

Charles E. Brockway, P.E., Ph.D.

**Brockway Engineering
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Present title:

Senior Member – Brockway Engineering P.L.L.C

Formerly-Research Professor – Civil and Agricultural Engineering: Supervision of research conducted by the University Water Resources Research Institute and the College of Engineering at Kimberly, Idaho. Graduate student supervision and directed studies instruction in Water Management and Water Resources related subjects.

Associate Director – Idaho Water Resources Research Institute

Summary of education beyond high school:

Institution, Degree, Year

University of Idaho 1955-1959, B.S.-Civil Engineering, 1959

California Institute of Technology 1959-1960, M.S. – Civil Engineering, 1960

University of Colorado, Denver, Colorado, Management, 1963

University of Denver; Denver, Colorado, Civil Engineering, 1964

Utah State University, Ph.D.-Water Resources Engineering, 1977

Years of service on U of I Faculty: 32

Date of original appointment: 1965

Dates of advancement in rank:

Associate Research Professor: 1974

Professor – 50% Agricultural Engineering, 50% Civil Engineering: 1978

Subjects and courses taught:

CE 500, CE 600, CE 502

Summary of academic experience:

University of Idaho – Research Professor–Civil and Agricultural Engineering, 1978

University of Idaho – Associate Research Professor, Civil Engineering, 1974-1978

University of Idaho – Assistant Research Professor, Civil Engineering, 1965-1974

Boise College – Instructor in Engineering, 1961-1963

Summary of other experience:

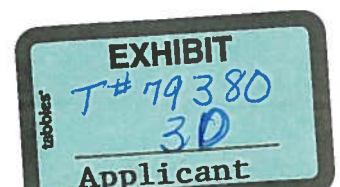
Senior Member, Brockway Engineering P.L.L.C. Water Resources Engineering

University of Idaho – USAID Pakistan Project on Irrigation Systems Management Research, 1984

U.S. Bureau of Reclamation – Hydraulic Research Laboratory, Denver, Colorado – Hydraulic Research Engineer, 1963-1965

U.S. Bureau of Reclamation – Boise, Idaho – Hydraulic Engineer, 1961-1963

Converse Foundation Engineering, Inc. – Pasadena, California – Foundation Engineer, 1960-1961



California Institute of Technology – Pasadena, California – Assistant Project Engineer,
U.S. Public Health Services Research Project, 1959-1960

Partial Client List:

Twin Falls Canal Company – Hydrology and water use
North Side Canal Company – Hydrology and water use
Micron Technology – Ground water and water supply
J.R. Simplot Company – Land disposal of processing waste, water supply, water rights
City of Twin Falls, ID – Water supply and hydrology
Idaho Trout Processors – Hydraulics and water supply
Cedar Mesa Reservoir and Canal Co. – Water Management Consultant
Clear Springs Trout Company, ID – Water supply and distribution systems, expert testimony
Idaho Power Company – Relationships of groundwater and surface water – Upper
SNAKE RIVER BASIN – Water right adjudication
Idaho Department of Fish and Game – Evaluation of groundwater/stream relationship for litigation – Parma vicinity
Blaine County, ID – Waste disposal systems for high-density rural subdivisions
City of Mountain Home, ID – Water Rights, hydrologic analysis, expert testimony
Rinker Company, CA – Hydrology, water rights
U.S. Bureau of Reclamation (was Maricopa County Water District) – Arizona Flood Study, expert testimony
Office of Technology Assessment (U.S. Congress) – Irrigation Distribution Systems
U.S. Department of Justice – Indian Water Rights, expert testimony
Montgomery Engineers – Ground water quality evaluations
J.U.B. Engineers, ID – Groundwater and hydraulics
Amalgamated Sugar Company, ID – Hydrology and waste disposal
Pioneer Irrigation District, ID – Water rights and hydrology, urbanization impacts on canal companies
Aries Development Co. – Subdivision water rights
Eagle View Farms, ID – Water rights and irrigation system
Rim View Trout Company, ID – Hydraulics
Surface Water Coalition – Canal Company water requirements, project water management, water rights.
Clear Springs Foods, Inc., ID – Aquaculture water use, hydrology, hydraulics and water rights
Heart Rock Ranch, ID – Water Rights, rehabilitation of streams, irrigation water requirements, wildlife, recreation, river restoration and management
Valley Club, ID – Irrigation water requirements, aquifer recharge evaluations, groundwater modeling
Idaho Water Company – Water Rights, transfers, groundwater modeling
Silver Springs Ranch, ID – Stream renovation, irrigation water requirements, diversion systems

