging-.
ABSTRACT: The Corps of Engineers Buffalo District conducted a demonstration of equipment for dredging contaminated sediments. Several thousand cubic yards of sediment were removed from outside the Buffalo River Federal navigation channel limits using three dredge types: (1) open bucket, (2) enclosed bucket, and (3) submersible pump. The effectiveness of a silt screen deployed downstream of the dredge to reduce suspended sediment transport was also evaluated. Extensive sediment and water column monitoring and sampling were conducted during the 2-week demonstration as part of the effort to determine sediment resuspension rates and contaminant releases associated with the dredging operations. Water column samples were analyzed for total suspended solids, total organic carbon, PCBs, PAHs, metals, ammonia, and pH. A water column bioassay test using *Daphnia magna* was also performed to assess toxicity effects of the dredging operation. Results of this study were used to assess and refine techniques and laboratory tests that have been previously developed by the Corps of Engineers to predict sediment resuspension rates and contaminant releases. In another phase of the

study, the Bureau of Mines demonstrated the use of polyelectrolytes for rapid removal of suspended solids from a dilute dredged material slurry.

REPORT NUMBER: WESTREL962

TITLE: Sediment-Water Interactions and Their Effects Upon Water Quality. (Latest citations from the NTIS Bibliographic Database). Published Search.

CORPORATE SOURCE: Performer: NERAC, Inc., Tolland, CT.
Funder: National Technical Information Service, Springfield, VA.

REPORT DATE/PAGINATION: Sep 95. P.

DESCRIPTIVE NOTE: Updated with each order. Supersedes PB95-854055. Sponsored in part by National Technical Information Service, Springfield, VA.

NTIS PRICE CODES: PC N01/MF N01

MINOR DESCRIPTORS: Rivers-; Water-chemistry; Sediment-transport; Contaminants-; Toxicity-.

MAJOR DESCRIPTORS: *Bibliographies-; *Water-quality; *Water-pollution; *Fresh-water.

MAJOR IDENTIFIERS: *Sediment-water-interactions; *Contaminated-sediments.

ABSTRACT: The bibliography contains citations concerning the testing and evaluation of fresh-water sediments. Citations discuss assessment and remediation of contaminated sediments, monitoring systems, sediment transport, water pollution effects, water traffic, habitats and fisheries, and the effect of dredging operation. National programs, acts, regulations, and criteria are examined. (Contains 50-250 citations and includes a subject term index and title list.) (Copyright NERAC, Inc. 1995)

TITLE: Dredging: Environmental Aspects. (Latest citations from the NTIS Bibliographic Database). Published Search.

CORPORATE SOURCE: Performer: NERAC, Inc., Tolland, CT.
Funder: National Technical Information Service, Springfield, VA.

REPORT DATE/PAGINATION: Aug 95. P.

DESCRIPTIVE NOTE: Updated with each order. Supersedes PB84-864370. Sponsored in part by National Technical Information Service, Springfield, VA.

NTIS PRICE CODES: PC N01/MF N01

MINOR DESCRIPTORS: Sediments-; Earth-fills; Containment-; Dredged-materials; Solid-waste-disposal; Ocean-waste-disposal; Dredge-spoil.

MAJOR DESCRIPTORS: *Bibliographies-; *Dredging-; *Water-pollution.

ABSTRACT: The bibliography contains citations concerning various environmental aspects of dredging and dredge spoil handling. The studies include the use of spoil sites, pollution control, effects on water quality, and sediment transport. Dredging operations at specific sites are discussed. Biological effects are included in a companion bibliography. (Contains 50-250 citations and includes a subject term index and TITLE list.)

TITLE: Contaminant Modeling. Environmental Effects of Dredging. Technical note.

CORPORATE SOURCE: Performer: Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.

REPORT DATE/PAGINATION: Mar 88. 6p.

NTIS PRICE CODES: PC A02/MF A01

MINOR DESCRIPTORS: Water-quality; Toxic-hazards; Environmental-impact; Dredging-; Sediments-.

MAJOR DESCRIPTORS: *Contaminants-; *Dredged-materials; *Hydraulic-models.

ABSTRACT: This note provides initial information on contaminant models that are potentially applicable to situations where the presence of toxic materials in sediments complicates Corps of Engineers (CE) dredging activities.

REPORT NUMBER: WESTNELEEDP0111

TITLE: Long-Term Dredged Material Management Plan Within the Context of Maumee River Watershed Sediment Management Strategy. Phase 1. Final rept.

CORPORATE SOURCE: Performer: Corps of Engineers, Buffalo, NY. Buffalo District.

REPORT DATE/PAGINATION: Mar 93. 175p.

NTIS PRICE CODES: PC A08/MF A02

MINOR DESCRIPTORS: Reduction-; Confined-environments; Rivers-; Watersheds-; Waste-management; Water-quality; Sediments-; Channels-Waterways.

MAJOR DESCRIPTORS: *Waste-disposal; *Dredging-.

