



Wright Water Engineers, Inc.

IAN PATON, P.E.
CHIEF OPERATING OFFICER
SENIOR WATER RESOURCES ENGINEER

CURRENT

Employed by Wright Water Engineers, Inc. (WWE) from July 2000 to the present. Consultant to public and private sector clients on assignments related to surface water and groundwater quantity and quality engineering with emphasis on stormwater quantity and quality; analyses of the fate and mobility of contaminants in surface water; surface water hydrology; sediment transport; floodplain analysis and permitting; drainage channel design; National Pollutant Discharge Elimination System (NPDES) permitting, and erosion/sediment control.

EDUCATION

University of Colorado, Boulder, 1993
Master of Science, Civil Engineering

University of Colorado, Boulder, 1982
Bachelors, Environmental Design, with honors

REGISTRATIONS

Registered Professional Engineer in Colorado – #41756
Registered Professional Engineer in Texas – #126341
Registered Professional Engineer in Wisconsin – #49560
Certified Professional in Erosion and Sediment Control – #3770
Certified Floodplain Manager

REPRESENTATIVE PROJECTS

Water Quality/Contaminant Transport

Pueblo County, Colorado – Fountain Creek Water Quality and Sediment Transport Analysis.

Conducted study on behalf of Pueblo County regarding the modified hydrology and transport of sediment in the Fountain Creek drainage as a result of development in the upper watershed and imported water from trans-basin diversions. Results of the analysis were used in the development of an Intergovernmental Agreement (IGA) between Pueblo County, the City of Colorado Springs, and Colorado Springs Utilities, which requires the expenditure of \$460 million of stormwater program and capital improvements over 20 years. WWE continues to support Pueblo County with monitoring the implementation of IGA projects.

U.S. Department of Energy Legacy Management, Rocky Flats Site, Colorado – Water Quality Study. Conducted evaluation of transport of uranium and nitrate in the North and South Walnut Creek drainages. Analysis includes an evaluation of surface water and groundwater data, including isotopic uranium analyses to determine fractions of anthropogenic versus natural uranium.

Confidential Client, San Juan Basin, Colorado and New Mexico, and Anadarko Basin, Oklahoma – Oil Spill Transport and Fate Modeling. Evaluated the projected fate and transport of oil if a release was to occur from facilities located in the San Juan and Anadarko Basins. The analyses involved over 2,500 facilities and evaluated transport overland, and in ephemeral channels and perennial water courses. Analysis results were used in the evaluation of Spill Control and Countermeasures (SPCC) planning for oil releases.

Confidential Client, Permian Basin, Texas – Oil Spill Transport and Fate Modeling. Evaluated the projected fate and transport of oil released from over 150 facilities located in the Permian Basin in Texas. The analyses were used in the evaluation of SPCC planning for oil releases.

U.S. Department of Energy Rocky Flats Site – Actinide Migration Evaluation Project. Supported the Kaiser-Hill Company, LLC, and the actinide migration technical advisory committee on multiple investigations and models related to actinide transport in surface water and groundwater at the U.S. Department of Energy (DOE) Rocky Flats Site.

U.S. Department of Energy Rocky Flats Site – Pathway Analysis Study. Supported multi-disciplinary investigation to quantify transport of plutonium, americium, and multiple uranium isotopes in the environment at the Rocky Flats site. The study involved analyses of air, surface water, groundwater, and biological transport pathways. Coordinated the investigation with the Actinide Migration Evaluation advisory committee and presented study findings to the public and regulatory agencies.

U.S. Department of Energy Rocky Flats Site – Groundwater IM/IRA. Lead author responsible for developing the Interim Measure/Interim Remedial Action (IM/IRA) regulatory decision document, on behalf of Kaiser-Hill, for groundwater at the Rocky Flats Site. The Groundwater IM/IRA is a regulatory decision document that provides an evaluation of groundwater contaminant distribution, including radionuclides, volatile organic compounds, and metals, and an analysis of remedial action alternatives. Following a public comment period, the Groundwater IM/IRA was approved by the State and EPA in 2005.

