FENNEMORE.

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March 1, 2024

Trisha Osborne
Assistant Commission Secretary
Public Utilities Commission of Nevada
1150 E. William Street
Carson City, NV 89701

Re: **Docket No. 24-_____: Application of Great Basin Water Co., Pahrump, Spring Creek, Cold Springs, Pahrump, and Spanish Springs Divisions for Approval of its 2024 Integrated Resource Plan and to designate certain system improvement projects as eligible projects for which a system improvement rate may be established, and for relief properly related thereto.**

Dear Trisha:

Accompanying this letter for filing with the Public Utilities Commission of Nevada (the "Commission"), is Great Basin Water Co.'s ("GBWC") Application of Great Basin Water Co., Pahrump, Spring Creek, Cold Springs, Pahrump, and Spanish Springs Divisions for Approval of its 2024 Integrated Resource Plan and to designate certain system improvement projects as eligible projects for which a system improvement rate may be established, and for relief properly related thereto.

Courtesy copies of the filing are being provided to the Regulatory Operations Staff ("Staff") and the Bureau of Consumer Projection ("BCP") by electronic mail with hard copies to follow.

In addition, GBWC is providing Staff and BCP will all executable files supporting the Application. These executable files are being provided via a Box.com data room (the "Data Room"). Links to this Data Room will be emailed to pucn.sc@puc.nv.gov (Staff) and to bcpserv@ag.nv.gov (BCP). Please note that this Data Room contains a folder marked "Confidential." The executable files in this folder will be made available to Staff and BCP upon the execution of a protective agreement.

GBWC is also filing a Request for Confidential Treatment for certain documents in the Application. The confidential documents consists of maps that depict GBWC's infrastructure and flow diagrams and schematics illustrating GBWC's various systems.

A check in the amount of $200.00 is included with this filing.

Sincerely,

Wade Beavers

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

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In the Matter of: Application of Great Basin Water Co., Pahrump, Spring Creek, Cold Springs, Pahrump, and Spanish Springs Divisions for Approval of its 2024 Integrated Resource Plan and to designate certain system improvement projects as eligible projects for which a system improvement rate may be established, and for relief properly related thereto.	Docket No. 24-_____

VOLUME 1 OF 18

Great Basin Water Co.
2021 Integrated Resource Plan
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Appendix C – Lumos & Associates Drawings Flow Schematics denoting utility infrastructure	Volume 6, Appendix C, Pages 5-25, 28-30, 33, 36
Appendix D – Lumos & Associates Drawings System Maps denoting utility infrastructure	Volume 6, Appendix D, Pages 40-41, 44-51, 53, 55
Appendix M – Lumos & Associates Drawings System Maps denoting utility infrastructure	Volume 17, Appendix M, Pages 307-308, 325-326

CERTIFICATE OF SERVICE

I hereby certify that I am an employee of Fennemore Craig, P.C. and on March 1, 2024, I caused to be served, a true and correct copy of **Application**, via Electronic Mail, or as indicated below, to the following parties:

Electronic Mail Only:

Regulatory Operations Staff
Public Utilities Commission of Nevada
1150 E. William Street
Carson City, Nevada 89701
Pucn.sc@puc.nv.gov

Office of the Attorney General
Bureau of Consumer Protection
100 N. Carson Street
Carson City, Nevada 89701
bcpserv@ag.nv.gov

Dated this 1st day of March, 2024

/s/ Diana L. Wheelen
Diana L. Wheelen

Great Basin Water Co.
2024 Integrated Resource Plan
Checklist — NAC 704.565, *et seq*.

	NAC Section	Application Section
❑	NAC 704.5661 Resource plan: Summary.	Docket Vol. 2, IRP Executive Summary & Introduction of the IRP.
❑	NAC 704.5662 Resource plan: General requirements.	Docket Vol. 2, IRP Vol. I, §1.2, Vol. II, §1.2 (Pahrump); Docket Vol. 3, IRP Vol. III, §1.2 (Spring Creek), Vol. IV, §1.2 (Cold Springs), §1.2 (Spanish Springs) (ownership, history & organization of utility). Docket Vol. 2, IRP Vol. I, §1.4 (acknowledgments). Docket Vol. 2, IRP Vols. I, II (Pahrump); Docket Vol. 3, IRP Vol. III, (Spring Creek); Docket Vol. 3, IRP Vol. IV (Cold Springs) & Vol. V (Spanish Springs). Table of Contents; List of Figures; List of Tables; List of Technical Appendices; List of Abbreviations (organization of resource plan). Docket Vol. 2, IRP Vol. II, §2.1 (Pahrump); Docket Vol. 3, IRP Vol. III, §2.1, Docket Vol. 4, IRP Vol. IV, §2.1 (Cold Springs) & Vol. V, §2.1 (Spanish Springs) (service area). Docket Vol. 2, IRP Vol. II, §1.3 (Pahrump); Docket Vol. 3, IRP Vol. III, §1.3 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §1.3 (Cold Springs) & Vol. V, §1.3 (Spanish Springs) (Issues for water & sewer). Docket Vol. 2, IRP Vol. II, §1.3 (Pahrump); Docket Vol. 3, IRP Vol. III, §1.3 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §1.3 (Cold Springs) & Vol. V, §1.3 (Spanish Springs) (Objectives). Docket Vol. 2, IRP Vol. II (Pahrump); Docket Vol. 3, IRP Vol. III, §1.2 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §1.2 (Cold Springs) & Vol. V, §1.2 (Spanish Springs), §1.2; Docket Vol. 6, IRP Appendix D (Maps of service areas).
❑	NAC 704.5663 Resource plan: Identification of inapplicable regulatory provisions.	*See* request for waivers in Application.

	NAC Section	Application Section
❑	NAC 704.5664 Resource plan: Written testimony.	Docket Vol. 1 (includes the Prepared Direct Testimony of James T. Eason, Michael Hardy, Mara Quiroga, Deborah D. Woodland, Aleksey Dolinko, and Terry J. Redmon).
❑	NAC 704.5665 Resource plan: Integrated analysis.	Docket Vol. 2, IRP Vol. I, §1.0, Vol. II, §1.0 (Pahrump); Docket Vol. 3, IRP Vol. III, §1.0 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §1.0 (Cold Springs) & Vol. V, §1.0 (Spanish Springs) (Introduction). Docket Vol. 2, IRP Vol. II, §4.0 (Pahrump); Docket Vol. 3, IRP Vol. III, §4.0 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §4.0 (Cold Springs) & Vol. V, §4.0 (Spanish Springs) (Water Supply and/or Wastewater Plan). Docket Vol. 2, IRP Vol. I, §5.0; Docket Vol. 12, IRP Appendix J (Emergency Response Plan). Docket Vol. 2, IRP Vol. I, §6.0; Docket Vol. 13, IRP Appendix K (Water Conservation Plan). Docket Vol. 2, IRP Vol. II, §7.0 (Pahrump); Docket Vol. 3, IRP Vol. III, §7.0 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §7.0 (Cold Springs) & Vol. V, §7.0 (Spanish Springs) (Preferred Plan). Docket Vol. 2, IRP Vol. II, §8.0 (Pahrump); Docket Vol. 3, IRP Vol. III, §8.0 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §8.0 (Cold Springs) & Vol. V, §8.0 (Spanish Springs) (Action Plan). Docket Vol. 2, IRP Vol. I, §9.0, Vol. II, §9.0 (Pahrump); Docket Vol. 3, IRP Vol. III (Spring Creek), Docket Vol. 4, IRP Vol. IV, §9.0 (Cold Springs) & Vol. V, §9.0 (Spanish Springs) (Funding Plan). Docket Vol. 2, IRP Vol. II, §10.0 (Pahrump); Docket Vol. 3, IRP Vol. III, §10.0 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §10.0 (Cold Springs) & Vol. V, §10.0 (Spanish Springs) (System Improvement Rate Request).
❑	NAC 704.5666 Resource plan: Technical appendix.	Docket Vols. 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18.
❑	NAC 704.5667 Resource plan: Forecasts; inconsistent water sources; changes in methodology of forecasting.	Docket Vol. 2, IRP Vol. II, §§ 2.1, 3.0 & 4.3 (Pahrump); Docket Vol. 3, IRP Vol. III, §3.0 (Spring Creek); Docket Vol. 4, IRP Vol. IV, § 3.0 (Cold Springs) & Vol. V, §§2.1, 3.0 & 4.3 (Spanish Springs).

	NAC Section	Application Section
❑	NAC 704.5668 Resource plan: Information concerning entire system of utility for 10 previous years.	Docket Vol. 2, IRP Vol. II, §3.0 (Pahrump); Docket Vol. 3, IRP Vol. III, §3.0 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §3.0 (Cold Springs) & Vol. V, §3.0 (Spanish Springs). *See also* request for waivers in Application.
❑	NAC 704.5669 Resource plan: Assessment of projected reliability of water service; population estimates.	Docket Vol. 2, IRP Vol. II, §§3.0 & 4.0 (Pahrump); Docket Vol. 3, IRP Vol. III, §§3.0 & 4.0 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §§3.0 & 4.0 (Cold Springs) & Vol. V, §§3.0 & 4.0 (Spanish Springs).
❑	NAC 704.567 Conservation plan: General requirements.	Docket Vol. 2, IRP Vol. I, §6.0 (Water Conservation Plan), Docket Vol. 13, IRP Appendix K (Water Conservation Plan).
❑	NAC 704.5671 Conservation plan: Analysis for potential water shortages.	Docket Vol. 2, IRP Vol. I, §6.0 (Water Conservation Plan). Docket Vol. 13, IRP Appendix K (Water Conservation Plan).
❑	NAC 704.5672 Conservation plan: Information about reclaimed water.	Docket Vol. 2, IRP Vol. I, §6.0 (Water Conservation Plan). Docket Vol. 13, IRP Appendix K (Water Conservation Plan).
❑	NAC 704.5673 Water supply and wastewater treatment plan: Options for meeting demand for water and wastewater treatment.	Docket Vol. 2, IRP Vol. II (Pahrump), §§4.0 & 8.0; Docket Vol. 3, IRP Vol. III, §§4.0 & 8.0 (Spring Creek), Docket Vol. IV, IRP Vol. IV, §§4.0 & 8.0 (Cold Springs) & Vol. V, §§4.0 & 8.0 (Spanish Springs).
❑	NAC 704.5674 Water supply and wastewater treatment plan: Preferred plan.	Docket Vol. 2, IRP Vol. II, §7.0 (Pahrump); Docket Vol. 3, IRP Vol. III, §7.0 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §7.0 (Cold Springs) & Vol. V, §7.0 (Spanish Springs).
❑	NAC 704.5675 Water supply and wastewater treatment plan: Description of system and separate components; map of facilities; description of deficiencies.	Docket Vol. 2, IRP Vol. II, §§2.0 & 4.1 (Pahrump), Docket Vol. 3, IRP Vol. III, §§2.0 & 4.1 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §§2.0 & 4.1 (Cold Springs) & Vol. V, §§2.0 & 4.1 (Spanish Springs); Docket Vol. 6, Appendix D (Service Maps) and Appendix C (Flow Schematics).
❑	NAC 704.5676 Funding plan: Requirement for certain items identified in conservation plan or water supply and wastewater treatment plan.	Docket Vol. 2, IRP Vol. I, §9.1; and Docket Vols. 13-14, Appendix L.

	NAC Section	Application Section
❑	NAC 704.5677 Funding plan: Information concerning costs utility will incur during term of action plan.	Docket Vol. 2, IRP Vol. I, §§9.1 & 9.6; and Docket Vols. 13-14, Appendix L.
❑	NAC 704.5678 Funding plan: Options for defraying expenditures.	Docket Vol. 2, IRP Vol. I, §9.3 and Docket Vols. 13-14, Appendix L.
❑	NAC 704.5679 Funding plan: Estimates of financial information; assumptions.	Docket Vol. 2, IRP Vol. I, §§9.2, 9.3 & 9.5 and Docket Vols. 13-14, Appendix L.
❑	NAC 704.568 Action plan: General requirements.	Docket Vol. 2, IRP Vol. II, §8.0 (Pahrump); Docket Vol. 3, IRP Vol. III, §8.0 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §8.0 (Cold Springs) & Vol. V, §8.0 (Spanish Springs); and Docket Vol. 11, Appendix I.
❑	NAC 704.5681 Action plan: Budget of planned expenditures.	Docket Vol. 2, IRP Vol. II, §8.0 (Pahrump); Docket Vol. 3, IRP Vol. III, §8.0 (Spring Creek), Docket Vol. 4, IRP Vol. IV, §8.0 (Cold Springs) & Vol. V, §8.0 (Spanish Springs); and Docket Vol. 11, Appendix I.

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

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In the Matter of: Application of Great Basin Water Co., Pahrump, Spring Creek, Cold Springs, Pahrump, and Spanish Springs Divisions for Approval of its 2024 Integrated Resource Plan and to designate certain system improvement projects as eligible projects for which a system improvement rate may be established, and for relief properly related thereto.	Docket No. 24-_____

APPLICATION

Great Basin Water Co. ("GBWC" or the "Company") respectfully files with the Public Utilities Commission of Nevada (the "Commission"), this Application for acceptance of its 2024 Integrated Resource Plan ("IRP") and to designate certain system improvement projects as eligible projects for which a system improvement rate ("SIR") may be established. This Application is made and based on Sections 704.661 through 704.6624 of the Nevada Revised Statutes ("NRS"), and Sections 704.565 through 704.5688 of the Nevada Administrative Code ("NAC") (the "Resource Plan Regulations").

All communications regarding this Application should be directed to:

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The Company is a Nevada corporation, with its principal office at 1240 East State Street, Suite 115, Pahrump, Nevada 89048.

I. CONTENTS OF THE APPLICATION

GBWC is a public utility comprised of four divisions (Pahrump, Spring Creek, Cold Springs, and Spanish Springs), that furnishes water for municipal, industrial or domestic purposes or services for the disposal of sewage, or both, and which had an annual gross operating revenue of $1,000,000 or more for at least 1 year during the immediately preceding 3 years. Accordingly, pursuant to NRS 704.661(1), GBWC submits herewith its 2024 Integrated Resource Plan, which consists of the following volumes:

Docket Volume	**Documents**
Volume 1	Application
	Prepared Direct Testimony of James T. Eason and Attachments
	Prepared Direct Testimony of Michael Hardy and Attachments
	Prepared Direct Testimony of Mara Quiroga and Attachments
	Prepared Direct Testimony of Deborah D. Woodland and Attachments
	Prepared Direct Testimony of Aleksey V. Dolinko and Attachments
	Prepared Direct Testimony of Terry J. Redmon and Attachments

Volume 2	2024 Integrated Resource Plan: Volume I: Introduction • Introduction (§1.0) • Existing Conditions (§2.0) • Historical Data and Forecasting (§3.0) • Water Supply and Wastewater Treatment Needs (§4.0) • Emergency Response Plan (§5.0) • Water Conservation Plan (§6.0) • Preferred Plan (§7.0) • Action Plan (§8.0) • Funding Plan (§9.0) • System Improvement Rate Request (§10.0)
	Volume II: Pahrump • Introduction (§1.0) • Existing Conditions (§2.0) • Historical Data and Forecasting (§3.0) • Water Supply and Wastewater Treatment Needs (§4.0) • Emergency Response Plan (§5.0) • Water Conservation Plan (§6.0) • Preferred Plan (§7.0) • Action Plan (§8.0) • Funding Plan (§9.0) • System Improvement Rate Request (§10.0)
Volume 3	Volume III: Spring Creek • Introduction (§1.0) • Existing Conditions (§2.0) • Historical Data and Forecasting (§3.0) • Water Supply and Wastewater Treatment Needs (§4.0) • Emergency Response Plan (§5.0) • Water Conservation Plan (§6.0) • Preferred Plan (§7.0) • Action Plan (§8.0) • Funding Plan (§9.0) • System Improvement Rate Request (§10.0)
Volume 4	Volume IV: Cold Springs • Introduction (§1.0) • Existing Conditions (§2.0) • Historical Data and Forecasting (§3.0) • Water Supply Needs (§4.0) • Emergency Response Plan (§5.0) • Water Conservation Plan (§6.0) • Preferred Plan (§7.0) • Action Plan (§8.0) • Funding Plan (§9.0) • System Improvement Rate Request (§10.0)
	Volume V: Spanish Springs • Introduction (§1.0) • Existing Conditions (§2.0) • Historical Data and Forecasting (§3.0) • Water Supply Needs (§4.0) • Emergency Response Plan (§5.0) • Water Conservation Plan (§6.0)

	• Preferred Plan (§7.0) • Action Plan (§8.0) • Funding Plan (§9.0) • System Improvement Rate Request (§10.0)
Volume 5	Technical Appendix • Appendix A • Appendix B
Volume 6	Technical Appendix • Appendix C • Appendix D • Appendix E
Volume 7	Technical Appendix • Appendix F, Part 1
Volume 8	Technical Appendix • Appendix F, Part 2 • Appendix G
Volume 9	Technical Appendix • Appendix H, Part 1
Volume 10	Technical Appendix • Appendix H, Part 2
Volume 11	Technical Appendix • Appendix H, Part 3 • Appendix I
Volume 12	Technical Appendix • Appendix J
Volume 13	Technical Appendix • AppendixK • Appendix L
Volume 14	Technical Appendix • Appendix L-1 • Appendix L-2 • Appendix M, Part 1
Volume 15	Technical Appendix • Appendix M, Part 2
Volume 16	Technical Appendix • Appendix M, Part 3
Volume 17	Technical Appendix • Appendix M, Part 4
Volume 18	Technical Appendix • Appendix M, Part 5

II. ADDITIONAL INFORMATION AND REQUEST FOR WAIVERS

The items listed in the previous section contain the information required by NRS 704.661 and the Resource Plan Regulations. GBWC is requesting that the Commission accept this information as complying with the requirements of the Resource Plan Regulations. GBWC further requests that the Commission approve GBWC's 3-year Action Plan and find that the projects included in the Action Plan are prudent investments. GBWC requests that the Commission approve its Funding Plan and its Water Conservation Plan and corresponding tariff pages. GBWC also requests approval to designate the following projects in the Action Plan as eligible for SIR:

Pahrump (IRP Vol. II)

- New Well in High Zone at Well 13 Property
- Pipeline via Mesquite Booster Station (Avenue of the Stars) to Calvada Meadows

  Alternative - Pipeline Tie-in from CV North to Calvada Meadows
- Wastewater Treatment Plant 3 - Influent Pre EQ-Building and Tank Rehabilitation
- Wastewater Treatment Plant 3 - Sand Filter Rehabilitation

Spring Creek (IRP Vol. III)

- New Production Well (Well 12 Replacement)
- Pipe Replacement Projects (All Tracts)
- High Tank Rehabilitation

  Alternative - High Tank Replacement

  Alternative - Booster Pump (Tract 200)
- WWTP Reconditioning (De-Ragging & Lift Station Rehabilitation)

Cold Springs (IRP Vol. IV)

- Tank 2 Factory Rehabilitation

  Alternative - Tank 2 Replacement

Spanish Springs (IRP Vol. V)

- Rehabilitation of Suki Well (Well 2)

This request for designation is based on NRS 704.663, and the implementing regulations adopted by the Commission in NAC 704.633 through NAC 704.63435.

Finally, GBWC requests waiver from certain components that are generally required to be included in a triennial IRP filing. NAC 704.0097 provides that the Commission may allow deviation from a provision of NAC Chapter 704 if good cause for the deviation appears, an applicant provides a specific reference to each provision of the chapter from which the deviation is requested, and the Commission finds that the deviation is in the public interest and not contrary to statute. NAC 704.5668 requires that GBWC provide 10 years of historical information. GBWC has provided this information to the extent possible, but GBWC requests certain limited waivers from NAC 704.5668 for each of its divisions to acknowledge specific gaps in the 10 years of information provided, due to the unavailability of the data necessary to compile the historical information:

- For its Pahrump Division ("GBWC-PD"), GBWC requests waiver from:
    - NAC 704.5668(1)(b), as it pertains to wastewater, because GBWC-PD does not meter wastewater flows per customer, customers are instead charged a "flat rate" for this usage;
    - NAC 704.5668(1)(e)-(f), as GBWC has provided three years of effluent information for Plant 3 (Calvada Valley). This request for a waiver is based upon the expert opinion of the engineering firm contracted to compile and prepare the IRP for GBWC-PD, which concludes that analyzing three years of data in this circumstance does not impair the reliability of the engineering projections. *See* Prepared Direct Testimony of Mara Quiroga (Lumos & Associates), GBWC Docket Vol. 1 at Q&A 26.

- NAC 704.5668(1)(a)-(f), as it relates to data for the new Spring Mountain Motor Ranch prior to 2020, as the Company only began data collection for this service area in that year.

- For its Spring Creek Division ("GBWC-SCD"), GBWC requests waiver from:
  - NAC 704.5668(1)(b), as it pertains to wastewater because GBWC-SCD does not meter wastewater flows per customer, customers are instead charged a "flat rate" for this usage.
  - NAC 704.5668(1)(e), because the Mar-Wood WWTP does not meter effluent as it is disposed. However, 10 years of metered *influent* wastewater flow data for the Mar-Wood WWTP in the 100 Tract sewer service area is provided in Table 3.18 of Volume III of the 2024 IRP.
  - NAC 704.5668(1)(f), to the extent that the Commission deems waiver necessary given that GBWC-SCD does not sell or utilize reclaimed water.
- For its Cold Springs Division ("GBWC-CSD"), GBWC requests waiver from:
  - NAC 704.5668(1)(b) and (e)-(f), to the extent the Commission deems waiver necessary given that GBWC-CSD does not offer wastewater services.
  - NAC 704.5668(2), for recorded sales, peak demand and actual water used organized by service class for 2010 – 2013 because this data is not available.
- For its Spanish Springs Division ("GBWC-SSD"), GBWC requests waiver from:
  - NAC 704.5668(1)(b) and (e)-(f), to the extent the Commission deems waiver necessary given that GBWC-SSD does not offer wastewater services.
  - NAC 704.5668(2), for water use organized by service class for 2010 – 2013 because this data is not available.

Good cause exists for these waiver requests because GBWC is unable to provide the information at issue due to the unavailability of the raw data necessary to compile the historical information outlined in NAC 704.5668. In some cases, the unavailability is due to the size of the division (for example, GBWC-SSD did not file its first IRP until 2018 and was not previously required to comply with NAC 704.5668). In other cases, the data is not available because the division does not provide the type of service relevant to the regulatory requirement or the division does not charge its customers in a manner that necessitates collecting that information (for example, GBWC-PD and GBWC-SCD do not charge wastewater customers based on wastewater flows). These waiver requests pursuant to NAC 704.0097 are not contrary to any statute to GBWC's knowledge, and the Commission's approval of the request is in the public interest. The requested waivers avoid unnecessary filing and preparation costs where the required information is unavailable and compliance with NAC 704.5668 is impossible or impracticable. Moreover, as explained above, the required information is not available as the listed division either does not provide wastewater service or it does not charge its customers in a manner that would allow it to provide historical information. Finally, it is the expert opinion of GBWC witness Michael Hardy that analyzing three years of historical information is the standard industry practice. *See* Prepared Direct Testimony of Michael Hardy, GBWC Docket Vol. 1 at Q&A 41. For these reasons, GBWC respectfully requests a limited waiver pursuant to NAC 704.0097 from the requirements of NAC 704.5668 as it applies to the four divisions.

III. CONCLUSION AND REQUEST FOR RELIEF

Based on the foregoing, Company respectfully requests that the Commission:

1. Accept and approve the 2024 Integrated Resource Plan;
2. Approve the respective Action Plans for each of GBWC's divisions and find that any future investments associated with those plans are prudent investments for which GBWC may recover all just and reasonable expenses;
3. Approve the Funding Plan;
4. Approve the Water Conservation Plan;

5. Approve the Company's request to designate certain Action Plan projects as eligible for a System Improvement Rate;

6. Approve GBWC's request for waivers from certain subsections of NAC 704.5668 for each of its divisions pursuant to NAC 704.0097, as described in this Application; and

7. Grant any further relief that it deems just and reasonable.

Dated and respectfully submitted this March 1, 2024.

FENNEMORE CRAIG, P.C.

By: _____

Dan R. Reaser
Nevada Bar No. 1170
Wade Beavers
Nevada Bar No. 13451
7800 Rancharrah Parkway
Reno, Nevada 89511

Attorneys for Great Basin Water Co.

DRAFT NOTICE

PUBLIC UTILITIES COMMISSION OF NEVADA
DRAFT NOTICE
(Applications, Tariff Filings, Complaints, and Petitions)

Pursuant to Nevada Administrative Code ("NAC") 703.162, the Commission requires that a draft notice be included with all applications, tariff filings, complaints and petitions. Please complete and include **ONE COPY** of this form with your filing. (Completion of this form may require the use of more than one page.)

A title that generally describes the relief requested. NAC 703.160(5)(a).

Application of Great Basin Water Co. Pahrump, Spring Creek, Cold Springs, Pahrump, and Spanish Springs Divisions for Approval of its 2024 Integrated Resource Plan and to designate certain system improvement projects as eligible projects for which a system improvement rate may be established, and for relief properly related thereto.

The name of the applicant, complainant, petitioner or the name of the agent for same. NAC 703.160(5)(b).

Great Basin Water Co. ("GBWC")

A brief description of the purpose of the filing or proceeding, including, without limitation, a clear and concise introductory statement that summarizes the relief requested or the type of proceeding scheduled AND the effect of the relief or proceeding upon customers. NAC 703.160(5)(c).

GBWC files this Application seeking approval of its 2024 Integrated Resource Plan ("IRP") and to designate certain system improvement projects as eligible projects for which a System Improvement Rate ("SIR") may be established. This application is made and based on Sections 704.661 through 704.6624 of the Nevada Revised Statutes. Both water and wastewater operations are impacted by this IRP.

For water operations, approval for all of the water-related projects included in the action plan would result in estimated incremental overall annual changes in rates of the following percentages after the implementation of rates stemming from GBWC's 2027 Consolidated Rate Case:

- ***Pahrump Division: approximately 13%***
- ***Spring Creek Division: approximately 15%***
- ***Cold Springs Division: approximately 23%***
- ***Spanish Springs Division: approximately 23%***

The above estimated rate increases would be incremental to the rate increases expected to result from the 2024 Consolidated Rate Case, which is not impacted by this IRP.

For wastewater operations, approval of all of the wastewater-related projects included in the action plan would result in estimated incremental overall annual changes in rates of the following percentages after the implementation of rates stemming from GBWC's 2027 Consolidated Rate Case:

- ***Pahrump Division: approximately 16%***
- ***Spring Creek Division: approximately 51%***

The above estimated rate increases would be incremental to the rate increases expected to result from the 2024 Consolidated Rate Case, which is not impacted this IRP.

SIR – Pahrump
Approval of all water projects for which GBWC is requesting SIR eligibility would result in an estimated total annual revenue impact of $652,998 for the Pahrump Division. Broken out by customer class, this would yield a total estimated SIR impact for water service as follows:

For the Residential customer class, a monthly charge of $0.84 per 1,000 gallons
For the Multi-Family customer class, a monthly charge of $0.84 per 1,000 gallons
For the Non-Residential customer class, a monthly charge of $0.84 per 1,000 gallons
For the Irrigation customer class, a monthly charge of $0.84 per 1,000 gallons

Approval of all wastewater projects for which GBWC is requesting SIR eligibility would result in an estimated total annual revenue impact of $430,640 for the Pahrump Division. Broken out by customer class, this would yield a total estimated SIR impact for wastewater service as follows:

For the 5/8", 3/4", and 1" customer classes, a monthly charge of $5.34
For the 1.5" customer class, a monthly charge of $32.55
For the 2" customer class, a monthly charge of $47.00
For the 3" customer class, a monthly charge of $123.36
For the 4" customer class, a monthly charge of $176.38
For the 6" customer class, a monthly charge of $222.03
For the 8" customer class, a monthly charge of $322.63
For the 10" customer class, a monthly charge of $2,491.29 or $2.32 per bed

SIR – Spring Creek
Approval of all water projects for which GBWC is requesting SIR eligibility would result in an estimated total annual revenue impact of $795,783 for the Spring Creek Division. Broken out by customer class, this would yield a total estimated SIR impact for water service as follows:

For the Residential customer class, a monthly charge of $1.05 per 1,000 gallons
For the Multi-Family customer class, a monthly charge of $1.05 per 1,000 gallons
For the Non-Residential customer class, a monthly charge of $1.05 per 1,000 gallons
For the Irrigation customer class, a monthly charge of $1.05 per 1,000 gallons

Approval of all wastewater projects for which GBWC is requesting SIR eligibility would result in an estimated total annual revenue impact of $80,508 for the Spring Creek Division. Broken out by customer class, this would yield a total estimated SIR impact for wastewater service as follows:

For the Single-Family Residential customer class, all meter sizes, a monthly charge of $21.04
For the Multi-Family and Non-Residential 3/4" customer classes, a monthly charge of $36.20

For the Multi-Family and Non-Residential 1" customer classes, a monthly charge of $61.03
For the Multi-Family and Non-Residential 1.5" customer classes, a monthly charge of $101.01
For the Multi-Family and Non-Residential 2" customer classes, a monthly charge of $168.36
For the Non-Residential 3" customer class, a monthly charge of $378.80

SIR – Cold Springs
Approval of all water projects for which GBWC is requesting SIR eligibility would result in an estimated total annual revenue impact of $88,777 for the Cold Springs Division. Broken out by customer class, this would yield a total estimated SIR impact for water service as follows:

For the Residential customer class, a monthly charge of $0.20 per 1,000 gallons
For the Multi-Family customer class, a monthly charge of $0.20 per 1,000 gallons
For the Non-Residential customer class, a monthly charge of $0.20 per 1,000 gallons
For the Irrigation customer class, a monthly charge of $0.20 per 1,000 gallons

SIR – Spanish Springs
Approval of all water projects for which GBWC is requesting SIR eligibility would result in an estimated total annual revenue impact of $65,805 for the Spanish Springs Division. Broken out by customer class, this would yield a total estimated SIR impact for water service as follows:

For the Residential customer class, a monthly charge of $0.38 per 1,000 gallons
For the Multi-Family customer class, a monthly charge of $0.38 per 1,000 gallons
For the Non-Residential customer class, a monthly charge of $0.38 per 1,000 gallons
For the Irrigation customer class, a monthly charge of $0.38 per 1,000 gallons

The SIR impacts described above, are subject to annual adjustment per NAC 704.63435.

A statement indicating whether a consumer session is required by Nevada Revised Statute 704.069(1).[1] NAC 703.162(2).

A consumer session is not be required.

If the draft notice pertains to a tariff filing, please include the tariff number and the section number(s) or schedule number(s) being revised.

GBWC Tariff 1-W (Water), Rule No. 23

[1] NRS 704.069 states in pertinent part:
1. . . . [T]he Commission shall conduct a consumer session to solicit comments from the public in any matter pending before the Commission pursuant to NRS 704.061 to 704.110 inclusive, in which:
(a) A public utility has filed a general rate application, an application to recover the increased cost of purchased fuel, purchased power, or natural gas purchased for resale, an annual deferred energy accounting adjustment application pursuant to NRS 704.187 or an annual rate adjustment application; and
(b) The changes proposed in the application will result in an increase in annual gross operating revenue, as certified by the applicant, in an amount that will exceed $50,000 or 10 percent of the applicant's annual gross operating revenue, whichever is less.

PREPARED DIRECT TESTIMONY OF
JAMES T. EASON

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

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In the Matter of:

Application of Great Basin Water Co., Cold Springs, Pahrump, Spanish Springs and Spring Creek Divisions for approval of its 2024 Integrated Resource Plan and to designate certain system improvement projects as eligible projects for which a system improvement rate may be established, and for relief properly related thereto.

Docket No. 24-_____

PREPARED DIRECT TESTIMONY OF

JAMES T. EASON

ON BEHALF OF GREAT BASIN WATER CO.

March 1, 2024

PREPARED DIRECT TESTIMONY

OF JAMES T. EASON

ON BEHALF OF GREAT BASIN WATER CO.

Q.1 PLEASE STATE YOUR NAME, PRESENT POSITION AND BUSINESS ADDRESS.

A.1 My name is James T. Eason, and I am the Director of State Operations for Great Basin Water Co. in Nevada ("GBWC" or the "Company" or the "Utility") and Bermuda Water Company in Arizona. My business addresses are 1240 E. State Street, Suite 115, Pahrump, Nevada 89048 and 1005 Terminal Way, Ste. 294, Reno, Nevada 89509.

Q.2 WHAT ARE YOUR DUTIES IN YOUR CURRENT POSITION AND HOW LONG HAVE YOU HELD THIS POSITION?

A.2 The title of my position changed from the VP of Operations to Director, State Operations for Nevada in December of 2020. The job description has not changed at this time only the title. As the Director of State Operations my role is to support the President in providing visionary and strategic leadership and direction to all functions of the Utility to achieve customer, regulator, and employee satisfaction. In addition, since December of 2023, I am also providing support to the President in many facets of the business, which may include the following: culture, operations, finance, safety, environmental compliance, legislative and regulatory matters, and customer engagement. I have held my current or previous titles and positions since September of 2015.

Please *see* Attachment JTE-01 to Exhibit ___, *Director, State Operations Job Description.*

Q.3 WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

A.3 Please *see* Attachment JTE-02 to Exhibit ___, *James Eason Resume.*

Q.4 HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA (THE "COMMISSION")?

A.4 Yes. I have testified in eighteen (18) dockets:

1. Docket No. 15-06063, *Utilities, Inc. of Central Nevada ("UICN") General Rate Case ("GRC").*
2. Docket No. 16-03006, *Utilities, Inc. of Nevada ("UIN") 2016 Integrated Resource Plan ("IRP").*
3. Docket No. 16-12006, *GBWC Spring Creek Meter Reading*
4. Docket No. 16-12037, *GBWC Pahrump GRC*
5. Docket No. 17-12022, *GBWC Spring Creek GRC*
6. Docket No. 18-03005, *GBWC 2018 Consolidated IRP*
7. Docket No. 18-11014, *GBWC Cold Springs /Spanish Springs GRC*
8. Docket No. 19-12029, *GBWC Pahrump GRC*
9. Docket No. 20-07015, *GBWC Cold Springs GRC*
10. Docket No. 20-07017, *GBWC Spring Creek GRC*
11. Docket No. 21-03003, *GBWC 2021 Consolidated IRP*
12. Docket No. 21-03042, *SIR Well 2 PD*
13. Docket No. 21-06009, *SIR Dewatering PD*
14. Docket No. 21-12025, *GBWC 2021 Consolidated GRC*
15. Docket No. 23-09015, *SIR Pahrump Firebird Circle Loop*
16. Docket No. 23-03003, *SIR Mountain Falls Tank 1 Floor Project*
17. Docket No. 24-02018, *SIR SCD Pipeline Replacement Phase 4*
18. Docket No. 24-02023, *SIR PD SCADA and Comstock to Mountain View Pipe*

Q.5 HAVE YOU TESTIFIED BEFORE ANY OTHER PUBLIC UTILITIES COMMISSION?

