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DEPARTMENT OF  
WATER RESOURCES

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STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES

IN THE MATTER OF DISTRIBUTION OF  
WATER TO VARIOUS WATER RIGHTS  
HELD BY OR FOR THE BENEFIT OF  
A&B IRRIGATION DISTRICT,  
AMERICAN FALLS RESERVOIR  
DISTRICT #2, BURLEY IRRIGATION  
DISTRICT, MILNER IRRIGATION  
DISTRICT, MINIDOKA IRRIGATION  
DISTRICT, NORTH SIDE CANAL  
COMPANY, AND TWIN FALLS CANAL  
COMPANY

Docket No. CM-DC-2010-001


**IGWA'S EXPERT WITNESS  
DISCLOSURE**

Idaho Ground Water Appropriators, Inc. ("IGWA"), by and through counsel, hereby provide their list of expert witnesses they intend to rely on at the hearing.

- (1) **Sophia Sigstedt**. Lynker Technologies, 5445 Conestoga Ct., Boulder, Colorado 80301; (855) 596-5371. A copy of Ms. Sigstedt's updated curriculum vitae is attached hereto as Exhibit A.
- (2) **Jaxon Higgs**. Water Well Consultants, 355 West 500 South, Burley, Idaho 83318; (208) 650-6605. A copy of Mr. Higgs' updated curricula vitae is attached hereto as Exhibit B.

Dated this 7th day of November, 2025.

RACINE OLSON, PLLP

By:   
Thomas J. Budge  
*Attorneys for IGWA*

## CERTIFICATE OF SERVICE

I hereby certify that on this 7th day of September, 2025, I cause the foregoing document to be served on the persons below via the method below:

  
Thomas J. Budge

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# Sophia C. Sigstedt

## Professional Hydrogeologist (PH-GW)



### Education

M.S., Hydrology, New Mexico Institute of Mining and Technology, 2010

B.S., Environmental Science with Biology, New Mexico Institute of Mining and Technology, 2008

### Years of Experience

15+

### Employment History

Lynker, LLC, Hydrogeologist, 2015-Present

AMEC Environment & Infrastructure, Hydrogeologist, 2010-2015

NM Institute of Mining and Technology, Research Assistant, 2008-2010

NM Institute of Mining and Technology, Teaching Assistant, 2009

Laboratory of Biochemical and Biomedical Research, Research Assistant, 2007-2008

### Summary

Sophia Sigstedt is a certified professional hydrogeologist by the American Institute of Hydrology. She has a M.S. in Hydrology and a B.S. in Environmental Science and Biology. She has over 15 years of experience. Professional experience includes hydrogeochemical evolution and water quality analysis, geochemical modeling, applications of stable isotopes to groundwater and water resource studies, radiocarbon dating of groundwater, numerical groundwater modeling, basin-scale water resource management, and conjunctive use management.

She has diverse experience in hydrology, water rights, water resources engineering, and water resources planning and management. She has been integral in several basin-scale water management studies involving development of hydrologic data, forecast of future water demands, and creation of planning models to investigate effects of changes in water management. Her work includes litigation support in a variety of water rights proceedings including historical consumptive use analysis, evaluation of surface/groundwater interactions, groundwater modeling, conjunctive administration of surface water and groundwater rights, stream depletion analysis, development of protective terms and conditions, settlement negotiations, and expert witness testimony.

Her hydrology graduate degree experience includes surface-water, vadose zone and groundwater hydrology with an emphasis in hydrogeology and hydrogeochemistry. Undergraduate background includes microbiology, environmental geology, toxicology, ecology and waste water treatment.

She has run stable isotopic analysis using mass spectrometry for the New Mexico Tech Stable Isotope Lab. She has taught laboratory and field techniques in hydrology at New Mexico Institute of Mining and Technology. Techniques included surveying, employing tensiometers and infiltrometers to quantify unsaturated flow, solute transport experiments, well hydraulic tests, and stream gauging.

### Core Skills

Hydrogeologic and hydrogeochemical analysis performed using Modflow2K, Modflow-Surfact, Modflow-USG, MODPATH, PEST, IDSCU-AWAS, SAC-SMA, Lag/K, Snow-17, StateCU, RefET, Hydrus, Leapfrog, Netpath, Phreeqc, SaltNorm, Aquachem, ArcGIS, and RockWare.

### Selected Project Experience Water Resources

#### Snake River Conjunctive Administration of Water Rights

*Idaho Ground Water Appropriators, ID, 2012-2024*

Ms. Sigstedt provides expert support in the evaluation of conjunctive administration of ground water rights with modeling of aquifer management and mitigation plans, consumptive use analysis, and analysis of historical water use. Ms. Sigstedt provides project support on the Eastern Snake Plain Aquifer Model and its development under the Eastern Snake Hydrologic Modeling

Committee, as well as, its application for conjunctive use management of water rights.