U.S. Department of Energy Rocky Flats Site – 903 Pad Lip Area IM/IRA. Lead author responsible for developing the Interim Measure/Interim Remedial Action (IM/IRA) regulatory decision document, on behalf of Kaiser-Hill, to evaluate alternatives and guide remedial actions at the 903 Pad Lip Area at the Rocky Flats site. The 903 Pad Lip Area is the location with the highest levels of plutonium and americium contamination in surface soil at Rocky Flats. Following a public comment period, the 903 Pad Lip Area IM/IRA was approved by the State and EPA in 2004.

U.S. Department of Energy Rocky Flats Site – Actinide Migration Model. Developed methodology to merge WEPP and HEC-6T erosion and sediment transport models with soil actinide data to predict the migration of plutonium and americium in surface water actinide at RFS.

U.S. Department of Energy Rocky Flats Site – Environmental Assessment, Hydrology and Contaminant Transport Issues. Supported the assessment of hydrologic and contaminant transport issues, and integrated expertise to provide support on earthen dam and wetlands issues for a National Environmental Policy Act (NEPA) Environmental Assessment (EA) for the reconfiguration of the Walnut Creek retention ponds at the Rocky Flats site.

U.S. Department of Energy Rocky Flats Site – Watershed Best Management Practices. Managed watershed improvement program to reduce erosion of soil with the associated migration of plutonium and americium in runoff from selected areas at RFS.

U.S. Department of Energy Rocky Flats Site – Source Investigation. Co-authored of Source Investigation and Preliminary Mitigation Plan for Walnut Creek; comprehensive investigation into the cause of elevated plutonium levels in 1997 in Walnut Creek at RFS.

Fayetteville, Arkansas – Nutrient Loading Plan. Developed plan to reduce nutrient loading into Beaver Lake, the primary water supply for the Fayetteville/Rogers metropolitan area. The primary focus of WWE's work was to develop conceptual designs of structural Best Management Practices (BMPs) for reducing phosphorus loads from specific existing residential and commercial developments.

Copper Mountain Resort, Colorado – Water Quality Protection Strategy. Developed water quality protection strategy for major base area development proposed for the Copper Mountain Resort. The strategy document was included as part of the base area PUD submittal in 2008.

Springfield, Missouri – City Lakes Water Quality Study. Conducted assessment of the nature and causes of water quality degradation in lakes in parks throughout Springfield, Missouri. The project involved working closely with City staff.

Stormwater Quality Permitting/Compliance

Centex Homes, Western U.S. – Stormwater Compliance Audits. Conducted construction stormwater permit compliance audits at residential development sites in Colorado, Southern California, and New Mexico. Audits involved both filed inspections and reviews of Storm Water Pollution Prevention Plans.

Confidential Client, Piceance Basin, Colorado – Oil and Gas Facilities Stormwater Compliance Inspections. Conducted construction stormwater permit compliance audits at numerous oil and gas facilities, including well pads and along pipeline corridors, in the Piceance Basin.

ExxonMobil, Piceance Basin, Colorado – Oil and Gas Facilities, Stormwater Pollution Prevention Plans. Developed Storm Water Management Plans for numerous natural gas well pad sites and pipelines in the Piceance Basin in northwest Colorado.

ExxonMobil, Mobil, Alabama – Oil and Gas Facilities, Stormwater Pollution Prevention Plans. Conducted field inspections and developed Storm Water Pollution Prevention Plans (SWPPPs) for multiple well pads, gas facilities and pipelines in Mobil, Alabama.

ExxonMobil, Mobil, Alabama – Gas Plant Decommissioning Project Stormwater Pollution Prevention Plan. Conducted field inspections and developed SWPPP for decommissioning of gas plant.

ExxonMobil, Sublette and Lincoln Counties, Wyoming – Developed SWPPPs and reclamation plans for multiple well pads, pipelines and fiber optic lines in Sublette and Lincoln Counties, Green River Basin, Wyoming.