A.5 Yes. I have testified before the Arizona Corporation Commission in two (2) dockets:

1. Docket No. W-01812A-20-0109, *Bermuda Water Co 2020 Rate Case*
2. Docket No. W-01812A-22-0256, *Bermuda Water Co 2022 Rate Case*

Q.6 PLEASE PROVIDE A GENERAL DESCRIPTION OF GBWC'S ORGANIZATIONAL STRUCTURE FOR THE COMMISSION.

A.6 GBWC-PD and GBWC-SCD operate both water and wastewater systems within their service territory while GBWC-SSD and GBWC-CSD only operate water systems. Each system is supported by localized operations personnel, area managers, as well as support staff, such as project managers, compliance managers and finance personnel located in Pahrump, Spring Creek, and Reno, NV, and Chicago, IL. In addition, Water Service Corporation ("WSC") provides corporate services throughout the GBWC Divisions. The Corix Senior Vice President/President for Nevada/Arizona is currently located in Fairbanks, Alaska and Director of State Operations for Nevada/Arizona is located in Reno, NV, while the Water Conservation Coordinator for GBWC is located in Pahrump, NV. A more detailed description of the structure and organization of the GBWC can be found in the Volume 1, section 1.2 of the IRP.

Q.7 WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS DOCKET?

A.7 The purpose of my testimony is to provide certain information supporting the 2024 Integrated Resource Plan ("2024 IRP") for the four divisions of GBWC: the Pahrump Division ("GBWC-PD" or the "Pahrump Division"), the Spring Creek Division ("GBWC-SCD" or the "Spring Creek Division"), the Spanish Springs Division ("GBWC-SSD" or the "Spanish Springs Division"), and the Cold Springs Division ("GBWC-CSD" or the "Cold Springs Division"). My testimony is organized as follows:

- ***GBWC System Description*** **(Q&A 8-9)**
    - Provide an overview of the four divisions of GBWC operating under Certificate of Public Convenience and Necessity ("CPCN") 2692 Sub 7, including the organizational structures, history and system descriptions.
- ***GBWC 2024 IRP Framework*** **(Q&A 10-23)**
    - Discuss GBWC's philosophy and approach to developing the 2024 IRP, including its asset management practices.
    - Update to past approved projects.
- ***Emergency Response*** **(Q&A 24-25)**
    - Review how the Utility responds to emergencies.
- ***NRW/Water Conservation Plan*** **(Q&A 26-33)**
    - Provide an overview of how GBWC addresses Non-Revenue Water ("NRW"). as well as the Water Conservation Plan.
- ***Action Plan Projects*** **(Q&A 34-48)**
    - Review certain Action Plan projects and explain why these projects are necessary to minimize cost, mitigate risk and maximize the reliability of service in each of the four divisions.
- ***System Improvement Rate*** **(Q&A 49-59)**
    - Explain GBWC's approach for designating projects for system improvement rate ("SIR") eligibility and explain how the projects requested for SIR treatment satisfy the Commission's regulations.
- ***Commission Order, Docket 21-03003, Directives 4-5*** **(Q&A 60)**
    - Address how the Utility has complied with Directives 4 and 5 in the July 19, 2021, Order in GBWC's 2021 Consolidated IRP proceeding at Docket No. 21-03002 ("2021 IRP Order") regarding conducting meetings with various stakeholders to discuss storage needs in GBWC's Spring Creek and Cold Springs divisions.

- ***Update on the Status of the Investigatory Docket Established for the Spanish Springs Division in Docket 21-07020*** **(Q&A 61)**
    - Provide an update on the status of the investigatory docket established to evaluate rate impacts and water quality concerns in the Spanish Springs Division, as well as an update on GBWC's Test Well and New Production Well Project previously approved in the 2021 IRP.
- ***Request for Approval*** **(Q&A 62)**

GBWC SYSTEM DESCRIPTION

Q.8 PLEASE PROVIDE A BRIEF HISTORY OF THE FOUR GBWC DIVISIONS.

A.8 ***PAHRUMP DIVISION:***

The predecessor of GBWC-PD was Central Nevada Utilities Company ("CNUC"), which was organized and began its operations in the mid 1970's. CNUC was sold and its Certificate of Public Convenience and Necessity transferred to GBWC PD in 2002. The GBWC-PD existing service area is 43 plus square miles and consists of the original core service area of the Preferred Equities subdivisions of 28,000 lots. In the late 1970's, the Preferred Equities Corporation ("PEC") began recording subdivision plats and selling single family housing, multi-family housing and commercial lots throughout the Pahrump Valley. PEC left many infrastructure challenges and deficiencies:

- Non-Looped Systems or Intermittent Distribution Systems
- Undersized Mains
- Main Line Dead Ends
- Limited Fire Flow Capacity
- Checkboard Lot Designations

Historically these infrastructure deficiencies have created expensive line extension costs for new service to individual lots and existing and future subdivisions, which has

contributed to the proliferation of domestic wells within Hydrographic Basin 162 ("Basin 162" or "Pahrump Basin"). In addition to the original CNUC service territory, the system has expanded over the years by acquiring or through annexation the Mt. Falls and Spring Mountain Motor Raceway systems in the Pahrump Basin. Both systems have been and continue to be constructed and dedicated by a third-party developer to GBWC. All infrastructure costs were paid for by the developers for these two systems. A breakdown of Basin 162 water allocations can be found in Volume II of the 2024 IRP, relating to the Pahrump Division, at section, 1.2.2. GBWC has worked throughout the years with Commission Staff, Nye County, Nye County Water District, the Basin 162 Water Committee and the State Water Engineer to address these infrastructure deficiencies. A more detailed description of the history of the system can be found in Volume II of the 2024 IRP relating to the Pahrump Division, at section 2.1.

SPRING CREEK DIVISION:

The predecessor of GBWC-SCD was MCO Properties, Inc., which was organized and began its operations in the mid 1970's. MCO Properties, Inc., also established the Spring Creek Utilities Company ("SCUC") to operate and maintain the water and wastewater infrastructure in the Spring Creek system. SCUC became a public utility providing water and sewer service subject to the jurisdiction of the Commission within a portion of Elko County, Nevada. Great Basin Water Co. began the purchase of the Spring Creek Utilities from MCO Properties, Inc. in April of 1996 under Docket No. 96-4028. The Certificate of Public Convenience and Necessity was transferred to GBWC-SCD in December of 1996. MCO Properties, Inc., originally developed and subdivided the Spring Creek community into Tracts 100, 200, 300 and 400 and developed and installed the Spring Creek water and wastewater infrastructure system. The infrastructure was installed substandard for today's requirements, meaning GBWC inherited multiple issues:

- High and low water pressures,

- Undersized water mains,
- Water outages,
- Non-Revenue Water ("NRW") issues, and
- Limited fire flow capacity.[1]

The planned community of Spring Creek was subdivided into primarily 5,420 residential lots, ranging in size from 1 to 10 acres and as of December 2022, GBWC-SCD has approximately 5,102[2] customers connected to the water system and approximately 155[3] customers connected to three separate wastewater systems located in the 100, 200 and 400 Tracts, respectively. A more detailed description of the history of the water and wastewater systems can be found in Volume III of the 2024 IRP, relating to the Spring Creek Division, Overview section 2.1.

COLD SPRINGS DIVISION:

The predecessor of GBWC-CSD was Reno Park Water Company ("RPWC") which was organized and began its operations in the mid 1970's. Reno Park Water Company was sold, and its Certificate of Public Convenience and Necessity transferred to the predecessor of GBWC-SCD on June 23, 1998, in the Public Utilities Commission Order under Docket No. 98-2009.

Prior to the sale of the RPWC to GBWC-CSD, an annexation was completed under Public

[1] The original Order and Certificate of Public Convenience and Necessity for Spring Creek Utilities, Co., an approved method for fire protection by the Nevada Division of Forestry for SCUC was recognized: "Due to the large size of lots within the Spring Creek subdivision, fire protection can be best provided by chemical trucks with limited portable water capacity . . . The State of Nevada Division of Forestry has agreed to provide fire protection. The subdivision developer has donated $15,000 to the Division of Forestry for the construction of an all-wheel drive fire truck. Also, a firehouse and living quarters were constructed." SCUC was developed to be a pumper system for fire protection in a rural community and the CPCN was approved by the Commission as such.

Through the approval and construction of the Pipeline Replacement Projects Phases 1, 1A, 2, 3 and 4 in the 200 Tract area of the Spring Creek System. The areas which have received the new minimum eight-inch (8") pipeline replacement now meet all current NACs for fire requirements.

[2] Volume III Table 3.02: GBWC-SCD Water Connections.

[3] Volume III Table 3.30: 100 Tract Sewer-Projected Wastewater Connection and Flows.

Utilities Commission Docket No. 95-11002. The majority of the property which was annexed is the current Woodland Village Subdivision of Cold Springs. The Woodland Village Subdivision began in October 1999 and is approximately 90% built out at this time.

Since the acquisition of the water company by GBWC-CSD in 1998, various developments have been completed or added to the service territory including (1) White Lake Estates (the Roston development), (2) Canyon Hills (Cold Springs Property, LLC), (3) Lake Hills subdivision, (4) Northridge Estates (the Springer development), (5) Village Center, existing service territory (multi-family residential units), (6) Peterson Village, annexed 2021 (multi-family residential units), and (7) Cold Springs Drive, annexed 2021 (residential units). An additional annexation of the Lakefront Project (commercial and storage units) is pending approval by the Commission in Docket No. 23-08027. With the completion of these existing subdivisions and the expansion of the service territory, GBWC-CSD increased its customer base from approximately 1,250 customers at the time of acquisition to approximately 3,777[4] in 2022 with a current build out projection of approximately 4,430 customers for all service types in the approved subdivisions and new annexation areas. The service area of 3 square miles has increased to approximately 4 square miles with the three additional annexations. A more detailed description of the history of the system can be found in Volume IV of the 2024 IRP, relating to the Cold Springs Division, Overview sections, 2.1.

SPANISH SPRINGS DIVISION:

The predecessor of GBWC-SSD was Sky Ranch Water Service ("SRWS"), which was organized and began its operations in the earlier 1980s. SRWS was sold and its Certificate of Public Convenience and Necessity was transferred to GBWC-SSD on July of 1999 in the Public Utilities Commission Order under Docket No. 99-3028.

[4] Volume IV Table 3.01: Population and GBWC-CSD Service Connection Projections.

After the purchase of the SRWS by GBWC, a de-annexation was approved by the Public Utilities Commission of 34 lots in Sky Ranch North. Additionally, in 2022 a De-Annexation application was submitted by a developer to the commission for the removal of five parcels in the northern portion of the Spanish Springs service territory. The De-Annexation was finalized and approved in 2023. *See* Volume V, Spanish Springs Division, Figure E-1. "Overview of the Existing Water Service Boundaries." Currently, GBWC-SSD has approximately 581[5] customers with a current build out of approximately 610 connections for the approved parcels and subdivisions in the existing service area of 1.5 square miles. A more detailed description of the history of the system can be found in Volume V of the 2024 IRP, relating to the Spanish Springs Division, Overview section 2.1.

Q.9 PLEASE PROVIDE A GENERAL DESCRIPTION OF THE SERVICE TERRITORIES OF THE FOUR GBWC DIVISIONS.

A.9 General descriptions of each division's service territories are set forth below:

PAHRUMP DIVISION:

The GBWC-PD system consists of various customer classes with a majority of the classes consisting of residential and commercial customers. The GBWC-PD service area is located approximately 60 miles west of Las Vegas, NV along U.S. Route 160. GBWC-PD is managed locally and operates the system with an average of eleven operations personnel, an area manager and administrative staff in Pahrump and Reno, NV. The service area is comprised of five separate water systems, five active and one which is working under an Interim Service Agreement, Spring Mountain Motorsports Ranch ("SMMR"), Annexation Docket No. 16-07011), and four seperate wastewater collection systems, four active and one which is working under an Interim Service Agreement (SMMR). As of Januarary of

[5] Volume V, Table 3.01: Population and Service Connection Projections

2024 the former Mountain View Estates System was consolidated into the Calvada Valley System upon the completion of the Commission-approved Calvada Valley Interconnect to Mountain View Project that was presented in the 2021 GBWC Consolidated IRP.

- The water systems in Pahrump are as follows:
  - Calvada Valley
  - Calvada North/Country View Estates
  - Calvada Meadows
  - Mountain Falls
  - SMMR
- The wastewater systems in Pahrump are as follows:
  - Septic Systems
    - 121 West Calvada (Serving one customer)
    - 2350 East Feather Street (Serving two customers)
    - 2900 South Blagg Road (Serving one customer)
  - Plant 3 in the Calvada Valley, Central Area,

Permitted Annual Daily Average:	2022 Annual Daily Average:
1,500,000 gpd	718,000 gpd

  - Plant F in the CalvadaNorth, North Area,

Permitted Daily Average:	2022 Annual Daily Average:
49,990 gpd	26,000 gpd

  - Mountain Falls Plant in the South Area.

Permitted Annual Daily Average:	2022 Annual Daily Average:
750,000 gpd	125,000 gpd

  - Future plant at Spring Mountain Motorsports Ranch (SMMR)

Permitted Annual Daily Average:	2022 Annual Daily Average:
108,000 gpd	8,000 gpd[6]

As of December of 2022 there are approximately 6,402[7] metered water connections which are currently installed along with 4,499[8] sewer connections in the GBWC-PD, Pahrump service area. Groundwater pumped from wells are the only source of water utilized by GBWC-PD, in Basin 162 or the Pahrump Valley. GBWC-PD has a total of 11 wells which provide potable drinking water to these service customers and 2 future exsisting wells after the dedication and approval of the SMMR infrastructure, which is anticipated to be the second half of 2024. GBWC-PD owns 28,546.99 acre-feet annually ("AFA") of water rights from which to provide water service to its customer base. A more detailed description of the water system can be found in Volume II of the 2024 IRP, relating to the Pahrump Division, Overview section 1.2.

SPRING CREEK DIVISION:

The GBWC-SCD system consists of predominantly residential customers with a limited number of commercial customers. The GBWC-SCD service area is located in the Northeast section of Nevada in Elko County approximately 10 miles southeast of Elko, Nevada, on Lamoille Highway (State Route 227). It covers an area of approximately 8 miles east-west by 9 miles north-south. GBWC-SCD is managed locally and operates the system with an average of five operations personnel, an area manager and administrative staff in Pahrump and Reno, NV. The GBWC-SCD maintains two separate water systems and three separate wastewater systems. The GBWC-SCD water system has many pressure zones covering various elevation ranges, which results in high pressures in some areas and low pressures

[6] GBWC did not start collecting data for the interim operations of the new SMMR plant until 2020.

[7] Volume II Table 3.02: GBWC-PD Residential and Commercial Connections Projections.

[8] Volume II Table 3.19: GBWC-PD Wastewater Connection Projections.

in others. Many of the high-pressure issues arise when the wells are feeding storage tanks located at high elevations. Correcting the high-pressure issue may include the construction of high-pressure dedicated well supply lines to fill the system storage tanks and the installation of Air Release Valves ("ARVs"), Pressure Reducing Valves ("PRVs") and/or the installation of Variable Frequency Drives ("VFDs") to help regulate the discharge pressures to and from the storage tanks. This implementation will not only help GBWC address high pressure problems but will also minimize the amount of damage occurring to aging distribution pipe and reduce non-revenue water in the water systems.

- The water systems in the Spring Creek Division are as follows:
  - Spring Creek Mobile home section (200 Tract, NV5027)
  - Spring Creek Housing (100, 300 and 400 Tracts, NV036)
- The wastewater systems in the Spring Creek Division are as follows:
  - Wastewater Treatment Plant (100 Tract)

Permitted Annual Daily Average:	2022 Annual Daily Average:
50,000 gpd	40,320 gpdu

  - Septic # 2 (200 Tract)

Permitted Annual Daily Average:	2022 Annual Daily Average:
6,000 gpd	1,318 gpd

  - Septic # 3 (400 Tract).

Permitted Annual Daily Average:	Annual Daily Average:
General Permit	806 gpd

As of December, of 2022, there are a total of 5,066[9] water customers and 155 wastewater connections within the GBWC-SCD, 23 square mile service area. GBWC-SCD currently

[9] Volume III Table 3.02: GBWC-SCD Water Connections

has three arsenic removal plants in service at three of the 12 ground water wells, 149 miles of watermain (primarily PVC), 10 Ground Storage Tanks, 3.5 miles of sewer and there are 387 fire hydrants and 1,115 watermain valves. GBWC-SCD owns 7,103.27 AFA of water rights from which to provide water service to its customer base. GBWC is anticipating that within the next 5-10 years, the State Water Engineer may designate the basins located in Humboldt River Basins as possible Critical Management Areas or issue an order for specific basins, pending any court decisions on the current water rights litigation by the Pershing County Water Conservation District. If not properly planned for, these possible actions could negatively affect the level of service for GBWC customers in Spring Creek. A more detailed description of the Humboldt River Basin issue can be found in Volume III of the 2024 IRP, relating to the Spring Creek Division, Basin 48 Overview, section 1.2.2, and a more detailed description of the water system can be found in Overview section, 1.2.

COLD SPRINGS DIVISION:

The GBWC-CSD system is a predominantly residential community with limited commercial services. GBWC-CSD is located in the City of Reno and Washoe County, approximately 10 miles northwest of downtown Reno on U.S. Highway 395 at the Nevada / California state line. GBWC-CSD is managed locally and operates the system with an average of four operations personnel (shared with the Spanish Springs Division), an area manager and administrative staff in Pahrump and Reno, NV. The single system in Cold Springs is served by 5 ground water wells which then pump to four storage tanks to provide service to four pressure zones. The wastewater services for the GBWC-CSD customers are either provided by customer septic tanks or by Washoe County. GBWC-CSD consists of one water system serving approximately 3,633[10] customers. GBWC-CSD owns 2,414.89 acre-feet annually (AFA) of water rights from which to provide water service to its customer base. A more detailed description of the water system can be found in Volume

[10] Volume IV Table 3.01: Population and GBWC-CSD Service Connection Projections.

IV of the 2024 IRP, relating to the Cold Springs Division, Overview section 1.2.

SPANISH SPRINGS DIVISION:

The GBWC-SSD system is predominantly a residential community with limited commercial services. GBWC-SSD is in the City of Sparks and Washoe County, approximately 7.5 miles northeast of downtown Sparks on Pyramid Lake Highway (State Highway 445). GBWC-SSD is managed locally and operates the system with an average of four operations personnel (shared with the Cold Springs Division), an area manager and administrative staff in Pahrump and Reno, NV. The single system in Spanish Springs is served by 2 ground water wells, which then pump to three storage tanks to provide service to two pressure zones. The wastewater services for the GBWC-SSD customers are either provided by customer septic tanks or by the City of Sparks. GBWC-SSD consists of one water system serving approximately 581[11] customers. GBWC-SSD owns and maintains 716.06 acre-feet annually (AFA) of water rights from which to provide water service to its customer base. A more detailed description of the water system can be found in Volume 5 of the 2024 IRP, relating to the Spanish Springs Division, Overview section, 1.2.

GBWC 2024 IRP FRAMEWORK

Q.10 WHAT IS THE PURPOSE OF THE IRP PROCESS FOR WATER COMPANIES?

A.10 My understanding is that the primary purpose of the IRP process is for the utility to provide, analyze and establish priorities to ensure that it meets all Nevada Administrative Code ("NAC") compliance standards of service. The IRP must take into account how the utility will be able to accommodate future growth and changes within its service territory for the next one to three years ("Action Plan") and for a twenty-year ("Preferred Plan") planning period. The IRP also provides a list of projects at a high-level analysis to be recommended

[11] Volume V Table 3.01: Population and Service Connection Projections.

for review and acceptance and a framework for utilities to establish priorities for water conservation. In setting the priorities for an IRP, a utility company must balance the operational objectives of minimizing cost to rate payers, mitigating demand risk, and maximizing service reliability to customers. Please refer to the Prepared Direct Testimony of Mike Hardy (Lumos & Associates, Inc.) for additional specific information related to this question. An example of these practices is in the updates to past approved IRP projects. See Q&A 15, infra. In addition, these approved projects also benefited from the Asset Management Process ("AMP"), which helped identify assets to be replaced, upgraded, or installed. See Q&A 16, infra.

Q.11 WHAT IS THE VALUE OF THE IRP PROCESS FOR GBWC?

A.11 For GBWC, the IRP is a key exercise performed every three years to review past, current, and future projects. This review transforms into what is known as the Action Plan and the Preferred Plan and allows GBWC to plan for the immediate and long-term future of its utilities. The near-term planning influences staffing for the projects team, operations team, and support team, influences corporate debt financing decisions and, most importantly, gives GBWC an opportunity to understand and prioritize the infrastructure, refurbishment, replacement, and upgrades that will be needed to reliably provide clean and safe drinking water to its customers, and to discharge clean water to the environment.

Q.12 HOW DID GBWC APPROACH DEVELOPING THE 2024 IRP?

A.12 As with its last IRP, GBWC has worked to take a disciplined approach to developing and prioritizing projects within the Action Plans and Preferred Plans. Development of the IRP began with an in-depth evaluation and review of the systems by the engineering team with input from the operations team. Understanding the systems' and GBWC's customers' needs was key in prioritizing the projects required in order to continue providing consistent serving through the next three years and beyond. As the needs of the system were

established, the engineering team began work on construction estimates. Prior to completing the Action Plans or the Preferred Plans, the GBWC team analyzed once more what is immediately necessary and what might be pushed out in the planning process, leading to the creation of the final list of projects for the Action Plans and the Preferred Plans.

Q.13 DID GBWC MEET WITH COMMISSION STAFF PRIOR TO FILING THE 2024 IRP?

A.13 Yes. I, along with GBWC representatives, met with Staff and the Nevada Attorney General's Bureau of Consumer Protection ("BCP") on November 14, 2023. At this meeting, we discussed our approach to developing the IRP and provided updates on prior-approved projects and new capital improvement projects for potential inclusion in the Action Plans for the current filing.

Q.14 WHAT OTHER MEETINGS DID GBWC HAVE WITH STAKEHOLDERS WHILE DEVELOPING THE IRP?

A.14 Representing GBWC, I met with the board of the Spring Creek homeowners' association (the Spring Creek Association) on February 28, 2024, to present an overview of GBWC's past and current proposed IRP projects, along with summary handout materials for attendees. I also gave a similar presentation regarding past and current proposed IRP projects at the February 8, 2024, meeting of the Nye County Community Development Group (which includes members of the County Commission, County Manager's staff and representatives of other local utilities and developers). In these meetings GBWC explained the reasoning behind the projects and the benefits they would bring to the community. GBWC also conducted meetings with current and prospective water customers, including Lifestyle Homes in the Cold Springs Division and Adaven Management in the Pahrump Division, to provide an update and overview of planned Action Plan projects that might

impact ratepayers.

Q.15 PLEASE PROVIDE AN UPDATE ON GBWC'S PROGRESS ON IMPLEMENTING THE ACTION PLAN PROJECTS FROM THE 2021 IRP AND ONGOING PROJECTS APPROVED IN IRPS PRIOR TO 2021.

Q.15 Below is a summary of updated status, as of February 2024, of ongoing Action Plan projects that were approved in Docket No. 21-03003, as well as in prior IRP dockets.

Pahrump Division:

Of the six projects approved in the 2021 IRP, one hundred percent (100%) have been evaluated, are in progress, or have been completed less than 36 months after the issuance of the 2021 IRP Order. The Calvada Valley Well 10 to Municipal Compliance Project is in progress, the CN/CVE Well Rehabilitation Program is in progress, the SCADA Upgrade for Water System Project is completed, the Mountain Falls Tank-1 Floor Replacement Project is completed, and the Calvada Valley Lift Station (LS-1 & LS-2) Electrical Upgrades and Backup Generators Project is in progress.

The final remaining project approved in the 2018 IRP, the Firebird Circle Loop Project, was completed in 2023, and on December 21, 2023, the Commission entered its order in Docket No. 23-09015 approving a System Improvement Rate to recover the costs of that project.

Spring Creek Division:

Of the four projects approved in the 2021 IRP, one hundred percent (100%) have been evaluated, are in progress or have been completed less than 36 months after the issuance of the 2021 IRP Order. The Arsenic Drying Beds Project is completed, the Well 11

Rehabilitation Project is completed, the Well 4 Rehabilitation Project is completed, and the Pipeline Replacement Project (Annual) is completed.

The final remaining project approved in the 2018 IRP, the Well 8 Replacement, is still in progress and its current status is as follows: The RFP, design and engineering, permitting, construction and testing of the well has been completed. The final electrical connection from NV Energy and well house construction work will begin in the second quarter of 2024.

Cold Springs Division:

Of the three projects which were approved in the 2021 IRP, one hundred percent (100%) have been evaluated, are in progress, have been completed, or have been reconsidered less than 36 months after the issuance of the 2021 IRP Order. The Surge Protection and Power Conditioning on Well 6 and 7 Project has been completed, the Pipeline and Meter Pit Replacement Project has been partially completed (with the remaining phases of the project being reconsidered at this time, due to financial impacts on existing customers), and the Test Hole for Future Replacement Well and Long Valley Well Replacement Project is currently in progress. Another project not approved through the IRP Process, but through a prior annexation docket, was the Cold Springs Drive Booster Project, which is in progress with an anticipated completion date of June of 2024.

Spanish Springs Division:

Of the two projects approved in the 2021 IRP, one hundred percent (100%) have been evaluated, are in progress or have been completed less than 36 months after the issuance of the 2021 IRP Order. The Spanish Springs SCADA Upgrade Project has been completed, and the Spanish Springs Test Well Project has been completed, with further progress on

the production well currently on hold due to drilling issues, site limitations and water quality concerns encountered during the drilling of the various SSD-Test Hole/Well locations. A summary of the status of the well drilling program has been provided monthly to the Commission in the investigatory docket that was established for the Spanish Springs Division pursuant to the 2021 IRP Order (see Docket No. 21-07020).

ALL GBWC DIVISIONS:

Of the projects approved in the 2021 IRP Proceeding and the Cold Springs Drive Booster Project, that was the subject of a stipulation in an annexation docket (*see* Docket No. 21-05008), one hundred percent (100%) or sixteen have been completed, are in progress and evaluated within 36 months of the issuance of the relevant orders. Of those sixteen projects, one has been modified (Cold Springs' Meter Pit and Service Line Replacement Project) and one project is on hold (Spanish Springs' Test Well/New Production Well) pending the reevaluation of the Spanish Springs Systems needs and proposed rehabilitation of the Suki Well in the 2024 Consolidated IRP. It is the intention of GBWC to keep costs as low as possible, while still providing safe and reliable service for rate payers.

Q.16 HOW DOES GBWC'S ASSET MANAGEMENT PLAN ("AMP") HELP THE UTILITY MAINTAIN ITS ASSETS?

A.16 To maximize the useful lives and functionality of our assets, GBWC follows a set of internal preventative maintenance guidelines and our newly adopted remove and replace program ("R&R"), which identifies timing of assets end of useful life. These guidelines help to ensure the GBWC systems remain in good operating condition. In turn, GBWC has adopted and continues annually scheduled inspections and maintenance programs to meet all state and federal guidelines to deliver safe and reliable drinking water. Scheduled Inspections and Maintenance Programs of capital assets are shown below in the table 1, followed by a detailed description of the inspections.

Table 1

Type of Equipment	Maintenance Program	Comments
Facility and Electrical Insp.	Annually	Conducted by GBWC staff and/or qualified third-party contractors or vendors.
Towers / GSTs	Internal and external inspection at 5-year intervals	Conducted by GBWC staff and/or qualified third-party contractors or vendors. All GSTs are inspected in accordance with guidelines. Towers are inspected on 5-year intervals as required.
Hydrant Inspection Hydrant Painting	Exercise annually Hydrants are painted as needed	Conducted by GBWC staff and/or qualified third-party contractors or vendors. Annual letters are sent to local Fire Departments, identifying flows. Foot valves exercised annually. Repairs are made immediately as identified by GBWC or local Fire Departments.
Water Distribution Valves	Exercised annually	Conducted by GBWC staff Initiated marking valves in the field with blue paint and GIS.
Hydro-pneumatic tanks	All Hydro tanks are at different time periods of the inspection process but are all up to date.	GBWC staff and/or qualified third-party contractors or vendors. Internal and external inspections on all tanks – every 5 years
Sewage Collection System	10% of collections lines per year are cleaned with 100% inspected and cleaned within 10 years	GBWC staff and/or qualified third-party contractors or vendors. 100% will be inspected and cleaned every ten years. Videoing to accompany the Inspection and Cleaning. Pahrump and Spring Creek only.
Lift Stations	Annual inspection and cleaning per checklist	GBWC staff and/or qualified third-party contractors or vendors. Inspection performed by outside contractors to do annual electrical and pump condition assessments. Pahrump and Spring Creek only.
Fats, Oils and Grease (FOG) Insp.	Annual inspection of facilities	Inspection performed by GBWC staff. Pahrump and Spring Creek only.
Backflow Prevention	Annual inspection of devices	GBWC staff and/or qualified third-party contractors or vendors. All internal inspections conducted annually and documented. Cross Connection Control plan for commercial customers has been established in accordance with NDEP requirements, all customers have been notified of the requirements.
Wells and Intake Pump Equipment	Annual inspection (including control panel inspections & amp draws, etc. by cert. electrician).	Conducted by GBWC staff and/or qualified third-party contractors or vendors. Sanitary Surveys conducted by State Regulators (3-5 years).
Water main Replacement	Based on break frequency, pressure problems, customer complaints	Incorporated in proposed projects in the IRP Action Plan. Presently. Asset Registry info is used to assist in identifying needs…
Wastewater/Manholes Water/Confined Space	Receiving manholes, receiving Flow from Force Mains = annual inspection No-receiving manholes, 10% per year Are cleaned with 100% inspected, video and cleaned within 10 years	Conducted by GBWC staff and/or qualified third-party contractors or vendors. Receiving manholes Pahrump and Spring Creek only. Non-receiving manholes Pahrump and

		Spring Creek only.
PRVs	Annually	Conducted by GBWC staff and/or qualified third-party contractors or vendors.
Air Release Valves	Annually	Conducted by GBWC staff.
Chemical feed systems and tanks	Chemical feed equipment is visually inspected for leaks and proper operation at each visit and as part of annual facility inspections. Items are repaired or replaced as needed	Conducted by GBWC staff. During weekly and annual well checks and inspections.
Standby Generators	Annually	Conducted by GBWC staff and/or qualified third-party contractors or vendors.
NDEP Facility Insp	Triennial	Conducted by NDEP staff and GBWC Staff

Q.17 CAN YOU PROVIDE ADDITIONAL INFORMATION ABOUT GBWC'S ASSET INSPECTION PROCESS?

A.17 Yes, below I provide detailed descriptions of the Utility's asset inspection processes for the various categories of assets in the systems.

Facility and Electrical Inspections – All GBWC Facility and Electrical Inspections are conducted annually by GBWC staff and/or qualified third-party contractors or vendors to ensure the safety and continued reliability of the GBWC systems. These inspections may also include the Chemical feed systems, SCADA, and tanks (Hydro-pneumatic) depending on the sites and asset configuration.

Ground Storage Tank Inspection – The American Water Works Association has established recommended procedures for the inspection of water storage tanks. These recommendations state that tanks should be inspected every three to five years, depending on water quality. GBWC schedules to have third-party inspections done typically every five years or more frequently as required. This inspection consists of a visual inspection of both the interior and exterior of the tanks by qualified tank inspection specialists. The internal inspections can be done by draining the tanks and performing the inspection with the tank empty. The tank can also be left in service, and the inspection performed using divers, or robotic equipment. The inspections include a physical inspection which is supported by video documentation and a written report. In addition, some inspections can

include ultrasonic tank measurements, if requested by the system operator. Ultrasonic tank measurements of the steel thickness are performed using handheld equipment at preselected locations throughout the tank. The measurements are then subjected to analysis by a structural steel engineer to determine the overall integrity of the steel. The engineer will then make recommendations as to the repair or replacement of the defective sections. The inspection process also includes the removal of any sediment found in the tanks. The benefit derived from this activity is mainly for to us to see the overall condition of the tanks and to allow for us to correct any deficiencies noted in the inspection. The last inspections for all GBWC tanks were done through the 2021-2023 period.

Hydrants – Generally, there are two types of hydrants GBWC's distribution systems. First, flushing fire hydrants, which are two to four inches in diameter and are used for scheduled flushing/cleaning of the water distribution system and are usually located in cul-de-sacs and dead-end sections of the system. Second, traditional fire hydrants that are six inches in diameter and used for fire protection. GBWC is currently responsible for the maintenance of all fire hydrants in the GBWC systems, except for private hydrants owned by customers. The hydrants are color coded per the direction of local County Fire District to provide a visual pressure reference to the fire protection staff. The inspection also identifies which hydrants need repairing or replacement and all the repair or replacement work is done in coordination with the local County Fire District and this work is completed at GBWC expense.

Water Distribution System Valves – GBWC's process for exercising valves in the water distribution system is to exercise valves on an annual or triennial basis, depending on their classification as either critical or non-critical. The critical valves identified have been determined to be essential to controlling pressure zones in the 4 different divisions are exercised annually. The non-critical valves identified are also located in the six different

systems and are on a 3-year rotating schedule.

Hydro-pneumatic Tanks – Hydro-pneumatic tanks provide pressure to elevated areas of the distribution system that cannot be served by the conventional storage tanks. Industry recommendations are that the tanks be inspected every five years by qualified specialists to determine overall tank integrity. The GBWC-PD system is the only system which currently has any operating hydro-pneumatic tanks in service.

Sewage Collection System – The sewage collection system is cleaned and inspected on a ten-year cycle. The cleaning process utilizes a hose that is inserted into the pipe and features a high-pressure wash. Debris is removed at the next downstream manhole. Inspection procedures include visual inspection of all manholes, visual inspection of the pipeline interior using a camera, and in some instances a smoke testing procedure can be utilized, though it has not been used throughout the GBWC wastewater systems in Pahrump and Spring Creek. The benefits of these processes are the early detection of possible leaks and identification of areas that may need repair. Inspections also help to minimize or help to identify the impact of ground and storm water intrusion which can impact the treatment process at the plant.

Lift Stations – Sewage pump stations, commonly referred to as 'lift' stations are on a monthly cleaning, and an annual inspection cycle. Cleaning consists of spraying down the sides of the sump to control buildup of fats and grease that will accumulate and possibly interfere with normal operations. During the inspection, all components of the station are inspected by a qualified electrician. The inspection includes all electric components and functions, pumping equipment operation, and visual inspection of the sump and discharge piping. Operations staff will also periodically inspect the interior of the station to ensure that all components are operating properly. This maintenance activity will ensure

consistent operation and extend the life of the equipment. If it is identified during the inspection that additional repair or replacement of pumping equipment is necessary, a third party will be contacted to perform that work.