Registered Professional Engineer:

Idaho and Washington

Special Awards or Honors:

Honorary Membership ASTM, 1959

U.S. Army National Defense Transportation Award, 1958
Distinguished Military Graduate – University of Idaho
Top Ten Graduating Senior – University of Idaho, 1959
No. 2 in graduating class of 889, University of Idaho, 1959
Representative of USBR Division of Research at 1963 Intergovernmental Training Program, Denver, 1964
Scholarship – University of Denver, Graduate School of Management, 1964
National Science Foundation Fellowship – Utah State University, 1967-1968
Outstanding Young Engineer Award for Idaho, National Society of Professional Engineers, 1968
Engineer of the Year, 1997 American Society of Agricultural Engineers
Idaho Water Users Hall of Fame - 1998

Membership in professional and scholarly organizations:

National Society of Professional Engineers, 1967- present
Idaho Society of Professional Engineers, 1967- present: President 1978
American Society of Civil Engineers – Irrigation & Drainage Division Committee
Chairman:
1.) Operation and Maintenance of Irrigation and Drainage Systems, 1975-1981
2.) Water Quality Committee, 1980-1984, Chairman
3.) Task Committee on Guidelines for Erosion and Sediment Control in Irrigated Agriculture, 1980-1983, Chairman
4.) Publications Committee, 1985-1992
Research Society of America
National Council of Examiners for Engineering and Surveying, 1981-1991
Idaho Board of Professional Engineers and Professional Land Surveyors, 1981-1991, Chairman
American Water Resources Association

Offices held in such organizations:

National Society of Professional Engineers
Member – Young Engineers Committee, 1973-1974
Chairman – Young Engineers Committee, 1975-1977
Member – President's Committee on Board of Directors Organization, 1977
Member – Registration and Qualification for Practice Committee, 1979-1981
Chairman – Registration and Qualification for Practice Committee, 1982-1984
Member – Participating Organizations Liaison Committee to NCEE, 1982-1984
Idaho Society of Professional Engineers, President 1978
President - Magic Valley Chapter, 1970-1971
Member – State Ethical Practices Committee, 1966-1977
Member – State Intersociety Relations Committee, 1968
Member – State Nominating Committee, 1975-1976
Member – Board of Directors, 1972-1973
Member – Board of Directors, Past President Chairman – Nominating Committee 1979
State Director – Representative for Idaho NSPE, 1982-1983
Nominating Committee for Idaho Board of Professional Engineers & Land Surveyors Member
American Society of Civil Engineers

Member – Operation and Maintenance of Distribution Systems Committee
Irrigation and Drainage Division, 1975-1981
Chairman – Irrigation and Drainage Division, Operations and Maintenance
Committee, 1977-1979
Member – Water Quality Committee, Irrigation and Drainage Division, 1980-1984
Chairman – Water Quality Committee, Irrigation and Drainage Division, 1982-
1984
Member – Task Committee on Water Measurement, 1980-1983
Chairman – Task Committee on Guidelines for Erosion and Sediment Control in
Irrigated Agriculture, 1984 – Present
Member – Publications Committee, 1985 – Present
Corresponding Member – ASCE irrigation and Drainage Division Committee on
Operation and Maintenance of Irrigation Systems
Reviewer – ASCE Irrigation and Drainage Division Committee on Publications
Idaho Board of Professional Engineers and Land Surveyors Member, 1981
Vice Chairman, 1983-1984
Chairman, 1984-1986, 1990-1992
National Council of Engineering Examiners
Assistant Vice President, Western Zone
Member, Professional Examinations Advisory Committee
Member, Committee on Uniform Procedure and Legislative Guidelines, 1984
Member, Communications and Publications Committee, 1983
Member, Uniform Examinations and Qualifications Committee, 1984 – 1986
Member, Committee on Examination Policies and Procedures, 1987 – 1989
Member, Advisory Committee on Council Activities, 1986-1987
Assistant Vice President – Western Zone, 1986-1987
Member, Fundamentals Examination Review Committee, 1986 1988