Williams Companies, Overland Pass Pipeline, Southern Wyoming – Conducted field evaluation and developed monitoring and compliance protocol for stormwater permit compliance for 320 miles of pipeline transporting 245,000 barrels per day of Liquid Natural Gas. Monitoring protocol was approved by the Wyoming Department of Environmental Quality.

U.S. Department of Energy Rocky Flats Site, Stormwater Quality Inspections. Conducted stormwater pollution prevention inspections and compliance audits at the Department of Energy Rocky Flats Site. Inspections involved a wide range of industrial and manufacturing facilities at industrial complex covering approximately 385 acres during cleanup and remediation activities.

Confidential Client, Aurora, Colorado – Residential Development Site, Construction Stormwater Permit Compliance. Supported client with construction stormwater permit compliance and developed action plan to respond to potential storm water permit violations at a residential development site in Aurora, Colorado.

U.S. Department of Energy Rocky Flats Site, NPDES Stormwater Permit Compliance. Authored Storm Water Pollution Prevention Plan (SWPPP) for the DOE Rocky Flats Site during initial phase of site cleanup and remediation.

Mortenson Construction Company – Construction Dewatering Permit Compliance. Managed construction dewatering sampling and preparation of Discharge Monitoring Reports for dewatering operations during construction of an office tower in downtown Denver.

Drainage Engineering/Floodplain Studies

Mile High Flood District, Denver, Colorado – Todd Creek Drainage Improvements. Engineer of Record for over 4,000 linear feet of drainage channel improvements for Todd Creek channel, including obtaining approval for Conditional Letter of Map Revision (CLOMR), obtaining 404 permit and channel design. (2022 – project in process).

Majestic Commerce – Floodplain Conditional Letter of Map Revision (CLOMR). Managed study to obtain CLOMR for First Creek stormwater drainage improvements, including coordinating with design of stormwater detention facility and bridge improvements to improvement detention and conveyance of flood flows along First Creek.

Confidential Client, Oil and Gas Facilities, Texas – Drainage Channel. Engineer of Record for hydrology study and design of drainage improvements for multiple well pads and gas processing facilities in southern Texas.

SM Energy, Webb County, Texas – Floodplain Permitting. Conducted hydraulic analyses and obtained floodplain development permits for multiple oil and gas facilities located in the Eagleford Field in Webb County, Texas.

City of Manitou Springs, Colorado – Post-Wildfire Drainage Channel. Engineer of Record for design and construction of debris basin, debris nets and drainage channel improvements in the Williams Canyon drainage in the City of Manitou Springs. The project was designed and constructed in response to the increased runoff and flooding occurring following the Waldo Canyon wildfire in 2012.

City of Rogers, Arkansas – Drainage Criteria Manual. Working as a subconsultant to Crafton Tull, authored sections of the *Drainage Criteria Manual* in chapters on water quality, detention design, stormwater management principles and stormwater planning.

City of Springfield, Missouri – Drainage Criteria Manual. Authored sections on open Channels and Runoff in the *Drainage Criteria Manual* for the City of Springfield, Missouri. Taught session on open channels at Manual workshop.

Confidential Client, Means, Texas – Oil and Gas Tank Battery Drainage. Developed drainage plan for tank battery located in the Means oil field north of Odessa, Texas.

Spring Mesa Subdivision, Arvada, Colorado – Flooding and Sediment Transport Evaluation. Conducted an engineering analysis of flooding and sediment transport associated with a new subdivision under construction in Arvada, Colorado. The study evaluated rainfall data, stormwater Best Management Practices, and sources of sediment that were mobilized during a large rainstorm in 2006.

Hydrology

Confidential Client, Southern California – Post-Wildfire Flooding and Debris Flow Analysis. Conducted fieldwork and analyses to evaluate hydrology and evaluate debris flow volumes and pathways following the Thomas wildfire in southern California.

Confidential Client, Durango, Colorado – Post-Wildfire Flooding and Debris Flow Analysis. Conducted fieldwork and analysis to evaluate hydrology and evaluate debris flow following the 401 wildfire in southern Colorado.