Fats, Oils and Grease ("FOG") Inspections – The GBWC FOG Program is vital to controlling the accumulation of FOG in the GBWC sewage collection system. This is accomplished by GBWC field and operations staff conducting annual inspections of all commercial accounts that generate grease. Those accounts include restaurants, bakeries, gas stations/minimarts, car washes, auto repair shops, etc. The FOG Maintenance Program and inspection activity helps ensure consistent operation of the sewage collection system, improves the treatment processes at the plant, and will extend the life of the equipment.

Backflow Preventers – Backflow preventers are installed at the following locations: water treatment plants, sewage treatment plants, fire service lines, irrigation lines, commercial and industrial properties, and at any other facilities when warranted by Nevada statutes or regulations. These devices prevent any water used from flowing back into the water distribution system. The backflow devices which are owned by the Utility and are on an annual inspection cycle and conducted annually by GBWC staff and/or qualified third-party contractors or vendors to ensure the safety and continued reliability of the GBWC systems. Backflow devices which are owned by the customer are also on an annual inspection cycle as required by the Nevada Revised Statutes ("NRS"). GBWC has an approved Cross Connection Control Plan on file with the State.

Wells and Intake Pumps – GBWC has established procedures for the inspection and cleaning of groundwater wells in all the GBWC systems. GBWC will inspect and clean groundwater wells and pumps every five to ten years depending on well production and water quality. In addition, these inspections may also include the Chemical feed systems,

SCADA and tanks (Hydro-pneumatic) depending on the sites and asset configuration. The GBWC's well maintenance program and plan were initially started in the 2015 Spring Creek IRP and the 2016 Cold Springs IRP proceedings and was then presented in the GBWC 2018 and 2021 Resource Plans. GBWC at this time is only recommending one well rehabilitation (Suki Well in Spanish Springs) in the 2024 Consolidated IRP. With the support, guidance, and approval of the Commission, GBWC has been able to establish a robust and efficient well rehabilitation and maintenance program to maintain a sustainable level of service in our respective systems for the past nine years. The Well Rehabilitation program or projects previously approved by the Commission have allowed GBWC to maintain existing critical infrastructure, plan for the future replacement of critical infrastructure and explore new technologies to extend the useful life of the critical infrastructure. Of all the scheduled inspection and maintenance programs conducted or performed by GBWC. The Well and Intake Pumps (Well Rehabilitation Program) inspection program ranks as one of the most critical to the GBWC systems. Because of the need to meet the quality and quantity requirements of providing safe and reliable drinking water to our customers without critical system disruptions.

Watermain Replacement – The waterlines in the water distribution system are scheduled for replacement on an as-needed basis or as approved in an IRP. The watermain replacement projects are generally included in the Triennial IRP and are recommended for replacement based on the following factors: age of the pipe, the overall condition of the pipe, the material composition of the pipe, the size of the pipe, system pressures, the number of repairs to the section of the pipe, and how critical the section of pipe is to the system functioning properly. Previous Pipeline Replacement Projects have been approved by the Commission for various GBWC systems in the 2018 and 2021 IRP proceedings. Since the 2021 IRP, GBWC has been tracking all main line and service break information in the EAM/GIS system, which then can be provided to the GBWC engineer who will be

conducting the next IRP or Pipe Replacement Projects. Historically, break information was tracked in an excel file and was then presented to an engineer to build a matrix for recommending which sections of watermain should be replaced.

Manholes – In the water distribution and sewage collection system, manholes are inspected in conjunction with the confined space inspection program and the annual or monthly scheduled cleaning operations. Manholes which are receiving sewage from a force main, are on an annual inspection and a monthly cleaning cycle. GBWC believes that inspection of manholes helps to identify deterioration that may lead to an increase in ground water and storm water intrusion, which can cause the following problems: safety hazards, system problems such as backups to the sewer treatment plant and limited to control valves.

Pressure Regulating Valves ("PRVs") – PRVs automatically adjust the pressure in the distribution system to prevent high pressure in the lower areas of the system. The PRV devices are inspected annually by a qualified third party, which specialize in this work, or done internally by a qualified operator. During the inspection, the technician checks all operations of the valve, and will also replace wearable parts, such as springs, diaphragms, and needle valves. This inspection and service assures the operators that the device is working properly and will adjust automatically as needed to regulate the pressure in the GBWC systems.

Air Release Valves – Air Release Valves are devices which automatically release any buildup of air in the distribution system. The air comes from water mixing with air (entrained air) during the pumping of groundwater or the normal release of oxygen from the water in the distribution system. These devices are on an annual inspection cycle, which assures GBWC that the devices are in good working order, minimizing both customer complaints and possible damage to pipe and equipment due to the effects of water hammer.

The annual inspection is usually conducted in-house by GBWC staff.

Standby Generators – The standby generators in the GBWC-SCD system ensure the redundancy of backup power when commercial power disruptions occur in the GBWC system. The groundwater wells' standby generators have annual electrical inspections and maintenance inspections conducted by qualified third parties. Currently, GBWC has standby generators serving all the ground water wells or booster stations located in the systems.

Nevada Division of Environmental Protection ("NDEP") – NDEP conducts a triennial sanitary survey/inspection of all of the GBWC systems except for Cold Springs and Spanish Springs (where inspections are performed by the local health district). GBWC field staff and operators review and inspect the physical facilities used to operate the GBWC systems with NDEP. NDEP will review any new installations of physical facilities or capital assets added since the previous sanitary survey and inspect existing GBWC facilities for NDEP compliance. Any changes or recommendations cited by the NDEP during sanitary surveys are addressed promptly by GBWC staff or qualified third-party contractors as appropriate.

By implementing the asset management framework, GBWC aims to take a proactive approach instead of a reactive approach toward asset failure. The integrated portion of the IRP's asset management plan has identified several areas which should be addressed to mitigate risk, minimize costs, and maximize service reliability. GBWC staff believes the best defense against emergencies is to avoid them through routine inspections, routine equipment maintenance, comprehensive sampling plans, security checks, usage checks, and communication. In the event of emergencies such as a natural disaster or a man-made event, the best response to a catastrophic interruption of service is to be prepared. Staff is

trained for emergency response in OSHA safety, Electrical Safety, Lock Out / Tag Out, Generator Operation, and recognizing chemicals in an uncontrolled environment.

Q.18 WHAT SIGNIFICANT PRACTICAL CONSIDERATIONS DID GBWC TAKE INTO ACCOUNT IN DEVELOPING THE GBWC 2024 IRP?

A.18 The AMP approach or process has been similarly deployed in each Division since the introduction of the AMP process in December 2013 to the GBWC-SCD system. The AMP approach or process is continually evolving as demonstrated in each of the GBWC Divisions' implementation/utilization of the recently adopted R&R process in 2022 and 2023. By now using the R&R process, GBWC continues to develop the necessary tools to better understand its assets, implement monitoring programs, and refine established maintenance protocols, which will help to determine how much useful life remains in each of the assets.

Q.19 CAN YOU BRIEFLY DESCRIBE GBWC'S AMP.

A.19 GBWC initially adopted the USEPA-endorsed "best practices" recommends that a water or wastewater system prepare an asset inventory and system map, develop a condition assessment and rating system, assess remaining useful life by consulting projected-useful-life tables or decay curves, and determine asset values and replacement costs. Generally, the AMP begins with five core questions:

- What is the current state of my assets?
- What is my required sustainable level of service?
- Which assets are critical to sustained performance?
- What is my minimum life-cycle costs?
- What is my best long-term funding strategy?

The goal of these core questions is to develop a framework that walks through all the major activities associated with each asset, considering limitations on resources, delivering expected levels of service to meet the customer's expectations and regulators requirements, and while minimizing the total costs of operating, maintaining and renewing assets.

Since the last IRP filed in 2021, GBWC has continued to build upon the core foundation of AMP and has continued to review and update the Asset Registries for all the GBWC systems, which includes the previously described projects in the 2021 Consolidated IRP. In addition, GBWC also continues to use the formerly named OMS software, now called Center Square Enterprise Asset Management (adopted in 2017-2018), which is synched into the ESRI "GIS" platform to track, monitor, and maintain vertical and horizontal assets. The OMS/GIS platform and the newly implemented R&R process continues to assist GBWC in providing a sustainable level of service, by tracking the most critical assets throughout the GBWC systems and helping identify their replacement lifecycle, while minimizing system disruptions and forecasting future replacement timing and costs. The OMS/GIS platform and R&R process will continue to support the described Scheduled Inspections and Maintenance Programs of capital assets and track the life cycles of all assets and their long-term replacement strategy.

Q.20 WHAT ARE THE BENEFITS OF THIS ASSET MANAGEMENT APPROACH?

A.20 The asset management framework provides a systematic methodology to incorporate the gathered information into an IRP, prioritizing capital projects based on level of service requirements, criticality of assets and condition assessments of those assets. In addition, GBWC has developed asset maintenance guidelines (*see* Table 1, *supra*) in conjunction with its parent company, Corix Regulated Utilities (US) Inc. (herein, "Corix"), to extend the life of current assets. GBWC has found this to be a valuable tool in assessing the infrastructure needs for all the GBWC divisions. An AMP is a dynamic plan evolving with

changes in required levels of service, continued information gathering and condition assessments, and the inclusion of new infrastructure.

Using a dynamic AMP approach with the R&R process, it allows GBWC to continue refining how it operates the four different divisions and present projects and information in the IRP. For example, in past IRPs, projects have focused heavily on the production/supply side (*e.g.*, Well Rehabilitation Programs) of the water systems. This focus ensured that GBWC continued to meet quality and quantity requirements of providing safe and reliable drinking water to our customers without critical system disruptions. As the production/supply (wells) needs are addressed, the AMP now directs GBWC's focus to the supply (pipes) and storage (tanks) aspects of a system. Historically, an approach to IRP projects may have been to focus on replacing or constructing assets in all areas of the system, where now the approach can be focused on just the critical components in the system or specific problems or issues in the production, supply, storage, treatment water/wastewater and collection infrastructure of a system. Examples of the dynamic approach to using the AMP for IRP projects are past well rehabilitations, pipeline replacement projects and meter replacements. GBWC has been able to stabilize water production in wells, identify wells for replacement, replace existing undersized mainline, emergency broken mainline, fire hydrants, valves, service lines, meter pits, and continue to replace non-AMR meters with AMR meters in all the systems to address NRW issues, under these approved IRP projects. The approach has allowed GBWC to keep costs as low as possible, even modifying or delaying infrastructure replacement projects, which are necessary and have been deemed prudent, to control costs to ratepayers without critical system disruptions.

Q.21 HOW DID GBWC EMPLOY THESE GUIDELINES FOR THE GBWC 2024 IRP?

A.21 For the 2024 IRP, GBWC began by updating the Asset Registries for all the existing and

new GBWC systems. The work was done by evaluating all the existing and new components, which support the infrastructure of the GBWC water and wastewater systems. GBWC updated the Asset Registries with new information or created new assets to be reviewed, which included all the critical assets identified in the R&R process for the water and wastewater systems. Please see an example below of the components and refer to Appendix A in the 2024 IRP for Asset Registry and R&R's:

Water Resource

- Wells (well casing size, new linear size, pump and motor configurations, variable frequency drives ("VFDs"), meters, valves, transducers, electrical upgrades, generators, SCADA controls, discharge piping, system pressure information and new well pumping configurations).
- Treatment
    - Arsenic Plant (drying beds, media, medial vessels, pumps and motor configurations, variable frequency drives ("VFDs"), electrical upgrades, SCADA controls, discharge piping changes and system pressure information)

Water Distribution

- Pressure Reducing Valves (electrical upgrades, SCADA controls, discharge piping changes and system pressure information)
- Booster Stations (pumps and motor configurations, variable frequency drives ("VFDs"), meters, valves, electrical upgrades, SCADA controls, generators, discharge piping changes and system pressure information).

Water Storage

- Tanks/Hydro-Pneumatic (new OSHA or NDEP requirements, cathodic protection, pumps and motor configurations, variable frequency drives ("VFDs"), electrical upgrades, SCADA controls, discharge piping changes and system pressure information)

Wastewater Treatment

- Wastewater Plant (tanks, dewatering equipment, water treatment filters/media, odor scrubbers, meters, pump and motor configurations, valves, ventilation changes, electrical upgrades, generators, and SCADA controls),

Wastewater Collection

- Lift Stations (pump and motor configurations, meters, valves, ventilation changes or odor scrubbers, electrical upgrades, generators, and SCADA controls)

In addition, GBWC looked at specific system processes within the water and wastewater facilities to review and evaluate the probability of failure based on asset life, criticality, and usage, while assessing critical assets through the R&R process. GBWC used information from past IRP FMEA processes, new information from the Asset Registries, new changes in regulations and requirements and system changes not identified before in past IRPs. Also, GBWC reviewed past and recent projects to evaluate by production, supply, storage, treatment water/wastewater and collection system to focus on critical components or specific problems or issues. The objective was to develop solutions that will reduce the risks of system failures and support GBWC's mission to provide safe and reliable drinking water to its customers and reduce or eliminate critical system disruptions.

Q.22 HOW DID THIS AMP APPROACH INFLUENCE THE ACTION PLAN PROJECTS IN THE 2024 IRP?

A.22 This approach has helped GBWC prepare a disciplined and focused IRP. For the 2024 IRP, GBWC looked at all the infrastructure components, but it also subdivided the systems into the categories of water resource, water distribution, water storage, wastewater treatment and collections. This practice allows the needs of the individual system to be more strategically addressed. As a result, projects recommend for review and approval are more focused and fewer projects may be presented because the needs of some categories have been previously addressed.

Q.23 CAN YOU GIVE SOME EXAMPLES OF HOW THIS APPROACH HELPED GBWC SELECT PROJECTS FOR THE ACTION PLANS?

A.23 The Action Plan projects were determined through using the historic information from the Asset Management Framework and the current AMP/R&R processes, along with the professional analysis of Lumos and Associates. Lumos was the engineering firm selected for the GBWC 2024 IRP to analyze our systems and help develop our current and future system needs and requirements. GBWC's separate divisions have historically undergone the FMEA or Asset Management Analysis process in previous IRP workshops, conducted field investigations, completed and reviewed Level of Service ("LOS") analysis in past IRPs and recently updated Asset Registries and R&Rs. Additionally, GBWC reviewed past and recent projects to evaluate by water resource, water distribution, water storage, wastewater treatment and collections to focus on critical components or specific problems or issues.

Some examples of how this approach influenced the new Action Plan projects as seen in the Utility's recommendations and as they relate to Water Sources, Distribution, Storage, Wastewater Treatment and Collections are as follows:

- Water Source: New well projects are being proposed in the Pahrump and Spring Creek systems;

- Water Distribution: Pipeline projects are being proposed in the Pahrump, and Spring Creek systems;
- Water Storage: Tank Rehabilitation in Cold Springs, Spanish Springs and Spring Creek systems;
- Wastewater Treatment: The Rehabilitation of the pre-EQ tanks and building, rehabilitation of the sand filters at WWTP #3 in the Pahrump system and upgrading the existing SCADA in the Spring Creek Wastewater system, and
- Wastewater Collection: The installation of de-ragging equipment and the rehabilitation of the lift station at the WWTP in the Spring Creek system.

By evaluating and analyzing these categories and components, GBWC can focus on the most critical individual system needs without causing an excessive burden to the ratepayers.

EMERGENCY RESPONSE

Q.24 HOW DOES GBWC PREPARE FOR AND RESPOND TO EMERGENCIES?

A.24 When an emergency event arises, public notification procedures have been established with contact numbers for GBWC customers. Communication procedures and equipment are in place to provide support to GBWC customers, GBWC Staff, and First Responders. The primary and secondary emergency responders are designated. Emergency equipment and spare parts are available through the support of vendors and other GBWC systems located in Nevada. If, during a dire emergency, a well is contaminated or damaged, the well will be disconnected from the distribution system and not be used to distribute water to the public. GBWC will provide staff personnel to work in partnership with local authorities to distribute drinking water. In a worst-case scenario, where GBWC would have no safe drinking water, bottled water can be purchased to be supplied to GBWC customers. Should

a catastrophic disaster occur in Pahrump, Spring Creek, Cold Springs and/or Spanish Springs, GBWC has put the plans and resources together to respond quickly and efficiently to ensure safe drinking water. These plans have been approved by NDEP and the Emergency Response Plans for all GBWC Divisions are discussed in more detail in Volume I of the 2024 IRP and are provided as Appendix J.

In addition to the resources identified in the Emergency Response Plans for the individual GBWC systems, GBWC may draw upon resources from its parent and sibling companies. When a catastrophic event or natural disaster occurs, such as the event which impacts the entire system. GBWC has the resources through Corix's Incident Command Center/Team, an extension of GBWC's parent company, to request the needed additional support to help restore service back to customers. Corix can accomplish the request by directing resources and personnel from other business units (sibling companies) to Nevada, while the system is down or needing support in restoring services. Two recent examples of Corix providing support to sibling companies: During the most recent hurricane season (2020), Corix provided different business units support in the southeast by sending personnel and resources from states not impacted by the hurricanes, to states impacted by hurricanes. These crews helped by restoring service, bring in backup generators and relieving exhausted crews. In the most recent winter weather emergency event in Texas, a team was sent from Alaska to Texas to help restore service, relieve exhausted crews, and help Texas crews identify water and wastewater infrastructure impacted by the freezing temperatures. The unique skillset of dealing with extreme freezing conditions in water and wastewater system proved to be invaluable to the customers and operators in the Texas systems. The GBWC systems are very fortunate to have these additional resources available during times of need, which provides for another level of support that other utilities may not have.

Q.25 HOW DOES GBWC EVALUATE FIRE FLOW REQUIREMENTS IN THEIR

SYSTEMS FOR EXISTING INFRASTRUCTURE, NEW INFRASTRUCTURE, PROPOSED IRP PROJECTS, AND APPROVED IRP PROJECTS?

A.25 **Existing Infrastructure:**

The process begins with reviewing the existing water model and determining if there has been any changes or new infrastructure added to the area. The changes are then added to the model if applicable, the model is then updated and then the model output is compared to the most current NAC provisions to determine if the existing infrastructure complies with fire flow requirements. There are areas currently within the GBWC's Service Territories which do not meet the current minimum fire flow requirements as established in the NAC and by the local jurisdictions (Planning and Fire Departments and the BOCCs/City Councils i.e., Elko County, Washoe County/City of Reno and Nye County). As described in this filing, these areas were either constructed in a time period which had different minimum fire flow requirements, or the developer requested a waiver from the minimum fire flow requirement. The waiver would have been approved and granted by the various State Agencies and/or Local Government jurisdictions before the construction could have begun on the new facilities in the development.

New Construction of Infrastructure:

When new facilities, as defined by NDEP, are constructed in Spring Creek, Cold Springs, Spanish Springs, and Pahrump by either GBWC or a developer, the system water model must be updated to determine if the new construction or infrastructure meets the minimum fire flow requirements as outlined by the NACs and the local codes or ordinances (established by Planning, Fire Departments and BOCCs/City Councils i.e., Elko County, Washoe County/City of Reno, and Nye County). The new facilities must be approved by the various State Agencies and/or Local Government jurisdictions prior to the construction of any new facilities. If the proposed new facilities do not meet the minimum fire flow requirements, as outlined by the NACs and the local jurisdictions, the project owner may

request a waiver from the requirement to construct the proposed new facilities from the various State Agencies and/or Local Government jurisdictions. The waiver must be approved and granted by the various State Agencies and/or Local Government jurisdictions before construction can begin on the new facilities. If a developer is proposing a new subdivision, which will be annexed into our service territory. The steps outlined above for the construction of new facilities, along with the review and approval by the NDEP, are required before the project can be annexed, constructed, and accepted by the Utility.

Changes to fire flow requirements:

When the Utility conducts the IRP process every three years, the Utility's Engineer updates the system water model, and reviews any changes in the NACs and local codes or ordinances, which are for the minimum fire flow requirements. The Utility's Engineer then compares those changes to the existing system to identify areas in the system, which may be affected by the changes. The Utility is not required to address the areas affected by changes immediately because those areas were approved and constructed under different NACs and local codes or ordinances for maintaining the minimum fire flow requirement. The Utility is required to meet the changes in the NACs and local codes or ordinances when it constructs new facilities or proposes to replace existing facilities in the IRP.

IRP Projects:

When the Utility constructs new facilities approved by the Commission in the Utility's IRP, some new facilities may require system water model updates and all the new facilities must meet the minimum fire flow requirements as outlined by the NACs and the local jurisdictions. The new facilities must be approved by the various State Agencies and/or Local Government jurisdictions prior to the construction of any new facilities. If the proposed new facilities do not meet the minimum fire flow requirements, as outlined by the NACs and the local jurisdictions, the project owner may request a waiver from the

requirement to construct proposed new facilities by the various State Agencies and/or Local Government jurisdictions. The waiver must be approved and granted by the various State Agencies and/or Local Government jurisdictions before construction can begin on the new facilities. After the construction of the new facilities has been completed, the Utility will then submit the completed project to the Commission for review and approval of recovery for the project.

NRW/WATER CONSERVATION

Q.26 WHAT IS NON-REVENUE WATER ("NRW")?

A.26 NRW is a term, "According to the American Water Works Association ("AWWA") that describes water that is produced by the utility but is used or lost before it reaches the customer. The water losses can be broken down into three types: Unbilled authorized consumption, Apparent loses and Real losses. Non-revenue water is equal to the total amount of water flowing into the water supply network from a water source such as a ground water well or a surface water treatment plant (the "System Input Volume") minus the total amount of water that industrial and domestic consumers are authorized to use (the "Bill Authorized Consumption") (please *see* Attachment JTE-03 to Exhibit ___, *WLCCKIReport2019*) and is used to reflect the distributed volume of water which is not reflected in customer billings. More specifically, NRW is the sum of unaccounted for unbilled authorized consumption (firefighting, utility plant use, etc.), plus apparent losses (customer meter inaccuracies, data handling errors, unauthorized consumption, etc.), and real losses (system leakage, main breaks, and storage tank overflows). In this way, NRW includes the sum of the varied and disparate types of losses and authorized unbilled consumption typically occurring in water utilities.

Q.27 TO WHAT DO YOU ATTRIBUTE GBWC'S NRW?

A.27 Sometimes it is difficult, if not impossible, to identify all specific causes which can contribute to NRW, whether it is unbilled authorized consumption, apparent losses or real losses from flushing main dead-ends, firefighting efforts, fire hydrant testing/flushing, non-functioning or slow reading meters, leaks, seeps, or breaks GBWC continues to monitor all of our systems. While NRW occurs in every system in GBWC, the GBWC-PD Calvada Meadows and the GBWC-SCD 200 Tract have historically been higher than other systems within their respective divisions.

A past example of GBWC staff addressing NRW in the GBWC-PD Calvada Meadows system is when Staff discovered and replaced broken and leaking distribution lines and replaced all existing meters with new Automatic Meter Reading ("AMR")/Advanced Metering Infrastructure ("AMI") meters in the system. The leaks were detected by monitoring the well pumping reports to the water sold reports, field inspections of facilities for leaks or wet spots and then going out and identifying locations to install and monitor portable pressure gages. Two sections were identified for replacement during this process. Since the replacement of these two areas in November 2019, the well pumping has decreased significantly in the system. Currently the annual average for the Calvada Valley System analyzed in the 2024 IRP is below the other systems within the division. Another example of GBWC addressing NRW issues is in the Spring Creek 200 Tract area. Since the submission of 2018 and 2021 Consolidated IRPs GBWC has completed substantial portions of its multi-phase pipe replacement program for this area. GBWC anticipates the NRW should start to trend down in the coming years, however, the total benefits will not be fully realized until all the aging distribution pipelines, and service lines have been replaced in the 200 Tract, a project which GBWC proposes to continue through the 2024 IRP. In other systems, GBWC Operations staff continues to monitor, discover, and replace non-working customer meters, as well as identify and repair or replace leaking service lines, which has historically been attributed to the wide ranges of NRW.

Q.28 WHAT DOES GBWC DO TO MANAGE NRW?

A.28 In addition to GBWC managing the apparent losses by monitoring or tracking non-functioning meters during meter read cycles and then replacing those meters upon discovery and identifying real losses and then immediately repairing or replacing the damaged infrastructure, GBWC also uses a multi-faceted approach to address NRW in its systems for apparent or real losses.

GBWC staff has used the following tools or methods:

- Pumping reports
- Water sold reports
- Zero read reports
- Field investigations
- Field inspections
- Leak detection equipment
- Portable pressure sensors

GBWC staff is exploring and using some of the following tools or methods:

- Permanent Pressure Sensors located in fire hydrants to monitor system pressure fluctuations associated with pumping demands or leaks;
- Implementation of AMI Infrastructure to provide utility with real time system metrics, such as customer usage, water temperature or pressure;
- Continue to analyze the different types sounding technologies;
- Continue to analyze system data, such as high-pressure areas, main/service line breaks, meter replacements and customer complaints to recognize specific problem areas or areas needing infrastructure replacement or upgrades;

- Continue to analyze the usage of new technologies to identify areas of NRW, such as utilizing drones and thermal imaging equipment.

Q.29 HOW IS THE UTILITY ADDRESSING APPARENT WATER LOSSES?

A.29 Recently, GBWC has addressed apparent water loss by installing Automatic Meter Reading ("AMR") meters in GBWC systems. These efforts have had an immediate impact on NRW. Currently, the procedure which GBWC operators follow when a problematic meter needs to be replaced with a new meter is to install an AMR/AMI meter. GBWC currently installs AMR/AMI meters for all new services for single residences or developments and for any meter replacements. GBWC, has replaced all non-AMR meters with AMR/AMI mechanical meters in the Cold Springs, Spanish Springs and Spring Creek Systems. GBWC continues to replace all the existing manually read mechanical meters with new AMR/AMI ultra sonic meters in the Pahrump System to help reduce NRW and the time necessary to collect the water consumption data each month, freeing up the operator's time for other operations and maintenance tasks.

Q.30 WHAT ARE THE BENEFITS OF AMR/AMI METERS?

A.30 AMR/AMI provides a more accurate water consumption record to customers and a more detailed consumption history to help customer service resolve customer questions and issues more effectively. The consumption history is currently being used to help customers and GBWC staff manage water conservation initiatives and provide customer support. There have been many examples of the consumption history being used by our Water Conservation Coordinator, Customer Service Department and Commission Staff to resolve billing questions, provide water consumption history and identify how customers can benefit from water conservation methods. In addition to water conservation and increased customer satisfaction, AMR/AMI also has the labor-saving advantage of allowing the operators to conduct more maintenance tasks and better monitoring of the

water system, such as conducting a leakage detection program. It also increases safety for the operators both from a driving perspective and physical labor perspective. In the 2024 Consolidated IRP, GBWC explored the installation of the next generation of water meters that are being installed in other water systems across the country. As stated above, GBWC's Cold Springs, Spanish Springs and Spring Creek systems have been completely changed to AMR meters. Currently the conversion of the Pahrump system is approximately seventy percent complete with an anticipated completion time by end of the first quarter in 2027.

GBWC analyzed the benefits of installing the next generation of Neptune Ultra Sonic meters "AMI" technology and infrastructure into the Spanish Spring System, which is being proposed as one of the Action Plan projects, due to the size of the system, age of the existing AMR meters, existing mechanical AMR meters and the ease of installation. In 2022-2023 Corix executed a master meter agreement with Neptune to install their new AMI technology for meter replacements and new installs throughout their business units. Currently, the Pahrump system is installing the new Neptune Ultra Sonic meter AMR/AMI technology for all new meter services and replacements. The conversion from AMR/AMI meters to AMI meters only, will be after the AMI infrastructure of fixed based or cellular technology has been decided or installed for use in the Pahrump system. Additionally, to meet the replacement of the non-AMR mechanical meter goal for the Pahrump system, GBWC will need to replace between 500-1,000 non-AMR mechanical meters a year until the system has been completely replaced. GBWC will continue to utilize existing GBWC resources such as; the EAM/GIS system to identify the oldest meters, analyze meters with extremely high usage and problematic meter reading sections. GBWC intends to use existing staff to perform the meter exchanges, thus reducing the costs of the project if the meters were replaced by a contractor.

Q.31 HOW IS THE UTILITY CONTINUING TO ADDRESS REAL WATER LOSSES?

A.31 Additional approaches to addressing NRW will be to concentrate on real water loss through reviewing and analyzing new technologies used to identify and replace damaged or leaking infrastructure. Examples of these technologies would be using drones and thermal imaging equipment to identify unusual vegetation growth, wet spots or different ground temperature conditions due to leaking or broken lines, permanent pressure monitoring stations in strategic locations and/or fire hydrants along with starting the installation of AMI ultra sonic meters and AMI infrastructure to collect real time data consumption of the GBWC systems. For additional conversation and NRW measures, please see the Water Conservation Plan, which is discussed in more detail herein and which is provided as Appendix K to the 2024 IRP, as well as Prepared Direct Testimony of Mike Hardy in this docket.

Q.32 HAS GBWC PROVIDED AN UPDATED WATER CONSERVATION PLAN ("WCP") IN THIS FILING?

A.32 Yes. Deborah Woodland, our Water Conservation Coordinator, has worked with Lumos and Associates to update the WCP with the most recent system information and data. The WCP has been consolidated for all GBWC divisions since the first consolidated IRP in 2018.

Water conservation is, in many ways, about changing a culture regarding how we use water. When conservation is forced through curtailment because of drought, or other long-term water shortages, we see that people rarely go back to using the pre-curtailment volumes of water; the culture is changed. GBWC seeks to change the way people think about water conservation through education rather than through enforcement as a primary means. To this end, Ms. Woodland works collaboratively with the communities we serve.

In addition, the proposed WCP is comprehensive addressing drought, systems management, and other specific conservation measures. Multiple projects have the potential to positively impact water conservation through systems management. To name some:

- Pipeline and Meter Replacement Project
- AMI Meter Replacement Project
- Tank Rehabilitation Projects

In addition, AMR/AMI is currently being installed in all GBWC divisions with a cost savings approach to limit rate impact to our customers. Other specific water conservation efforts in past IRPs have focused on rebates to make it more financially affordable for customers to implement their own water conservation efforts, such as retrofitting pluming through the use or rebates, and by providing water conservation landscaping equipment (like irrigation timers).

More detailed support of the WCP and water conservation systems management projects can be found in the Prepared Direct Testimony of Deborah Woodland and Michael Hardy.

Q.33 IS GBWC PROPOSING ANY NEW WATER CONSERVATION REBATES IN ITS 2024 IRP?

A.33 No, GBWC is not introducing any new or additional rebates in the 2024 GBWC Water Conservation Plan. The rebates described in the 2021 Water Conservation Plan all remain in effect and available in all of GBWC's divisions.

GBWC 2024 ACTION PLAN

Q.34 HOW DID GBWC DETERMINE THE ACTION PLAN PROJECTS?

A.34 The three-year action plan projects are focused on the immediate asset concerns that have been identified through the development of past and future asset management components, customers LOS, NAC compliance, and GBWC staff recommendations. As discussed above, for the 2024 Consolidated IRP, GBWC looked at all the infrastructure components, but also subdivided the systems into the categories of "Water Resources", "Water Distribution", "Water Storage", "Wastewater Treatment and Collections". Other considerations taken into account in determining the Action Plan projects for each division included local, state, and federal initiatives and requirements; potential rate impacts to GBWC customers; workload for GBWC staff; short and long term cost saving initiatives; health and safety concerns to GBWC operators, vendors, and customers; maintaining reliable service to GBWC customers; system and operational efficiencies; water-saving initiatives for all the GBWC operations and customers; and previous input from GBWC customers, the Commission and Commission Staff. *See* Q&A 21-23, *infra*. Please refer to the Prepared Direct Testimony of Mike Hardy and Mara Quiroga (Lumos & Associates, Inc.) for additional information related to this question.

Q.35 WHY AND HOW DID GBWC ESTIMATE CAPITALIZED TIME FOR EACH PROJECT?

A,35 In Docket 15-06063, the UICN 2015 General Rate Case, Staff witness Adam Roney stated the following: "in the future, UICN's IRP costs should include estimates of cap time, AFUDC, and governmental review for future projects, especially since the additional Nye County permits and review costs have become significant." Roney Prepared Direct Testimony; Page 4; Q&A 12. While GBWC has not been ordered by the Commission to do so, we continue to make an effort to include estimated capitalized time pursuant to Mr. Roney's feedback. However, it should be noted that there is no exact science to estimating capitalized time. There are simply too many unknown demands on time, particularly in local jurisdictions when permitting to start a project can be an unknown and even getting a

final walk-through can take months so that the project can be closed.

In the 2024 IRP, GBWC staff in coordination with our engineers, developed estimates, which included Capitalized Time and associated timelines for projects. The methodology assumed eight hours of capitalized time per week for each week the project was estimated to be open, a given hourly rate was then applied to the project, which assumed one employee on average would be working on the project. GBWC understands this is a very basic method to estimate; but it provides a starting number for estimating Capitalized Time and recognizes Staff's feedback to the Utility.

As discussed in the Action Plans for some of the IRP projects, estimating permitting for the various local governmental jurisdictions is even more difficult to accurately estimate, as the permitting requirements vary from project to project and local jurisdiction to local jurisdiction. Even when GBWC has in writing from a local jurisdiction what the requirements will be, when GBWC goes to implement the project, the permitting requirements may change, so throughout all the GBWC divisions' proposed IRP Action Plan projects, GBWC and Lumos have added cost estimates to the projects per feedback from Staff. In addition, GBWC has added estimated timelines to help understand the necessary project steps.

Q.36 HOW HAS THE UTILITY COMPLIED WITH ITS AGREEMENT WITH STAFF TO INCLUDE A RATING FOR EACH PROPOSED ACTION PLAN PROJECT FOR PURPOSES OF PROJECT PRIORITIZATION?

A.36 In the Stipulation that led to the 2021 IRP Order in the last Resource Plan proceeding, GBWC and Staff agreed that "in any future IRP Application, [GBWC] will include a rating for each proposed Action Plan project designating it as a 'Tier 1,' 'Tier 2," or 'Tier 3' project for purposes of project prioritization." *See* 2021 IRP Order, at page 6, paragraph

16 (reciting stipulation). In compliance with that agreement, GBWC has designated the projects proposed in the current Action Plan for the 2024 IRP by three levels of priority: "High Priority" (i.e., "Tier 1"), Medium Priority (i.e., "Tier 2"), and Low Priority (i.e., "Tier 3").

While GBWC has taken care to ensure that all of the projects proposed in the Action Plan are important to its water systems' short- and long-term viability and to its customers' needs, balancing considerations of efficiency and cost, GBWC has been able, pursuant to Staff's direction, to rank each of its proposed Action Plan projects by priority to reflect the immediacy of the need and the level of criticality of the proposed improvement to GBWC's system infrastructure and its ability to reliably provide safe and clean drinking water and adequate levels of service to its customers.