### **City of Boulder Water Supply Planning and Water Resources Engineering**

*City of Boulder, CO, 2020-2024*

Ms. Sigstedt is project manager under contract with City of Boulder for water resources engineering and water supply planning services. Ms. Sigstedt provides evaluation of the city's water system and ability to meeting policy and planning goals, computer modeling of the city's water supply and water rights portfolio and water system operations, evaluation of climate change impacts, drought planning, water efficiency planning, evaluation and forecasting of water demands and technical analysis around water rights administration.

### **South Platte River & Boulder Creek Conjunctive Administration of Water Rights**

*City of Boulder, CO, 2010-2020*

Ms. Sigstedt provides expert support in the evaluation of applications to the state focused on assessing the quantity and timing of depletions to streamflow. Ms. Sigstedt provides review and independent analysis of numerical modeling, consumptive use and historical use for technical support in the evaluation of conjunctive use management of water rights. This work includes analysis of certain water court cases and State Engineer proceedings to which the City of Boulder is a party.

### **Laramie County Control Area Hydrogeologic Model**

*Wyoming State Engineer's Office, WY, 2013-2014*

Ms. Sigstedt developed a hydrogeologic model for management of the Laramie County Groundwater Control Area. Ms. Sigstedt was tasked with data review for model inputs and development of a hydrogeologic model of the High Plains Aquifer System using MODFLOW-SURFACT. Modeling included developing DCMI's, consumptive use for irrigation withdrawals, recharge estimates, and modeling stream flows (STR). The model was calibrated using PEST. The groundwater modeling analysis was used to determine the status of appropriable water in the county.

### **Determination of Appropriable Water for Salt Basin Groundwater System**

*New Mexico State Engineer's Office Interstate Stream Commission (ISC), NM, 2007-2010*

Ms. Sigstedt acted as a hydrogeochemist for the analysis of the Salt Basin groundwater system to determine water resources available for appropriation by the State. For this project Ms. Sigstedt's primary tasks included developing a hydrogeochemical model based on environmental tracers collected from groundwater, surface water and precipitation sources within the basin. Ms. Sigstedt collected samples for carbon-14, tritium, oxygen and deuterium stable isotopes, and general ion chemistry analysis. Ms. Sigstedt analyzed the environmental tracers and general ion chemistry data to delineate recharge zones, identify groundwater flow paths and characterize fracture flow, estimate groundwater flow rates and permeability and elucidate the controls on the evolution of groundwater chemistry and the water quality distribution of the basin. The geochemical modeling was used to calibrate a basin-scale MODFLOW-SURFACT model.

### **Navajo Nation Zuni Basin Water Rights Adjudication**

*Navajo Nation, NM, 2011-2012*

Ms. Sigstedt provided water resource management consulting for the Zuni basin. Ms. Sigstedt was tasked with DCMI estimates as well as the development of a hydrogeologic model. Three-dimensional geologic model built using Leapfrog Hydro. Groundwater model was run using MODFLOW-SURFACT and used to develop scenarios and determine impacts of claims on appropriable water in the basin.

### **Middle Rio Grande Conservancy District (MRGCD) Ad Valorem Tax Assessment**

*Bureau of Indian Affairs (BIA), NM, 2011*

Ms. Sigstedt provided a detailed Ad Valorem tax assessment for properties with acreage benefitted by the Middle Rio Grande Conservancy District (MRGCD) water services. Ms. Sigstedt's analysis included identifying non-pueblo, irrigable acres evaluating the ad valorem and water services collections and providing a summary for both the residential and non-residential property for each county within the conservation District. Ms. Sigstedt's data compilation and mapping were performed with the use of Microsoft Access and ArcGIS.

### **National Weather Service Hydrologic Modeling and Support**

*National Oceanic Atmospheric Administration (NOAA), Federal, 2014-2017*

Lynker under contract with NOAA calibrated and implemented models for use in NWS river, flood, and drought forecast processes. Ms. Sigstedt's work includes developing and modifying hydrologic inputs, understanding groundwater-surface

water interactions, consumptive use analysis and hydrologic model calibration. Ms. Sigstedt is currently involved in the Northwest River Forecast Center (NWRFC), Missouri Basin River Forecast Center (MBRFC), and the West Gulf River Forecast Center (WGRFC) calibration tasks, which involve calibration of the SAC-SMA, SNOW-17, and LAG/K hydrologic models. The task was completed using a variety of tools including the CHPS environment, GIS, and Python scripting.