Scholarly and creative activity:**Research:**

Development of systems analysis procedures for optimization of irrigation system
designs with environmental, physical, and social constraints.
Evaluation of crop consumptive use, irrigation requirements, and methods of
determining basin depletion from agricultural development
Systems analysis of water use to develop mathematical methods for studying
complex ground water-surface water systems – mathematical modeling of
aquifers,
Ground water quality and river system water quality evaluations for nutrient load
determination and river system modeling.
Development of guidelines for design of sediment removal facilities for on-farm
and irrigation distribution system waste ways
Evaluation of attainable impacts on water quality of irrigation return flows due to
implementation of best management practices for sediment and nutrient control.
Evaluation of alternate energy sources for irrigation and municipal needs in
Idaho.
Analysis of operation and maintenance cost of water distribution systems and
determination of the relationship of costs to known physical and organizational
parameters and water use efficiency.
Evaluation of the economic potential for use of geothermal hot water and steam
in Idaho,

Study of the movement of water from canals to local water tables under saturated and partially saturated conditions.

Studies of the mechanisms of microbial action, sedimentation and soil-water-chemical interactions involved in natural sealing phenomenon in canals and reservoirs,

Evaluation of irrigation management practices for sustained land disposal of geothermal fluids.

Evaluation of practices and systems for controlling sediment and other pollutant losses from irrigated lands.

Investigation of the response of aquifer systems to changes in recharge or withdrawal due to change in land use.

Evaluation of procedures for estimating crop water requirements,

Development of cost effective procedures and equipment for measurement of irrigation diversions and power use in open and closed systems

Community services and other relevant activities:

Member – Intermountain District Church of the Nazarene; Camps Board – 1976-1984,
Board of Church Properties – 1976-1979

Member and Vice President, Twin Falls Reformed Church Consistory 2000-Present

Member – Twin Falls City Planning and Zoning Commission 12/1978-9/1979

Member – College of Southern Idaho Geothermal Energy Commission

Member – Governor's Committee on Energy Use – 1980-1981

Member – Idaho Technical Advisory Committee for Sediment in Surface Water

Chairman – Snake River Technical Advisory Committee – Idaho Legislative Council,
1983-1985

Advisor – Governor's Snake River Advisory Committee – 1985

Member – Water Resources Foundation Board of Directors – 1985

Chairman – Idaho Technical Committee of Hydrology

Member – Idaho Department of Health & Welfare Sediment Criteria Committee

Member – Snake Plain Advisory Committee of Idaho Department of Health & Welfare

Member – Idaho Water Users Water Quality Committee – 1980

Member – INEL Dose Evaluation and Risk Assessment Committee

Member – Columbia River System Operations Review

Member – Mid Snake River Nutrient Management Advisory Committee

Member - Mid Snake River Irrigation Water Quality Coordination Committee

Technical Advisor – Middle Snake River Committee

Member – Liaison Committee, U.S. Geological Survey National Water Quality
Assessment Program, Snake River Basin

Member – Snake River Studies Committee, Idaho Department of Water Resources

Member – City of Twin Falls Wellhead Protection Committee

Member-Eastern Snake River Plain Groundwater Modeling Committee

Publications:

Brockway, C.E. 1964. Progress Report – Investigation of a Seepage Meter Designed by the Agricultural Research Service – Lower Cost Canal Lining Program, Bureau of Reclamation Hydraulic Branch HYD-529

Brockway, C.E. 1964. Flow Resistance Coefficients of Three Sizes of Cast-in-Place Concrete Pipe. Bureau of Reclamation Hydraulic Branch, HYD-533, 1964

Brockway, C.E. 1965. Investigation of the Effect of Turnout Geometry on the Registration Accuracy of a Propeller-Type Open Flowmeter Bureau of Reclamation, HYD-545, 1965

Brockway, C.E. 1966. Groundwater Investigations and Canal Seepage Studies. Engineering Experiment Station, University of Idaho, Progress Report No. 1, 1966.

Schuster, J.C. and C.E. Brockway. 1967. Investigation of a 4-Inch Magnetic Flowmeter. Bureau of Reclamation, HYD-574

Worstell, R.V. and C.E. Brockway. 1967. Estimating Seasonal Changes in Irrigation Canal Seepage. Presented at Spokane, Washington October 20, 1967.

Worstell, R.V. and C.E. Brockway. 1967 Groundwater Investigations and Canal Seepage Studies. Engineering Experiment Station, University of Idaho, Progress Report No. 2

Bloomsburg, G.L. and C.E. Brockway. 1968. Movement of Water from Canals to Groundwater Tables. Research Technical Completion Report, Idaho Water Resources Institute.