ABSTRACT: This technical report draws several preliminary conclusions about the investigations needed to develop specific management options. It recommends moving ahead to the Phase 2 Study to address these options that would meet the goals of sediment load reduction, improvement in sediment and water quality, beneficial uses of the material, and a reduced dependency on construction of new Confined Disposal Facilities (CDF).

TITLE: Environmental Effects of Dredging. A Method for Calculating Chemical Loading Rates in Riverine Wetland Systems. Technical note.

CORPORATE SOURCE: Performer: Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.

REPORT DATE/PAGINATION: May 89. 10p.

NTIS PRICE CODES: PC A02/MF A01

MINOR DESCRIPTORS: Computer-programs; Data-processing; Water-flow; Chemical-contamination; Hydrology-; Regression-analysis; Environmental-impact; Water-pollution; Mass-flow; Stratification-; Concentration-Chemistry; Streams-; Water-chemistry.

MAJOR DESCRIPTORS: *Rivers-; *Wetlands-.

ABSTRACT: This note describes the application of FLUX to riverine wetland systems. FLUX is a computer program designed to estimate tributary mass discharges (loadings) into reservoirs. The program uses periodic concentration data and continuous flow records to estimate chemical loadings. This information can be used to consider the influence of wetlands on the water quality of adjacent lotic water bodies. (AN).

REPORT NUMBER: EEDP036

TITLE: Seasonal Restrictions on Dredging Operations in Freshwater Systems. Technical note.

CORPORATE SOURCE: Performer: Army Engineer Waterways Experiment Station, Vicksburg, MS.

REPORT DATE/PAGINATION: May 89. 8p.

NTIS PRICE CODES: PC A02/MF A01

MINOR DESCRIPTORS: Coastal-regions; Survivability-; Chemical-contamination; Monitoring-; Cost-analysis; Stress-Physiology; Sediment-transport; Fresh-water; Water-pollution; Seasonal-variations; Navigation-; Sampling-; ReSOURCE-management; Life-cycles; Plumes-; Site-investigations; Habitats-; Aquatic-organisms; Questionnaires-; Dredged-materials; Reproducibility-; Channels-Waterways; Fishes-; Ocean-surveillance; Biochemical-oxygen-demand; Turbidity-.

MAJOR DESCRIPTORS: *Environmental-impact; *Marine-biology; *Water-quality; *Dredging-; *Noise-pollution; *Ocean-waste-disposal.

ABSTRACT: This note summarizes the status of seasonal restrictions on dredging operations in freshwater navigable waterways. The information presented is based on replies received from a questionnaire sent to all US Army Corps of Engineers (CE) District and Division offices that conduct OM dredging operations in freshwater systems. -BKA.

REPORT NUMBER: WESTNEEDP0116

TITLE: Review of Possible Causes of Nutrient Enrichment and Decline of Endangered Sucker Populations in Upper Klamath Lake, Oregon. Water resources investigation.

CORPORATE SOURCE: Performer: Geological Survey, Portland, OR. Water Resources Div., Performer: Bureau of Reclamation, Washington, DC., Performer: Fish and Wildlife Service, Washington, DC., Performer: Federal Energy Regulatory Commission, Washington, DC.

REPORT DATE/PAGINATION: 1993. 34p.

DESCRIPTIVE NOTE: Prepared in cooperation with Bureau of Reclamation, Washington, DC., Fish and Wildlife Service, Washington, DC. and Federal Energy Regulatory Commission, Washington, DC.

NTIS PRICE CODES: PC A03/MF A01

MINOR DESCRIPTORS: Lake-basins; Nutrients-; Aquatic-plants; Fishes-; pH-; Ammonia-; Dissolved-oxygen; Algae-; Water-temperature; Environmental-effects; Dikes-; Dredging-; Agriculture-; Water-chemistry; Water-properties; Eutrophication-; Fishing-.

MAJOR DESCRIPTORS: *Upper-Klamath-Lake; *Water-quality; *Aquatic-ecosystems.

MAJOR IDENTIFIERS: *Suckers-Fish.

ABSTRACT: Upper Klamath Lake, and the connecting Agency Lake, is a large (140 square mile) lake in south-central Oregon. Typically, the algal bloom causes nuisance and detrimental conditions, including a deep-green 'pea soup' appearance, from mid-May to late October. Ten possible causes for this excessive enrichment in nutrients are described. Three of these hypothesis are suggested for immediate testing because of large-scale changes in nutrient loading that may have occurred as a result of man's activities. These three hypotheses relate nutrient enrichment to (1) conversion of marshland to agricultural land, (2) agricultural drainage from the basin, and (3) reservoir regulation. Eleven possible hypothetical causes for the decline in sucker populations also are described.

REPORT NUMBER: USGSWRIR934087

TITLE: Impervious Surface Area and Benthic Macroinvertebrate Response as an Indicator of Impact from Urbanization of Freshwater Wetlands.

CORPORATE SOURCE: Performer: Massachusetts Univ., Amherst. Environmental Inst., Funder: Corvallis Environmental Research Lab., OR.