Q.37 WHAT ACTION PLAN PROJECTS IS GBWC PROPOSING IN THIS 2024 IRP?

A.37 Please see the list below, organized by division system categories, and with projects designated with a tiering priority (and, where applicable, designations of proposed project alternatives). For example, you will see the system name "Pahrump", "Spring Creek', "Cold Springs" and "Spanish Springs"; followed by the system categories of "Water Resources", "Water Distribution", "Water Storage", "Wastewater Treatment and Collections", and a project designation of "High", "Medium" or "Low Priority," and for those projects for which multiple alternatives are being proposed, a designation of which is the "Preferred Alternative."

The Funding Plan is discussed in more detail in Volume I of the 2024 IRP filing, as well as in Appendices L, Ll and L2.

Pahrump: [12]

The GBWC-PD three-year Action Plan focuses on asset concerns that have been identified in connection with the following projects:

***Water Resources*:**

1. **Medium Priority** – New Well in High Zone at Well 13 Property (PD Replacement Well – Calvada Meadows (HZ)

Water Distribution:

2. **High Priority** – Calvada Meadows System Consolidation
    a) **Preferred Alternative -** Pipeline from Mesquite Booster Station (Avenue of the Stars) to Calvada Meadows; or
    b) **Alternative -** Pipeline from Country View Estates to Calvada Meadows

***Wastewater Treatment/Collections*:**

3. **High Priority** – Rehabilitate EQ-Building and Tanks[13]
4. **Medium Priority** – Plant 3 Sand Filter Rehabilitation

Spring Creek:[14]

The GBWC-SCD three-year Action Plan focuses on asset concerns that have been identified in connection with the following projects:

***Water Resources*:**

[12] There are no Water Storage projects identified for the Pahrump System in the 2024 IRP. Currently, GBWC has completed and submitted to the Commission for SIR approval the one Water Storage Project approved in the 2021 IRP for the Mountain Falls System. Additionally, Wastewater Treatment and Collections have been combined into one category for testimony purposes. There are no Wastewater Collection projects identified for the Pahrump Systems in the 2024 IRP.

[13] As discussed in Section 8 of Volume II of the 2024 IRP, GBWC explored the option to Convert and Cover Existing Marwood Digester Tanks as an alternative, but due to the cost of the alternative being cost prohibitive was not included in the funding plan.

[14] The Booster Pump Project is categorized in the IRP as a Water Distribution Project. For the purpose of comparing like alternatives projects together, I have placed the Booster Pump Project under the Water Storage category, due to it being an alternative for the removal of the High Tank in the 200 Tract System. Additionally, Wastewater Treatment and Collections have been combined into one category for testimonial purposes.

1. **High Priority** - Well 12 Replacement (400 Tract)

Water Distribution:

2. **Medium Priority** - Pipeline Replacement Project (All Tracts)

Water Storage:

3. **High Priority –** High Tank (Tract 200) Rehabilitation or Replacement
    a) ***Preferred Alternative*** **-** Rehabilitation of High Tank (Tract 200); or
    b) ***Alternative*** - Replacement of High Tank (200 Tract); or
    c) ***Alternative*** - Booster Pump (Tract 200)

Wastewater Treatment/Collections**:**

4. **High Priority** - WWTP Reconditioning (Tract 100);
    a) ***Preferred Alternative*** - WWTP De-Ragging and Lift Station Rehabilitation; or
    b) ***Alternative*** – WWTP Lift Station Rehabilitation
5. **Low Priority** - SCADA Wastewater Upgrades (Tract 100).

<u>Cold Springs</u>:[15]

The GBWC-CSD three-year Action Plan focuses on asset concerns that have been identified in connection with the following projects.

Water Distribution**:**

1. **High Priority** - PRV Installation for Fire Flow between Tanks 3 and 4.

Water Storage:

2. **High Priority** – Tank 1 Rehabilitation; and
3. **High Priority –** Tank 2 Factory Rehabilitation or Replacement
    a) ***Preferred Alternative*** – Factory Rehabilitation of Tank 2; or
    b) ***Alternative*** – Replacement of Tank 2

[15] There are no Water Resource projects identified for the Cold Springs System in 2024 IRP. GBWC is currently working on one Water Resource project approved in the 2021 IRP for the Cold Springs pressure zone 1 area.

<u>Spanish Springs</u>:

The GBWC-SSD three-year Action Plan focuses on asset concerns that have been identified in connection with the following projects:

***Water Resources*:**

1. **High Priority** - Rehabilitation of Suki (Well 2);

***Water Distribution*:**

2. **Medium Priority** - AMI Meter Replacement; and

Water Storage:

3. **High Priority** - Rehabilitation of Tank 2 (Interior and Exterior).

Q.38 EACH OF THE ACTION PLAN PROJECTS ARE DESCRIBED IN THE GBWC 2024 IRP, ALONG WITH THE REASON THE ENGINEERS RECOMMEND THAT THESE PROJECTS BE COMPLETED. DO YOU HAVE ANYTHING TO ADD FROM GBWC'S PERSPECTIVE?

A.38 Yes. In addition, to the Action Plan Projects discussed in Section 8 of each division's IRP Volume, GBWC 2024 IRP, the Prepared Direct Testimonies of Mike Hardy, Mara Quiroga, Aleksey Dolinko and Terry Redmon, I would like to add additional information to some of the proposed Action Plan Projects. Specifically, I address why certain of the proposed projects are critical for maintaining safe and reliable service. I also explain why the Utility is including in these Action Plans some projects which were denied or withdrawn in previous IRPs.

Q.39 SOME OF THESE PROPOSED ACTION PLAN PROJECTS WERE WITHDRAWN OR REJECTED IN PAST IRPS. WHY IS IT APPROPRIATE TO RE-SUBMIT THESE PROJECTS AS PART OF THE 2024 IRP?

A.39 GBWC values the analysis and feedback the parties provide as part of the IRP process.

Often, when a project is rejected or withdrawn, the Commission and the parties anticipate that the projects (or variations thereof) will be proposed again. For example, some projects are withdrawn or denied so that GBWC and the parties can conduct additional investigation or further evaluation of the project's potential alternatives. In some cases, the potential impact to ratepayers combined with more pressing system deficiencies trump even much-needed projects. As time goes on, circumstances change and GBWC continues to collect information and evaluate how to best balance the objectives of minimizing cost, mitigating risk and maximizing the reliability of service. In some instances, those changing circumstances and additional information re-affirm the need for previously proposed projects. Such is the case with several projects being re-proposed in this 2024 IRP that have been previously addressed and/or analyzed in prior IRP proceedings:

Pahrump:

- Calvada Meadows System Consolidation
- Sand Filter Rehabilitation at WWTP 3

Spring Creek:

- High Tank Rehabilitation or Replacement

Cold Springs:

- Tank 2 Rehabilitation or Replacement

Spanish Springs:

- Rehabilitation of Suki Well (Well 2)[16]

As discussed in further detail below, GBWC has considered the concerns raised by parties in previous IRPs and is proposing renewed variations of these project in the current 2024 IRP because it believes that under present circumstances the projects are critical to maintaining safe and reliable service. The current circumstances warrant re-evaluation of

[16] The rehabilitation of the Suki Well in Spanish Springs is being proposed in this 2024 IRP as an alternative to continuing to drill new test wells in the Spanish Springs system in this time.

these through a fresh lens and with updated data.

Pahrump

Q.40 HOW IS THE PIPELINE FROM MESQUITE BOOSTER STATION (AVENUE OF THE STARS) TO CALVADA MEADOWS (PD PIPELINE TIE-IN) PROJECT CRITICAL TO MAINTAINING SAFE AND RELIABLE SERVICE?

A.40 The Calvada Meadows system currently only has one active well and one storage tank. Installing a new pipeline between the Mesquite Booster Station and the Calvada Meadows system (serving the area surrounding the airport) will tie the system into the Calvada Valley system and provide redundancy for the Calvada Meadows area. In addition, this would allow the Calvada Meadows well to be removed from service and thereby reduce sand in the system from this well. If the Calvada Meadows system cannot be tied-in to another system, the only remaining alternative would be replacing the existing well that is sanding and potentially close to failure (included as an alternative project in the Preferred Plan). Replacing the existing well would still not provide sufficient storage to the system, and NDEP would likely require a second well (~$1,600,000), storage tank (~$900,000), and booster pump station (~$700,000) to meet storage, pressure, and fire flow requirements to meet NAC requirements (total of ~$3,200,000). The system would be better served interconnecting with the Calvada Valley system to provide the best operational flexibility and redundancy.

By consolidating these systems, redundancy is improved with supply provided from either system, allowing for more dependable operation of the overall system and eventually reduces the reporting requirements for the one system. GBWC-PD aims to eventually consolidate all independent systems under its purview.

Of the possible pipeline tie-ins for Calvada Meadows (see discussion regarding a possible tie-in to Calvada North / Country View Estates, below), GBWCs preferred project is this one to consolidate the Calvada Meadows system with the Calvada Valley system. The Calvada Valley system is the largest in the GBWC-PD system and would provide redundancy and supply to Calvada Meadows. The pipeline project will consist of 6,500 linear feet of 12-inch C900 PVC and will follow Avenue of the Stars. The pipeline will connect to the upstream side of the Mesquite Booster Pump Station, which is a high-pressure area (over 100 psi). Due to the connection point, a PRV will be required prior to the first connection in the Calvada Meadows system. For cost estimating, a 6-inch PRV with a 3-inch bypass was assumed for the station and the recommended model is a Cla-Val 90-01 PRV. The downstream pressure setting for the PRV will be set to ensure sufficient operational pressures and fire flow is available to the Calvada Meadows system. Additional modeling will be required to finalize establish the design of the PRV station. The pipeline to the Calvada Meadows system is significantly less expensive than the Calvada North/Country View Estates pipeline (Alternative 2) and would connect Calvada Meadows to the larger Calvada Valley system, thereby increasing redundancy and resilience. It is recommended that this alternative be pursued. **GBWC has established this project to be a High Priority, and the preferred alternative evaluated.**

Q.41 PLEASE DESCRIBE THE POTENTIAL ALTERNATIVE PIPELINE TIE-IN PROJECT FROM CALVADA MEADOWS TO THE CALVADA NORTH COUNTRY VIEW ESTATES WATER SYSTEM.

A.41 GBWC has identified an alternative project to consolidate the Calvada Meadows system via a pipeline to interconnect with the Calvada North/Country View Estate system. This project would consist of the installation of approximately 14,450 linear feet of 12-inch pipe to connect the existing pipes on Bell Vista Avenue and Black Rock Avenue (existing 6-inch).

This pipeline project would increase the resiliency of the GBWC-PD system by interconnecting the independent Calvada Meadows and Country View Estates water systems. If this project is not completed under the Action Plan, it will be put in the Preferred Plan to be completed at a future time in order to continue GBWC-PD's goal of interconnecting all of its independent systems. **If the pipeline tie-in between Calvada Meadows and Calvada Valley is not approved, GBWC has established the tie-in to Country View Estates as a High Priority.**

Q.42 HOW IS THE PLANT 3 SAND FILTER REHABILITATION PROJECT CRITICAL TO MAINTAINING SAFE AND RELIABLE SERVICE?

A.42 In past IRPs, GBWC has submitted proposed projects to replace the sand filters with new filtering equipment, but the projects were either denied or withdrawn by GBWC. For example, in the 2021 IRP, GBWC proposed the replacement of three sand filters with cloth disc media filter technology. GBWC received estimates in 2021 to replace the sand filters with cloth disc media filters at a cost of $1,669,096. With inflation, GBWC believes these costs would now be closer to $2,000,000 if that project were pursued today. In this 2024 Consolidated IRP, GBWC has decided to re-submit a project for the sand filters in the form of a rehabilitation, at a portion of what the replacement cost would have been as proposed in the 2021 Consolidated IRP. To complete the rehabilitation project, GBWC has determined the estimated cost is $1,086,752, which GBWC estimates is approximately 50% of what the replacement cost of the cloth disc media filter would be today.

The sand filter tanks are showing signs of rust, and the depth of this corrosion is unknown without further inspections. It could be superficial surface rusting or deeper structural damage. The gearbox for the traveling bridges is no longer manufactured and in order to replace these gearboxes, GBWC will need to reach out to a third-party fabricator for a

replacement at that time of failure.

Currently media levels in filter # 2 have dropped to approximately 6 inches in the last 8 to 9 years. Historically, portions of the media have been lost during storm upset events, increased backwashing and normal operations. This lost media decreases the treatment capabilities of the sand filters, which are shallow bed filters that require a specific media type and size. This media will also need to be entirely removed, so the underdrain system can be inspected and repaired as needed. The media has not been fully replaced and the underdrain system has not been inspected since the installation of the sand filters.

The rehabilitation would consist of the below steps:

- Drain one tank at a time to keep the WWTP operational and be able to continue processing the effluent as required by our permit, while rehabbing the offline tank;
- Media removed from the offline tank;
- Splitter box being by-passed and drained;
- Tanks being cleaned, inspected and ultra-sonic testing being completed to determine steel thickness of tanks as necessary;
- Interior sand blasting and any repairs, if necessary;
- Exterior spot repairs due to coating damage during welding of interior work and rusting;
- Interior coating system: Two coats 10 mils - Sherwin Williams Macropoxy 646;
- Exterior coating system: One full coat of hi-solids Polysiloxane - Sherwin Williams Sherloxane Coating; and
- Replace sand filter media.

Replacing the media, recoating the tanks, and replacing any needed specialty parts (gearboxes, tracks, chains, and electrical components) will extend the useful life of the sand

filters.

With the above-organized workflow for the project, GBWC could also approach the rehabilitation as it has with pipeline projects in Spring Creek, to only rehabilitate one tank every IRP cycle (3 years) to mitigate rate impacts to customers. **GBWC has established the sand filter rehabilitation project to be a Medium Priority.**

Spring Creek

Q.43 HOW IS THE REHABILITATION OF HIGH TANK PROJECT (TRACT 200) CRITICAL TO MAINTAINING SAFE AND RELIABLE SERVICE?

A.43 GBWC continues to believe, as it has stated in prior IRP proceedings, that it is critical to address the ongoing issues with the High Tank in the Spring Creek Division. The High Tank is needed to maintain adequate pressures and fire flow protection in the upper 200 Tract pressure zone and distribution system. The High Tank ensures the reliability of supply to all of the upper pressure zone customers and helps to improve operational flexibility and efficiency in the system. In past IRPs GBWC has asked for the full replacement of the 500,000 gallon and 53-year-old High Tank and stated that the tank has engineering concerns. Following the 2021 IRP, in which Staff stated concerns regarding project cost for the tank replacement, and GBWC withdrew the High Tank replacement project without prejudice, GBWC worked to explore and identify with its engineer, Lumos, any alternatives to a replacement that might be viable, including alternatives for rehabilitation that had not previously been analyzed or which employed new technology. For the 2024 IRP, Lumos identified and has recommended a new project for the High Tank to be rehabilitated using an internal NSF-61 liner material, with installation of a new steel floor and new roof supports and other structural upgrades to address structural concerns with the tank that had been noted in previous inspections. New design plans would need to be generated and submitted to NDEP. The project would include the installation of

cathodic protection to reduce corrosion and extend the service life of the new tank. Based on Lumos' engineering recommendation, GBWC believes that the rehabilitation would be a viable, and less costly, alternative to High Tank replacement, and would address, at least for some period of time, GBWC's serious concerns with the aging asset. **GBWC has established this project to be a High Priority, and the preferred alternative to a full tank replacement, which is also being re-proposed.**

Q.44 HOW IS REPLACEMENT OF HIGH TANK PROJECT (TRACT 200) CRITICAL TO MAINTAINING SAFE AND RELIABLE SERVICE?

A.44 As described above, GBWC believes that, notwithstanding its cost, the replacement of the High Tank would be a prudent investment to provide a long-term solution that would address the ongoing engineering issues with the aging asset. This alternative involves the removal and replacement of the High Tank with a new 500,000-gallon bolted steel tank. The design of the new tank has already been completed including a topographic survey, geotechnical investigation, and contract documents that are ready for bid. Since the original design was for a welded steel tank, some design plan modifications and specification would need be reviewed and approved by NDEP before it could go out for bid. The project would include the installation of cathodic protection to reduce corrosion and extend the service life of the new tank. **Like the other alternatives proposed, GBWC has established this project to be a High Priority.**

Q.45 HOW IS THE BOOSTER PUMP PROJECT (TRACT 200) ALTERNATIVE CRITICAL TO MAINTAINING SAFE AND RELIABLE SERVICE?

A.45 This alternative to a High Tank rehabilitation or replacement involves the complete demolition/removal of the High Tank from the system and modifications to the existing Twin Tank Booster Station. By removing the tank from the Upper Zone, the Upper Zone becomes operationally deficient to provide constant 24-hour hydraulic pressure, the

necessary fire flow and operational storage requirements to the needs of the customers in the Upper Zone, who would be impacted by the storage tank's removal. The major modifications to the booster station that would be required would include the integration of a maintenance pump, variable frequency drive, electrical upgrades, and reconfiguration of the piping systems to meet constant 24-hour hydraulic pressure and operational storage. However, the system would still be deficient in meeting the necessary fire flow requirements in the Upper Zone of the 200 Tract system. The way the booster station would operate is the maintenance pump would operate during times of very low demand to ensure the Upper Zone received constant hydraulic pressure. When there is an increase in demand, pump 1 would turn on and run off the VFD until the demand reaches it pumping capacity. Pump 1 would then be transferred to an alternative electrical starter system to run and the VFD would start to ramp up Pump 2 as water demand increases (the system would monitor pressures in the distribution waterlines). If Pump 2 reaches its full pumping capacity, it would also be switched over to an electrical starter system and Pump 3 would be started by the VFD and ramped up. This is the common operational system for booster pumps that provide constant 24-hour hydraulic pressure to water systems. **GBWC has established this project to be a High Priority, as an alternative to the High Tank rehabilitation or replacement project described above.**

Cold Springs

Q.46 HOW IS THE FACTORY REHABILITATION OF TANK 2 PROJECT CRITICAL TO MAINTAINING SAFE AND RELIABLE SERVICE?

A.46 As has been stated in prior IRP proceedings, GBWC continues to believe that the replacement of Storage Tank 2 is needed to maintain adequate pressures and fire flow protection in the Pressure Zone 2 distribution area of the Cold Springs system. The presence of Tank 2 in the water system ensures the reliability of supply to all of the Pressure Zone 2 customers and helps to improve operational flexibility and efficiency in the system.

In the 2021 IRP, GBWC recommended that Thank 2, which has been in its present location since 1975 is and past its useful life, be replaced, noting that the tank has significant engineering concerns. Following the 2021 IRP, in which Staff stated concerns regarding project cost for the tank replacement, and GBWC withdrew the Tank 2 replacement project without prejudice, GBWC worked to explore and identify with its engineer, Lumos, any alternatives to a replacement that might be viable, including alternatives for rehabilitation that had not previously been analyzed or which employed new technology. For the 2024 IRP, Lumos identified and has recommended a new project for Tank 2 to be rehabilitated through a factory rehabilitation process in which the existing tank structure is initially evaluated, and structural components may be removed, refurbished, replaced, and then re-erected on the exact location of the existing tank to meet the all of the existing specifications and sizes of the tank as it was originally designed. This process would address structural concerns with the tank that had been noted in previous inspections. New design plans may need to be generated and submitted to NDEP. The project would include the installation of cathodic protection to reduce corrosion and extend the service life of the new tank. Based on Lumos' engineering recommendation, GBWC believes that the rehabilitation would be a viable, and less costly, alternative to Tank 2 replacement, and would address, at least for some period of time, GBWC's serious concerns with the aging asset. **GBWC has established this project to be a High Priority, and the preferred alternative to a full tank replacement, which is also being re-proposed.**

Q.47 H**OW IS THE REPLACEMENT OF TANK 2 PROJECT CRITICAL TO MAINTAINING SAFE AND RELIABLE SERVICE?**

A.47 As described above, GBWC believes that, notwithstanding its cost, the replacement of Tank 2 would be a prudent investment to provide a long-term solution that would address the ongoing engineering issues with the aging asset. If the current Tank 2 is decommissioned and replaced with a new 420,000-gallon storage tank, Pressure Zone 2

will continue to have dedicated storage (Tank 2) and supply (Van Dyke Well) for the zone. A full replacement would prolong the life of Tank 2 by another 45 years but comes at more than twice the price of rehabilitation. **Like the rehabilitation proposed, a replacement of the tank has been established as a High Priority.**

Spanish Springs

Q.48 HOW IS THE REHABILITATION OF SUKI WELL (WELL 2) PROJECT CRITICAL TO MAINTAINING SAFE AND RELIABLE SERVICE?

A.48 In the 2021 IRP proceeding, GBWC presented a rehabilitation of Suki Well (Well 2) in its preferred plan for the Spanish Springs Division and Staff acknowledged the need to address the fact that the well has reached the end of its useful life and opportunities to explore new well locations are severely limited. The Commission approved a project for GBWC to explore potential new well sites in Spanish Springs, but the results of that project have not resulted in the identification of a suitable location that would provide for the water quantity and quality needs of the system.[17] GBWC is now proposing in its Action Plan for this 2024 IRP a project to perform an extensive rehabilitation of the well as a viable means to prolong its useful life as a productive asset. GBWC and its engineers have assessed that, due to the condition of the well, a traditional rehabilitation of the Suki Well is not viable at this time. The project being proposed would instead involve an extensive rehabilitation of the Suki Well with installation of a liner, to also include videoing, brushing or cleaning, swabbing, airlifting, initial acid treatment, pump testing, and replacement of the pumping equipment after pump and motor design has been determined from the pump test. A rehabilitation of this well was completed in May 2016, which helped to clean the screen intervals and return some lost capacity, but the condition of the casing continues to make clear that this well is at or beyond the end of its useful life. GBWC believes that if it attempted any type of additional traditional well rehabilitation with cleaning or scrubbing—including any form

[17] For further detail, please see Q/A 60, *infra*.

of treatment such as acid, jetting, or ultra-sonic treatment—with the current original well casing, the degraded well casing would fail, creating the need for the rehabilitation with a new liner that is proposed here. GBWC believes this project is critical and one of the only viable alternatives that exist for it to continue providing clean and reliable water service to its customers in the Spanish Springs Division into the near future. **GBWC has established this project to be a High Priority.**

SYSTEM IMPROVEMENT RATE

Q.49 PLEASE EXPLAIN THE BASIS FOR THE SYSTEM IMPROVEMENT RATE REQUEST.

A.49 GBWC's request that certain projects be designated as eligible for a System Improvement Rate ("SIR"), as set forth in the 2024 IRP, is based on NRS 704.663(3), and the implementing regulations adopted by the Commission (NAC 704.6339 - 704.63435).

Q.50 DO THE REGULATIONS SPECIFY THE INFORMATION THAT THE COMMISSION WILL REVIEW UNDER ITS AUTHORITY IN NRS 704.663(3)?

A.50 Yes, NAC 704.6339 specifies that applications for SIR must include the following information provided by the utility:

a) A description of the project.

b) A statement explaining the necessity of the project.

c) The resulting benefits of the project to the utility and the customers of the utility upon the completion of the project.

d) A statement supported by written testimony that the project is not designed to increase revenues by connecting an improvement to a distribution system or wastewater system to new customers.

e) A statement that the project was not included in the rate base of the utility in its most recent general rate case.

f) A statement that the project costs for which recovery will be sought represent an investment to be made by the utility and which will not be paid by another funding source, including, without limitation, a grant, developer contribution or other form of reimbursement.

g) If submittal to the Commission is not otherwise required by law or regulation, the utility's plan for construction and the proposed schedule for construction. A plan for construction and a proposed schedule for construction submitted pursuant to this paragraph must comply with the provisions of paragraph (a) of subsection 4 of NAC 704.568.

h) If submittal to the Commission is not otherwise required by law or regulation, a budget of planned expenditures which complies with the provisions of NAC 704.5681.

NAC 704.6339 further states that this information is "in addition to any information otherwise required to be submitted in support of an element of an action plan pursuant to NAC 704.565 to 704.5688, inclusive."

While items (g) and (h) are not required given the nature of this filing, I provide support for these items for each SIR project request in this filing for the Commission's ease of locating the required information. I will address items (a)-(d) and (f)-(h). GBWC witness Terry Redmon addresses item (c) in his prepared direct testimony. In addition, supporting information for the SIR eligibility requests are contained throughout this filing.

Q.51 HAS THE COMMISSION CONSIDERED ADOPTING ADDITIONAL REGULATIONS GOVERNING SIR ELIGIBILITY REQUESTS?

A.51 Yes, in the 2018 IRP Order, the Commission recognized that "it could be helpful to provide

additional guidance to water utilities regarding what the Commission needs to know about projects proposed for SIR eligibility."[18] The Commission then opened Docket No. 18-11006, an investigation and rulemaking to consider alternatives to improve the water resource planning process and clarify the processes for seeking System Improve Rate eligibility for certain projects (the "SIR Rulemaking"). During the SIR Rulemaking, the Utility, Staff, and BCP have commented on potential amendments to the SIR regulations. Some of the changes being considered include:

- Providing that SIR eligible projects should be a replacement, repair, or an upgrade to a distribution system, production system, transmission system or wastewater system and not a project that is undertaken by the utility as routine maintenance.
- Clarifying that the project benefits that must be described pursuant to NAC 704.6339(c) could include that the project extends the useful life of existing infrastructure.
- Requiring that the Commission consider whether:
    - the project replaces aging infrastructure,
    - the project materially improves service and/or reliability,
    - the project is critical to continued service and/or reliability,
    - the project is required for statutory or regulatory compliance, and
    - the cost of the project is significant relative to the size of the utility[19]

in determining whether to grant SIR eligibility.

As of this date, the Commission has not yet adopted final new regulations in connection with Docket No. 18-11006.

[18] Para. 225.

[19] During the June 18, 2019, workshop in the SIR Rulemaking, Staff and BCP supported interpreting "significant" to mean 5% of the utility's most recently approved rate base or $500,000, whichever is less.

Q.52 FOR WHAT PROJECTS ARE YOU REQUESTING SIR ELIGIBILITY?

A.52 In the 2024 IRP, GBWC is requesting a determination of SIR eligibility for the following Action Plan projects:

Pahrump:

- New Well in High Zone at Well 13 Property
- Calvada Meadows System Consolidation
    - Pipeline via Mesquite Booster Station (Avenue of the Stars) to Calvada Meadows (*Alternative 1*)
    - Pipeline Tie-in from CV North to the Calvada Meadows (*Alternative 2*)
- Wastewater Treatment Plant 3 – Pre-EQ Building and Tank Rehabilitation
- Sand Filter Rehabilitation at WWTP 3

Spring Creek:

- New Production Well (Well 12 Replacement)
- Pipe Replacement Project (All Tracts)
- High Tank Rehabilitation or Replacement
    - High Tank Rehabilitation (*Alternative 1*)
    - High Tank Replacement (*Alternative 2*)
    - Booster Pump (Tract 200) (*Alternative 3*)
- WWTP Reconditioning (De-Ragging & Lift Station Rehab)

Cold Springs:

- Tank 2 Factory Rehabilitation or Replacement
    - Tank 2 Factory Rehabilitation (*Preferred Alternative*)
    - Tank 2 Replacement (*Alternative*)

Spanish Springs:

- Rehabilitation of Suki Well (Well 2)

Q.53 WHY SHOULD THE COMMISSION GRANT SIR ELIGIBILITY FOR THE GBWC-PD PROJECTS LISTED ABOVE?

A.53 The table below explains how this filing satisfies the requirements of NAC 704.6339 for each of the GBWC-PD Action Plan projects listed in Q&A 52.

Table 7

NAC	New Well in High Zone at Well 13 Property	Pipeline from Mesquite Booster Station to Calvada Meadows	Rehabilitate Pre-EQ Building and Tanks	Plant 3 Sand filter Rehabilitation
704.6339(a) Description	Volume II, § 10.1.1	Volume II, § 10.1.2	Volume II, § 10.1.3	Volume II, § 10.1.3
704.6339(b) Necessity	Volume II, § 10.2.1	Volume II, § 10.2.2	Volume II, § 10.2.3	Volume II, § 10.2.3
704.6339(c) Benefits	Volume II, § 10.3.1	Volume II, § 10.3.2	Volume II, § 10.3.3	Volume II, § 10.3.3
704.6339(d) Revenues	Q&A 57, below	Q&A 57, below	Q&A 57, below	Q&A 57, below
704.6339(f) Funding sources	Q&A 58, below	Q&A 58, below	Q&A 58, below	Q&A 58, below
704.6339(g) Construction Schedule	Volume II, § 10.7.1	Volume II, § 10.7.2	Volume II, § 10.7.3	Volume II, § 10.7.3
704.6339(h) Budget	Volume II, § 10.8.1	Volume II, § 10.8.2	Volume II, § 10.8.3	Volume II, § 10.8.3

Q.54 WHY SHOULD THE COMMISSION GRANT SIR ELIGIBILITY FOR THE GBWC-SCD PROJECTS LISTED ABOVE?

A.54 The table below explains how this filing satisfies the requirements of NAC 704.6339 for each of the GBWC-SCD Action Plan projects listed in Q&A 52.

Table 8

NAC	Well 12 Replacement (400 Tracts)	Pipeline Replacement Project (All Tracts)	Rehabilitation High Tank (200 Tract)
704.6339(a) Description	Volume III, § 10.1.1	Volume III, § 10.1.2	Volume III § 10.1.3
704.6339(b) Necessity	Volume III, § 10.2.1	Volume III § 10.2.2	Volume III, § 10.2.3
704.6339(c) Benefits	Volume III, § 10.3.1	Volume III, § 10.3.2	Volume III § 10.3.3
704.6339(d) Revenues	Q&A 57, below	Q&A 57, below	Q&A 57, below
704.6339(f) Funding sources	Q&A 58, below	Q&A 58, below	Q&A 58, below
704.6339(g) Construction Schedule	Volume III § 10.7.1	Volume III, § 10.7.2	Volume III, § 10.7.3
704.6339(h) Budget	Volume III § 10.8.1	Volume III § 10.8.2	Volume III § 10.8.3

Q.55 WHY SHOULD THE COMMISSION GRANT SIR ELIGIBILITY FOR THE GBWC-SSD PROJECTS LISTED ABOVE?

A.55 The table below explains how this filing satisfies the requirements of NAC 704.6339 for each of the GBWC-SSD Action Plan projects listed in Q&A 52.

Table 9

NAC	704.6339(a) Description	704.6339(b) Necessity	704.6339(c) Benefits	704.6339(d) Revenues	704.6339(f) Funding sources	704.6339(g) Construction Schedule	704.6339(h) Budget
Suki Well Rehabilitation	Volume V, § 10.1	Volume V, § 10.2	Volume V, § 10.3	Q&A 57, below	Q&A 58, below	Volume V, § 10.7	Volume V, § 10.8

Q.56 WHY SHOULD THE COMMISSION GRANT SIR ELIGIBILITY FOR THE GBWC-CSD PROJECTS LISTED ABOVE?

A.56 The table below explains how this filing satisfies the requirements of NAC 704.6339 for each of the GBWC-CSD Action Plan projects listed in Q&A 52.

Table 10

NAC	704.6339(a) Description	704.6339(b) Necessity	704.6339(c) Benefits	704.6339(d) Revenues	704.6339(f) Funding sources	704.6339(g) Construction Schedule	704.6339(h) Budget
Tank 2 Factory Rehabilitation or Replacement	Volume IV, § 10.1	Volume IV, § 10.2	Volume IV, § 10.3	Q&A 57, below	Q&A 58, below	Volume IV, § 10.7	Volume IV, § 10.8

Q.57 CAN YOU CONFIRM THAT THE PROPOSED SIR PROJECTS ARE NOT DESIGNED TO INCREASE REVENUES AS REQUIRED BY NAC 704.6339(D)?

A.57 Yes, I confirm that none of the proposed projects for which GBWC seeks SIR eligibility are designed to increase revenues. Each of these projects is designed to meet the needs of our customers while minimizing cost, mitigating risk and maximizing reliability of service.

Q.58 CAN YOU CONFIRM THAT THE PROJECT COSTS FOR WHICH RECOVERY WILL BE SOUGHT REPRESENT AN INVESTMENT TO BE MADE BY THE UTILITY AND WHICH WILL NOT BE PAID BY ANOTHER FUNDING SOURCE, INCLUDING, WITHOUT LIMITATION, A GRANT, DEVELOPER CONTRIBUTION OR OTHER FORM OF REIMBURSEMENT AS REQUIRED BY NAC 704.6339(F)?

A.58 Yes. I confirm that none of the projects for which GBWC seeks SIR eligibility will be funded other than by an investment to be made by the Utility in compliance with NAC 704.6339(3)(f).

Q.59 IN SELECTING PROJECTS FOR SIR ELIGIBILITY, DID GBWC CONSIDER

WHETHER THE PROJECT WAS SCHEDULED FOR COMPLETION JUST PRIOR TO A PLANNED RATE CASE?

A.59 There are two distinct phases of implementing an SIR for any particular project. First, the Utility must request that the Commission determine, pursuant to NAC 704.6339(5), that a project is eligible for an SIR. Second, after the eligible project is completed, the Utility must file an application to establish the SIR and the Commission must approve that application pursuant to NAC 704.6343. For the reasons explained below, GBWC believes the timing of the completion of the project relative to an upcoming rate case is more relevant in deciding whether to proceed with the second phase than initially selecting projects for SIR eligibility.

While GBWC carefully plans the timing of the SIR projects, unplanned events may nevertheless impact the timeline for these projects. Emergency projects may take precedence over a planned project. Other variables like permitting delays or even global pandemics that we have seen in the past years may require the Utility to adjust its project schedules. Additionally, the rate case schedules are also subject to change, and rate cases do not necessarily occur precisely every three years for the utility. Because the timing of projects and rate cases may vary as the Utility responds to changing conditions, it is impractical for GBWC to select projects for SIR based upon the intended completion date and its relation to a potential rates case.

Rather, GBWC believes that this timing issue is more relevant in determining whether to proceed with filing an application to establish an SIR under NAC 704.63425. Certainly, if an SIR eligible project ends up being completed just prior to a rate case, it is likely more efficient for the Utility to recover the cost of that project as part of the rate case filing rather than by submitting an application to establish an SIR. Those considerations, however, are part of the Utility's evaluation and analysis in proceeding with applications under NAC

704.63425. Given all the variables that may impact the timing of projects and rate cases, it is premature to eliminate an otherwise qualified project from SIR eligibility based on project and rate case timelines which may ultimately shift.

Commission Order, Docket 21-03003, Directives 4 and 5

Q.60 HOW HAS GBWC COMPLIED WITH DIRECTIVES 4 AND 5. IN DOCKET NO. 21-03003?

A.60 GBWC was directed in the 2021 IRP Order to invite Regulatory Operations Staff and BCP to participate in one or more meetings between GBWC, NDEP, and the State Fire Marshal Division to discuss storage needs in GBWC's Spring Creek and Cold Springs divisions.