## Selected Project Experience Mineral Resources and Impact Analysis

### Ollachea Mine Hydrology and Hydrogeology for Feasibility Study

*Compania Minera Kuri Kullu, Peru, 2012*

Ms. Sigstedt provided hydrology and hydrogeological characterization for the Ollachea underground gold mine site for operational planning. Ms. Sigstedt was tasked with the development of the hydrogeological modeling with MODFLOW-USG to determine impacts on local streamflow and estimate mine tunnel inflows used in the assessment of sizing the on-site waste water treatment plant.

### Carmen de Andacollo Hydrogeologic Analysis of Tailings Expansion

*Compania Minera TECK, Chile, 2012*

Ms. Sigstedt provided hydrogeological characterization and analyses in support of expansion of the mine tailing facilities. As part of this effort Ms. Sigstedt provided consulting to the team in Santiago on water quality and geochemical evolution, stable isotope analysis and development of the hydrogeological modeling with MODFLOW-SURFACT.

### Corani Mine Water Resources Environmental Impact Analysis

*Bear Creek Mining Company, Peru, 2011*

Ms. Sigstedt was tasked with the surface water and groundwater quality analysis. Analysis included water quality comparisons to environmental standards, temporal and spatial distributions of contaminants of concern using ArcGIS mapping, analysis of geochemical evolution through the use of Piper and Stiff diagrams, stable isotope analysis, and identifying and analyzing impacts from existing environmental liabilities. Ms. Sigstedt assisted in the groundwater model development of a MODFLOW-SURFACT model to determine wetland impacts at the mine site.

### Antamina Mine Regional Hydrogeologic Integration and Geodatabase

*Antamina, Peru, 2011*

Ms. Sigstedt served as a hydrologist on a team charged with integrating all hydrogeologic data collected since site inception into an ArcGIS geodatabase, and compiling a hydrogeologic integration report. The hydrogeologic integration report involved summarizing all past work, identifying important data gaps, and developing a site-wide integrated hydrogeologic conceptual model that could be used to provide a framework for interpreting existing and newly acquired site data. Ms. Sigstedt's work focused primarily on hydrogeology and groundwater movement, water quality, geochemical evolution and developing the ArcGIS geodatabase.

### Expert Testimony

Before the Department of Water Resources of the State of Idaho In the Matter of Distribution of Water to Various Water Rights Held by or for the Benefit of the *Surface Water Coalition*, June 6, 2023.

Before the Michigan Department of Environment, Great Lakes and Energy in the Matter of *Wetland Permit issued to Aquila Resources docket #18-013058* June 10, 2019.

Before the Department of Water Resources of the State of Idaho In the Matter of *Application for Transfer no. 79560 in the Name of North Snake Ground Water Dist., Magic Valley Ground Water Dist., and Southwest Irrigation Dist.* December 18<sup>th</sup>, 2014.