REPORT DATE/PAGINATION: Aug 97. 155p.

DESCRIPTIVE NOTE: See also PB95-227211. Sponsored by Corvallis Environmental Research Lab., OR.

AVAILABILITY NOTE: This product may be ordered from NTIS by phone at (703)487-4650; by fax at (703)321-8547; and by email at 'orders ntis.fedworld.gov'. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

NTIS PRICE CODES: PC A09/MF A02

MINOR DESCRIPTORS: Aquatic-ecosystems; Habitats-; Watersheds-; Biological-indicators; Invertebrates-; Water-quality; Storm-water-runoff; Environmental-monitoring; Reviews-.

MAJOR DESCRIPTORS: *Wetlands-; *Urbanization-; *Environmental-impacts;
*Benthos-.

ABSTRACT: Urbanization is a continuing process in most societies around the world. Urban land uses produce many negative outputs in the form of sediments, excess nutrients, toxicants and pathogens. These are transported as non-point SOURCE pollution into receiving wetlands by stormwater runoff draining from the surrounding landscape. Urban land practices such as construction, extraction of groundwater, draining, filling and dredging of wetlands to make way for further development, are also SOURCES of impact. Related stresses to wetland ecosystem are either dehydration, inundation, sedimentation, light reduction, eutrophication, contamination, thermal warming, habitat fragmentation, exotic species invasion, acidification, and salinization. The evaluation of the impact to wetlands is a difficult and expensive process for management agencies. Procedures may include laboratory analysis of water and soil samples and toxicology tests. Invertebrates are becoming increasingly important as a measuring tool for monitoring pollution and trophic state of fresh waters. The aquatic habitat integrates most of the parameters of the environment because it accumulates water from both air and land. The presence of certain assemblages of species of aquatic invertebrates provides valuable information on water quality, as does the absence of sensitive organisms, or high populations of tolerant organisms. The use of benthic macroinvertebrates as bioindicators of water quality is not a new technique and is widely applied in streams, rivers, and lake biomonitoring programs and research.

REPORT NUMBER: EPA600R97075

CONTRACT/GRANT NUMBER(S): Grant: EPAR822916010

TITLE: Sediment-Water Interactions and Their Effects Upon Water Quality.
(Latest citations from the NTIS Bibliographic Database). Published Search.

CORPORATE SOURCE: Performer: NERAC, Inc., Tolland, CT.
Funder: National Technical Information Service, Springfield, VA.

REPORT DATE/PAGINATION: Oct 96. 50-250 citations.

DESCRIPTIVE NOTE: Updated with each order. Supersedes PB96-850755. Sponsored in part by National Technical Information Service, Springfield, VA.

NTIS PRICE CODES: PC N01/MF N01

MINOR DESCRIPTORS: Rivers-; Water-chemistry; Sediment-transport; Contaminants-; Toxicity-.

MAJOR DESCRIPTORS: *Bibliographies-; *Water-quality; *Water-pollution; *Fresh-water.

MAJOR IDENTIFIERS: *Sediment-water-interactions; *Contaminated-sediments.

ABSTRACT: The bibliography contains citations concerning the testing and evaluation of fresh-water sediments. Citations discuss assessment and remediation of contaminated sediments, monitoring systems, sediment transport, water pollution effects, water traffic, habitats and fisheries, and the effect of dredging operation. National programs, acts, regulations, and criteria are examined. (Contains 50-250 citations and includes a subject term index and title list.) (Copyright NERAC, Inc. 1995)

TITLE: GREAT I: A Study of the Upper Mississippi River. Volume I. Main Report. Final rept.

CORPORATE SOURCE: Performer: Florida Univ., Gainesville. Dept. of Nuclear Engineering Sciences.

REPORT DATE/PAGINATION: Sep 80. 415p.

DESCRIPTIVE NOTE: Original contains color plates: All DTIC and NTIS reproductions will be in black and white. See also Volume 2, AD-A126 968.

NTIS PRICE CODES: PC A18/MF A01

MINOR DESCRIPTORS: *Resource-management; *Management-planning-and-control; *Mississippi-River; *Environmental-management; Rivers-; Waterways-; Minnesota-; Iowa-; Culture-; Human-resources; Water-resources; Recreation-; Wildlife-; Fishes-; Water-traffic; Navigation-; Sedimentation-; Soil-erosion; Maintenance-management; Dredging-; Flood-plains; Water-quality.

MAJOR DESCRIPTORS: *Resource-management; *Management-planning-and-control; *Mississippi-River; *Environmental-management.

ABSTRACT: The Great I study covers the Upper Mississippi River from Minneapolis/St. Paul, Minnesota to Lock and Dam 10 at Guttenberg, Iowa. The main report describes Great I study organization, the study area, presents findings, conclusions and recommendations of the Great I Team; and provides a guide for implementation of the recommendations.

TITLE: GREAT I Study of the Upper Mississippi River. Technical Appendixes. Volume 4. Water Quality, Sediment & Erosion.

CORPORATE SOURCE: Performer: Florida Univ., Gainesville. Dept. of Nuclear Engineering Sciences.