Boulder County, Colorado – Post-Wildfire Hydrologic Modeling, Fourmile Canyon. Developed evaluation of the hydrologic changes in the Fourmile Canyon burn area. After a wildfire burned over 6,200 acres west of Boulder in September 2010, WWE was contracted by Boulder County to develop hydrologic models to project the estimated runoff for a range of storm events in the post-fire burn condition. HEC-HMS was used to develop models of routed flows from approximately 25 sub-basins, for storm events ranging from the 2-year to the 100-year, for the Fourmile Creek and Fourmile Canyon Creek basins.

City of Boulder, Colorado – Post-Wildfire Hydrologic Modeling, Fourmile Canyon. Conducted hydrology study for the City of Boulder to evaluate estimated peak flows and travel time for flood flows from burn scar resulting from the Fourmile Canyon fire.

Santa Susana Field Laboratory, California – Post-Wildfire Literature Review. Authored a literature review of the hydrologic recovery of chaparral watersheds following fire, in response to the 2005 Topanga fire that burned large portions of the rocket test facility operated by Boeing and the U.S. Department of Energy.

U.S. Department of Energy Rocky Flats Site – Hydrologic Modeling. Served as Project Manager and lead engineer for an evaluation of the hydrologic and floodplain impacts associated with engineered breaches of multiple dams at the Department of Energy site north of Golden. The analysis involved the use of the Colorado Urban Hydrograph Procedure (CUHP) and EPA SWMM models to evaluate the hydrology of different combinations of engineered dam breaches, for a range of storm events. HEC-RAS was used to delineate floodplain boundaries for the different scenarios evaluated. The modeling study was used as part of an Environmental Assessment (EA) for decommissioning of the Rocky Flats dams.

U.S. Department of Energy Rocky Flats Site – Hydrologic Modeling. Developed dynamically-linked hydrologic model of the retention pond system at RFS. The system was developed in response to flooding that occurred in 1995 and has been used for RFS water management operations for over 20 years.

U.S. Department of Energy Rocky Flats Site – Pond Operations Plan. Developed long-term plan for management of the Rocky Flats pond system. The plan was adopted by DOE and the regulatory agencies.

Water Rights

U.S. Department of Energy Rocky Flats Site – Water Rights Acquisition. Provided engineering support to DOE with negotiations to acquire long-term lease of water from neighboring municipality to

offset depletions related to operation of detention ponds. Support was also provided to assist the U.S. government attorneys with preparation of an application to file for storage rights and an augmentation plan in Water Court.

Other Projects

U.S. Department of Energy Rocky Flats Site – Emergency Response Decision Support System.

Developed emergency response action decision support system for responding to site spills, floods, and dam failures during remediation activities at the DOE Rocky Flats site.

EXPERT WITNESS ASSIGNMENTS

Expert Reports and Affidavits

Weld County, Colorado District Court. City of Greeley and Boyd Irrigation Company v. Aggregate Industries – WCR, Inc. Case No.: 2018CV030773. 2021: Affidavits regarding impacts from flood flows resulting in erosion of embankment of gravel pit and damage causing breach to agricultural water pipeline.

PROFESSIONAL & HONORARY SOCIETIES

Member – American Society of Civil Engineers (ASCE)

Member – Colorado Association of Stormwater and Floodplain Managers (CASFM)

AWARDS

American Nuclear Society Best Paper Award, Topical Meeting on Decommissioning, Decontamination, and Revitalization; Capturing Decommissioning Lessons Learned, Chattanooga, Tennessee, September 2007.

REPRESENTATIVE PRESENTATIONS

2017 Colorado Environmental Management Society. Spill Prevention, Control and Countermeasures (SPCC) Rule: Promoting Environmental Protection by Focusing Efforts on High Priority Facilities. October 10, 2017.

2016 Forester University Webinar. Post-Fire Hydrology: Estimating Watershed Impacts and Planning for Recovery. October 7, 2016.