In compliance with those directives, on October 13, 2023, GBWC conducted a teleconference meeting with invitations to Commission Staff, BCP, NDEP, the State Fire Marshal Division, and local fire authorities (TMFPD and Elko County Fire) to discuss the storage needs in both divisions. All invitees attended except Elko County Fire.

During the October 13, 2023, meeting, GBWC explained to all the attendees that GBWC is required to file IRP every three years for water systems it owns, maintains, and operates, and also explained the directive in the 2021 IRP Order, and invited the participants to discuss their interpretations of the applicable NACs, including NAC 445A.6674, in relation to fire storage requirements. Following the meeting, representatives from NDEP and the Washoe County Health Department provided their NAC interpretations in an email format to the group, for consideration in connection with GBWC's water model for Cold Springs.

On November 1, 2023, GBWC held another teleconference meeting with all the same attendees, along with Elko County Fire and representatives from Lifestyle Homes, a

developer and customer of GBWC's Cold Springs Division. The attendees discussed fire storage requirements generally as well as the contents of NDEP's email summary. During this meeting it was determined that GBWC would work on completing required updates to the water models for Cold Springs and the Spring Creek systems and provide the model information along with system capacity requirements to the respective fire authorities of each system, so they would be able to provide GBWC with a written response of how they determined the storage requirements and what they would require GBWC to provide. GBWC updated the model, then sent the updated model and system requirements information to the respected fire authorities on December 14, 2023. On January 11, 2024, GBWC, received a letter from TMFPD with its interpretation and requirements of the NACs for the Cold Springs System. A relevant portion of TMFPD's response, which was provided to all of the meeting participants, is recited below:

> "TMFPD is not amenable to removing this storage tank because CSD is a stand-alone (Isolated) water system and each of the existing storage tanks were the minimum that was required at the time of construction (the approved water supply) or were built in support of considering additional future construction at those moments, and the area continues to grow. Further, it is known that the system already has some deficiencies, in one or more Pressure Zones, in providing the minimum required fire flow."
>
> For this request, TMFPD's focus is on the minimum requirements for fire flow of the adopted fire code, and we are not in support of removing and/or reducing the existing water supply to this community, especially in an isolated water system."[20]

[20] For documentation of all correspondence with TMFPD related to Tank 2 and the required fire storage within the Cold Springs system, see Appendix M.

To date GBWC has not received an e-mail or a letter from Elko County Fire for their interpretation and requirements of the NACs in the Spring Creek System. GBWC has provided Elko County Fire with all the necessary information and has sent out numerous reminder e-mails requesting a response. During the second meeting the Elko County Fire representative did state they were happy with the pipeline projects in the Spring Creek Division and with the improvements made to upsizing pipes, increased fire flow and additional hydrants placed in the 200 Tract area by GBWC. The fire chief also stated that if he had to choose projects, he would like to see more pipeline projects over a new tank.

Update on the Status of the Investigatory Docket Established for the Spanish Springs Division in Docket No. 21-07020

Q.61 PLEASE PROVIDE AN UPDATE ON THE STATUS OF GBWC'S TEST WELL AND NEW PRODUCTION WELL PROJECT IN THE SPANISH SPRINGS DIVISION AND THE STATUS OF THE INVESTIGATORY DOCKET.

A.61 In the 2021 IRP Order, the Commission approved GBWC's proposed Test Well and New Production Well Project in GBWC-SSD, subject to a condition that GBWC would not move forward with the production well component of the project until the test well demonstrates that the production well will produce a sufficient quantity and quality of water, and also until completion of an investigatory docket that would be opened to "investigate, discuss, and review the potential rate impact of projects included in [GBWC-SSD's] Preferred Plan; the potential future operations and maintenance costs associated with the poor water quality in the basin; and potential remedies to address groundwater quantity and quality concerns."[21]

The investigatory docket was opened as Docket No. 21-07020, and on October 8, 2021,

[21] 2021 IRP Order at page 6, paragraph 15; page 13, paragraph 3.

the Commission issued a procedural order in that case directing that GBWC complete certain compliance items, including that GBWC should provide monthly updates regarding the completion of the new test well and corresponding results, for purpose of determining whether or not the test well demonstrates that the future production at the Spanish Springs test well site will produce a sufficient quantity and quality of water.[22]

Since that time, GBWC has complied with the Commission's directives, including that it has filed monthly updates on how the test well drilling was progressing and water quantity and quality results. Now that the test well work in the Spanish Springs system has been completed, GBWC will be organizing a conference with agencies including PUCN Staff, TMWA, GBWC and its engineers to review the test well comprehensive report (completed in the winter of 2023) and the TMWA Groundwater treatment evaluation study (submitted in January 2024) to determine next steps. GBWC is currently seeking to schedule a meeting with Commission Staff and TMWA to discuss and review the TMWA Blending and Treatment Evaluation along with GBWC's Technical Memorandum that provides three options that GBWC is suggesting as possible paths forward for the production issues in the Spanish Springs System, one of which includes the project to rehabilitate the Suki Well (Well 2) as proposed in the Action Plan in the 2024 IRP. The purpose of this project is to increase the capacity and resilience of the water system by increasing the Suki Well's total maximum capacity and extend its useful life.

Due to scheduling conflicts, the contemplated meeting with Commission Staff and TMWA has not yet gone forward, but a pre-meeting was held between GBWC, Staff, and TMWA representatives on February 26, 2024, where it was established that the meeting could likely be completed between March 11 and March 15, 2024, where the parties will discuss the work outlined above and options for next steps.

[22] *See* Procedural Order dated October 18, 2021, in Docket No. 21-07020, at page 2.

As has been reflected in its recent monthly reports in the investigatory docket, GBWC does not intend to recommend that additional test well work be completed. GBWC intends to request a stipulation from Commission Staff in the investigatory docket that the procedural order directive for GBWC to file monthly reports be modified (to provide for less frequent reporting) or terminated and intends to discuss with Staff whether the other purposes of the investigatory docket may have been satisfied such that a stipulation could be submitted for the docket to be closed entirely.

Requests for Approvals

Q.62 FOR WHAT DOES GBWC SEEK COMMISSION APPROVAL?

A.62 GBWC requests that the Commission:

1. Accept and approve the 2024 Integrated Resource Plan;
2. Approve the Action Plans for each division and find that any future investment associated with those plans are prudent investments for which GBWC may recover all just and reasonable expenses;
3. Approve the Funding Plan;
4. Approve the Water Conservation Plan;
5. Approve GBWC's request to designate certain Action Plan projects as eligible for a System Improvement Rate;
6. Find that GBWC has complied with Directives 4 and 5 in the Commission's July 19, 2021, Order in Docket No. 21-03003;
7. Approve GBWC's request for waivers from certain subsections of NAC 704.5668 for each of its Divisions as set forth in its Application; and
8. Grant any further relief that it deems just and reasonable.

Conclusion

Q.63 DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A.63 Yes, however I reserve the right to supplement or make corrections to this testimony at the time of the hearing in this proceeding.

AFFIRMATION

Pursuant to Section 703.710 of the Nevada Administrative Code, I hereby affirm that the foregoing testimony was prepared by me or under my direction and is correct to the best of my knowledge.

Signed: James Gason

Dated: March 1, 2024

Attachment JTE-1 to Exhibit ___

Building a World of Sustainable Communities

Director, State Operations

	Operations; Multiple
	President
	Exempt

Responsible for directing the safe and efficient operations of all Corix subsidiaries in assigned Business Unit(s) (BU). Oversees all areas of water, and wastewater operations and/or energy operations. Provides oversight, guidance, and leadership to the BU operations staff.

1	Leads and Provides direction to the BU's operations staff in the performance of their duties, establishes work priorities to achieve management strategic initiatives.
2	Responsible for the effective and efficient utilization of resources with an emphasis on safety, cost control, operational excellence reliability and regulatory compliance with regulations.
3	Leads operations team to be in compliance with all applicable local, state/provincial and federal regulations.
4	Assists in developing and executing the approved Operations operating budget which includes O&M, administrative and capital expenditures as well as the Capital improvement budget

- Responsible for the system asset management plan.
- Works cooperatively with the Customer Experience Team to analyze and ensure follow-up to all customer service issues.
- Develops and inspires a strong commitment to employee safety, recognition, and business development.
- Responsible for training, succession planning and the development of leadership within the Operations staff to ensure the operations area is prepared for future growth.
- Recruits, retains, manages, and provides leadership for operations staff.
- Drives EBITDA by effectively challenging and motivating employees to focus on efficient execution of day to day operations and continuous improvement concepts.
- Independent travel between worksites as required.
- Develops and maintains positive relationships with community.
- Remains up to date on new and revised regulations that may impact the company.
- Oversees the maintenance of facilities, company vehicles, tools and equipment as outlined by industry standards to ensure they are in good operating condition.
- Supports regulatory rate filings, through testimony generation; serves as a witness in rate cases.
- Aids in business development opportunities.

- Develops familiarity with other regulated industries
- Performs other duties as required.

- Ability to effectively supervise skilled and unskilled employees, including ability to mentor, evaluate and guide staff to increase skill level, morale, and efficiency.
- Ability to objectively coach employees and managers through complex, difficult and emotional issues.
- Ability to manage budget effectively; ability to interpret financial results and adjust plans to stay on target.
- Ability to define specific problems and offer variable solutions.
- Ability to implement recommendations to effectively resolve problems or issues by using judgment that is consistent with standards, practices, policies, procedures, regulation or government law.
- Ability to specify goals and effectively achieve them.
- Ability to establish and maintain effective working relationships with the general public, co-workers, regulatory agencies and their personnel.
- Ability to keep accurate records and prepare and submit accurate reports.
- Ability to provide for safe working conditions for fellow workers.
- Must have ability to effectively communicate with other employees and the public.
- Ability to understand and implement a variety of the field's concepts, practices and procedures.
- Ability to motivate others in the pursuit of Company goals.
- Excellent analytical, communication and organizational skills.
- Ability to read and comprehend maps, plans and surveys.

- Required: Bachelor's degree or a combination or related experience and education.
- Preferred: MBA
- Required: Valid driver's license
- Preferred: Evidence of having obtained certification in plant or system operations in one or more states.
- Minimum 9 years' experience with water and/or wastewater and/or Energy operations utility management with increasing levels of responsibility. Knowledge of all local, state and federal tariffs, regulations and laws pertaining to the assigned Business Unit.
- Required: MS Word, Excel, PowerPoint, Outlook and Explorer

- Light to moderate physical activity, requires normal hearing and vision.
- Equipment Used: Cellphone, PC and/or laptop, copy/fax/scan machine, telephone and other general office equipment. Operates a Company issued motor vehicle.
- Frequent travel may be required.

Attachment JTE-2 to Exhibit ___

James T. Eason | 1005 Terminal Way, Suite 294, Reno, Nevada 89502 | 775.432.3184
james.eason@greatbasinwaterco.com

Career Profile

Established and proven results-oriented senior level leader of business operations and affairs with over 15 years of management experience in municipal government, public utilities, and the private utilities industries with business and political acumen and is able to build trust, confidence, creditability and respect. Demonstrative responsibilities include team building, providing short and long-term strategic planning and execution of company vision; budget and overall company financial health management, and the allocation and implementation of resources, resulting in the success of multi-million dollar projects from initial concept to completion by being creative and innovative; developing and cultivating relationships in both the government and private sectors. Strengths and expertise includes visionary and strategic leadership with critical, scientific and technical decision-making skills, initiative, flexibility, strong ethics, excellent communication skills, dedication and determination, with a strong public presence and professional image.

Professional Experience

Director, State Operations, Great Basin Water Co. and Bermuda Water Co., Reno, Nevada 2021 – Present
Vice President of Operations, Great Basin Water Co. and Bermuda Water Co., Reno, Nevada 2015 – 2020

- Create and maintain a high performing organizational culture aligned with the company values while making challenging, technical and scientific decisions.
- Manages and directs the day-to-day operations and responsibilities of key resources, conducting regular employee performance evaluations and monitoring resources in line with operational needs and workforce demands with an emphasis safety, cost control and regulatory compliance a well as development of leadership necessary for future growth and succession planning.
- Works supportively, collaboratively, efficiently, and effectively with internal business partners and advisors in overseeing all strategic objectives and initiatives especially the preparation and execution of all rate cases , pass-through and indexing activities, changes to service and other PUCN related activities.
- Provides management oversight and recommend actions to ensure development, compliance and execution of developer agreements, payment of fees are in alignment with local, state and federal guidelines, rules, policy and procedures as well as providing guidance over legal issues.
- Actively participates with internal business partners to plan, identify and manage strategic relationships who have an interest in preserving, protecting, conserving, recharging, and preventing waste of ground water resources while executing all business initiatives, potential acquisitions and divestures.
- Develop, review and monitor budgets and financial planning to ensure financial operations and program effectiveness in accordance with overall companies fiscal policies.
- Act as a liaison, facilitate or and mediator between water users and key stakeholder groups, including residents, government agencies, business owners, environmental groups and major industry companies.
- Actively monitors and provides local and regional information related to proposed legislation, regulatory changes, studies, and reports, advising the company of potential impacts to the company and relevant responses involving groundwater resources and related topics.

Town Manager, Town of Tonopah, Tonopah, NV 2005 – 2015

- Developed, presented and implemented the strategic plan and vision for the Town of Tonopah, Tonopah Public Utilities, and the Tonopah Library District, with the Tonopah Town Board and staff, which included the responsibility for budgeting, departmental coordination, economic development, and long-term community sustainability while managing the town administrative departments and employees.

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james.eason@greatbasinwaterco.com

- Drove and executed economic development with businesses; promoted community development; and acted as the liaison between the town and various federal, state, and county agencies; administered, managed, and developed new and existing town infrastructure and facilities.

- Acted as a liaison between the community, town staff, and town board members, conducted assessments, procurement, administration; and management of federal, state, and county grants; set deadlines; monitored projects; prepared reports, delineated resources, supervised and organized multi-competing projects.

- As Town Manager, turned around the Town of Tonopah's beginning-ending fund balance increasing from $130,000 to $1.5 million; the Tonopah Public Utilities (TPU) beginning-ending fund balance increasing from a negative $170,000 to a positive of $400,000 and the Tonopah Public Library District had been saved from going into receivership by the Nevada Department of Taxation and continues to operate with a positive beginning-ending fund balance today. The Town of Tonopah was also able to create a community endowment fund to help reduce future operational and maintenance costs while providing scholarships for furthering the education of their citizens.

- Managed and directed the coordination and development of government projects, town swimming pool, volunteer firehouse, convention center, community water and sewer infrastructure, and job creation in the private sectors of retained, lodging, mining, and renewable energy. Extensive experience working with federal and state agencies and funding programs, including USDA, GDBG, EPA (Brownfield), and BLM.

Outside Plant Design Engineer and Project Manager, Southwestern Bell Corporation (SBC), Reno, NV 1997-2005

- Responsible for the detailed economic design and implementation of outside plant facilities in Northern Nevada wire centers. Specializing in commercial, residential and transmission projects; coordinating with large land developers, government agencies, elected officials, small business owners and residential customers regarding telephone facilities. This included organizing, administrating supervising meetings and negotiations involving placement, removal, rearrangement and new construction. This was accomplished through the development of relationships with developers, government officials, local government and residential customers which addressed issues that affected both the customer and SBC.

- Member of a fast paced, self-directed and results oriented team dedicated to providing customer service to both internal and external customers with the implementation of the 1996 TELCO Act for Nevada Bell, which involved disassembling various parts of the network to be leased to competitive local exchange carriers (CLEC) along with the metrics to track CLEC usage and established regulatory guidelines in Nevada.

Education

- University of Nevada, (UNR), Reno – Bachelor of Science, Business Logistics with a Political Science minor, 1995

Skills, Professional Groups and Achievements

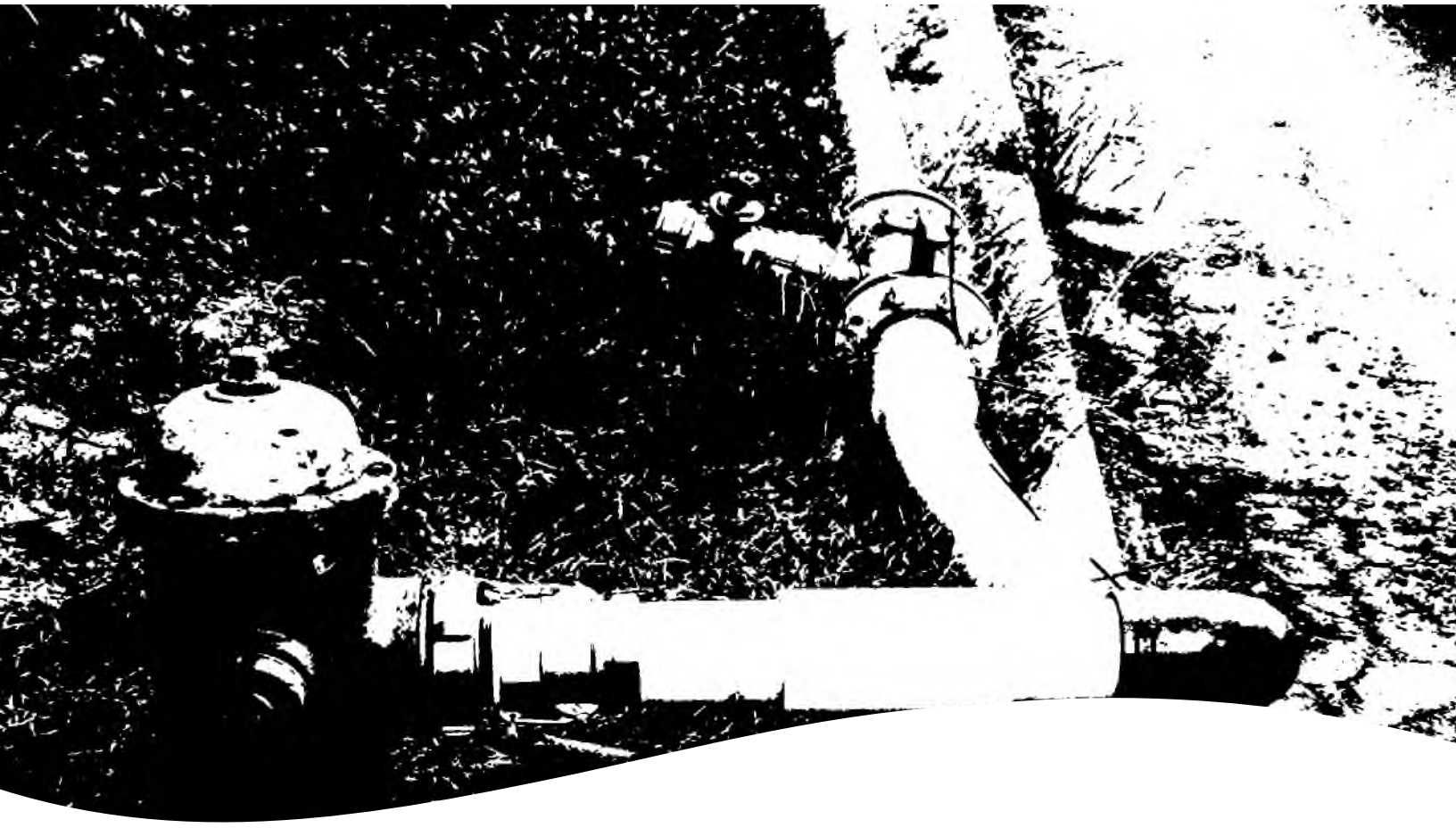
- Experienced professional in leadership and management of municipal government and utilities with knowledge of financial analytics, systems management, government affairs and long-range planning to meet current and future growth, modernization and redevelopment of infrastructure.
- Appointed Board Member of the University of Nevada Alumni Council, Past Member 2006 – 2012
- Nevada Insurance Pool/Pac, Past Board Member 2006 – 2015
- Appointed Board Member of the Nye County Water District, Past Member 2009 – 2015
- Member of Nye County's Renewable Energy Team, Past Member 2009 – 2015
- Tonopah Historic Mining Park Foundation Executive Board, Past Member 2011 – 2017
- U. S. Forest Service Rural Schools, Past Board Member 2011 – 2015
- Achieved the Nevada Rural Water Association - "2012 Manager of the Year" for Tonopah Public Utilities

Attachment JTE-3 to Exhibit ___

Key Performance Indicators for Non-Revenue Water

AWWA Water Loss Control Committee Report

November 2019



American Water Works Association

Dedicated to the World's Most Important Resource®

Key Performance Indicators for Non-Revenue Water

Prepared by the AWWA Technical and Education Council's Water Loss Control Committee

November 2019

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The American Water Works Association is the largest nonprofit, scientific and educational association dedicated to managing and treating water, the world's most important resource. With approximately 51,000 members, AWWA provides solutions to improve public health, protect the environment, strengthen the economy and enhance our quality of life.

This publication is a Technical and Education Council (TEC) Water Loss Control Committee Report. An AWWA Committee Report is a statement of findings made by a committee to the President, or Chair of the Committee, Council, or Division by which its formation was authorized. The reports are subject to approval by the Council under which they are developed and the Executive Committee should it choose to review them, or by the Board of Directors (if developed under the Board).

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List of Abbreviations

AWWA – American Water Works Association
CRUC – Customer Retail Unit Charge
DVS – Data Validity Score
DVT – Data Validity Tier
FA – Frontier Analysis
FPPI – Financial Percentage Performance Indicator
FWAS - AWWA Free Water Audit Software
KPI – Key Performance Indicator
LCR – Loss Cost Rate
NRW – Non-revenue Water
NWL – Normalized Water Losses
PITF – Performance Indicator Task Force
TEC – Technical and Educational Council
UFW – Unaccounted-for Water
VPC - Variable Production Cost
VPPI – Volumetric Percentage Performance Indicator
WLCC – Water Loss Control Committee

1. Background

Since 2003, AWWA's Water Loss Control Committee (WLCC) has encouraged utilities and other stakeholders to use the non-revenue water (NRW) key performance indicators (KPIs) in *M36 Water Audits and Loss Control Programs* and the associated Free Water Audit Software to help assess and control water losses. Based on potential new indicators and concern about the use of percentage indicators, however, the WLCC formed and directed a Performance Indicators Task Force (PITF) to draft a Committee Report that:

- recommends a new set of NRW KPIs; and
- provides guidance to utilities and other stakeholders on how best to interpret and use the KPIs.

The Committee Report (see below) was approved by the WLCC and includes three primary changes to the NRW performance indicators. The changes were based in part on the results from the Committee's 2018 TEC Project - *Assessment of Performance Indicators for Non-Revenue Water Target Setting and Progress Tracking*.

2. Introduction

Drinking water utilities are challenged by deteriorating infrastructure, growing customer expectations, new regulatory requirements, and a changing climate. Recognizing that "what gets measured gets managed", water utilities rely on performance indicators that are "actionable" to drive improvements in their operations.

Water loss control includes efforts that water utilities employ to minimize NRW, which is comprised of real (physical) losses, largely leakage, apparent (non-physical) losses that result in customer under-billing, and unbilled authorized consumption. The American Water Works Association (AWWA) recommends that water utilities employ a best practice water audit method embodied in Manual of Practice M36 – *Water Audits and Loss Control Programs* (4th ed., 2016)[1]. AWWA also provides a free spreadsheet software tool to apply this method - the AWWA Free Water Audit Software (FWAS) (version 5.0, 2014)[2] and forthcoming version 6.0 (2020). AWWA also supports the use of annual water audits by water utilities in its Metering and Accountability Policy Statement (https://www.awwa.org/Policy-Advocacy/AWWA-Policy-Statements/Metering-and-Accountability). These tools and policies guide water utilities in quantifying water losses, evaluating cost-effective loss control actions, and demonstrating to regulators, customers, and other stakeholders that they are responsible stewards of the valuable water resources and money that they manage.

Thousands of water utilities have used AWWA tools to compile a reliable water audit and implement effective loss control practices, and this approach is now required practice in several US states and at least one Canadian province. A large body of reliable water audit data has been collected from water utilities, and analysis of the data provides evidence of the types, extent, and costs of losses occurring in North American.

The traditional use of a single NRW percentage loss indicator or "unaccounted-for" water percentage – which is imprecise – continues to bring more confusion than coherence to water loss assessments. This method, arguably, has never been successful in motivating sustained, measurable loss reductions. The AWWA water audit method includes an array of key performance indicators (KPIs) that represent both traditional and new, more insightful ways to evaluate NRW. While the current FWAS includes effective KPIs, it also still employs two percentage indicators, although this is now considered to be a weakness by AWWA's WLCC.

With the development of version 6.0 of the FWAS, the WLCC determined that it was time to reevaluate its position on NRW KPIs. The WLCC believed that new KPIs are superior to percentages for water loss management and, in 2015, launched the Performance Indicators Task Force (PITF) to evaluate the acceptability of historically used KPIs and recommend the appropriate set of NRW KPIs to employ going forward, i.e. the ***2020 Position***.

The PITF included WLCC leadership and members from a broad spectrum of water industry professionals and affiliations. The PITF conducted research and evaluated traditional and contemporary NRW KPIs, which served as the basis of the 2020 position. The newly recommended slate of KPIs will appear in version 6.0 of the FWAS upon its release in 2020, the 2020 AWWA Benchmarking Survey, and the next edition of M36.

The decisions formulated by the PITF in guiding the new WLCC position include recommendations to:

- discontinue support for <u>any</u> percentage performance indicator; including the volumetric percentage performance indicator (VPPI), often expressed as an "unaccounted-for" water percentage, the financial percentage performance indicator (FPPI), and others structured as a percentage.
- promote certain existing and two new KPIs; the *Loss Cost Rate* and *Normalized Water Losses*, to use specifically in place of percentage indicators, and
- guide water utilities, regulatory agencies, and other stakeholders in employing and interpreting NRW KPIs in a manner that meets their situational needs.

The process leading to these recommendations is described in this report along with general guidance for implementing them. The WLCC's 2020 position is believed to be the important next step in the evolution of water loss control advancement for the North American drinking water industry.

3. The Evolution of NRW Performance Indicators

NRW assessments in North America date from the 1950's (***see sidebar***), but the "AWWA water audit method" dates from the 2003 AWWA WLCC Report. In this report, the WLCC recommended that the water industry <u>not</u> employ the "unaccounted-for water "(UFW) term or express losses as UFW%. Additionally, AWWA recommended against setting loss reduction goals around a specific target such as "less than 10%", recognizing that loss reduction targets are best tailored as system-specific goals for each water utility rather than a "one size fits all" approach.

While recommending against the use of percentage indicators, AWWA still retained VPPI and FPPI in its guidance materials and tools because some industry stakeholders believed that volumetric percentages are easy to understand. In 2015, the WLCC improved its messaging to the water community by stressing that water utilities should assess their NRW in terms of ***the three V's***:

- **Volume** – of annual losses: apparent and real
- **Value** – of annual losses: uncaptured revenue from apparent losses and (typically) excessive production costs from real (leakage) losses
- **Validity** – water audit data quality, as represented by the Data Validity Score (DVS), a rating of data quality included in the FWAS.

  Note that version 6.0 of the FWAS, to be released in 2020, will feature *Data Validity Tiers (DVT)*, which are band-type groupings of DVSs (e.g., Tier I: DVS=0-25; Tier II: DVS=26-50). The tiers will provide a broad indicator of audit reliability, with DVS measuring incremental changes towards a higher or lower tier. DVS should not be used as a quantitative indication of accuracy for the audit outputs.

Key Performance Indicators for Non-revenue Water Management in North America: a timeline

- **1957: AWWA Committee Report *Revenue-producing vs. Unaccounted-for Water*[3] results in many North American regulatory agencies adopting percentage indicators for NRW assessments.**
- **2000: International Water Association and AWWA undertook research and published a best practice water audit method[4] defining real and apparent losses and serving as the basis for the AWWA water audit method.**
- **2001: Beecher Policy Research published *Survey of State Agency Water Loss Reporting Practices*[5], noting that a "better system of accounting is the foundation for a better system of accountability for the drinking water supply industry".**
- **2003: Water Loss Control Committee Report *Applying Worldwide Best Management Practice Water Loss Control*[6] defines the AWWA water audit method.**
- **2006: the AWWA Free Water Audit Software is released for public use. Current Version 5.0 released in 2014. Version 6.0 to be released in 2020.**
- **2009: AWWA's 3rd edition guidance manual M36, Water Audits and Loss Control Programs, published terminology of 2003 Committee Report included. Current 4th Edition published in 2016.**

Although AWWA recommends that the industry stop using percentage indicators, the current versions of M36 and the FWAS include VPPI and FPPI. Thus, there is still confusion as evidenced by:

- Inquiries received by AWWA from the regulatory community and other stakeholders seeking the “acceptable” water loss percentage level.
- Publications on water loss that refer to the “AWWA Standard of ___%” - the “standard” listed as anything from 5% to 20%. These misrepresentations, often derived anecdotally, come from technology and service providers, regulatory agencies, environmental groups, and water utilities. Since 2003, AWWA has recommended that it is best for utilities to set system-specific loss targets, and not use a prescribed one-size-fits-all number.

These occurrences run counter to AWWA’s messaging that water utilities should use the three V’s when conducting water loss assessments. **VPPI and FPPI will be removed from the next versions of M36 and the FWAS.**

Many water utilities use the AWWA water audit method – the FWAS has been downloaded more than 12,000 times since its initial release in 2006. And many North American regulatory agencies have adopted the AWWA water audit method and require annual water audit data collection in this format. Leading examples include Georgia, California, and Quebec, CA which have implemented comprehensive water audit programs with formal training, structured audit data collection, and data validation that are helping to advance water utility knowledge and practice, as well as reducing water losses.

4. The Process Used by the Performance Indicator Task Force

The PITF set forth criteria for the suite of NRW KPIs advocated in the 2020 position and recommended they should be:

- technically rigorous, reflecting field observations and theoretical principles, without significant bias or influence from situational parameters;
- easily understood by a wide range of stakeholders, including water utilities, regulatory agencies, customers, elected officials, and the media;
- suitable for target-setting and progress monitoring of loss reduction activities, i.e., they must be actionable; and
- suitable for the state of readiness of North American water utilities and regulatory agencies, recognizing that many water utilities will be new to water loss control and that regulatory agencies need ways to collect water audit data and monitor loss control that can be readily implemented.

It is important to note that no KPI in the recommended suite is expected to satisfy all four of these criteria. However, they are all technically rigorous and suitable for the state of readiness of North American water utilities and regulatory agencies. Some KPIs are specifically suited for setting loss reduction targets, while others are fit for benchmarking, assessing operation and/or financial efficiency, etc. Certain KPIs are expected to resonate well with non-technical stakeholders, while others have strong appeal for regulatory agencies. Most importantly, the AWWA water audit method features a full array of KPIs that, when applied collectively, provide a fuller understanding of the occurrence of NRW and its costs in utility operations than previously available. Loss control

activities are reliably planned and conducted when using the full suite of NRW KPIs in the AWWA water audit method. This is significant because NRW management has been historically hindered by the longstanding misconception that NRW assessments can be reliably conducted using only a single KPI (percentage or otherwise).

The PITF knew the KPIs needed to be both technically astute and understood by general stakeholders. And they began with an understanding that percentage indicators are technically weak because they are distorted by changing customer consumption levels, and thus easily misunderstood. Additionally, percentages are not actionable. Setting and achieving goals involving lower percentages does not necessarily translate into saving water, reducing production costs, or gaining revenue. Certain NRW KPIs must be actionable or able to be used for translating loss reduction efforts to measurable savings in water and money. In moving beyond percentage indicators, the drinking water industry will also move beyond the misconception that a utility's loss standing can be assessed using any single KPI. Complex assessments, from financial performance to drinking water quality, typically rely on multiple parameters and KPIs to give a full and objective assessment of utility standing.

NRW KPIs must be applicable to the current state of readiness of water utilities and North American regulatory agencies to implement. While AWWA methods and tools have been embraced by many water utilities, they are still new to others. Thus, KPIs and their implementation must be readily grasped by water utilities of all sizes, albeit with moderate training to understand the methods.

The features of the 2020 position will be included in Version (6.0) of the FWAS (targeted for 2020) and the next edition (5th) of the AWWA M36 publication (targeted for 2021). Incorporating the 2020 position into AWWA's key water loss control publications will support the drinking water industry over the next five years or so, but additional improvements in the water audit process and data collection software platforms are already being planned. Over time the WLCC will consider further NRW KPIs advancements, based on the assumption that the drinking water industry will be more familiar with water loss control fundamentals and ready to advance to a higher level of performance assessment. The Committee expects that the volume and sophistication of NRW related data will increase greatly and that new platforms for North America-wide water efficiency data collection and analysis will be needed.

5. AWWA-funded Research on NRW Performance Indicators

Current and new NRW KPIs were examined using the PITF's four-part criterion as described in the Technical and Education Council's (TEC) report *Assessment of Performance Indicators for Nonrevenue Water Target Setting and Progress Tracking (2019)*[7]. The tasks conducted for this report included:

- Providing a list of NRW KPIs to evaluate and control NRW, including those that are suited for setting water loss control targets.
- Analyzing prospective KPIs using validated water audit data, including data from California[8] and Georgia[8] and an enhanced version of the AWWA Water Audit Data Initiative (WADI) known as the WADI Plus dataset[8].

- Surveying several US state and Canadian provincial regulatory entities that have implemented water loss control regulations and that document the key characteristics of their programs, including how they use NRW KPIs.

The core methodology of the research assessed each indicator for the four-criteria using a mix of quantitative and qualitative scoring. Technical rigor was assessed using the Frontier Analysis (FA) method which predicts relative performance for utilities in a similar mathematical situation. If an indicator measuring real losses, for example, is well correlated with real loss performance from the Frontier Analysis, then that indicator was considered technically rigorous.

The final TEC Project report presented a recommended set of NRW KPIs, and a rationale for phasing in or out certain indicators. The research provided objective assessments of NRW KPIs and provided the foundation of the WLCC's new position.

6. AWWA's 2020 Position on Non-revenue Water Key Performance Indicators

Since 2003, AWWA has advocated using the NRW KPIs included in the M36 publication and FWAS for water loss assessments and loss control planning. Informed by the TEC report and its member deliberations, the PITF recommended a new position on NRW KPIs along with specific guidance on their use. Three primary changes to the KPIs were recommended as follows:

1. **AWWA no longer supports any form of NRW percentage indicators**, including volumetric indicators such as water loss percentage indicators, "unaccounted-for" water percentages and financial percentage indicators.

2. **AWWA supports the use of the *Loss Cost Rate* indicator**, a new KPI expressed in value /service connection/year, with one expression for apparent losses and one for real (leakage) losses. These KPIs measure the negative impact of losses to a utility's finances.

3. **AWWA supports the use of the *Normalized Water Losses* indicator**, a new KPI expressed in volume/service connection/day. *Water losses* is the sum of apparent losses and real losses. It is meant to be employed only as a high-level indicator and in tandem with the disaggregated normalized KPIs: Normalized Apparent Loss (volume/service connection/day) and Normalized Real Loss (volume/service connection/day).