REPORT DATE/PAGINATION: Sep 80. 313p.

DESCRIPTIVE NOTE: Original contains color plates: All DTIC and NTIS reproductions will be in black and white. See also Volume 5, AD-A127 211.

NTIS PRICE CODES: PC A14/MF A01

MINOR DESCRIPTORS: *Mississippi-River; *Water-quality; *Sedimentation-; Minnesota-; Wisconsin-; Iowa-; Lakes-; Land-areas; Soil-erosion; Environmental-impact.

MAJOR DESCRIPTORS: *Mississippi-River; *Water-quality; *Sedimentation-.

ABSTRACT: Report 4 consists of two parts. Part A discusses the water quality impacts of dredging and shipping activities, and also water quality standards and criteria from other SOURCES of pollution. Part B analyzes soil erosion from the Mississippi River's upland basin which settles into the backwaters and Lake Pepin. The effects of sedimentation are accelerated by the pooling effects of locks and dams.

TITLE: Dredging: Environmental Aspects. 1977-March, 1984 (Citations from the NTIS Data Base). Rept. for 1977-Mar 84.

CORPORATE SOURCE: Performer: National Technical Information Service, Springfield, VA.

REPORT DATE/PAGINATION: Apr 84. 254p.

DESCRIPTIVE NOTE: Supersedes PB82-807637.

NTIS PRICE CODES: PC N01/MF N01

MINOR DESCRIPTORS: *Bibliographies-; *Dredging-; *Water-pollution; *Solid-waste-disposal; Sediments-; Earth-fills; Containment-; Sediments-.

MAJOR DESCRIPTORS: *Bibliographies-; *Dredging-; *Water-pollution; *Solid-waste-disposal.

MAJOR IDENTIFIERS: *Dredge-spoil.

ABSTRACT: This bibliography contains citations concerning various environmental aspects of dredging and dredge spoil handling. The studies

include the use of spoil sites, pollution control, effects on water quality, and sediment transport. Dredging operations at specific sites are discussed. Biological effects are included in a companion bibliography. (This updated bibliography contains 268 citations, 59 of which are new entries to the previous edition.)

TITLE: Pilot Study on Effects of Hydraulic Dredging and Disposal on Water Quality of the Upper Mississippi River (July 1976). GREAT I Water Quality Work Group. Final rept.

CORPORATE SOURCE: Performer: Corps of Engineers, St. Paul, MN. St. Paul District.

REPORT DATE/PAGINATION: Jul 76. 245p.

NTIS PRICE CODES: PC A11/MF A01

MINOR DESCRIPTORS: *Dredging-; *Disposal-; *Water-quality; *Mississippi-River; *Sediments-; *Sampling-; Contaminants-; Chemical-contamination; Pollutants-; Solids-; Bacteria-; Concentration-Composition; Hydraulic-equipment; Deposition-; Turbidity-; Three-dimensional; Plumes-; Statistical-analysis; Computer-programming.

MAJOR DESCRIPTORS: *Dredging-; *Disposal-; *Water-quality; *Mississippi-River; *Sediments-; *Sampling-.

ABSTRACT: A pilot study was designed and implemented to monitor the water quality impact of dredging and disposal using a variety of sampling techniques. The study took place at river mile 827 on the Upper Mississippi River immediately downstream of the Minneapolis-St. Paul metropolitan area (Grey Cloud Island). Samples of undistributed predredge bulk sediments and postdredge plume water were examined for physical, chemical and bacteriological parameters. Concentrations of contaminants in sediment samples were apparently influenced by seasonal fluctuation in flow, sediment deposition and water quality. Bottom sediments revealed high concentrations of several contaminants in comparison to other sediment studies conducted at the same locations. Most parameters exhibited an increase in concentration from above to below the dredging and disposal operation during the two days of monitoring. Ambient fluctuations in river water were, in many cases, greater than impacts caused by dredging and disposal. Physical and bacteriological parameters returned to background concentrations within 1.3 kilometers (0.8 mile) downstream of the disposal discharge. Chemical parameters normally returned to background within a much shorter distance. Impacts were generally localized due to the sorptive capacity of rapidly settling resuspended sediment particles and dilution. Most parameters, especially the suspended form of metals, showed a high positive correlation with suspended solids and other physical parameters.

TITLE: Planning Document: Investigate Sediment Transport/Deposition and Predict Future Configuration of UMRS Channels and Floodplain. Long Term Resource Monitoring Program.

CORPORATE SOURCE: Performer: National Biological Survey, Onalaska, WI. Environmental Management Technical Center. Performer: Army Engineer District, St. Paul, MN.

REPORT DATE/PAGINATION: Dec 94. 39p.

DESCRIPTIVE NOTE: See also PB92-161868, PB93-188472 and PB94-160199. Prepared in cooperation with Army Engineer District, St. Paul, MN.