Worstell, R.V. and C.E. Brockway. 1968. Field Evaluation of Seepage Measurement Methods. Presented at 2nd Seepage Symposium, Phoenix, Arizona February 1968.

Bondurant, J.A., C.E. Brockway, and R.V. Worstell. 1968. Plastic Casings for Soil Cores. Soil Science, Vol. 107 No. 1

Herbig, A.E. and C.E. Brockway. 1970. Operations and Maintenance Costs of Irrigation Distribution Systems. Proceedings, National Irrigation Symposium, Lincoln, Nebraska

Bondurant, J.A., C.E. Brockway and R.V. Worstell. 1971. Systems Analysis of Irrigation Water Management in Eastern Idaho. Progress Report No. 1, University of Idaho Engineering Experiment Station

Brockway, C.E. 1971. What Does It Cost to Operate an Irrigation District Proceedings, Fifth Regional Water Users' Conference, Bakersfield, California

Bondurant, J.A., R.V. Worstell, and C.E. Brockway. 1972. Water Resources Management in the Upper Snake River Valley. Proceedings, Irrigation & Drainage Division, Specialty Conference, ASCE, Spokane, Washington

Nicholas, C.R., Warnick, and C.E. Brockway. 1972. Geothermal Water and Power Resources Exploration and Development for Idaho. Research Technical Completion Report, University of Idaho, Idaho Water Resources Research Institute, Moscow, ID

Brockway, C.E. 1972. Estimating Irrigation Distribution System Operation and Maintenance Costs. Paper presented at the Annual Meeting, Pacific Northwest Region ASAE, Calgary, Alberta, Canada, October 10-12, 1972.

Bondurant, J.A., R.V. Worstell, and C.E. Brockway. 1973. Implications of Changes in Water Management in the Upper Snake River Basin. Paper presented at the ASCE Water Resources Conference, Washington, D.C., January, 1973

Brockway, C.E. 1973. Investigation of Natural Sealing Effects in Irrigation Canals, Research Technical Completion Report, Project A-023-IDA, Idaho Water Resources Research Institute

Reese, D.L. and C.E. Brockway. Operation and Maintenance Cost on Irrigation, Distribution Systems, Progress Report, University of Idaho, College of Engineering

De Sonnevile, Jos L.J. and C.E. Brockway. 1973. Systems Analysis of Irrigation Water Management in Eastern Idaho. Research Technical Completion Report, Project B-018-IDA, University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Reese, David L., H.F. Mayland, and C.E. Brockway. 1973. Alternative Methods of Estimating Snow Water Parameters. Water Resources Research, Vol. 9 No. 5

Bondurant, J.A. and C.E. Brockway. 1974. Operation and Maintenance Cost on Irrigation Distribution Systems. Proceedings, VIIIth International Congress of Agricultural Engineering, Flevohof, Netherlands

Bondurant, J.A. and C.E. Brockway. 1974. Sediment Ponds Clean Irrigation Runoff Water. Idaho Farmer.

Brockway, C.E. 1974. Water Resources of the Upper Snake River Basin, Proceedings, National Environmental Research Park Symposium, Idaho Falls, Idaho.

Watts, F.J., C.E. Brockway, and A.E. Oliver. 1974. Analyses and Design of Settling Basins for Irrigation Return Flow. Research Technical Completion Report, Project A-042-IDA, University of Idaho, Idaho Water Resources Research Institute, Moscow, ID

Warnick, C. and C.E. Brockway. 1974 Hydrology Support Study, A Case Study of Federal Expenditures on a water and Related Land Resource Project. Boise Project, Idaho and Oregon Project C-4202. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Brockway, C.E. 1975. Energy Plant Siting Position Paper, Idaho Society of Professional Engineers February, 1975 (Member of Committee on Energy Plant Siting).

Bondurant, J.A., M.J. Brown, and C.E. Brockway. 1975 Some Aspects of Sedimentation Pond Design. Proceedings, National Symposium on Urban Hydrology and Sediment Control, Lexington, Kentucky

Brockway, C.E. 1975. Issues Involved in Peoples Choices in Resources-Water. Idaho Academy of Science, Caldwell, ID.