Each of these areas is discussed further in the following sections.

AWWA has discontinued support of NRW percentage indicators: Percentages are problematic because their fractional components (numerator and denominator) can be unduly influenced by factors unrelated to water loss control activities. The basis for discontinuing support for them is given below:

1. *Volumetric Percentage Performance Indicator (VPPI)*: Often expressed as the "unaccounted-for" water percentage (UFW%), this indicator is a misleading and unreliable measure of utility performance because:

    i. VPPI is greatly affected by changing levels of customer consumption

ii. VPPI cannot distinguish the components of non-revenue water (apparent and real losses, and unbilled authorized consumption), and

iii. VPPI reveals nothing about water volumes and associated monetary values – the two most important factors in assessing a utility's water efficiency.

Additionally, percentage indicators like VPPI are not technically rigorous because they can be significantly influenced by parameters unrelated to NRW.

AWWA recommends that water utilities, regulatory agencies and other industry stakeholders discontinue use of a VPPI or "unaccounted-for" water percentage indicator.

2. *Financial Percentage Performance Indicator (FPPI)*: This indicator also has limitations due to similar undue influences on the numerator and denominator, particularly the wide annual variation in total operating costs (denominator) that has been observed across water utilities[7]. Also, the apparent loss cost – a component of the FPPI – is set by the Customer Retail Unit Charge (CRUC), which can also vary widely for several reasons (e.g., some water utilities include sewer charges in the CRUC).

   This KPI has been employed formally in a regulatory context in a single US State (the only such use of this KPI known to the PITF), which uses it as both a performance tracking indicator and a target-setting indicator. By removing its support for the FPPI, AWWA recognizes that an alternative financial indicator is needed, and the *Loss Cost Rate* KPI is offered for consideration by regulatory agencies because it is a superior KPI to the FPPI. AWWA firmly believes that water utilities should not employ a VPPI, FPPI or any percentage KPIs in water loss assessments.

   To this end, AWWA is removing all percentage indicators from its water loss publications and tools, including the next edition (5th) of the M36 guidance manual and the next version (6.0) of the AWWA Free Water Audit Software.

AWWA encourages drinking water industry stakeholders, including water utilities, and regulatory, financial rating, and water resource planning agencies to discontinue the use of percentage indicators and adopt the KPIs recommended in this report and AWWA's forthcoming publications and tools.

In recommending against using percentage indicators, AWWA instead recommends using the two new alternative KPIs described in the following.

1. *Loss Cost Rate (LCR)*: Expressed in $/service connection/year, the LCR is a financial KPI, with one expression for apparent losses and one for real losses. The LCR indicates the financial impact of the respective losses to the utility and has public relations value by expressing annualized loss costs (operating cost and revenue) on a 'per connection' basis. It is derived from each corresponding normalized volumetric loss indicator expressed in volume/connection/day, by converting the volume unit to its value of loss, expressed on a yearly basis. This KPI marries the *rate* of losses (apparent or real) with the *value* of those losses, as a cost rate of losses. The LCR KPIs are calculated as shown below in US customary units:

Apparent Loss Cost Rate (ALCR) calculation:

$$ALCR = \frac{(\text{AL Normalized, gal/conn/day})(\text{Customer Retail Unit Charge, \$/kgal})(365 \text{ days/year})}{1{,}000 \text{ gal/kgal}}$$

Kgal = 1,000 gallons

Real Loss Cost Rate (RLCR) calculation:

$$RLCR = \frac{(\text{RL Normalized, gal/conn/day})(\text{Variable Production Cost*, \$/mg})(365 \text{ days/year})}{1{,}000{,}000 \text{ gal/mg}}$$

mg = 1,000,000 gallons

*Real losses are valued at the Variable Production Cost (VPC) for most utilities; but some utilities value real losses at the Customer Retail Unit Charge (CRUC). An additional conversion factor of 1,000 kgal/mg is needed in the above equation when the CRUC is employed.

Utilities with a high LCR incur high losses and/or high costs. On a broad level, high LCR values give a water utility good incentive to enhance their water loss control interventions. Some positive attributes of LCR include:

i. Strong NRW assessment value at the utility level, by revealing the impact of changing loss and cost values year-to-year.
ii. Helps with public relations by expressing the impact of costs on a "per connection" level.
iii. Useful for regulatory agencies when employed as an "out-of-bounds" KPI to flag utilities with very high values. However, it is not appropriate to employ the LCR to set optimally low loss targets in water utilities.

PITF members have piloted and analyzed the LCR in several efforts including the 2018 TEC Project and independent work on water audit data from Pennsylvania and New Jersey[9,10]. Water Research Foundation Project 4695 includes a downloadable spreadsheet of LCR values from North America in the form of percentiles for the range of values across utilities[10]. While LCR is a new KPI, it should further help water utilities and other stakeholders assess and manage water loss.

While the LCR has many strengths, it is a high-level KPI and stakeholders are advised not to employ the LCR as a singular KPI for water loss assessments. Because it is influenced by the volume of losses and their monetary value, the LCR could change notably due to a significant change in a single component. For instance, an annual reduction in loss volumes (apparent or real) may be masked by a large monetary increase that year, either due to a large water rate increase (CRUC) or increase in the Variable Production Cost (VPC). In this way the LCR is not directly actionable as a target setting or benchmarking KPI. It is appropriate to assess the LCR in combination with the other KPIs in the AWWA water audit method.

2. *Normalized Water Losses (NWL)*: Expressed in volume/connection/day, NWL is a high-level KPI that represents the combined volume of apparent and real losses occurring in the water utility, on a per connection basis. The NWL metric allows utilities to track their year-to-year losses and provides additional insight during years when either portion of NWL (apparent or real normalized loss rate) varies notably from the prior year. NWL should not be used as a "stand-alone" KPI, but in combination with the apparent and real loss normalized indicators. Also, as a high-level indicator, NWL is not actionable because its components include water that is physically lost (real losses) and water that is not physically lost but under-recorded (apparent losses). Thus, NWL should not be used for target-setting. Instead, targets can be set using the Normalized Apparent and Real Loss indicators. NWL is best used to assist the data validation process by helping to broadly explain year-to-year changes in apparent and real loss volumes and provide a buffer against inordinate uncertainty in either of these volumes.

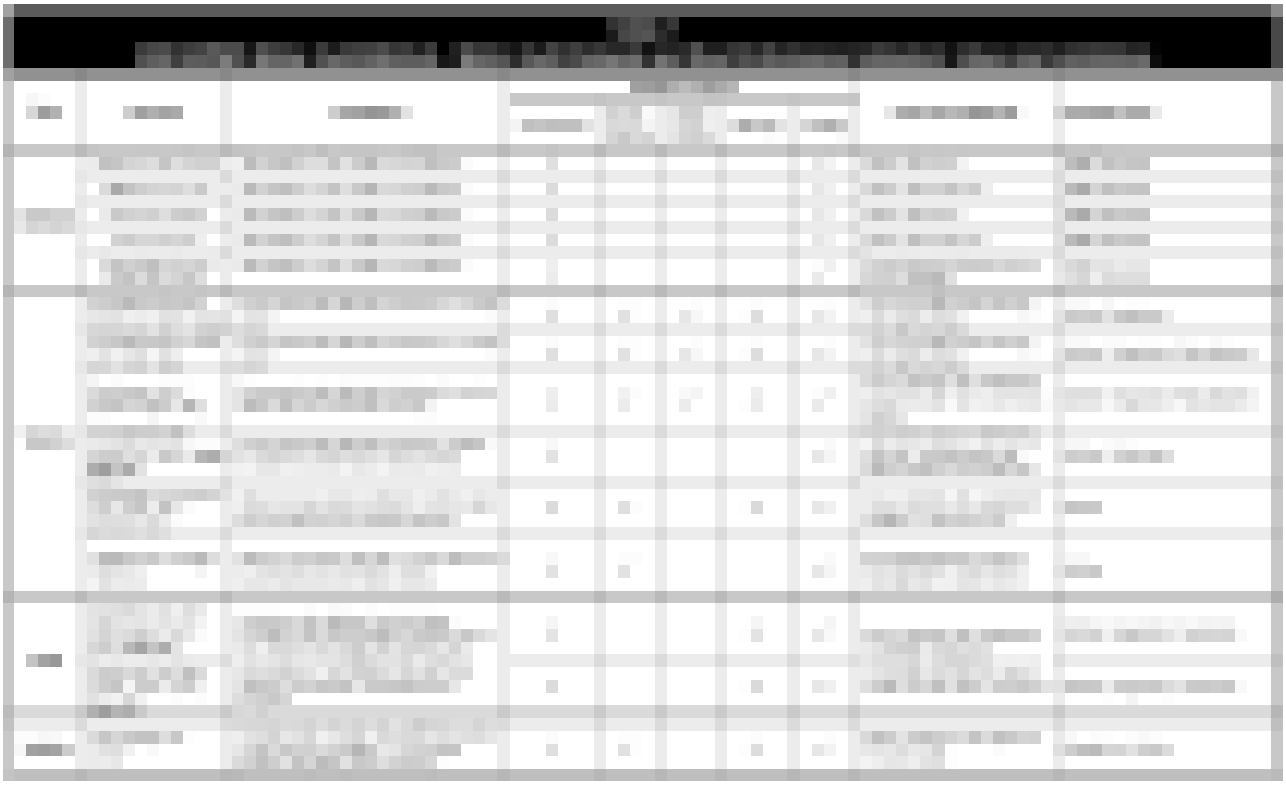
   NWL is new and has not yet been employed extensively. As a combined version of the Normalized Apparent Losses and Normalized Real Losses indicators, NWL is subject to the same influencing factors as those KPIs. AWWA believes that NWL – used for high-level trending in combination with other KPIs – adds value to water loss assessments.

KPI changes in the AWWA Free Water Audit Software (FWAS): Concurrent with the WLCC's efforts to update its position on NRW KPIs, the WLCC Software Subcommittee worked to develop version 6.0 of the FWAS. The PITF coordinated with the Subcommittee to include the two new KPIs – Loss Cost Rate (Apparent and Real forms) and Normalized Water Losses in version 6.0 of the FWAS, which is targeted for release in 2020. Version 6.0 will also include many additional improvements that reflect performance as detailed below:

1. Version 6.0 of the FWAS will include a means to recognize and capture when a water utility includes sewer charges in calculating the CRUC, which is the basis for valuing apparent loss. The FWAS will not include the actual sewer charge nor water charge, but rather will include the composite CRUC and a binary (yes or no) indication of inclusion of sewer charges incorporated into the CRUC.

2. Version 6.0 of the FWAS will include a change in the calculation of the Normalized Real Losses KPI for low service connection density utilities. Historically, the FWAS calculates Normalized Real Losses for low density systems (i.e., those with less than 32 service connections/mile of pipeline, or less than 20 service connections/kilometer of pipeline) in variant units of volume/length of pipeline/day. Low service density systems will have Normalized Real Losses calculated as both volume/connection/day (the same as systems that are not low density) and the variant form of volume/length of pipeline/day. This will place greater attention on low service density systems, but it is recognized that further research is needed on KPIs for low density systems and for wholesale water supply systems.

The updated water audit attributes and KPIs intended for version 6.0 FWAS are presented in Table 1. Using these KPIs will help utilities increase the objectivity and effectiveness of NRW assessments.



*Data Validity Tier is a new term that will appear in Version 6.0 of the FWAS (2020 release) and is a band-type grouping of Data Validity Scores: Tier I: DVS=0-25; Tier II: DVS=26-50; Tier III: DVS=51-70; Tier IV: DVS=71-90; Tier V: DVS=91-100

7. Guidance for NRW KPI Implementation

Since the launch of the FWAS in 2006, Georgia, California, Hawaii, and the province of Quebec, CA have adopted requirements for utilities to use the AWWA water audit method and the FWAS as the data collection tool. These initiatives have formal programs that offer training for water utilities in the water audit process, including data collection, validation, and analysis. The data quality of these programs is distinctly higher than programs that accept self-reported data from water utilities. ***It is strongly urged that regulatory agencies requiring water audit data collection use the AWWA FWAS, provide training for utility auditors and require formal validation of the reported water audits***. Several states have leveraged set-aside funds from their state revolving fund programs to pay for training and validation.

The FWAS is also used with lesser requirements in many other states and agencies, including Tennessee, New Mexico, Colorado, and the Delaware River Basin Commission, with pilot projects occurring in at least another six states. Data from thousands of water audits that were compiled using the FWAS is now available, and analysis of the data has provided deeper understanding of utility water efficiency than historic approaches employing only a single percentage indicator. Additional water regulatory agencies are expected to adopt requirements for the AWWA water audit method because it enables more rational assessments, improved NRW reduction tracking, and benchmarking among water utilities. With a suite of effective KPIs available in the AWWA tools, agencies can use appropriate combinations to meet their water efficiency objectives.

Water utilities, regulatory agencies, and other stakeholders using the AWWA NRW KPIs are offered specific guidance in their use, as described below:

a) Considerations for water utilities:

   i. <u>Water audit benefits</u>: By focusing on the three V's (volume, value, validity) the AWWA water audit method helps water utilities save water and energy resources, set equitable water rates, and improve their financial position which may gain better access to funding opportunities for capital improvements. Utilities can reliably track and benchmark their performance and strategically plan loss reduction efforts and set loss targets. Expressing losses/costs on a "per connection" basis provides effective public relations messaging, keeping customers, regulators, the media and other stakeholders informed of utility progress in NRW management.

   ii. <u>Data quality maturation</u>: utilities will build reliability in their processes by allowing for a period of 3-5 years for initial data collection and data quality improvement before considering loss reduction target-setting. Data validity is often low when water utilities compile their first water audit, and reasonable time is needed to improve data management and collection processes to elevate the quality of the water audit data. On a positive note, the focus on data quality often results in water utilities beginning to improve their water efficiency processes before specific water loss reduction initiatives have been implemented.

   iii. <u>Focus on good practice</u>: The data grading and data validation process is based on utility operational processes and good practice leads to good data. For example, many water utilities operate with water production flowmeter installations that are poorly designed, sited, installed, and maintained. Relatively few of these metering installations are reliably tested for accuracy. The water audit data grading criteria guides utilities in improving

these flowmeter installations that produce the foundational inputs to the water audit (source water withdrawals and imported/exported bulk water supplies). Similarly, testing and systematically replacing customer meters, conducting regular leak detection, auditing customer billing systems, and other functions are also important opportunities for utility practice improvement. It is important to note that the FWAS calculations are interdependent, and accurate production and customer metering data are also critical for calculating a representative annual real (leakage) loss volume, for which measured data are not required by the FWAS. If due diligence is not applied in understanding and attaining accurate production and customer metering data, the calculation of the annual real loss volume from the FWAS will not be accurate, and real loss target setting and reduction efforts may be misdirected.

b) Considerations for regulatory agencies

i. Water audit data collection process: Agencies collecting audits are encouraged to specify that water audit reports are submitted in the standardized electronic format of the FWAS. Agencies are also encouraged to provide training for water utility staff in the auditing process and provide for formal data validation to ensure an accurate assessment of data quality. Regulatory agencies collecting audits in the functional electronic worksheets of the FWAS will find additional value by employing the AWWA Compiler Software, which allows the data from multiple AWWA water audits to be easily compiled into a single spreadsheet. This software includes built-in capabilities to produce charts, as well as having an 'export' function that allows the data to be transferred to standard spreadsheet software for user-specific analysis.

ii. Regulatory mission: Agencies have broad missions (environmental/financial/other), and specific regional and temporal considerations (drought, floods, etc.). Environmental agencies with a mission to protect water resources may focus on leakage management and employ the Normalized Real Loss indicators (performance tracking) and Infrastructure Leakage Index (benchmarking). Financial regulators, such as public utility commissions or state fiscal officers, may focus on the Loss Cost Rates, but realize that this KPI is best employed for identifying outliers from more typical utility performance, and should not be used to set a single target for optimized loss control. Financial regulators can assess the Normalized Loss indicators when guiding water utilities toward loss reduction that can lower production costs (via leakage management) and enhance revenues (via apparent loss control).

iii. Identify financial improvements: By tracking costs of water the AWWA water audit method enables regulatory agencies to compile data on the range of utility cost impacts. Having this data enables agencies to identify utilities with relatively low customer water rates that may be under-funding their system, and utilities with high production costs, both of which may benefit from an effective water loss control program. Other financial considerations may also exist with improved water loss control. Utilities are better motivated by water loss reduction initiatives that yield improved financial performance and water resource sustainability from reduced water withdrawals.

iv. Loss reduction target-setting: The AWWA water audit method offers regulatory agencies improved flexibility in developing long-term water loss reduction goals for water utilities. By tracking loss volumes, costs, and data quality with effective KPIs, agencies can tailor specific requirements to achieve the goals for their jurisdiction, region, or class/size of water utilities.

A regulatory approach that aims to establish uniform loss level targets for all utilities is impractical for water loss control. Many agencies provide regulatory oversight of water quality regulations which are applied in a prescriptive manner to all water utilities. This approach is appropriate for water quality since all drinking water utilities must provide customers with water that is safe for human consumption. Conversely, water loss control is more akin to the utility process for setting rates and charges – a process specific to the unique costs, characteristics, and regional considerations of each system. Utilities have different costs of providing service and their specific rates and charges are based upon the need to recover their individual costs of operations. Each system is unique, and the ideal loss volumes to target are those known conceptually as the "economic" levels of losses, above which constitute all losses that are cost-effective for the utility to reduce or prevent.

Developing a process that establishes cost-effective, system-specific loss targets involves more analytical rigor and administrative effort than an approach that applies a single target to all water utilities. The challenge for regulators and utilities alike is the complexity of determining the value of each utility's loss reduction potential based upon its unique cost structure. Expected cost savings should be compared to the cost of specified loss reduction technologies and practices, which may also vary from utility to utility. Ultimately, targeted loss control activities should be cost-effective for water utilities. Agencies that routinely collect and review utility cost of service data, such as state public service commissions, may be better prepared to set individualized targets. In cases of water resources scarcity, regulatory agencies could consider setting loss reduction targets at levels lower than the economic level of water utilities within the region of scarcity. Regional thresholds for performance may need to consider regional water management goals, and factor in utility economics (short-term and long-term such as deferred infrastructure development) and the regional value of water supplies.

In 2019, the California State Water Resources Control Board began moving to establish a structure for system-specific leakage reduction targets for the 400+ water utilities that fall under its requirements.[11] An economic model is being developed for this purpose. The analytic tools developed for this rulemaking may subsequently be useful in other jurisdictions.

If, however, an agency is not initially in a position to devise or adopt a structure for system-specific loss reduction goals, the NRW KPIs may be used to support a tiered approach to loss reduction targets as described below.

Since many water utilities likely incur loss volumes that are well above economic levels, and many of the same water utilities are new to the water audit process, regulatory agencies might constructively begin by identifying the systems with the highest losses relative to typical utility performance. The AWWA NRW KPIs are quite useful for identifying these outliers. By focusing on the utilities with high losses and/or the greatest needs, agencies can identify that group of systems with the greatest loss reduction potential and direct resources accordingly. As data quality and system performance improve over time, agencies can consider lowering the "out-of-bounds" threshold volume so that the "bar of acceptable performance" gradually defines more efficient operations. During this phase, regulators may require a showing of improved water loss performance over a specified time period, using one or more KPIs as points of reference. This approach may be tiered with greater improvement expected of utilities whose loss volumes and/or loss costs are the greatest.

Stemming from regional water resource management concerns, the Metropolitan Atlanta, GA area set specific leakage reduction targets for participating water utilities to achieve by the year 2025. (*see below*). This is a good example of an agency employing a tiered approach to performance requirements based on a multi-year history of validated water audit data – the State of Georgia has required annual water audit data validation since 2011.

Metropolitan North Georgia Water Planning District Water Resource Management Plan[12]

Leakage Reduction Targets (issued June 2017)

- **Water utilities with real losses greater than 60 gallons/connection/day (2013 data) must adopt a 2025 goal to reduce to less than 60 gallons/connection/day and demonstrate progress in the interim years toward meeting this goal.**
- **Water utilities with real losses between 35 and 60 gallons/connection/day (2013 data) must adopt a 2025 goal to reduce to less than 35 gallons/connection/day and demonstrate progress in the interim years toward meeting this goal**

Applies to water utilities serving at least 3,300 individuals and with customer service connection density greater than 32 connections per mile of pipeline.

If a local water provider required to adopt one of the targets reasonably believes that, after detailed financial analysis, the applicable 2025 goal exceeds its system-specific economic level of leakage, then the local water provider may request a new 2025 goal that recognizes the higher leakage target.

c) Considerations for policy makers

i. Managing water resources: A fundamental concern for public water supply is the availability of sufficient water sources that can be treated to quality standards. Reliably tracking and managing source water withdrawals is, therefore, critical to the long-term sustainability of water supplies. Having robust NRW KPIs enables water resource planners to gauge the efficiency with which annual water withdrawals are treated and supplied to customers. When treated water is lost to leakage, this portion of the water withdrawal volume is wasted, along with energy and other resources. When water utilities employ effective leakage management, they optimize their source water withdrawals, ensuring that they only withdraw the amount of water needed to meet the legitimate customer water demands placed on the distribution system.

ii. Apparent loss control: When water utilities successfully control apparent losses, they increase the accuracy of customer consumption data, improving the reliability of regional planning studies and securing more revenue for the utility. Very importantly, accurate consumption data helps customers to better track their water usage and provides greater incentive for them to conserve. In addition, managing apparent losses improves the equity of cost allocation amongst customers.

iii. Setting the value/cost of water, particularly in times of water resource scarcity: What we don't properly value, we waste. In many parts of North America, water is under-valued

and underpriced, including both the cost to produce treated water and distribute water to customers. Because the AWWA water audit asks water utilities to input their Variable Production Costs (VPC) and their Customer Retail Unit Charges (CRUC), validated cost data for hundreds of North American water utilities is now available. Analysis of this data is revealing interesting trends on the range of costs across water utilities. Sturm, Gasner and Andrews (2015) noted that water utilities purchasing expensive imported bulk water tend to have lower leakage rates than self-supplied water utilities[13] (see Figure 1). Historic water loss assessments using UFW% do not report costs, thus masking the role that cost incentives or disincentives play in motivating successful water loss control. Using the AWWA water audit method allows planners to target economic water loss control at the utility level, and effective water withdrawal management at the watershed level. Arguably, scarcity of water resources should also play a role. As resources become scarce, such as from long-term drought, the value of the resource should increase in value. It can be argued that, at a certain level of scarcity, water utilities that typically value leakage at the VPC should value leakage at the CRUC. At the significantly higher CRUC, the economic benefit of aggressive leakage management increases dramatically. Alternatively, water might be valued at the long-term indirect costs of alternative water supply source development if water resources are in great scarcity. These are a few examples of the economic benefits achievable as more water utilities move away solely from using percentages and to the AWWA water audit method.

In a like manner, it can be argued that reduction of apparent loss volumes through customer meter replacement in utilities having increasing block rate structures (large water use is priced at higher unit commodity rates) should value that loss at higher than the average customer retail water rate, consistent with increasing billed water use at the highest block charged to an individual customer.

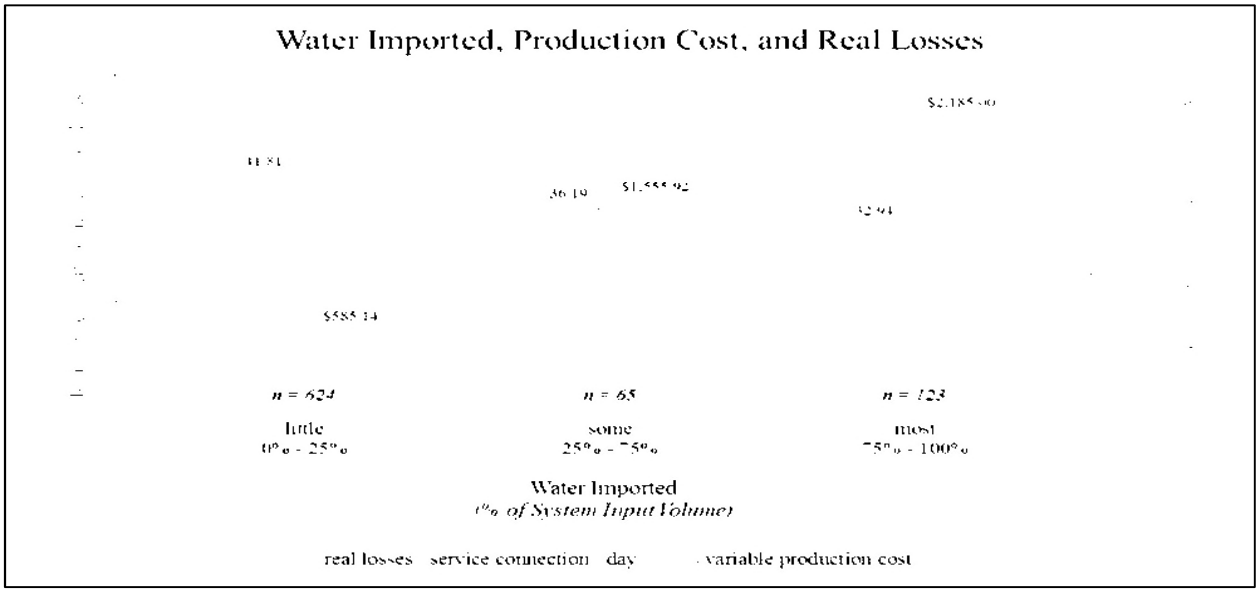


Figure 1 Incidence of real (leakage) losses in water utilities that purchase bulk imported water (data consisted of mostly self-reported water audits)

Source: Sturm et al. 2015. Reprinted with permission. © Water Research Foundation.

d) Considerations for water utility customers

i. The AWWA water audit method offers many opportunities to improve communications with water customers compared to the historic UFW% reporting. Utilities can quote water loss reduction success in terms of volume, value, or loss rates, expressed in "per connection" units. This enables the utility to convey water loss reduction targeting and performance tracking in an effective, easy-to-understand manner. Great value can be gained by tailoring messaging to water customers, informing them of utility progress in maintaining efficient water operations and mitigating periodic stress such as that associated with droughts. This can also assist the water utility in gaining customer acceptance of water rate increases.

Table 1 describes the KPIs of the 2020 position along with their suitability for specific purposes and their limitations.

8. Benefits for the Water Industry and Water Resources

The water industry's approaches of the past sixty years that have relied on imprecise "unaccounted-for water" percentages have not been successful in motivating measurable loss reductions. Consequently, losses have been increasing in some systems due to deteriorating infrastructure (distribution system piping and customer water meters), increasing costs, and other factors. AWWA has considerably advanced water auditing and loss control techniques over the past twenty years, and the Association believes that these newer approaches are improving water utilities' ability to assess their water loss control standing, plan and execute effective loss reductions, and communicate this progress to industry stakeholders and customers. The improved outcomes to society include:

- **Improved management of water resources**: Establishing integrity in measuring source water withdrawals and controlling leakage protects valuable water resources, which are stressed in some regions due to periods of drought, growing populations and other factors.
- **Improved utility operations and finances**: Lost water is lost money to water utilities. In most cases, water utilities stand to benefit financially from improved water loss control practices.
- **Consistent reporting and workable planning for loss control activities**. Validated data from hundreds of US water utilities are providing detailed insight on the efficiency and cost-effectiveness of water utility operations. This data allows for astute and strategic planning around water allocations, infrastructure, and rate-setting. Water utilities now have the tools to become proactive in their water loss control efforts.
- **Better understanding of water utility performance by customers, the media, elected officials, funding agencies, and other stakeholders**. Water utilities can expect to see better acceptance from customers for water rate increases, better access to funding for capital improvements, and a better reputation and standing in their communities. Customers are also more likely to respond favorably to their conservation requirements if it is visible that the utility is also conserving water.

Multiple benefits are available to drinking water utilities via effective water loss control. More water utilities and state/provincial regulatory agencies should embrace AWWA's water audit method.

9. Conclusions

AWWA has carefully investigated existing and new NRW key performance indicators and has recommended an updated set of KPIs for water utilities, regulatory agencies and other water industry stakeholders. Of particular note is the recommendation to discontinue support for percentage indicators which are known to be imprecise and misleading. AWWA advocates that water industry stakeholders discontinue using percentage indicators and embrace those existing and newly recommended performance indicators. This development will greatly improve the ability of drinking water utilities to identify, quantify, and value water losses and target actions to become more efficient and improve water resource management.

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American Water Works Association

PREPARED DIRECT TESTIMONY OF
MICHAEL HARDY

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

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In the Matter of:

Application of Great Basin Water Co., Cold Springs, Pahrump, Spanish Springs and Spring Creek Divisions for approval of its 2024 Integrated Resource Plan and to designate certain system improvement projects as eligible projects for which a system improvement rate may be established, and for relief properly related thereto.

Docket No. 24-_____

PREPARED DIRECT TESTIMONY OF

MICHAEL HARDY

ON BEHALF OF GREAT BASIN WATER CO.

March 1, 2024

PREPARED DIRECT TESTIMONY OF

MICHAEL HARDY

ON BEHALF OF GREAT BASIN WATER CO.

Q.1 PLEASE STATE YOUR NAME AND BUSINESS ADDRESS FOR THE RECORD.

A.1 My name is Michael Hardy. My business address is 950 Sandhill Road, Reno, NV 89521.

Q.2 BY WHOM ARE YOU EMPLOYED?

A.2 Lumos & Associates Inc. ("Lumos").

Q.3 WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

A.3 Bachelor of Science Degree in Geology, Bemidji State University, Bemidji MN

Graduate studies in Geology, Idaho State University, Pocatello, ID

- Professional Engineer, Nevada, License # 21862
- Certified State Water Right Surveyor, Nevada, Certification # 1274
- Professional Engineer, Arizona, License # 71093
- Professional Geologist, California, License # 7927

Employment History:

Cyprus Foote Mineral Company (In Situ Mining Operation in Silver Peak, NV)

- Exploration and Production Drilling Programs up to $2 million;
- Water Right Management;
- Pond Inventories;
- Pump/motor design of booster pumps & wells, distribution piping; and
- Special environmental projects for other company owned properties.

Layne Christenson Company (Carson City, NV; Woodland, CA; Bridgewater, NJ)

- Sales Engineer/Project Manager: Involved in drilling projects, bid proposals, trouble shooting and rehabilitation of wells, pump designs, well design;

- Project Manager: Work in the Integrated Groundwater Services division on large water resource projects up to $4.2 Million. Project Managed Wells, Pipelines, Well Houses, Primary and Secondary Electrical, Permits, Water Treatment Facilities, etc.

Integrated Resource Management, LLC (Carson City, NV)

- Conducted water resource evaluations and wrote reports on water and wastewater facilities owned by Con Agra Foods processing facilities in Oregon, Washington, Idaho, Nevada and California. Similar type water resource evaluations and wrote reports for Vulcan Materials operations in California.

Lumos & Associates, Inc. (Reno, NV)

- Water Resource Senior Project Manager for all aspects of water projects from planning documents, groundwater development, water treatment, water infrastructure, wastewater treatment and disposal/reuse.

My areas of expertise in water and wastewater infrastructure include:

- Water and wastewater system master planning, including hydraulic modeling analysis;
- Capital improvement program development;
- Regulatory and environmental compliance;
- Preparation of plans and specifications for pipelines, pump stations, water supply wells, treatment facilities, civil site work;
- Construction management and inspection.

Q.4 HAVE YOU TESTIFIED BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA (THE "COMMISSION")?

A.4 Yes, four times before in support of the 2015 Spring Creek Utility Co. Integrated Resource Plan ("IRP" or "Resource Plan"), the 2016 Utilities Inc. IRP, the Great Basin Water Co.'s ("GBWC") 2018 Consolidated IRP proceeding and the 2021 Consolidated IRP proceeding ("2021 IRP")s.

Q.5 HAVE YOU TESTIFIED BEFORE ANY OTHER PUBLIC UTILITY COMMISSION?

A.5 No, I have not.

Q.6 WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS DOCKET?

A.6 The purpose of my testimony is to describe Lumos' role in the preparation of GBWC's 2024 Consolidated Integrated Resource Plan ("2024 IRP" or "2024 Resource Plan") and to provide general summary information regarding the 2024 Resource Plan. Said summary will provide a brief description of the methods and results of the analyses more fully detailed in the Resource Plan. Lumos provided the analyses for the Resource Plan with input from GBWC and prepared all components of the GBWC 2024 IRP with the exception of the funding plans for each division, which were prepared internally by GBWC's Aleksey Dolinko with assistance from Terry J. Redmon, CPA.

Integrated Resource Plan Overview

Q.7 PLEASE SUMMARIZE THE SERVICES THAT LUMOS PROVIDED TO GBWC IN CONNECTION WITH THE 2024 RESOURCE PLAN.

A.7 Lumos prepared the Resource Plan and recommendations including, but not limited to, the following:

- Existing Conditions, with an Asset Registry and Condition Assessment
- Water and Wastewater Demand Forecasting
- Water Supply and Distribution System Evaluation
- Hydraulic Water Distribution Modeling
- 20-year Preferred Plan and Recommended Capital Improvement Projects
- Three Year Action Plan
- System Improvement Rate ("SIR") Request for Capital Improvement Projects

Q.8 WHAT APPROACH DID LUMOS TAKE IN PROVIDING THESE SERVICES.

A.8 Lumos worked as a team with the other project members performing site visits, including assessing existing asset management registries, evaluating subsystem challenges and reviewing the data Lumos gathered with GBWC assistance. With this information, Lumos used the developed fixed and linear asset registries and State Regulations to prioritize necessary capital improvements for the GBWC Divisions water and wastewater systems.

Q.9 PLEASE DESCRIBE HOW LUMOS ORGANIZED THE 2024 RESOURCE PLAN.

A.9 The Resource Plan was organized in the following format:

The 2024 Resource Plan includes specific volumes for each of the Divisions that make up the GBWC. A total of five (5) volumes are associated with this document with the Introduction (Volume I) containing all of the relevant common information that is associated with each of the four (4) Divisions as well-as the funding plan for all divisions. The other four (4) volumes contain information specific to each Division within the GBWC and include the following: Pahrump Division (Volume II), Spring Creek Division (Volume III), Cold Springs Division (Volume IV), and Spanish Springs Division (Volume V). Each specific Division volume has been organized as follows:

Executive Summary

The Executive Summary provides an overview of the study and the recommended capital improvement projects with the exception of the Introduction (Volume I).

Section 1.0 Introduction - This section provides background information for the specific Divisions and discussion of the objectives of the specific Division volume portion of the GBWC 2024 Resource Plan along with the references of relevant previous studies.

Section 2.0 Existing Conditions – Each specific Division volume presents a complete description of the service area, existing facilities, condition of major assets with remaining useful life, and their operation and control.