NTIS PRICE CODES: PC A03/MF A01

MINOR DESCRIPTORS: Long-term-effects; Forecasting-; Mississippi-River; Water-management; Spatial-distribution; Dredging-; Environmental-transport; Geomorphology-; Illinois-River; Maintenance-.

MAJOR DESCRIPTORS: *Sediment-transport; *Deposition-; *Channels-; *Flood-plains; *Water-quality.

ABSTRACT: Prediction of the future geometry of UMRS channels and floodplain is needed for managing UMRS natural resources and the Mississippi River and Illinois Waterway navigation system. Development of plans for managing the UMRS ecosystem will require prediction of future condition of the river system under various management alternatives. Prediction of future geomorphology of the system will be essential for predicting future amounts and spatial distribution of floodplain vegetation, aquatic habitats, water quality conditions, and recreational opportunities. Evaluation of the impacts of increased navigation and planning of long-term navigation channel maintenance activities will require prediction of future channel geometry and dredging requirements. A quantitative understanding of sediment transport and contaminant fate processes will be needed to manage contaminants. The proposed investigations of sediment transport processes and future condition of UMRS channels and floodplain would provide information needed to meet a number of objectives described in the Long Term Resource Monitoring Program (LTRMP) Operating Plan.

REPORT NUMBER: EMTC94P004

TITLE: Snake and Columbia Rivers Sediment Sampling Project.

CORPORATE SOURCE: Performer: Battelle Pacific Northwest Labs., Richland, WA.,
Funder: Department of Energy, Washington, DC.

REPORT DATE/PAGINATION: Dec 92. 102p.

DESCRIPTIVE NOTE: Sponsored by Department of Energy, Washington, DC.

NTIS PRICE CODES: PC A06/MF A02

MINOR DESCRIPTORS: Ammonia-; Chemical-Analysis; Columbia-River; Compiled-Data; Dredging-; Grain-Size; Metals-; Oils-; Pollutants-; Salmon-; Sampling-; Solids-; Sulfides-; Tables-data.

MAJOR DESCRIPTORS: *Polycyclic-Aromatic-Hydrocarbons; *Sediments-.

MAJOR IDENTIFIERS: *Water-pollution-sampling.

ABSTRACT: The disposal of dredged material in water is defined as a discharge under Section 404 of the Clean Water Act and must be evaluated in accordance with US Environmental Protection Agency regulation 40 CFR 230. Because contaminant loads in the dredged sediment or resuspended sediment may affect water quality or contaminant loading, the US Army Corps of Engineers (USACE), Walla Walla District, has requested Battelle/Marine Sciences Laboratory to collect and chemically analyze sediment samples from areas that may be dredged near the Port Authority piers on the Snake and Columbia rivers. Sediment samples were also collected at River Mile (RM) stations along the Snake River that may undergo resuspension of sediment as a result of the drawdown. Chemical analysis included grain size, total organic carbon, total volatile solids, ammonia, phosphorus, sulfides, oil and grease, total petroleum hydrocarbons, metals, polynuclear aromatic hydrocarbons, pesticides, polychlorinated biphenyls, and 21 congeners of polychlorinated dibenzodioxins and dibenzofurans.

REPORT NUMBER: PNL8479

CONTRACT/GRANT NUMBER(S): Contract: AC0676RL01830

TITLE: Using Digital Scanned Aerial Photography for Wetlands Delineation.
Scientific paper 2-5 Apr 92.

CORPORATE SOURCE: Performer: Army Topographic Engineering Center, Fort Belvoir, VA.

REPORT DATE/PAGINATION: 5 Apr 92. 8p.

NTIS PRICE CODES: PC A02/MF A01

MINOR DESCRIPTORS: Engineers-; Environmental-protection; Filling-; Fishes-; Image-processing; Logic-; Management-; Photography-; Rasters-; Regulations-; Resource-management; Rivers-; Scanners-; Wildlife-; Habitats-.

MAJOR DESCRIPTORS: *Aerial-photography; *Dredging-; *Ecosystems-; *Wetlands-.

MAJOR IDENTIFIERS: *Water-quality-management.

ABSTRACT: The Corps of Engineers. U.S. Fish and Wildlife Service and the Environmental Protection Agency are charged the responsibility to jointly manage the nation's wetlands in accordance with the Clean Water Act and the Rivers and Harbors Act. The Corps' role is enforcement of regulations concerning dredging and filling of specific types and areas of wetlands that fall within jurisdictional boundaries. Current research is being conducted to enhance the field scientist's ability to manage these ecosystems using digital aerial photography, image processing and photo interpretation logic. This paper presents techniques used to scan (digitize), archive and use digital aerial photography for environmental reSOURCE management using a photogrammetrically accurate, CCD-based scanner. Spectral characteristics of the imagery and useful image processing routines to enhance the resulting raster file(s) for interpretation will be discussed. DIGITAL AERIAL PHOTOGRAPHY, IMAGE PROCESSING, ENVIRONMENTAL RESOURCE MANAGEMENT, CCD-BASED SCANNER.

REPORT NUMBER: TECR187

TITLE: Sediment-Water Interactions and Their Effects Upon Water Quality.
(Latest citations from the NTIS Bibliographic Database). New

Search.