Brockway, C.E. 1975. Science in Idaho's Future, Idaho Academy of Science, Panel Symposium

- Claiborn, B.A. and C.E. Brockway. 1975. Impact of Changes in Irrigation Water Management in Eastern Idaho. Research Technical Completion Report, Project A-040-IDA, University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.
- Bondurant J.A., C.E. Brockway, and M.J. Brown. 1976. Characterizing Irrigation Return Flow Streams. 7th U.S. Technical Conference and 10th ICID Congress.
- Brockway, C.E. 1977. Vegetative Buffer Strips for Sediment Retention in Irrigation Runoff. Proceedings, ASCE irrigation and Drainage Division Specialty Conference on Water Management for Irrigation and Drainage, Reno, Nevada
- Brockway, C.E. 1977. Sediment Ponds for Irrigation Return Flow and Potato Fresh Pack Effluent. Research Technical Completion Report, Project A-042-IDA. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.
- Fitzsimmons, D.W., G.C. Lewis, J.R. Busch, G.M. McMaster and C.W. Berg. 1977. On-Farm Methods for Controlling Sediment and Nutrient Losses. Proceedings, National Conference on Irrigation Return Flow Quality Management, Fort Collins, Colorado.
- Brockway, C.E. 1977. Investigation of Natural Sealing Effects in Irrigation Canals. Ph.D. Dissertation, Utah State University.
- Brockway, C.E. and K.P. Grover. 1977. Water Management and Groundwater in the Henry's Fork-Upper Snake River Basin of Idaho. Research Technical Completion Report, ASCE Henry's Fork Project, Idaho Water Resources Research Institute.
- Bondurant, J.A., M.J. Brown and C.E. Brockway. 1977. Predicting Irrigation Return Flow Rates. ASAE-SW-192.
- Claiborn, Brent and C.E. Brockway. 1977. Predicting Attainable Irrigation Efficiencies. ASCE.
- Grover, K.P. and C.E. Brockway. 1978. Evaluation of Urbanization and Changes in Land Use on the Water Resources of Mountain Valleys. Research Technical Completion Report. Project B-038-IDA. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.
- Robbins, C.W. and C.E. Brockway. 1978. Irrigation Water Salt concentration Influences on Sediment Removal by Ponds. Soil Sci. Soc. Am. J. 42:478-481.
- Longley, T.S., C.E. Brockway, and E.C. Larsen. 1978. Low Energy Sprinkler Equipment. ASAE Annual Meeting, Spokane, Washington. PN-78-406.
- Brockway, C.E. 1978. Systems Analysis of Irrigation Water Use in Eastern Idaho. OWRT.
- Brockway, C.E. 1978. Alternative Irrigation Systems for Flood Damaged Irrigation Lands Below Teton Dam. Research Technical Completion Report, Idaho Water Resources Research Institute.

Busch, J.R., R.G. Allen and C.E. Brockway. 1978. Irrigation Rehabilitation Plans in the Teton Flood Area. ASCE Convention and Exposition, Chicago, Illinois.

Allen, R.G., J.R. Busch, and C.E. Brockway. 1979. Optimal Irrigation Systems Subject to Available Resources Constrains. IX Congress CIGR 1979.

Brockway, C.E. 1979. Relationship of Costs and Water-Use Efficiency for Irrigation Projects in Idaho. Research Technical Completion Report, University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Brockway, C.E. 1979. Effects of Changing Irrigation Efficiencies on Water Supplies. ASCE Irrigation and Drainage Division Specialty Conference. Albuquerque, New Mexico.

Brockway, C.E. 1979. Snake Plain Aquifer Model Studies. Idaho's Water, September 1979. Vol. 6 No. 4

Brockway, C.E., editor. 1980. Manual on Operation and Maintenance of Irrigation and Drainage Districts, American Society of Civil Engineers, prepared by Committee on Operation and Maintenance of Irrigation and Drainage Division.

Allen, R.G. and C.E. Brockway. 1980. Problems in Developing and Applying an Optimal Irrigation Plan. ASCE Journal of the Water Resources Planning and Management Division, Vol. 106 No. WR 1.

Mayland, H.F. and C.E. Brockway. 1980. Frequency Analysis of Western Snow Data. Proceedings. 1980 ASCE Watershed Management Symposium. Boise, Idaho.

Robinson, C.W. and C.E. Brockway. 1980. Vegetal Filters for Controlling Sediment in Irrigation Return Runoff. Proceedings. 1980 ASCE Irrigation and Drainage Division Specialty Conference. Boise, Idaho.