2015 Rocky Mountain Hydrologic Research Center Annual Meeting. Fountain Creek Sediment Load Changes. October 23, 2015.

2013 International Erosion Control Association Rocky Mountain Regional Conference. After the Wildfire: Impacts from Flooding and Debris Flows. December 4, 2013..

2012 StormCon Conference. Fire and Rain Workshop. Module 3: Hydrologic Changes After a Fire. August 21, 2012.

2012 International Erosion Control Association Rocky Mountain Regional Conference. Changes in Hydrology After a Wildfire. Case Study: The Fourmile Canyon Burn Area. December 5, 2012.

2012 EWRI Conference. Estimating the Probability of Storm Runoff Impacts in a Burned Watershed. Fourmile Canyon, Colorado. May 24, 2012.

2012 Colorado Association of Stormwater and Floodplain Managers. Assessing the Probability of Impacts from Storm Runoff Following wildfire. Case Study: The Fourmile Canyon Wildfire. September 27, 2012.

2007. American Nuclear Society. Understanding Contaminant Transport Pathways at Rocky Flats. September 18, 2007.

2004. Waste Management Conference Development of an Independent Scientific Advisory Committee to Support the Closure of Rocky Flats. March 2, 2004.

PUBLICATIONS

Paton, I.B. 2016. "Drought Planning and the Hydrologic Impact of Wildfires." American Water Resources Association IMPACT. Volume 18, Number 2. March.

Paton, I.B., T. A. Earles, S.M. Tillack. 2012. "Estimating the Probability of Storm Runoff Impacts in a Burned Watershed." Proceedings, World Environmental and Water Resources Congress. American Society of Civil Engineers, Environmental and Water Resources Institute. Albuquerque, New Mexico, May 2012.

Clark, D. L., G.R. Choppin, C.S. Dayton, D. R. Janecky, L. J. Lane, I. B. Paton. 2007. Rocky Flats closure: the role of models in facilitating scientific communication with stakeholder groups. *Journal of Alloys and Compounds*. V. 444-445. No. SPEC. ISS p. 11-18. November.

Paton, I.B., 2007. "Understanding Contaminant Transport Patterns at Rocky Flats---A Basis for Remediation Strategy. *Proc. Topical Meeting on Decommissioning, Decontamination, and Revitalization; Capturing Decommissioning Lessons Learned, Chattanooga, TN, September*.

Paton, I.B., C. Dayton, D.M. Jubenville, E.R. Weiner, and M. Hyder. 2004. "Quantification of Actinide Migration Pathways at Rocky Flats, Colorado." *Journal of the American Water Resources Association*.

Paton, I., and C. Dayton. 2004 (co-authors and presenters). "Development of an Independent Scientific Advisory Committee to Support the Closure of Rocky Flats." *Proc. Waste Management Conference*. Tucson, Arizona.

Squibb, G., and I. Paton (co-authors and presenters). 2003. "The Rocky Flats Site BMP Experience and Implications for Site Closure." *Proc. Experience with Best Management Practices conference, sponsored by the Colorado Association of Stormwater and Floodplain Managers, Urban Drainage and Flood Control District*. Denver, Colorado.

Paton, I. (co-author and presenter) C. Dayton, D. Jubenville, R. Weiner, and M. Hyder. 2001. "Quantification of Actinide Migration Pathways at Rocky Flats, Colorado." *Proc. American Water Resources Association Annual Water Resources Conference*. Albuquerque, New Mexico.

Wetherbee, G., and I. Paton. 1996. "Water Quality Control at Rocky Flats: A Wet Detention Model for Stormwater Radionuclide Removal." *Proc. Colorado Association of Stormwater and Floodplain Managers Annual Conference*. Vail, Colorado

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Wolaver, H., and I. Paton. 1993. "Toxicity Monitoring for Industrial Wastewater." *Proc. Purdue Industrial Waste Conference*. Purdue, Indiana.

Amy, G., and I. Paton. 1992. "Modeling the Formation of Trihalomethanes." *Proc. AWWA Water Quality Treatment Conference*. Vancouver, B.C.