CORPORATE SOURCE: Performer: NERAC, Inc., Tolland, CT.
Funder: National Technical Information Service, Springfield, VA.

REPORT DATE/PAGINATION: Oct 94. 250 citations.

DESCRIPTIVE NOTE: Updated with each order. Supersedes PB94-887635. Sponsored in part by National Technical Information Service, Springfield, VA.

NTIS PRICE CODES: PC N01/MF N01

MINOR DESCRIPTORS: Rivers-; Water-chemistry; Sediment-transport; Contaminants-; Toxicity-.

MAJOR DESCRIPTORS: *Bibliographies-; *Water-quality; *Water-pollution; *Fresh-water.

MAJOR IDENTIFIERS: *Sediment-water-interactions; *Contaminated-sediments.

ABSTRACT: The bibliography contains citations concerning the testing and evaluation of fresh-water sediments. Citations discuss assessment and remediation of contaminated sediments, monitoring systems, sediment transport, water pollution effects, water traffic, habitats and fisheries, and the effect of dredging operation. National programs, acts, regulations, and criteria are examined. (Contains 250 citations and includes a subject term index and TITLE list.)

TITLE: Seminar Proceedings Coastal and Inland Water Quality 22nd Held in Las Vegas, Nevada on 6-7 February 1990.
CORPORATE SOURCE: Performer: Hydrologic Engineering Center, Davis, CA.
REPORT DATE/PAGINATION: May 90. 333p.
NTIS PRICE CODES: PC A15/MF A02
MINOR DESCRIPTORS: Case-studies; Estuaries-; Rivers-;
MAJOR DESCRIPTORS: *Coastal-regions; *Inland-waterways; *Water-quality.
ABSTRACT: This COLLECTION of 34 papers presented at the seminar includes copies of reservoir and riverine case studies, and coastal and estuarine case studies. Also included are 2 papers from the plenary session and 7 abstracts regarding poster session displays.

TITLE: Short- and Long-Term Water Quality Impacts for Riverine Dredging.
CORPORATE SOURCE: Performer: Army Engineer Waterways Experiment Station, Vicksburg, MS.
REPORT DATE/PAGINATION: Oct 92. 6p.
DESCRIPTIVE NOTE: This article is from 'Water Operations Technical Support Program: Proceedings of the Seminar on Water Quality (9th) Held in San Antonio, Texas on 16-20, March 1992', AD-A251 411, p172-177.
NTIS PRICE CODES: Not available NTIS
MINOR DESCRIPTORS: Dredged-materials; Environmental-impact; Mississippi-; Channels-Waterways; Hydraulics-; Test-and-evaluation.
MAJOR DESCRIPTORS: *Water-quality; *Rivers-; *Dredging-.
MAJOR IDENTIFIERS: *Vicksburg-; *Upper-Yazoo-River-Basin; *Water-pollution.
ABSTRACT: Short- and long-term water quality impacts associated with hydraulic and dragline dredging have been investigated recently by the Vicksburg District's Water Quality Section. Impacts to water quality needed to be defined and quantified in order to prepare separate Environmental Impact Statements (EIS) on three channelization projects in the Upper Yazoo River Basin (UYRB). The Dredged Material Research Program has studied hydraulic dredging operations in ocean and estuaries; however, impacts caused by dragline and hydraulic dredging of in-land riverine dredging have not been fully addressed. To evaluate water quality impacts, minor adaptations to proven numerical models and analysis of past water quality data were utilized. This paper presents the methodology and assumptions used in evaluating and quantifying water quality impact due to dragline and hydraulic dredging channelization in the UYRD.

TITLE: Modeling of Hypolimnetic Water Quality in Deep Pits Created by Sand Dredging in the Lake IJssel Area.
CORPORATE SOURCE: Performer: Waterloopkundig Lab. te Delft (Netherlands).
Funder: National Aeronautics and Space Administration, Washington, DC.
REPORT DATE/PAGINATION: Aug 84. 14p.
NTIS PRICE CODES: PC A02/MF A01
MINOR DESCRIPTORS: Plankton-; Stratification-; Summer-; Temperature-distribution; Water-temperature.
MAJOR DESCRIPTORS: *Dredged-materials; *Hydrology-models; *Lakes-; *Sands-; *Water-management; *Water-quality.
MAJOR IDENTIFIERS: *Foreign-technology.
ABSTRACT: Water quality modeling techniques were developed and used to simulate the oxygen budget in the hypolimnetic region of pits with a depth up to 45m created in the Lake IJssel area (Netherlands) as a result of sand dredging. The settling of organic matter originating from phytoplankton growth and the related decomposition can create a high demand for oxygen in the

hypolimnetic region of the pit. During the summer period when the pit is thermally stratified this can result in anaerobic conditions. Based on the models, a better understanding of the dominant processes and the influence of pit geometry and water quality of the lake is established. Such information is of special interest for the development of design criteria for new pits or the extension of existing pits in relation to water quality management in the area.
REPORT NUMBER: PUBL323

TITLE: Modelling of Hypolimnetic Water Quality in Deep Pits Created by Sand Dredging in the Lake IJssel Area.