Section 3.0 Historical Data and Forecasting – Each specific Division volume presents an evaluation of the historical population and connections to the existing system. This data is presented and used as a basis for the population and demand forecasting for the specific GBWC Divisions.

Section 4.0 Water Supply and Wastewater Treatment Plan – Each Division volume presents the analysis of the existing water and wastewater (if applicable) systems with regard to how they will be impacted by the demand forecasting presented in Section 3.0.

Section 5.0 Emergency Response Plan – This section is provided in the Introduction (Volume I) with a general references to Volume I in the four (4) Division volumes. The actual Emergency Response Plans for each of the Divisions are provided in the technical appendices.

Section 6.0 Water Conservation Plan – Since it has been the objective of GBWC to have one plan that spans all of the Divisions, a reference to Volume I is provided in each of the four (4) Division Volumes with Volume I referencing the Water Conservation Plan in the technical appendices.

Section 7.0 Preferred Plan and Recommended Capital Improvement Projects. Each Division Volume has a 20-year projected evaluation, which includes a

preferred plan for the projected necessary improvements over the 20-year planning period. The preferred plans are planning level guidelines based on current demands, growth projections and useful remaining life of major assets.

Section 8.0 Action Plan – Each Division has a summary subset of the Preferred Plan detailing the improvements, which are recommended for implementation in the three years following the approval of the GBWC 2024 Integrated Resource Plan.

Section 9.0 Funding Plan – Each Division volume refers to the Introduction (Volume I), which contains all the details of the financing impacts and strategies for meeting the needs addressed in the Action Plans for each Division volume.

Section 10.0 System Improvement Rate Request – Each Division volume will outline information required by Nevada Administrative Code ("NAC") 704.6339 to support a request to designate water projects in the Action Plans as eligible for a System Improvement Rate (SIR) Request.

Technical Appendix

The GBWC 2024 IRP contains one comprehensive technical appendix that details the methodologies used in developing the IRP along with all of the GBWC division's data used in the study. Subsections of each appendix provide the specific information related to each Division's volume.

Q.10 HOW DID THE APPROACH TO THE 2024 IRP DIFFER FROM PRIOR RESOURCE PLANS?

A.10 For the 2024 IRP, we focused on all four of GBWC's divisions and built upon the information gathered through each division's historic resource plans. For instance, while the asset management component was again integrated into the separate division resource plans, the tools used to identify and determine when existing critical assets will need to be replaced or rehabilitated has evolved. The changes and integration of the asset management plan into the GBWC 2024 IRP helps to support future resource plans and greatly assist with the Preferred Plan in making recommendations associated with monitoring, maintenance, and inspections for several of the more expensive critical assets in the water and wastewater systems. The purpose of these recommendations is to extend the useful life of the assets, prolonging the need for replacement or refurbishment or rehabilitation.

Q.11 WHAT ASSET MANAGEMENT APPROACH WAS USED FOR THE 2024 RESOURCE PLAN?

A.11 In preparing the 2024 IRP, Lumos continued to follow an asset management approach (as in previously completed resource plans for the GBWC), but with the use of the Replace & Rehabilitate (R&R) method adopted by GBWC, which is a part of the existing OMS software. Since 2017-2018, GBWC has been using the CentralSquare Enterprise Asset Management (CS EAM) software to assist in asset management (formally known as Lucity).

Q.12 CAN YOU BRIEFLY DESCRIBE THE ASSET MANAGEMENT PROCESS?

A.12 The CentralSquare Enterprise Asset Management (CS EAM) system interfaces with the existing ESRI GIS platform and is used as a digital asset management program to track assets over their entire lifecycle. This tool can track how an asset has performed from field observations and actual work completed during its useful life to help better determine an asset's longevity (useful life) in the future. In addition, by GBWC adopting and implementing the Replace & Rehabilitate (R&R) method to specifically identify and track

critical assets throughout their lifecycle, GBWC can better plan the replacement of a critical asset in the future to minimize system disruptions and forecast the replacement cost of the critical asset. This is an internal approach focused only on critical assets that have been identified in the Fixed Asset Registries for each of the Divisions.

Q.13 HOW DID GBWC EMPLOY THESE GUIDELINES WITH GBWC DIVISIONS?

A.13 Over the course of the past three years, GBWC worked to update the separate asset registries in the CS EAM platform for all divisions from historic asset registries and then expanded on each asset in greater detail. The fixed asset registries were completed at the end of 2023. The new asset registries provide better monitoring maintenance mechanisms through chronologic schedules which notify the managers when they are due. Once the monitoring or maintenance is completed, the data is entered into the software to update the information for all assets.

Q.14 IS THIS ASSET MANAGEMENT APPROACH REFLECTED IN THE IRP?

A.14 Yes, as part of the IRP processes, Lumos conducted site visits to each of the divisions to assess the condition of the critical assets. The critical assets are described in Sections 2 (Existing Conditions) for each division.

Q.15 PLEASE DESCRIBE THE METHOD OF POPULATION FORECASTING PREPARED BY LUMOS.

A.15 The Nevada County Population Projections 2022 to 2041 dated October 1, 2022, prepared by the Nevada State Demographer's Office were used to develop the future population and connection projections in the existing divisions' service areas as well as the overall population data specific to each region's projections. The U.S. Census Bureau American FactFinder was also used to provide past and current population information (when available) for the specific divisions if they were labeled a Census-Designated Place

("CDP"). Based on population and growth rate data available, each specific division used the most appropriate growth rate data for its region. In most cases, the Demographer's Office growth rate estimates were used, even though projected new developments appear to outpace the Nevada States Demographer's projections.

The next step was to correlate each division's residential water and wastewater service connections with their regional population. In forecasting population growth specific to each division service area, an occupancy density of people per household was obtained and used. The occupancy density is based on the most recent CDP data available for each specific division. The following occupancy density of people per household for each specific division included: Pahrump Division (2.36), Spring Creek Division (3.19), Cold Springs Division (2.77), and Spanish Springs Division (2.78). Service connection estimates were than based on the Demographer's Office growth rate estimates and other census data for the specific Divisions. This provided the 20-year population projection for each of the GBWC Division service areas.

Q.16 PLEASE DESCRIBE THE METHOD OF WATER AND SEWER DEMAND FORECASTING PREPARED BY LUMOS

A.16 For each of the specific divisions, water demand forecasting took into account an analysis of both production and metered water data. Production data was used as an indicator of how much water is actually being delivered to the system, as well as for the development of peaking factors. Metered data was used to develop service class demand factors and also to compare to metered water data to calculate system wide non-revenue water quantity.

As previously stated, service connection and population projections were based on the State Demographer's Office growth rate estimates and a specific occupancy density for each Division. The connections were then divided into the specific Division service areas.

The first step in determining future water demands was to perform a historical analysis of water use in the GBWC service areas. The projection data was analyzed for average use, peak use, and seasonal use. System peaking factors were developed based on an analysis of production data over a 3-year period from 2020-2022 (a standard engineering methodology for developing customer demands reflective of recent trends). Using the maximum month production, the average day of the maximum month ("ADMM") was calculated. A maximum day demand ("MDD") was determined by multiplying the ADMM by 1.25 (a standard of the American Water Works Association ("AWWA")). A MDD to average day demand ("ADD") ratio was then generated for each water system. A peaking factor of 1.75 was applied to the MDD to estimate a peak hour demand ("PHD").

Future water demands were projected based on calculated water demand factors for residential, industrial, public, and commercial service classes within each division service area. Water demand factors for 2020-2022 were calculated based on actual metered water use divided by the number of residential, industrial, public, or commercial water system connections. To account for non-revenue water or system water losses (combined with unbilled authorized consumption, apparent and real losses), the calculated water demand factors were increased based on the specific division's percentage of apparent and real losses (as defined by the American Water Works Association). Non-revenue water was calculated based on the difference between historical water production and metered usage.

Based on this data, projected average day and maximum day demands were developed for specific division's water systems for the 20-year planning period.

If applicable to a specific division, the wastewater connections and flow forecasts were completed in much the same manner as the water demand forecasts. The wastewater

forecasting focused on primarily the Spring Creek Division's 100 Tract sewer service area and Pahrump Division's Calvada Valley (Plant 3), Calvada North (Plant F), and Mountain Falls (Plant MF). The Spring Creek Division wastewater connections and flows for the 200 Tract and 400 Tract have three small community septic systems with negligible growth potential. The Pahrump Division also has three small community septic systems that service four customers total with negligible growth potential. The projected wastewater flows to the wastewater treatment plant were calculated based on a maximum monthly flow per connection generation factor. This factor was applied to the projected wastewater connections to project the future wastewater flows through the 20-year planning period (See Pahrump Division "Volume II" and Spring Creek Division "Volume III" of the 2024 IRP for specific existing and future demands).

Q.17 IS THE METHOD FOR CALCULATING THE WATER AND SEWER DEMAND FORECASTS REASONABLE?

A.17 Yes, the water and sewer forecasting is based on an analysis of historical data and projections from the State Demographer's Office and U.S. Census Bureau. It should be noted that forecasts by nature are typically only accurate in the short term with decreasing accuracy over the long term. Each specific division's water and (where applicable) sewer demand forecasts will continue to be updated and validated through the subsequent preparation of future resource plan updates.

Q.18 PLEASE PROVIDE A SUMMARY OF THE WATER SUPPLY EVALUATION.

A.18 Each division's water system capacity was evaluated based on available well capacity compared to the current and projected future water demands. Each water system was evaluated separately if a division contains multiple systems that are not interconnected. The criteria for evaluating adequate supply capacity is based on NAC 445A.6672 which requires that a system that relies exclusively on wells provide a total system capacity

sufficient to meet the MDD when all wells are operational, or the ADD with the most productive well out of service. The total capacity of the system also includes available storage capacity.

Water storage capacity was calculated based on NAC 445A.6674, 445A.66745, 445A.6675, and 445A.66755.

Total system capacity was calculated based on the requirements of NAC 445A.66725, which state that when analyzing the total system capacity of a public water system with regard to the requirements for MDD, only the alternative pumping capacity and the storage capacity of the public water system may be considered as a source of supply. NAC 445A.6554 defines alternative pumping capacity as those wells equipped with a backup power supply, which in each division's case included the wells and booster pump stations equipped with permanent emergency backup power. Lumos included Operating Storage of MDD for one day, fire flow storage (dependent on the pressure zones highest requirement) and emergency reserves of ADD in its system-wide storage assessments.

For the 2024 Resource Plan, the system capacity analysis includes an additional scenario to check the total capacity of the water systems, as defined by NAC 445A.6672. Since the systems rely exclusively on groundwater wells for their water, it was determined that incorporating a more robust analysis would be the most conservative approach to ensure the systems could successfully provide for the following two scenarios:

- Scenario A: Total system capacity requirements for one day of MDD, Emergency reserves, and the most extreme fire flow/demand required in the system area. The system capacity includes any storage tanks and all wells in service with an alternative power source;

- Scenario B: Total system capacity requirement for one day of ADD, emergency reserves, and the most extreme fire flow/demand required in the system area. The system includes all storage tanks and wells with an alternative power source, except for the largest producing well.

It is important to note that the system capacity analysis performed in the previous GBWC consolidated Resource Plans (2018 and 2021) is still being performed in the 2024 IRP under Scenario A. The only modification to this analysis was the addition of Scenario B (NAC 445A.6672) to provide insight into possible system vulnerabilities. Some results of the analysis are summarized below.

Pahrump Division

Please refer to the Testimony from Mara Quiroga (Lumos & Associates, Inc.) for specific information related to water supply analysis for the Pahrump Division.

Spring Creek Division

Well Capacity

As the two existing service areas in the Spring Creek Division are not currently interconnected, they were evaluated separately. Based on the analysis described above, each service area's well capacity was compared to current and projected system demands:

- 200 Tract -- The 200 Tract existing well capacity can meet existing and projected future (2044) demands. The existing well capacity with the largest well out of service (Well-11) also exceeds average day demands.
- Housing Tracts – The Housing Tracts' existing well capacity can meet existing and projected future (2044) demands. The existing well capacity with the largest well out of service (Well-101) also exceeds average day demands.

It should be noted that several wells are at or near the end of their useful service life and will need to be replaced during the 20-year planning period to maintain adequate system capacity. Currently, a replacement for Well-8 (Test Well) has been drilled and currently the project is going out to bid for the well house and distribution system. One replacement well (Well-12) is being recommended as part of the Action Plan.

Storage Capacity

- 200 Tract – The 200 Tracts water system has an existing total storage capacity of 2.00 million gallons and alternative pumping capacity of 2.45 million gallons for a total of 4.45 million gallons and with the largest well off line a total of 3.41 million gallons. The analysis concluded that the 200 Tract has sufficient storage to satisfy both existing and the 20-year projection for the required MDD, ADD, Fire Flow conditions based on the Scenario-A and Scenario-B storage calculation methods described above.
- Housing Tracts – The Housing Tracts' (All Tracts) water system has an existing total storage capacity of 2.59 million gallons and alternative pumping capacity of 6.79 million gallons and with the largest well off line a total of 5.35 million gallons. The analysis concluded that that the Housing Tracts have sufficient storage to satisfy both existing and the 20-year projection for the required MDD, ADD, Fire Flow conditions based on the Scenario-A and Scenario-B storage calculation methods described above.

Cold Springs Division

Well Capacity

Based on the projections presented in the resource plan, the Cold Springs Division MDD by the end of the 20-year planning period meet the system capacity under the conditions described above. Due to the declining well capacity in wells 6 and 7 in Pressure Zone 1,

one additional water supply was recommended and approved in the 2021 IRP and is currently being developed. It should also be noted that several of the wells appear to have reached the end of their useful life and replacement will be needed within the 20-years planning period. The wells include Well 6, Well 7 and possibly Well 8.

Storage Capacity

Each pressure zone storage capacity was analyzed separately for Scenario-A and Scenario-B. Pressure Zone 1 meets existing and 20-years projected future storage capacity regulatory requirements with a total storage and alternative pumping capacity of 1.44 million gallons (existing requirement is 1.14 million gallons and future requirement is 1.28 million gallons). Pressure Zone 2 currently meets existing storage capacity regulatory requirements for Scenario-A, but not for Scenario-B with a total storage capacity of 1.77 million gallons (existing requirement is 1.43 million gallons). According to the Nevada Division of Environmental Protection ("NDEP"), of the two scenarios, the storage capacity needs to meet the largest of the two demands, which is Scenario-A. The 20-year projection for storage capacity is estimated at 1.63 million gallons, which will meet Scenario-A, but not Scenario-B. Scenario-A is the larger of the two demand scenarios. Pressure Zone 3 meets the existing storage capacity requirement and future (100% built out at a storage requirement of 0.35 million gallons) storage capacity requirements when supplemental storage from Tank 4 is boosted up into Tank 3. Pressure Zone 4 has 3.03 million gallons of storage capacity and meets storage capacity requirement for existing (Scenario-A, but not Scenario-B) and will meet the 20-years projection for storage capacity (Scenario-A, but not Scenario-B), with Scenario-A having the largest demand. See Tables 4.04 – 4.11 in the 2024 IRP "Volume IV" for the Cold Springs Division.

Spanish Springs Division

Well Capacity

With the declining well capacities in Well 1 and Well 2, the well capacity for the Spanish Springs water system can meet existing MDD but not the future projected MDD (at buildout). The existing total well capacity is 875 gallons per minute (gpm) and the existing MDD is 866 gpm. The future projected (2044) total well capacity is anticipated to be 908 MDD. It should be noted that both existing production wells are reaching the end of their useful life. As a reminder, the rehabilitations of Well 1 (2017) and Well 2 (2016) helped to return some loss capacity from the wells, the structural integrity of the screen intervals in both wells are failing. Since 2018, GBWC has been looking for a suitable site for a new well in Spanish Springs. Multiple sites have been drilled and tested unsuccessfully. The sites either didn't meet water quality or quantity. To date, no new sites have been identified to drill. A rehabilitation of Well 2 (with a well liner) is being proposed in the Action Plan to hopefully extend its useful life, as one alternative to address the declining capacity.

Storage Capacity

Each pressure zone storage capacity was analyzed separately. The Lower Pressure Zone currently does meet the storage capacity regulatory requirement with a storage tank capacity of 0.55 million gallons and alternative well capacity of 1.26 million gallons for a combined total capacity of 1.81 million gallons (existing requirement of 1.07 and future requirement of 1.11 million gallons). The Upper Pressure Zone will meet existing and future storage capacity regulatory requirements with a total tank storage of 0.35 million gallons and alternative booster station capacity of 1.25 million gallons for a combined total capacity of 1.61 million gallons (existing requirement is 0.85 and future requirement of 0.89 million gallons). The reason these two pressure zones can now meet the existing and future storage capacities is the addition of backup generators installed at Wells 1, and 2

and at the booster pumping station. See Tables 4.02 – 4.05 in the 2024 IRP, Volume V for the Spanish Springs Division.

Q.19 PLEASE PROVIDE A SUMMARY OF THE HYDRAULIC MODEL SELECTION AND DEVELOPMENT.

A.19 The hydraulic water models for the GBWC divisions were analyzed using the Bentley® WaterCAD® v8i modeling software. The existing models for the water systems were selected and updated to ensure that each GBWC Division's model's matched current demand conditions meeting the existing conditions (ADD, MDD, PHD). Once each GBWC divisions' hydraulic model runs for the existing conditions met the current demand condition, the demands were adjusted up to account for projected growth for the planning periods (Action Plan-2027 and Preferred Plan-2044).

The hydraulic modeling scenarios performed included:

- Existing MDD
- Existing MDD with fire flow
- Existing Peak Hour Demand (PHD)
- 3-Year Action Plan (2027) MDD
- 3-Year Action Plan (2027) MDD with fire flow
- 3-Year Action Plan (2027) PHD
- Future (2044) MDD
- Future (2044) MDD with fire flow
- Future (2044) PHD

Q.20 PLEASE PROVIDE A SUMMARY OF THE DISTRIBUTION SYSTEM EVALUATION.

A.20 **Pahrump Division**

Please refer to the Testimony from Mara Quiroga (Lumos & Associates, Inc.) for specific information related to the distribution system evaluation for the Pahrump Division.

Spring Creek Division

- 200 Tract -- The 200 Tract distribution piping is currently divided into two pressure zones, which cover more than one hundred feet of elevation change. This gives rise to a static pressure range greater than 40 psi from the low boundary to the high boundary of the pressure zones. The largest pressure differences in the system are observed when the wells are pumping water into the system. Wells 1 and 11 have discharge pressures as high as 175 psig, while the Well 3 discharge pressure has been observed at 165 psig. This leads to high pressures throughout the distribution system that exceed 100 psig in many areas. VFDs have been installed on Wells 1, 3, and 11, which helps alleviate high pressures when the well pumps are operating. The undersized distribution pipelines, 2-inch to 4-inch diameter in many areas, cannot deliver sufficient fire flows at any pressure. There is also severe head loss along the primary transmission line serving the Twin Tanks. Throughout the 200 Tract, there are several other areas in which primary transmission lines are undersized, the most noticeable being the waterlines to and from the PRV at the north end of the 200 Tract (Lily/Sterling PRV). A new PRV on Hayland Drive was installed as part of the Phase 4 pipeline replacement project to address this issue (completed in 2023). Even after four (4) phases of pipeline replacement projects since 2022, pressures range from 41 – 117 psi and

115 – 148 in the Lower and Upper pressure zones. Similarly, fire flow deficiencies are 61 and 16 nodes in the Lower and Upper pressure zones.

- Housing Tracts -- The Housing Section consists of three separate tracts and six distinct pressure zones. The Housing Section tracts are interconnected with PRVs and/or isolation valves. Section 2.3 of Volume III of the 2024 IRP provides a detailed description of the Housing Section pressure zones. The pressure zones generally cover too much of an elevation range to provide proper pressures throughout the zones. Similar to the 200 Tract, high discharge pressures for wells in the 100 Tract result in high distribution system pressures when the well pumps are operating (above 120 psig). The majority of the distribution pipelines in the 400 Tract are smaller than 6-inch diameter, which results in a reduced ability to serve both peak demands and fire flows throughout much of the area.

Annual pipeline replacement projects are being recommended in the Action Plan for the Spring Creek Division in Section 8 of Volume III of the 2024 IRP.

Cold Springs Division

The hydraulic model was analyzed for existing, 3-year Action plan (2027), and Preferred Plan (2044) demands basis for ADD, MDD + fire flow, and peak hour demand ("PHD") conditions. The pipeline network was also evaluated based on flow velocities and head losses as they related to pressures throughout the distribution system. With the exception of some very minor issues (high pressures in small area of Pressure Zone 1), no significant deficiencies were identified in any of the model runs. Section 4.2.2 of Volume IV of the 2024 IRP contains more detailed information on the minor issues associated with the hydraulic model runs for the Cold Springs Division.

Spanish Springs Division

The hydraulic water model was analyzed for existing, 3-year Action Plan (2027), and Preferred Plan (2044) demands basis for ADD, MDD + fire flow, and PHD conditions. Since buildout for the water system is anticipated to occur within the 3-year action plan period, the analysis for the 3-year Action Plan (2027) and Preferred Plan (2044) have the same results. No significant deficiencies were identified in any of the model runs. Section 4.2.2 of Volume V of the 2024 IRP contains more detailed system information on the minor issues associated with the hydraulic model runs for the Spanish Springs Division.

Q.21 PLEASE PROVIDE A SUMMARY OF THE WASTEWATER TREATMENT PLAN.

A.21 **Pahrump Division**

Please refer to the Testimony from Mara Quiroga (Lumos & Associates, Inc.) for specific information related to the wastewater treatment plan for the Pahrump Division.

Spring Creek Division

GBWC's Spring Creek Division has one wastewater treatment plant, the Mar-Wood WWTP, a conventional activated sludge treatment plant with a leach field located in the 100 Tract; and two septic systems: Septic #2, a septic tank system in the 200 Tract designed for a maximum of 10 customers; and Septic #3, another septic tank system in the 400 Tract designed for a maximum of 10 customers.

The septic tank systems in the 200 and 400 Tracts are small systems and are not anticipated to serve more than a few additional customers. As of end of 2022, the septic systems in the 200 Tract (Septic #2) and 400 Tract (Septic #3) were serving five (5) and seven (7) customers each.

As of end of 2022, the Mar-Wood WWTP was serving 142 total customers (125 active accounts and 17 inactive accounts). The ADF to the WWTP from 2020-2022 was 38,700 gpd. The AFMM for the same period averaged 43,876 gpd. One of the proposed Action Plan projects in the 2021 IRP was the replacement/expansion of the existing Mar-Wood WWTP, which Staff opposed. The proposed Action Plan project was withdrawn without prejudice by GBWC as part of the stipulation in the 2021 IRP Action Plan. GBWC thereafter worked with Commission staff, Elko County and NDEP to institute a waiver for all new connections to be served by a septic system until additional capacity at the WWTP becomes available. If the waiver is not extended and development continues in the 100 Tract sewer service area in accordance with the recent requests for service, the maximum monthly flow will likely exceed the 50,000 gpd design flow capacity of the WWTP by 2025. A total plant capacity of 75,000 gpd will be needed to accommodate buildout of the service area as recommended in the PER. The preferred alternative identified in the PER is a new 75,000 gpd Aero-Mod WWTP, with in-basin equalization and surge capacity, to replace the existing 50,000 gpd Mar-Wood WWTP. An additional 25,000 gpd leach field capacity will also be required for a total disposal capacity of 75,000 gpd to match the treatment plant capacity. *See* Section 3.4.1.2 of Volume III of the 2024 IRP relating to the Spring Creek Division.

Additionally, several changes have occurred since submission of the 2018 and 2021 IRPs that further support the need for the project. These changes include additional deterioration of the concrete treatment structures (see Section 2.4.2.1 of Volume III of the 2024 IRP), an increase in near-term growth projections based on multiple new service requests (see "Near-Term Growth", subsection under Section 3.4.1.2 of Volume III of the 2024 IRP), updated historical flows including data from a new flow meter (see Section 3.4.1.1 of Volume III of the 2024 IRP), a change in forecasting methods (see "Updated Methodology", subsection under 3.4.1.2 of Volume III of the 2024 IRP), and the

completion of a Preliminary Engineering Report ("PER"), which has been reviewed and approved by NDEP. The PER was prepared by Lumos to evaluate WWTP replacement alternatives and to recommend a preferred alternative. The report was submitted to NDEP in December 2018 and an approval letter was received by NDEP in January 2019 for the preferred alternative. The preferred alternative identified in the PER is a new 75,000 gpd Aero-Mod WWTP (with in-basin equalization and surge capacity) to replace the existing 50,000 gpd Mar-Wood WWTP. An additional 25,000 gpd leach field capacity will also be required for a total disposal capacity of 75,000 gpd to match the treatment plant capacity. The Mar-Wood WWTP Replacement Project is included in the Preferred Plan for the Spring Creek Division at Section 7 of Volume III of the 2024 IRP.

Additionally, a dedicated building is recommended at the WWTP site for routine sampling and logging activities. The only covered space at the WWTP is an open shed containing the aeration blowers. However, this space is not enclosed and does not provide protection against weather for the operators, nor does it have sufficient space for sampling work. Note that if the Mar-Wood WWTP Replacement Project is constructed, a blower building is included for installation of the blowers and compressors under a roofed structure. This space could serve as a safe working environment during cold weather extremes and could serve as a space for sampling activities instead of a separate building as included in the Preferred Plan.

Q.22 DOES THE 2024 RESOURCE PLAN FOR GBWC'S DIVISIONS MEET THE REQUIREMENTS OF THE COMMISSION'S REGULATIONS?

A.22 Yes, and I have attached to my testimony a checklist that cross references the regulations to the IRP document. Please see Attachment MH-1 to Exhibit ____. Regulation Checklist.

Action Plan Projects

Q.23 HOW WERE THE ACTION PLAN PROJECTS DEVELOPED FOR EACH OF THE DIVISIONS.

A.23 The recommended Action Plan projects for each GBWC division target the water and sewer systems in a way that help maintain and improve the customers' LOS, provide redundancy to the system, and ensure compliance with NAC regulations. Every option provided in the Action Plan represents the most viable option that is cost-effective and beneficial for both customers and the Company. For every action plan item related to a forecasted demand deficiency, we have considered all relevant and required factors in reaching our determination. The professional engineers conducted assessment to determine the best valued engineering alternative that would benefit the customers and GBWC.

The three-year action plan projects prioritize immediate asset concerns that have been identified through the development of the asset management component, customers LOS, NAC compliance, and staff recommendations. For the 2024 IRP, the capital improvement projects were reorganized using different categories for water and wastewater. For the water systems, categories were broken out into Water Resource, Water Distribution and Water Storage. For the wastewater systems, a general category of Wastewater Treatment was used for the appropriate divisions. In addition, a tiered priority structure (High/Medium/Low) was developed for the Action Plan Projects in each division.

Summaries of Action Plan projects in the Spring Creek, Cold Springs, and Spanish Springs divisions are set forth below. Please refer to the Testimony from Mara Quiroga (Lumos & Associates, Inc.) and James T. Eason for specific information related to the Action Plan projects in the Pahrump Division.

Spring Creek Division Action Plan Projects

Spring Creek - Water Resources

Q.24 WHY IS THE REPLACEMENT OF WELL 12 IN THE 400 TRACT A PRIORITY?

A.24 Well 12 has had issues with the pumping water level drawing below the upper screened interval causing problems with the well such as air entrainment, which lowers water production. In May 2017 the well underwent a rehabilitation that included the installation of patches to repair holes identified in the screen interval. The well was brought back online with the original pump and motor which is a FlowServe Model 10EMM turbine pump assembly and a 150-HP U.S. vertical turbine hollow shaft motor. A VFD was also installed in 2017, which has helped address the air entrainment issues. The final video log of the well after the rehabilitation indicated that the well cleaning was moderately successful.

On April 27, 2022, Well 12 went down. The pump was removed and a video survey revealed the portions of the screen were heavily plugged starting at 180 feet below ground surface. The well appeared to need a full cleaning and rehabilitation. GBWC identified Well 12 as a critical well to the system. Customers in the lower pressure zone reported complaints of milky water as a result of relying on Well 8 with Well 12 being offline. Given Well 12's critical importance, cleaning and rehabilitation were postponed to the fall when demand was lower.

In the beginning of May 2023, Well 12 underwent another rehabilitation. The well was video surveyed, shock chlorinated, double acid treated, and redeveloped by airlifting and swabbing after each acid treatment. The pump assembly was rebuilt and installed with the replacement of some of the column pipe and shaft. The rehabilitation was completed at the end of May 2023. Currently, the well has 7 swage patches in it. The objective is to try and get 3-4 more years out of the well and then re-drill in the same location.

The replacement of Well 12 has been established as a High Priority project. The previously approved replacement of Well 8 in the 400 Tract is currently underway, and an 8-inch test

well was previously drilled in 2021 at the terminus of Scrub Oak Drive. However, if Well 12 fails, the Well 8 test well does not have the capacity to make up for the loss of Well 12's capacity in the 400 Tract.

Spring Creek - Water Distribution

Q.25 WHY IS THE PIPELINE REPLACEMENT PROJECT A PRIORITY?

A.25 It is recommended in the Action Plan and the Preferred Plan that the Spring Creek Division continue with pipeline replacement projects for both the 200 Tract and the Housing Section. The work would target replacement of pipeline that is undersized, subject to frequent breaks and leaks, and/or that has poor condition ratings (e.g. condition ratings of "very poor" and "poor", red and orange in the GIS Mapping Database, respectively). The Spring Creek Division has been documenting breaks and leaks in both tabular and map format to help identify critical areas and prioritize pipeline replacement projects. A map showing the location of breaks and leaks from 2010-2022 is included in Appendix M. Distribution system leaks and fire flow capacity were noted as significant deficiencies for the Spring Creek Division's distribution systems in the NDEP Bureau of Safe Drinking Water ("BSDW") sanitary survey inspection letters, dated January 6, 2021. This highlights the severity of the distribution system deficiencies and the importance of continuing and prioritizing pipeline replacement projects.

The four phases of pipeline replacement that have already been completed in the 200 Tract were previously approved by the Commission in prior Resource Plan proceedings. Like the current Action Plan project, those earlier projects addressed both undersized pipeline and pipeline that had been experiencing multiple breaks and leaks. Hydraulic modeling report results showed that the pipeline replacement projects have significantly improved available flows and residual pressures near the project area during fire flow conditions. Available fire flows will continue to improve with additional pipeline replacement projects.

For the pipeline replacement projects, all the recommended pipes to be replaced will be reconstructed with the appropriate pipe size (8-inch minimum per GBWC standards) to ensure proper hydraulic pressures and flows are achieved. The projects will be coordinated with Elko County and the Spring Creek homeowner's association ("SCA") to help reduce costs associated with road repairs and the associated impacts on ratepayers. Water system appurtenances will also be replaced or added to the system and will be included in the project design (e.g. isolation valves, water service connections, fire hydrants).

Replacement of pipe in poor condition will help reduce pipe breaks and leaks, which in turn will reduce non-revenue water in the system. Pipeline replacement projects will also help bring the system into conformance with NAC standards by using minimum water main diameters and by adding valves and fire hydrants as necessary to meet maximum spacing requirements. Prioritization and scheduling of replacement projects by GBWC will be coordinated with Elko County, the SCA, and other utilities to coincide with annual road repair projects to reduce construction impacts and for cost efficiency. Right of way permits will first need to be approved by SCA and then the County in accordance with a Memorandum of Understanding between the two agencies. This project has been established as a Medium Priority project.

Spring Creek - Water Storage

Q.26 WHY IS THE REHABILITATION OR REPLACEMENT OF THE HIGH TANK IN THE 200 TRACT A PRIORITY?

A.26 The 500,000-gallon High Tank is 53 years old and is well beyond its useful service life. The High Tank is in need of replacement or rehabilitation to ensure adequate operational, emergency, and fire flow storage in the 200 Tract water system and to meet required system

pressures in accordance with NAC standards. The rationale for the replacement or rehabilitation of the 500,000-gallon tank is outlined below.

Tank Condition

The High Tank was inspected in 2014, 2015, 2019, 2020 and 2023 and was observed to be in poor condition. A Lumos structural engineer inspected the tank in preparation for the 2021 IRP and identified that the tank has a compromised structural integrity. The Spring Creek Division is now having an inspection of the High Tank conducted annually due to its physical condition. In the 2015 inspection, the inspector noted unacceptable amounts of material loss from corrosion on the tank floor, shell, and roof ranging from 28-54% based on ultrasound measurements. The 2019 inspection also noted an overall degradation of the steel with moderate to heavy cracking in the walls. During the 2019 inspection, the tank floor was found to be in such poor condition that cleaning of sediment could not be performed without risk of further damage. The six structural support columns were also found to be in fair to poor condition with heavy cracking, de-lamination, 33% uniform surface corrosion, and 50% rust nodules. The overall recommendation in the 2020 tank inspection report was to decommission and replace the tank due to heavy amounts of metal loss and coating failure. The 2023 tank inspection report has not been provided to GBWC as of the end of February 2024, but is expected to provide similar overall recommendations and concerns as did the 2020 tank inspection report.

In addition to the tank inspections capturing the severe condition of the tank, a sanitary survey performed by NDEP BSDW in 2017 noted that the High Tank is at or beyond its useful life with a possible leaking floor because of healthy vegetation observed near the base of the tank. In the most recent sanitary survey inspection letter, dated January 6, 2021, NDEP carried forward the 2017 comment that the “tank is at or beyond its useful life” and elevated it to a “significant deficiency”. This significant deficiency highlights the severity

of tank condition and the importance of replacing the tank, especially when noting that fire flow capacity was also noted as a significant deficiency for the 200 Tract.

Fire Protection

In September 2017, a wildfire burned to the big Elko "E" signage, located on Lamoille Summit, which is located between Elko and Spring Creek, and was dangerously close to approaching homes in the 200 Tract. Wildfires are a major threat in Elko County, and the availability and access to fire flow storage in water storage tanks, such as the High Tank, are of critical importance for firefighting and protection of the community. Without the High Tank, the available fire flows would be reduced significantly in the 200 Upper Zone at several locations. Although the 200-2 Tank is also interconnected with the 200 Upper Zone, the base elevation of the 200-2 Tank (5,735 feet) is 65 feet lower than the base elevation of the High Tank (5,800 feet). Even though the 200-2 Tank can provide water to the 200 Upper Zone, the lower elevation of this tank cannot provide proper distribution pressure and flows to adequately support the 200 Upper Zone. The 200-2 Tank was not designed to provide fire storage for the 200 Upper Zone; rather, it was designed at a location to provide additional elevated storage for the 200 Lower Zone. Replacement/rehabilitation of the High Tank is needed to maintain the LOS for fire protection that is currently being provided to customers in the 200 Upper Zone.