Busch, J.R. and C.E. Brockway. 1980. Systems Approach to Irrigation Planning Research. 1980 ASCE Irrigation and Drainage Specialty Conference, Boise, Idaho.

Brown, M.J., C.E. Brockway, and J.A. Bondurant. 1981. Ponding Surface Drainage Water for Sediment and Phosphorus Removal. Transactions ASAE, Vol. 24, No. 6 pp. 1478-1481.

Brockway, C.E. and R.G. Allen. 1982 Impact of the Energy Crisis on Irrigation and Drainage, Part IV: System Design and Management Practices to Reduce Energy Requirements and Consumption. Paper Presented at the 9th Congress of the International Committee on Irrigation and Drainage, National Conference. Jackson, Mississippi.

Everts, Chris and C.E. Brockway. 1982. Reducing Soil Losses with Filter Strips. Current Information Series No. 587 University of Idaho College of Agriculture. January 1982.

Luttrell, S.P. and C.E. Brockway. 1982 Impacts of Individual On-Site Sewage Disposal Facilities on Mountain Valleys – Phase I. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Wells, R., C.E. Brockway, and J.R. Busch. 1983. Management, Maintenance and Operation of Pump Supplied Irrigation Resources Projects. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow ID.

Freeman, G., C.E. Brockway, and R.G. Allen. 1983. Management and Systems for Water and Energy Savings, Bruneau Proj, Idaho. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Allen, R.G., C.E. Brockway, and J.L Wright. 1983. Weather Station Siting and Consumptive Use Estimates. Journal of the Water Resources Planning and Management Division, American Society of Civil Engineers.

Allen, R.G. and C.E. Brockway. 1983. Estimating Consumptive Irrigation Requirements for Crops in Idaho. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Allen, R.G. and C.E. Brockway. 1983. Weather and Consumptive Use in the Bear River Basin, Idaho During 1982. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Allen, R.G. and cb31983. Operation and Maintenance Costs and Water Use by Idaho Irrigation Projects. Proceedings of the 1983 Specialty Conference, Irrigation and Drainage Division, American Society of Civil Engineers, Jackson Hole, Wyoming.

Allen, R.G. and C.E. Brockway. 1983. Estimating Consumptive Use on a Statewide Basis. Proceedings of the 1983 Specialty Conference, Irrigation and Drainage Division, American Society of Civil Engineers, Jackson Hole, Wyoming.

Johnson, G.S. and C.E. Brockway. 1983. Users Manual for University of Idaho Ground-Water Flow Model and Recharge Program. Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Johnson, G.S., C.E. Brockway, and S.P. Luttrell. 1984. Application of a numerical Ground-Water Flow Model to the Mud Lake Area in Southeastern Idaho. Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Johnson, G.S., C.E. Brockway, and S. Ramseyer. 1984. Water Resource References for the Snake River Basin above Swan Falls. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Luttrell, S.P. and C.E. Brockway. 1984. Impacts of Individual On-Site Sewage Disposal Facilities on Mountain Valleys – Phase II – Water-Quality Considerations. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Robison, C.W., C.E. Brockway, C.W. Robbins, and G.S. Johnson. 1984. Evaluation of Irrigation Management Procedures for Geothermal Effluent. Completion Report, university of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Fitzsimmons, D.W. and C.E. Brockway. 1984. Irrigation Systems Management Research Design. Final Report submitted to USAID/Pakistan under Contract No. 391-0467-C-00-4028 prepared by Research Definition Team in Cooperation with Washington State University and Development Alternatives, Inc. University of Idaho, Moscow, ID. 354 p.

Johnson, G.S., C.E. Brockway, J.L. Wright, and A.L. Coiner. 1984. Remote Sensing for Irrigated Crop Water Use Phase I. Technical Completion Report, Idaho Water Resources Research Institute, submitted to NASA-Ames Research Center.

Johnson, G.S., C.E. Brockway, and A.L. Coiner. 1985. Evaluation of Methods for Estimation of Aquifer Recharge from Precipitation on Semi Arid Lands. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Brockway, C.E. and G.S. Johnson. 1985. Calibration of the Snake Plain Aquifer Ground-Water Flow Model. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Johnson, G.S., C.E. Brockway, and S.P. Luttrell. 1985. Ground-Water Model Calibration for the Henry's Fork Recharge Area. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Brockway, C.E. 1986. Remote Sensing for Crop Water use. Presented at Idaho Potato School January 29, 1986, Pocatello, Idaho.