CORPORATE SOURCE: Performer: Waterloopkundig Lab. te Delft (Netherlands).

REPORT DATE/PAGINATION: Aug 84. 17p.

NTIS PRICE CODES: PC E03/MF E01

MINOR DESCRIPTORS: Phytoplankton-; Humus-; Plant-growth; Summer-; Anaerobic-processes; Oxygen-; Mathematical-models.

MAJOR DESCRIPTORS: *Dredging-; *Pits-Excavations; *Water-pollution; *Lake-IJssel.

MAJOR IDENTIFIERS: *Foreign-technology; *Hypolimnion-.

ABSTRACT: Deep pits with a depth up to 45 m have been created in the Lake IJssel area as a result of sand dredging. The settling of organic matter originating from phytoplankton growth and the related decomposition can create a high demand for oxygen in the hypolimnetic region of the pit. Especially during the summer period when the pit is thermally stratified this can result in anaerobic conditions. Water quality modelling techniques have been developed and used to simulate the oxygen budget in the hypolimnetic region of the pit. Based on the results of modelling a better understanding of the dominant processes and the influence of pit geometry and water quality of the lake was established.

REPORT NUMBER: PUB323

TITLE: Potential of Remote Sensing in the Corps of Engineers Dredging Program. Special rept.

CORPORATE SOURCE: Performer: Cold Regions Research and Engineering Lab., Hanover, NH.

REPORT DATE/PAGINATION: Nov 85. 48p.

NTIS PRICE CODES: PC A03/MF A01

MINOR DESCRIPTORS: Remote-detectors; Airborne-; Pulses-; Radar-; Bathymetry-; Mapping-; Aerial-photography; Army-corps-of-engineers; Disposal-; Sites-; Land-use; Sediment-transport; Multispectral-; Remote-detectors; Surface-truth; Coastal-regions; Currents-; Mapping-; Environmental-impact; Monitoring-; Multispectral-; Scanners-; Plumes-; Drift-; Depth-finders; Sonar-; Vegetation-; Soils-; Filters-; Water-quality.

MAJOR DESCRIPTORS: *Hydrographic-surveying; *Dredged-materials; *Dredging-; *Recording-systems.

MAJOR IDENTIFIERS: *Remote-sensing.

ABSTRACT: The potential of remote sensing in the Corps of Engineers Dredging Program for providing data on channel surveys, sediment drift and dispersion during dredging, water quality and suspended sediment concentrations, and selection of disposal sites and monitoring environmental effects at disposal sites was reviewed. The recommended remote sensor combination for recording dredging and environmental changes was a small, single-engine aircraft equipped with at least two 70-mm or 35-mm cameras. The first camera should be loaded with color film and the second camera with color infrared film for vegetation or land use mapping, or panchromatic film with special filters for water

studies. For bathymetric mapping, the cameras will have to be supplemented by airborne impulse radar or laser profilers, and possibly sonar depth finders. A combination of small aircraft and boats is optimum for mapping currents and observing plume dynamics. Additional research is required to study the use of multispectral scanners for bathymetric mapping of large coastal areas, for mapping sediment transport in shallow waters, for mapping concentrations of suspended matter or organic or inorganic origin, and for detecting vegetative stress and soil properties. Along with the acquisition of the multispectral data, ground truth needs to be taken to verify the interpretation of the data. Long-range plans, on the order of 30 to 50 years, are necessary for managing the disposal of dredged material. Keywords: Aerial photography; Army Corps of engineers; Dredged materials; Dredging; Remote sensing.

REPORT NUMBER: CRRELSR8520

TITLE: Effects of Gravel Extraction on the Meade River at Atqasuk, Alaska.
CORPORATE SOURCE: Performer: Alaska Univ., Fairbanks. Inst. of Water Resources., Funder: Geological Survey, Reston, VA. Water Resources Div.

REPORT DATE/PAGINATION: May 84. 30p.

NTIS PRICE CODES: PC A03/MF A01

MINOR DESCRIPTORS: Environmental-impacts; Turbidity-; Detritus-; Oxygen-; Dissolved-gases; Fisheries-; Suspended-sediments; Alaska-.

MAJOR DESCRIPTORS: *Dredging-; *Gravel-; *Water-pollution; *Meade-River.

ABSTRACT: The water quality impacts resulting from dredging gravel in the Meade River at Atqasuk, Alaska, have been studied in the context of fishery resources, principally least cisco, broad whitefish and chum salmon used by local Inupiat residents. Gravel was removed during the summer ice-free months and conveyed via pipeline to an on-land storage site. Runoff from the storage pile was returned to the Meade River with the accompanying fine inorganic particulate matter and organic detritus at loadings up to 10,000 mg/l. The major immediate effects on the receiving waters were to increase turbidity and suspended sediment loads near Atqasuk and downstream as far as 60 km. Inorganic sediments settled out faster than the organic peat detritus and the ratio of organic/inorganic matter increased with distance downstream. Carbon/nitrogen ratios in the organic fraction were constant with time and distance indicating low biological activity in the peat particles.