### Appointed as an Expert to:

Big Lost Modeling Technical Advisory Committee (2022) **Idaho**

Surface Water Coalition Technical Working Group (2015) **Idaho**

Eastern Snake Hydrologic Modeling Committee (2014) **Idaho**

Case no. 10CW306 Technical Working Group (2014) **Colorado**

Swan Falls Technical Working Group (2013) **Idaho**



## Expert Reports & Publications

- “Expert Report Hydrology, Water Rights, and Groundwater Modeling Evaluation of the Fifth Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover and the Final Order Regarding April 2023 Forecast Supply issued April 21, 2023, in the Matter of Distribution of Water to Various Water Rights Held by or for the Benefit of the Surface Water Coalition” Prepared for IGWA May 30, 2023.
- “Expert Report of the Idaho Ground Water Appropriators, Inc (IGWA) Concerning Applications for Permit Nos. 36-17121 and 36-17122” Prepared for IGWA February 7<sup>th</sup>, 2020.
- “Opinions to Date of Louis Rozaklis and Sophia Sigstedt Regarding Case No. 16CW3200 Application for Change of Water Rights and Appropriation of Return by Arapahoe County Water and Wastewater Authority, East Cherry Creek Valley Water and Sanitation District and United Water and Sanitation District” Prepared for City of Boulder, 2018.
- “Engineering Report in the Evaluation of Consolidated Case Nos. 13CW3144 and 14CW3134: Application for Groundwater Rights and Augmentation Plan by Timbro Ranch and Cattle Company, LLC” Prepared for City of Boulder by Sophia C. Sigstedt, Lee T. Rozaklis, and Shaden A. Musleh, 2018.
- “Opinions to Date of Louis T. Rozaklis and Sophia Sigstedt Regarding Case No. 14CW3068 Application for Change of Water Rights and Addition of Sources of Augmentation and Substitute Supply by the Town of Wiggins” Prepared for City of Boulder, 2017.
- “Groundwater flow in an ‘underfit’ carbonate aquifer in a semiarid climate: application of environmental tracers to the Salt Basin, New Mexico (USA)”, S.C. Sigstedt, F.M. Phillips, and A.B.O Ritchie, Hydrogeology Journal DOI 10.1007/s10040-016-1402-2, 2016.
- “Evaluation of Hydrogeology and Groundwater Modeling of Case no. 13CW3144 Applications for Water Rights of Timbro Ranch & Cattle Company, LLC” prepared for City of Boulder by S.C. Sigstedt, Lynker Technologies, 2015.
- “Water Right, Water Measurement, and Groundwater Modeling Evaluation of Rangen 2014 Delivery Call” Prepared for Idaho Ground Water Association by C.M. Brendecke & S.C. Sigstedt, Lynker Technologies, 2015.
- “Hydrogeologic Study of the Laramie County Control Area” Prepared for the Wyoming State Engineer’s Office by AMEC Environment & Infrastructure, Hinckley Consulting & HDR Engineering, Inc, 2014.
- “Opinions to Date of Louis Rozaklis and Sophia Sigstedt Regarding Case No. 13-SE-18 Applications by 70 Ranch Resource Development, L.L.C.”, Prepared for the City of Boulder, CO by AMEC Environment & Infrastructure, 2014.
- “Nontributary Determination Huerfano County, Colorado Raton Basin”, prepared for SWEPI LLP, by R. McGregor, D.S. Kaback, J. Clark & S. Sigstedt at AMEC Environment &Infrastructure, 2013.
- “Opinions to Date of Louis Rozaklis, Shaden Musleh, Sophia Sigstedt, and Courtney Black Regarding Case No. 10CW306 Applications by the Arapahoe County Water and Wastewater Authority, United Water and Sanitation District, and East Cherry Creek Valley Water and Sanitation District”, Prepared for the City of Boulder, CO by AMEC Environment & Infrastructure, 2013.
- “Freeman 3-24 Well Nontributary Determination Huerfano County, Colorado Raton Basin, by R. McGregor, D.S. Kaback, J. Clark & S. Sigstedt at AMEC Environment &Infrastructure, 2013.
- “Ollachea Gold Project PERU NI 43-101 Technical Report on Feasibility Study: Chapter 16.4 Hydrogeology”, Prepared for Minera Kuri Kulla S.A. by AMEC Environment & Infrastructure, 2012.
- “Environmental tracers in groundwater of the Salt Basin, NM, and implications for water resources” Sophia Sigstedt. New Mexico Institute of Mining and Technology, Socorro, NM. 2010.

# Exhibit B

Jaxon Higgs, Professional Geologist (PGL - 1672)  
Water Well Consultants, Inc.  
355 West 500 South  
Burley, Idaho 83318

## Education:

- B.S., Geology, Brigham Young University Idaho, 2010
- M.S., Hydrogeology, University of Idaho, 2012

## Employment History:

- Water Well Consultants, Inc.
  - Field Tech (2000-2012)
  - Staff Hydrogeologist & GIS Analyst (2012-Present)

## Summary:

Jaxon Higgs is the principal owner and operator of Water Well Consultants, Inc. (“WWC”). WWC provides a variety of hydrogeologic services in southern Idaho related to aquifer management and water conservation. Contracted duties include, but are not limited to, monitoring of aquifer health, usage measurement and reporting, and management of aquifer recharge programs.

WWC is a consultant for Idaho Ground Water Appropriators, Inc. (“IGWA”). In that capacity Higgs provides technical assistance on a variety of matters, including groundwater modelling and other issues related to the Surface Water Coalition (“SWC”) delivery call. Higgs also attends IGWA board meetings, including those involving the settlement agreement entered into between IGWA and the SWC in 2015 (the “2016 Settlement Agreement”). Among other things, Higgs prepares the spreadsheets showing groundwater diversion and recharge data that IGWA submits to the SWC and IDWR under section 2.a of the Second Addendum to the 2016 Settlement Agreement.

Higgs is also a consultant for five of IGWA’s member ground water districts: North Snake Ground Water District, Magic Valley Ground Water District, Southwest Irrigation District, American Falls-Aberdeen Ground Water District, and Bonneville-Jefferson Ground Water District. He provides input on the development of, and is familiar with, each of these districts’ programs for conserving groundwater under the 2016 Settlement Agreement (Southwest Irrigation District conserves water under a separate settlement agreement with the SWC).