Robinson, C.W. and C.E. Brockway. 1986. Modeling Erosion and Sedimentation in Irrigation. Presented at ASCE Water Forum '86. At Long Beach CA, August 1986.

Brockway, C.E. 1987. Swan Falls Data and Research Program Status Report by Idaho Technical Committee on Hydrology. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Brockway, C.E. and C.W. Robinson. 1987. Evaluation of Closed Conduit Measuring Devices for Irrigation Diversions. Research Technical Completion Report, University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Brockway, C.E. and C.W. Robinson. 1987. Pump System Evaluation Using Microprocessor-Based Monitors. American Society of Agricultural Engineers, Paper No. 87-3502. Presented at the ASAE International Winter meeting December 15-18, 1987, Chicago, IL, December 1987.

Brockway, C.E. 1987. Report on "Evaluation of the Idaho-USGS Cooperative Water data Collection Program: A Report to Ken Dunn, Director of the Idaho Department of Water Resources from the Idaho Technical Committee on Hydrology.

Hill, R.W., C.E. Brockway, et al. 1987. Duty of Water under Bear River Compact: Field Verification of Empirical Methods. Summer 1987 Progress Report of the Bear River Commission.

Robinson, C.W. and C.E. Brockway. 1987. Demonstration of Monitors for Pumping Stations. Research Technical Completion Report for the Idaho Department of Water Resources, Contract No. DWR-86-03-21-704-37. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

France, K.E. and C.E. Brockway. 1987. Flow Measurement using Ramped Broad Crested Weirs. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Robinson, C.W. and C.E. Brockway. 1987. Demonstration of Monitors for Pumping Stations. Research Technical Completion Report, Contract No. DWR-86-03-21-704-37. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Brockway, C.E. and C.W. Robinson. 1988. Development and Demonstration of Pump Station and Surface Diversion Monitor Systems for Water and Energy Efficiency Improvements. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Brockway, C.E. and C.W. Robinson. 1988. Water Resources Data and Management Model for Beaver Creek, Camas Creek and Mud Lake Area of Eastern Idaho. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Hill, R.W., C.E. Brockway, R.D. Burman, L.N. Allen, and C.W. Robinson. 1989. Field Verification of Empirical Methods for Estimating Depletion; Research Report 125; Utah Agricultural Experiments Station, Logan, Utah, Two Volumes.

Brockway, C.E. 1989. Mud Lake Standing Operating Procedures. Draft Operating Procedures Manual for Mud Lake Water Users and Water District 31.

Robinson, C.W., C.E. Brockway, T. Gray, and T. Henschield. 1990. Irrigation Water Allocation System for Bell Rapids Mutual Irrigation Company.

Brockway, C.E., C.W. Robinson and J.S. Kolar. 1991. Municipal Pump Monitor Demonstration Project. Final Report to the Idaho Department of Water Resources. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Hamilton, B. and C.E. Brockway. 1991. Effects of Non-Continuous Turnout Operation on the Aberdeen-Springfield Canal System. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Sandoval, V.B. and C.E. Brockway. 1991. Ground-Water Investigations for the Fremont-Madison Irrigation District, Southeastern Idaho. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Sandoval, V.B. and C.E. Brockway. 1992. Water Rights Accounting on the Upper Snake River, Water District 01, Southeastern Idaho. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID. In press.

Brockway, C.E. and C.W. Robinson. 1992. Middle Snake River Water Quality Study, Phase I: Final. Technical Completion Report Submitted to Idaho Department of Health

and Welfare, Division of Environmental Quality. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Brockway, C.E., C.W. Robinson, G.S. Johnson. 1992. Evaluation of Water Quality in Shallow Ground-Water Systems. Final Report to the Division of Environmental Quality, Contract No. 82-600945. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Robison, C.W. and C.E. Brockway. 1991. Operations Manual for Electronic Pumping System Monitors. Research Technical Completion Report. University of Idaho, Idaho Water Resources Research Institute, Moscow, ID.

Robison, C.W. and C.E. Brockway. 1992. "Thinking about Post-Project Evaluation START NOW!" in: Proceedings of the National RCWP Symposium – 10 Years of Controlling Agricultural Nonpoint Source Pollution: the RCWP Experience. Orlando, Florida. September 13-17, 1992. US-EPA Office of Research and Development Office of Water, Washington DC. EPA/625/R-92/006.

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