REPORT NUMBER: COMPLETIONI8414, USGSG82702

CONTRACT/GRANT NUMBER(S): Grant: DI14080001G827

TITLE: Water Management, Water Quality and Alluvial Morphology of Selected Iowa Oxbow Lakes. Phase 1. Final rept.

CORPORATE SOURCE: Performer: Iowa Dept. of Water, Air and Waste Management, Des Moines., Performer: Iowa State Univ., Ames. Engineering Research Inst., Performer: Iowa State Geological Survey, Iowa City., Funder: Environmental Protection Agency, Kansas City, KS. Region VII., Funder: Iowa State Conservation Commission, Des Moines.

REPORT DATE/PAGINATION: Nov 77. 93p.

DESCRIPTIVE NOTE: Also pub. as Iowa State Univ., Ames. Engineering Research Inst. rept. no. ISU-ERI-AMES-78157. Prepared in cooperation with Iowa State Univ., Ames. Engineering Research Inst., and Iowa State Geological Survey, Iowa City. Sponsored by Environmental Protection Agency, Kansas City, KS. Region VII, and Iowa State Conservation Commission, Des Moines.

NTIS PRICE CODES: PC A05/MF A01

MINOR DESCRIPTORS: Aquatic-plants; Growth-; Pumping-; Dredging-; Sampling-; Recommendations-; Management-.

MAJOR DESCRIPTORS: *Water-pollution; *Blue-Lake; *Oxbow-Lakes.

ABSTRACT: Blue Lake, Iowa had unstable water levels and at low levels had a massive growth of aquatic vegetation. The restoration should involve supplemental pumping of groundwater from well and dredging. The Oxbow Lakes are of two types which receive water from groundwater versus surface waters.

TITLE: Influence of Lake Restoration Measures on Water Quality and Water Quantity in Blue Lake, Iowa. Oxbow Lake Study. Phase 3. Final rept.

CORPORATE SOURCE: Performer: Iowa State Water Resources Research Inst., Ames., Performer: Iowa State Univ., Ames. Engineering Research Inst., Funder: Environmental Protection Agency, Kansas City, MO. Region VII., Funder: Iowa Dept. of Environmental Quality, Des Moines.

REPORT DATE/PAGINATION: Jun 82. 56p.

DESCRIPTIVE NOTE: Also pub. as Iowa State Univ., Ames. Engineering Research Inst. rept. no. ISU-ERI-AMES-83042. Prepared in cooperation with Iowa State Univ., Ames. Engineering Research Inst. Sponsored by Environmental Protection Agency, Kansas City, MO. Region VII, and Iowa Dept. of Environmental Quality, Des Moines.

NTIS PRICE CODES: PC A04/MF A01

MINOR DESCRIPTORS: Weed-control; Aquatic-plants; Dredging-; Chemical-analysis; Water-reclamation.

MAJOR DESCRIPTORS: *Lakes; *Water-pollution.

MAJOR IDENTIFIERS: *Blue-Lake-Iowa; *Water-quality-management.

ABSTRACT: Blue Lake, 48 km (30 mi) south of Sioux City, Iowa is one of four oxbow lakes on the floodplain of the Missouri River which provide important recreational resources to the people of western Iowa and eastern Nebraska. The other lakes are Brown's Lake, DeSoto Bend, and Lake Manawa. It was recognized in the mid-1970s that all of these lakes have problems associated with poor water quality and/or limited water quantity. Diagnostic studies were conducted on the four lakes and recommendations presented for possible restoration or improved management. Blue Lake was the first of the group to have the management recommendations implemented. The report describes the effect of the restoration measures based upon observations covering one year after the measures were put into effect.

REPORT NUMBER: ISWRRI130

TITLE: Proceedings of the Fifth Corps Chemists Meeting Held in Vicksburg, Mississippi on 17-18 May 1988. Final rept.

CORPORATE SOURCE: Performer: Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.

REPORT DATE/PAGINATION: Apr 89. 31p.

NTIS PRICE CODES: PC A03/MF A01

MINOR DESCRIPTORS: Ammunition-; Chromatography-; Core-sampling; Data-management; Dredging-; Inspection-; Ions-; Laboratories-; Methodology-; Quality-assurance; Quality-control; Water-quality;

MAJOR DESCRIPTORS: *Analytical-chemistry.

MAJOR IDENTIFIERS: *Meetings.

ABSTRACT: This paper contains a summary of the Proceedings of the Fifth Corps Chemists Meeting. Presentations and discussions centered around laboratory validations, quality assurance/quality control for Superfund/DERP projects, laboratory inspections, analytical methodology, sampling techniques, and data

management. Keywords: Water quality; Dredging; Core sampling; Munitions analyses; Ion chromatography; Analytical chromatography. (AW)
REPORT NUMBER: WESMPEL892