There is also potential for a wildfire to damage other critical facilities such as the booster pumps at the Twin Tanks site. The booster station is the only means for supply water (from the three existing wells) to be conveyed from the 200 Lower Zone into the 200 Upper Zone. Damage to these pumps would reduce available fire flows and firefighting capabilities even more drastically. In preparing the 2024 IRP, Lumos conducted three scenario hydraulic water model runs on the 200 Tract. They included the following:

- **Scenario-1**: Involves a fire flow and maximum day demand flow requirement with the High Tank operational. The hydraulic water model identified 11 nodes in the Upper Zone that did not meet fire flow with a minimum residual pressure of 20 psi.
- **Scenario-2**: Involves a fire flow and maximum day demand flow requirement with the High Tank not operational and the booster station operational. The hydraulic water model identified 16 nodes in the Upper Zone that did not meet fire flow with a minimum residual pressure of 20 psi.
- **Scenario-3**: Involves a fire flow and maximum day demand flow requirement with the High Tank not operational and the booster station not operational. The hydraulic model identified 49 nodes in the Upper Zone that did not meet fire flow with a minimum residual pressure of 20 psi.

In all cases, the Upper Zone sees an increased deficiency in fire flow requirements without the use of the High Tank.

System Operations

Replacement/rehabilitation of the High Tank has many operational, health, and safety benefits including the following:

- Reduces strain on Wells 1, 3, and 11 in meeting maximum day and peak demands;
- Provides a reliable source of fire flow to the 200 Tract Upper Zone and protects the health and safety of residents in an area where wildfires are a major threat;
- Provides a source for fire protection in the event that a wildfire damages other critical infrastructure in the 200 Tract such as the booster pumps at the Twin Tanks site; and
- Provides reserve capacity to meet demand during an emergency event such as a waterline break, arsenic treatment plant failure, booster pump failure, or well pump failure.

For the 2024 IRP, Lumos evaluated three alternatives to address the ongoing issues with the High Tank, with estimated costs. The first alternative is a complete replacement of the High Tank, the second is a rehabilitation of the High Tank using an internal liner material. The third alternative that Lumos evaluated is to demolish the High Tank and make upgrades to the existing booster station at the Twin Tanks to provide a constant hydraulic pressure to the Upper Zone. The first alternative (replacement) is the most expensive but would provide an asset that would have the longest useful life. The second alternative (rehabilitation) is the least expensive and would provide for at least another 10 years of useful life of the asset. The third alternative is the second most expensive alternative and may not be approved by NDEP due to the additional loss in fire flow requirements for the Upper Pressure Zone as the water model showed, which would have to be provided with the water application project.

For the rehabilitation project, the High Tank would be rehabilitated using an internal NSF-61 liner material. A new steel floor would need to be installed as well as new roof supports. New design plans would need to be generated and submitted to NDEP. The rehabilitation project would include the installation of cathodic protection to reduce corrosion and extend the service life of the new tank. Of the three alternatives Lumos evaluated, GBWC is proposing a rehabilitation of the High Tank as the "Preferred" Alternative in the Action Plan due to cost and anticipated approval from NDEP. The rehabilitation project is about half the cost of a new storage tank. It allows GBWC to test out the installation of a liner material in a failing tank to see if future tanks can be rehabilitated in the same manner. According to a storage tank specialist company, these liners should only be considered for welded steel storage tank use. The bolted tanks have the ability to tear through the liner over time due to the way the bolts protrude inside the tanks. The rehabilitation would also include the exterior of the High Tank to be sand blasted and recoated.

The rehabilitation or replacement of the High Tank has been established as a High Priority project.

Spring Creek - Wastewater Treatment

Q.27 WHY IS THE RECONDITIONING OF THE WWTP LIFT STATION AND DE-RAGGING SYSTEM IN THE 100 TRACT A PRIORITY

A.27 The interior of the concrete wet well for the WWTP Lift Station is showing signs of deterioration (e.g. exposed aggregates) from hydrogen sulfide gases generated from the sewer collection system. Rehabilitation of the concrete interior is needed to mitigate the corrosion damage, protect the concrete from further deterioration, and to extend the service life of the structure. Some of the internal metal components of the lift station are also in need of replacement due to corrosion. An interior liner system such as SprayWall, as manufactured by Sprayroq, is recommended for the concrete wet well (or an equal). SprayWall is a solvent-free, 100% solid, rigid polyurethane liner system that can provide structural reinforcement if needed in addition to corrosion protection. Rehabilitation work would include concrete surface repairs, spray application of the liner system, and bypass pumping while the station is out-of-service. As part of the project, the corroded internal metal components will be replaced with a corrosion resistant material such as stainless steel. Typically a 3 to 4 hour period is needed for installation of spray-on liner systems (concrete repairs, liner application, curing time, testing and inspection), but the total out-of-service duration will depend on the extent of repairs and also time for removal and reinstallation of the lift station pumps and internals (i.e., a 2-3+ day period total). Testing and inspection will be required by a third-party to ensure the integrity of the liner system and typically includes holiday/pinhole testing and adhesion testing.

The increase in popularity of toilet wipes is creating mechanical and treatment issues at the Mar-Wood WWTP. The Spring Creek Division's operators are removing approximately

70 pounds of wipes out of the Mar-Wood WWTP weekly. The existing de-ragging equipment was only designed to remove large rags and debris before entering the treatment train. Some research into de-ragging systems designed to remove these wipes has resulted in the Duperon Dual Auger System that can be installed into the WWTP Lift Station Inlet. A screen collects the wipes, and through an auger system, lifts the wipes out of the Lift Station and into a disposable bin that can be dumped periodically. This project can be incorporated into the Lift Station Rehabilitation Project thus providing cost savings. This project has been established as a High Priority project.

Q.28 WHY IS THE SCADA WASTEWATER UPGRADE IN THE 100 TRACT A PRIORITY?

A.28 The current SCADA system associated with the Mar-Wood WWTP is very limited in its functions and ability to monitor critical components. An upgraded system is needed in order to better monitor the condition of the WWTP Lift Station and Mar-Wood WWTP. GBWC is looking to add RTU's to the WWTP Lift Station and Mar-Wood WWTP along with an upgraded SCADA system in order to monitor and control specific attributes in the systems. These would include flow rates, pumps (on/off), water levels, and call-out alarms in the WWTP Lift Station. Regarding the Mar-Wood WWTP, the Spring Creek Division wants the ability to monitor dissolved oxygen, blowers (on/off), effluent pumps and flows, chlorine residual, and run times. This project has been established as a Low Priority project.

Cold Springs Division Action Plan Projects

Cold Springs - Water Distribution

Q.29 WHY IS THE PRV INSTALLATION BETWEEN TANK 3 AND TANK 4 PROJECT A PRIORITY?

A.29 Pressure Zone 4 is currently deficient for storage as shown in the NAC System Capacity Analysis in Section 4.1.3, specifically when ADD demands and fire flow demands are

present with the largest producer out of service. In order to address the storage deficiency, it is recommended a PRV station be installed to transfer flows from Pressure Zone 3 to Pressure Zone 4 during fire conditions. In order for this transfer of flow to be considered as an alternative source, there needs to be an automated valve between the two tanks, which would require a PRV. The average PRV has a life expectancy of 40 years.

The PRV will be located near the booster pump station between Tank 3 and Tank 4. The PRV will be branched off the 6-inch booster pump station line that fills Tank 3. For cost estimating purposes, a 6-inch PRV with a 3-inch bypass was assumed for the station and the recommended model is a Cla-Val 90-01 PRV. The downstream pressure setting for the PRV will be low, around 20 psi, because this water transfer will only be used to assist Pressure Zone 4 during fire conditions. The PRV will also need specific controls to shut off while the booster pump station is running to fill Tank 3. When open, the PRV would fill Tank 4 with the additional storage required to meet the demands. Additional modeling will be required to finalize the design of the PRV station. This project has been established as a High Priority project because it is critical to meeting fire flow storage requirements for Zone 4.

Cold Springs - Water Storage

Q.30 WHY IS THE RECONDITIONING OF TANK 1 PROJECT A PRIORITY?

A.30 Storage Tank 1 is located in Pressure Zone 1 and was constructed in 1999. The average useful life of a storage tank is 45 years, meaning that Tank 1 has approximately 21 years of useful life left. Tank 1 was last inspected in 2023 where minor seepage was observed. Reconditioning is necessary for aging storage tanks to keep them in good condition. Its common to need to recondition a storage tank in order to ensure it meets it's expected useful life. Standard interior/exterior sand blast and recoating of tanks meets this type of reconditioning.

The recommended reconditioning project is an interior/exterior coating project with exterior repairs to meet OSHA compliance. The interior coating will consist of sandblasting and an epoxy coating in the atmospheric zone and an elastomeric polyurethane coating in the immersion zone of the tank. Additionally, the roof will be re-caulked. Exterior coating includes sandblasting, a priming epoxy coat, and a finishing polyurethane coat. Exterior repairs included in this project are recommended based on OSHA requirements and listed below:

- Installation of self-closing gate at roof access for OSHA compliance.
- Installation of new gaskets on the manways and roof hatch.
- Installation of flex cable safety climb on exterior ladder
- Install three (3) bolts on roof anchor points.
- Install new FRP interior ladder.
- Install new roof vent and screen.
- Install new decals on the LLI gauge board.

This project has been established as a High Priority project because allowing tanks to deteriorate into poor conditions increases the risk of premature failure (Not reaching its expected useful life), which would compromise the entire water system.

Q.31 WHY IS THE REHABILITATION OF TANK 2 PROJECT A PRIORITY?

A.31 Storage Tank 2 is located in Pressure Zone 2. Tank 2 was relocated to its current location in 1975 (49 years ago) from another site and the actual age of the tank is unknown. The nominal useful life expectancy for a bolted steel tank is 45 years, meaning the tank is past its useful life. Tank 2 was last inspected in 2021 and was given poor ratings for most of its internal condition assessments including the internal sidewall plates, internal floor plate, common inlet/outlet, and manways.

The fire marshal having jurisdiction has the sole authority to determine, on a case-by-case basis, if fire flow storage can be conveyed from a high-pressure zone in a system or must be stored in the specific pressure zone. In discussions with TMFPD's Fire Marshal on January 8, 2019, and December 22, 2023, the Fire Marshal advised that TMFPD is not amenable to removing Tank 2 in any scenario because Cold Springs Division System is a stand-alone (isolated) water system. TMFPD's focus is on the minimum requirements for fire flow of the adopted fire code, and it was advised that they are not apt to give consideration to removing and/or reducing an existing water supply in any way, especially in an isolated water system. For documentation of all correspondence with TMFPD related to Tank 2 and the required fire storage within the Cold Springs system, see Appendix M..

When a water storage tank fails, it typically fails along a welded seam. This failure is commonly called "unzipping" of a storage tank due to the rapid failure. If a tank of this size and volume were to fail in this manner, it would result in a significant release of water all at once. Due to the high seismic activity in the area of Tank 2, even a small earthquake could trigger a welded seam failure. Tank 2 is a liability in its current state and in the event of failure, the pressure zone would not have sufficient storage for a fire event.

Two alternatives were assessed for Tank 2. A full replacement and a factory rehabilitation were considered for this project and are described in the 2024 IRP, Volume 4. GBWC's preferred alternative, as presented in the Cold Springs Division's Action Plan, is a factory rehabilitation, based on its reduced cost when compared to a full tank replacement. Tank 2 is past its useful life and in very poor condition. A factory rehabilitation of Tank 2 will result in an asset that isas close to a new tank as possible. In comparing the two alternatives, the factory rehabilitation offers the better solution and at a lower price compared to a full replacement.

The recommended factory rehabilitation project is a complete tear down of the original tank parts. The parts are then transported back to the contractor's shop and either reconditioned or completely remanufactured with replacement parts. Once all the parts of the tank have been assessed and either reconditioned or replaced, the parts are transported back to the site and the tank is reassembled in the exact same location and to the exact same specifications as originally designed. Additionally, a cathodic protection system would be installed to prevent further corrosion and is included in the cost estimate. Exterior repairs included in this project are recommended based on OSHA requirements and listed below:

- Installation of self-closing gate at roof access for OSHA compliance.
- Installation of new gaskets on the manways and roof hatch.
- Installation of flex cable safety climb on exterior ladder
- Install three (3) bolts on roof anchor points.
- Install new FRP interior ladder.
- Install new roof vent and screen.
- Install new decals on the LLI gauge board.

The factory rehabilitation or replacement of Tank 2 has been established as a High Priority project because allowing tanks to deteriorate into very poor condition increases the risk of a failure which would compromise the entire water system.

Spanish Springs Division Action Plan Projects

Spanish Springs - Water Resources

Q.32 WHY IS THE REHABILITATION OF WELL 2 (SUKI WELL) PROJECT A PRIORITY?

A.32 A new well was approved by the commission in the 2018 consolidated IRP. Multiple sites were evaluated and some of the sites were drilled looking for good water quality and water

quantity. Over the past few years, none of the proposed locations have had a positive outcome. Due to several constraints in the service area, there really isn't any additional locations that show promise. The real only other alternative now is to rehabilitate Well 2 to help extend its useful life and sometime in the future, redrill Well 1.

Well 2 was originally drilled and constructed in 1977. Well rehabilitation is proposed due to the condition of the well casing, which is nearing the end of its service life. Redrilling the well is not an option due to limited space on the associated parcel and the proximity of nearby septic systems. Based on its age and observed condition, it is unlikely that the existing well screen can withstand another cleaning without becoming compromised. The first step of the rehabilitation is to pull all pumping equipment and appurtenances from the existing well. A video survey should be completed for the entire well after it is flushed with clean water; this will help to document the pre-rehabilitation condition of the well. A nominal 10-inch diameter liner composed of stainless steel should then be installed in the original casing. Installation of filter pack between the new liner and existing well casing is not interpreted as practical and is not recommended due to limited annulus space. The well should then be acid treated and cleaned via swabbing. The well can also be pump tested to design the pumping equipment for the rehabilitated well. If necessary, GBWC may utilize or purchase water from Truckee Meadows Water Authority while Well 2 is out of service. The rehabilitation work should be completed during the winter when system water demands are at their lowest. This project has been established as a High Priority project because it is critical in order to extend the life of the well and maintain the current service area production capacity and meet customer demand.

Spanish Springs - Water Distribution

Q.33 WHY IS THE AMI METER REPLACEMENT PROJECT A PRIORITY

A.33 GBWC is recommending upgrading their current Automatic Meter Reading (AMR) System to Advanced Metering Infrastructure (AMI) System. An AMR System is the communication technology water utilities use to automatically collect water consumption and status data from water meters. AMR systems can be either walk-by or drive-by. An endpoint is connected to the meter's encoder register. The endpoint captures water flow and alarm data which is collected by utility personnel by walking or driving by with a data receiver in proximity to the device. After collection, the meter data is transferred to a database where utilities can monitor and analyze usage, troubleshoot issues, and bill customers based on actual consumption.

An AMI System is an integrated system of water meters, communication networks and data management systems that enables two-way communication between meter endpoints and utilities. Unlike AMR, AMI doesn't require utility personnel to collect the data. Instead, the system automatically transmits the data directly to the utility at predetermined intervals, freeing up valuable time for operators to be more proactive in conducting other critical activities. Meter data is sent to utilities via a fixed network. The utility can use the data to improve operational efficiencies and sustainability by effectively monitoring water usage and system efficiency, detecting malfunctions, and recognizing irregularities quicker. In today's world, the existing cellular networks designed to minimize downtime, can be used to make sure meter data is collected securely and without interruption.

GBWC is planning to conduct the upgrade using existing staff to cut down on costs. The upgrade will require the addition of a few strategically located towers and some software modifications. The preliminary plan is to conduct the transition over a 3-year period starting in January 2025; a tentative objective is to complete approximately one-third of the AMI installations during each of these years. This project has been established as a Medium Priority project.

Spanish Springs - Water Storage

Q.34 WHY IS THE RECONDITIONING OF TANK 2 (INTERIOR & EXTERIOR) PROJECT A PRIORITY?

A.34 Storage Tank 2 is a nominal 350,000-gallon welded steel storage tank, originally constructed in 1993. The most recent inspections of the tank occurred in 2019 and 2023. Some corrosion was observed on the tank's roof and paint coat. Based on the age and condition of the tank, both interior and exterior reconditioning is recommended to help preserve and extend the tank integrity. It is anticipated that the following reconditioning work will be conducted on Tank 2: recondition the exterior tank piping, sand blast interior of tank and recoat, install cathodic protection, sand blast the tank exterior and recoat the tank exterior. This project has been established as a High Priority project because it is critical for maintaining the tank integrity and upholding the necessary storage capacity for the Spanish Springs Division.

Conclusions and Summary Regarding Action Plan Projects

Q.35 HOW WERE THE PROJECTS IN THE 2024 IRP PRIORITIZED BETWEEN THE ACTION PLAN AND THE PREFERRED PLAN?

A.35 Projects in the Action Plan were determined to be priorities based on current needs to maintain GBWC's customers' existing levels of service. With so many detected issues with storage tanks across GBWC's various divisions, GBWC has established projects to replace, refurbish, and extend its storage tanks' nominal useful life expectancy as among its highest priorities. Also, since many of GBWC's wells have become a major concern, replacement and refurbishing of lost well capacity has also become a major priority in order to maintain the customers' current service levels. In working with GBWC to establish priority levels, Lumos also considered how to lower distribution pressures and reduce pipeline breaks in GBWC's water systems. The pipeline replacement projects that are recommended in the

2024 IRP will provide the best way to achieve better fire flow capacity and also reduce non-revenue water concerns.

Q.36 ARE ALL OF THE PROJECTS IN THE ACTION PLAN REQUIRED FOR THE PROPER OPERATION OF THE UTILITIES?

A.36 All of the recommended Action Plan items are required in order for GBWC to provide the level of service that GBWC customers experience today. The goal of the Action Plan projects is to maintain this level of service, but at the same time replace, refurbish, or improve major assets that need attention today.

Preferred Plan Projects

Q.37 PLEASE DISCUSS THE LONG-RANGE IMPROVEMENTS NECESSARY AS DETAILED IN THE PREFERRED PLAN IN THE 2024 RESOURCE PLAN.

A.37 The projects in the Preferred Plan are recommended to keep or bring GBWC in compliance with NAC water and wastewater systems construction standards and fire flow requirements. The preferred plan projects, which provide the greatest improvement at the lowest cost to ratepayers, were developed for each of the GBWC Divisions, and are primarily for the purpose of maintaining water and wastewater compliance, correcting low and high water distribution pressure problems, and replacing distribution pipe, service laterals, and other appurtenant infrastructure considered to be in very poor and poor condition. The improvements will strengthen water and wastewater reliability for all the divisions and help to improve fire flow conditions, especially for the Spring Creek Division. The distribution pipeline improvements were budgeted annually, for the purpose of implementing replacement pipeline projects when coordination with public road entities are financially favorable. This is so that pauses in construction between budgeted replacements will not be a detriment to the operation of the systems. In order to prevent additional problems in the systems, the work should be implemented in the Preferred Plan

as scheduled for each division's system(s). Failure to do this could result in reduced fire flow, extreme high pressures, and main breaks resulting in a higher then needed number of customers without water and increased non-revenue water.

Pahrump Division (GBWC-PD)

Please refer to the Testimony from Mara Quiroga (Lumos & Associates, Inc.) and James T. Eason for specific information related to the Preferred Plan projects in the Pahrump Division.

Spring Creek Division (GBWC-SCD)

The recommended Preferred Plan projects for the Spring Creek Division are spread out over 20 years with a total estimated cost of approximately $46.1 million. Some of the major work is planned to include well replacements, Tank Rehabilitation/Replacement, AMI conversion, sewer main replacements with manhole lining, and annual pipeline replacement projects.

Cold Springs Division (GBWC-CSD)

The recommended Preferred Plan projects for the Cold Springs Division are spread out over 20 years with a total estimated cost of approximately $12.6 million. Some of the major work is planned to include well replacement, Tank Rehabilitation/Replacement, AMI conversion, and annual pipeline and meter pit replacement projects.

Spanish Springs Division (GBWC-SSD)

The recommended Preferred Plan projects for the Spanish Springs Division are spread out over 20 years with a total estimated cost of approximately $10.7 million. Some of the major work is planned to include well replacement, Tank Rehabilitation/Replacement, AMI conversion, and annual pipeline and meter pit replacement projects.

Water Conservation Plan

Q.38 PLEASE SUMMARIZE THE WATER CONSERVATION PLAN THAT HAS BEEN SUBMITTED WITH THE 2024 IRP.

A.38 A Water Conservation Plan ("WCP") which supports conservation for all GBWC divisions is included in this 2024 GBWC IRP for review and approval by the Commission. It has been the goal of GBWC to develop one comprehensive Water Conservation Plan that meets the needs of all the GBWC divisions. A full comprehensive version of the submitted WCP is included in Appendix K of the 2024 GBWC IRP.

Q.39 PLEASE DISCUSS THE USE OF RECLAIMED WATER IN GBWC'S SERVICE AREAS.

A.39 **Pahrump Division**

Please refer to the Testimony from Mara Quiroga (Lumos & Associates, Inc.) for specific information related to use of reclaimed water in the Pahrump Division.

Spring Creek Division

The Spring Creek Division has no projections for use of reclaimed water during the 3-Year Action Plan or 20-Year Preferred Plan. Of the three existing wastewater systems for the Spring Creek Division, the only system with any potential for wastewater reclamation is the Mar-Wood WWTP located in the 100 Tract. Currently, the 100 Tract WWTP generates an ADF of approximately 38,700 gpd (2020-2022 average). The other two systems, Septic #2 and #3, are too small-scale to be developed as a source of reclaimed wastewater.

Potential uses of reclaimed water from the Mar-Wood WWTP include the Spring Creek Golf Course, Spring Creek Marina and surrounding park, and Ray Schuckmann's Sports Complex. However, with the low volume of effluent produced by the treatment plant,

recycling water and delivering to these potential customers is not cost-effective. Overall, it is concluded that as long as sufficient water is available from wells, there is little justification for the expenses (both capital and operating) that would be required to operate a wastewater reclamation system, especially given the relatively small quantity of water available for reclamation. This may change in the future with the possibility of new development (e.g. Ruby Vista Ranch) being annexed into the Spring Creek Division's system. GBWC will investigate the potential use of reclaimed water as projects develop.

Q.40 WERE THE WATER SYSTEMS ANALYZED FOR DROUGHT CONDITIONS?

A.40 The GBWC Divisions' water supplies for the service areas are solely based on groundwater withdrawals. Unlike surface water, the groundwater supply are much more drought resistant. Having said that, from 2001 through 2023, the GBWC divisions have experienced 13 years out of 23 years of "Moderate to Exceptional Drought" drought conditions. To my knowledge, there has been no recorded reduction in the availability of groundwater in any of the GBWC divisions' wells during this period of drought. As such, no additional modeling or analyses were performed to specifically evaluate this condition outside of the restrictions described in the Water Conservation Plan. GBWC should continue to monitor static water levels in all of their wells to see if new levels start to affect production capacity.

Q.41 WERE 10 PREVIOUS YEARS OF INFORMATION PROVIDE FOR EACH WATER AND WASTEWATER SYSTEM?

A.41 Information as provided in the 2024 IRP (Volume III (Spring Creek), Volume IV (Cold Springs Division), and Volume V (Spanish Springs Division) is discussed below. For specific information regarding the presentation of information in Volume II (Pahrump Division), please refer to the Testimony from Mara Quiroga (Lumos & Associates, Inc.).

- Peak Demand: A best estimate is provided based on available information. While the filing incorporates previous IRPs to include ten years of data for all GBWC, only the three previous consecutive years were evaluated in the IRPs because using data from more than three years could skew the data (see Explanation of Water Analysis, below).
- Recorded Sales of Water and Wastewater Flows: 10 years of recorded water production is provided in the IRP where applicable. Please note that some of the break-out data, specific pressure zones or customer types, were not delineated in earlier years and may not be available.
- Estimated or Actual Amount of Water Lost: While the filing incorporates previous IRPs to include ten years of data for all GBWC, only 3 years were evaluated in the IRPs (see Explanation of Water Analysis, below).
- Estimated or Actual Amount of Water Used: While the filing incorporates previous IRPs to include ten years of data for all GBWC, only 3 years were evaluated in the IRPs (see Explanation of Water Analysis, below).
- Estimated or Actual Amount of Effluent Disposed of by the Utility: Does not apply to Volume III of the IRP (Spring Creek Division), Volume IV of the IRP (Cold Springs Division), and Volume V of the IRP (Spanish Springs Division). For Volume II (Pahrump Division) effluent disposal for reuse, please refer to the written testimony of Mara Quiroga (Lumos & Associates, Inc.).
- Estimated or Actual Amount of Reclaimed Water Sold or Used by the Utility. Does not apply to Volume III of the IRP (Spring Creek Division), Volume IV (Cold Springs Division), and Volume V of the IRP (Spanish Springs Division). For Volume II (Pahrump Division) please refer to the written testimony of Mara Quiroga (Lumos & Associates, Inc.).

Explanation of Water Analysis:

It is this professional engineer's opinion that the only item that makes practical sense to track 10 years of historical data would be production from the wells. The reason is that all the divisions are entirely dependent on groundwater and conservation of the resource is critical. Tracking production each year helps to show how the conservation efforts are working in the WCP. For example, an increase in customers with well production staying constant or decreasing over the 10-year period, generally speaking, suggests that the programs in the WCP are working.

In my professional opinion, the rest of the 10 years of data required, while GBWC provides it where available as explained in the filing and in compliance with the regulations, does not provide any real value to analyzing the water and wastewater systems and putting the extra time into breaking out the data will substantially increase the cost to generate the IRP documents. Standard Engineering Practice for assessing utility systems (water and wastewater) is to analyze the past three (3) full years of data and generate a 3-year average for consumption of the different classes of customers (this has been accomplished in all the divisions). This data is, then, used in the projection of future growth to see if the utility has sufficient groundwater supplies and/or wastewater capacity in collection and treatment to meet the future demand. Analyzing data that is up to 10 years old will only result in skewing the analysis higher or lower due to old operational applications or practices, and customer behaviors that may no longer be occurring.

For instance, in the Spring Creek Division, prior to the rate case for the installation of the arsenic treatment plants, water use was very high in the 200 Tract. The volume of water used in the early 2000's (up until the installation of the arsenic treatment plan in 2011) was much higher. I recall the Area Manager telling me that they had trouble meeting demands in well capacity or storage capacity in the summer time. After the rate case, the customer

consumption went down, considerably reducing the "gallons per day per customer" average. While this example, now, exceeds the ten (10) years of data, if we were to incorporate those historical demands into our average daily use, the "gallons per day per customer" would be dramatically higher resulting in the Tract 200 showing insufficient well capacity and/or storage capacity for the water system.

Q.42 PLEASE DESCRIBE HOW GBWC COMPLIED WITH THE WATER CONSERVATION PLAN REQUIREMENTS IN NRS 704.6622?

A.42 Loss of Water in all of the Water Supplies (NRS 704.6622)

As was done in GBWC's 2021 Consolidated IRP), Lumos has analyzed the water loss in all of the water systems. Non-revenue water ("NRW") is a term used to reflect the distributed volume of water, which is not reflected in customer billings. The International Water Association (IWA) and the American Water Works Association (AWWA) define non-revenue water as equal to the total amount of water flowing into the potable water supply network from the source (Wells) minus the total amount of water that industrial and domestic consumers are authorized to use (metered/billed authorized consumption). There are two broad types of losses that occur in drinking water utilities, which include apparent losses and real losses.

Apparent losses: are the non-physical losses that occur in utility operations due to customer meter inaccuracies, systematic data handling errors in customer billing systems and unauthorized consumption. In other words, this is water that is consumed but is not properly measured, accounted, or paid for.

Real Losses: are the physical losses of water from the distribution system, including leakage and storage overflows. These losses inflate the water utility's production costs and

stress water resources since they represent water that is extracted (and/or possibly treated), yet never reaches beneficial use.

Tables 23 – 27 in the Water Conservation Plan show the difference (water loss) between historical water production and known usage over the past 3 years (2020 – 2022) in the GBWC service area divisions.

It should be noted that AWWA has been working over the past two decades to change the perception of what is considered an acceptable industry water loss percentage standard for NRW. Publications on water loss that refer to the "AWWA" Standard have ranged from 5% to 20% NRW. These inconsistent characterizations, often derived anecdotally, come from technology and service providers, regulatory agencies, environmental groups, and water utilities. Since 2003, AWWA has recommended that it is in the best interest of utilities to set system-specific loss targets and not use the prescribed "one size fits all" mentality. While in past IRP documents NRW has always been presented as a percentage loss with a goal of targeting 10% or less, it would be best to refrain from this type of objective and instead transition to the AWWA "Key Performance Indicators" (KPI) as provided in the "Non-Revenue Water AWWA Loss Control Committee Report" (AWWA Report) dated November 2019. A copy of the AWWA Report can be found in Appendix M. In order to meet the NAC 704.567 regulation, percentages for NRW are provided similar to previous IRP documents. However, for future analyses, it is recommended that GBWC work with the Commission and other regulators to develop their own NRW targets by implementing the AWWA KPI as provided in the AWWA Report. The following measures can be conducted by GBWC as an ongoing effort to reduce real water losses from the water production process to the water delivery point and apparent losses in the utility operations as outlined in the AWWA Report:

- Annual water audits should be performed using the AWWA Free Water Audit Software.
- Well production meters should be regularly tested, monitored, and maintained.
- Storage tanks should be inspected at regular intervals to assure integrity against leakage.
- High system pressures should be reduced by implementation of system improvement projects including, but not limited to, the addition of VFDs on wells and booster pumps, more pressure reducing stations, and pipeline replacement/improvements.
- GBWC's continued diligence in repairing all pipeline leaks and breaks in a timely manner.
- Ensure that automatic meter reading/advanced metering infrastructure (AMR) are working properly.
- Continue tracking waterline breaks and leaks as a tool to prioritize and target pipeline system improvements.
- Install water meters at PRVs to monitor water flowing between Tracts and/or pressure zones. The installation of flow meters at the existing and future PRVs will allow for better delineation of NRW between Tracts and pressure zones.

Based on the analysis that has been done of GBWC's divisions, it is recommended that these practices be continued and that investigations continue to be performed to determine the cause of high NRW for all the water systems in the four divisions.

Conservation Incentives (NRS 704.6622)

Price can be an effective instrument for reducing water demand. Research has consistently shown that water users respond in an inverse manner to changes in the price of water – in general, as the price of water increases, water use decreases. This principal, however, may only hold true for discretionary water use, the portion of a person's water use beyond what

is necessary to meet their perceived needs. Tiered-rate structures charge higher rates as water use increases. These rate structures encourage efficiency, while ensuring the affordability of water for essential uses. All divisions of Great Basin Water Co. have inclining block rates. The Utility will continue to recommend a tiered rate structure for metered customers to the Commission. All the Utility's customers are metered with utility bills divided between base rates and multiple tiered rates (as opposed to a flat rate), and; therefore, the monetary incentive exists to conserve water.

Water conservation incentives are defined as methods which motivate water users to implement conservation/efficiency measures. In itself, conservation incentives (like public education) do not directly save a single drop of water; they increase the customer awareness about the value of reducing water. Increasing public awareness about the value of reducing water will lead to users making behavioral changes which will result in the increased implementation of conservation measures which directly save a quantifiable amount of water. Conservation incentives are classified into three categories: environmental, financial, and regulatory. GBWC has implemented these measures to create incentive for their customers to conserve water better. These incentives are described in detail in Section 5.5 of the Water Conservation Plan.

Q.43 DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A.43 Yes, however I reserve the right to supplement or make corrections to this testimony at the time of the hearing in this proceeding.

Attachment MH-1 to Exhibit ___

Great Basin Water Co.
2024 Integrated Resource Plan
Checklist — NAC 704.565, et seq.
(Spring Creek Volume III; Cold Springs Volume IV; Spanish Springs Volume V)

	NAC Section	Application Section
❑	NAC 704.5661 Resource plan: Summary.	IRP Vol. I, IRP Executive Summary & Introduction of the IRP.
❑	NAC 704.5662 Resource plan: General requirements.	IRP Vol. I, III IV, V § 1.2 (ownership, history & organization of utility) IRP Vol. I, § 1.4 (acknowledgments). IRP Vols. I, III (Spring Creek), IV (Cold Springs), V (Spanish Springs) Table of Contents; List of Figures; List of Tables; List of Technical Appendices; List of Abbreviations (organization of resource plan). IRP Vol. III (Spring Creek), Vol. IV (Cold Springs), Vol. V (Spanish Springs), §§ 2.1 (service area). IRP Vol. III (Spring Creek), Vol. IV (Cold Springs), Vol. V (Spanish Springs), §§ 1.3 (Issues for water & sewer). IRP Vol. III (Spring Creek), Vol. IV (Cold Springs), Vol. V (Spanish Springs), §§ 1.3 (Objectives). IRP Vol. III (Spring Creek), Vol. IV (Cold Springs), Vol. V (Spanish Springs), §§ 1.2 and Appendix D (Maps of service areas).
❑	NAC 704.5663 Resource plan: Identification of inapplicable regulatory provisions.	See requests for waivers in application.
❑	NAC 704.5664 Resource plan: Written testimony.	IRP Vols. I, III (Springs Creek), IV (Cold Springs), V (Spanish Springs); Testimony of James T. Eason, Michael Hardy, Mara Quiroga, Deborah D. Woodland, Aleksey Dolinko, Terry J. Redmon).

	NAC §	APPLICATION §
❑	NAC 704.5665 Resource plan: Integrated analysis.	"Introduction" - IRP Vol. I, §1.0; Vol. III (Spring Creek), §1.0; Vol. IV (Cold Springs), §1.0; Vol. V (Spanish Springs), §1.0 "Water Supply and/o Wastewater Plan" - IRP Vol. I, §4.0; Vol. III (Spring Creek), §4.0; Vol. IV (Cold Springs), §4.0; Vol. V (Spanish Springs), §4.0 "Emergency Response Plan" - IRP Vol. I, §5.0; Vol. III (Spring Creek), §5.0; Vol. IV (Cold Springs), §5.0; Vol. V (Spanish Springs), §5.0; and Appendix J "Water Conservation Plan" - IRP Vol. I, §6.0; Vol. III (Spring Creek), §6.0; Vol. IV (Cold Springs), §6.0; Vol. V (Spanish Springs), §6.0; and Appendix K "Preferred Plan" - IRP Vol. I, §7.0; Vol. III (Spring Creek), §7.0; Vol. IV (Cold Springs), §7.0; Vol. V (Spanish Springs), §7.0 "Action Plan" - IRP Vol. I, §8.0; Vol. III (Spring Creek), §8.0; Vol. IV (Cold Springs), §8.0; Vol. V (Spanish Springs), §8.0 "Funding Plan" - IRP Vol. I, §9.0; Vol. III (Spring Creek), §9.0; Vol. IV (Cold Springs), §9.0; Vol. V (Spanish Springs), §9.0 "System Improvement Rate Request" - IRP Vol. I, §10.0; Vol. III (Spring Creek), §10.0; Vol. IV (Cold Springs), §10.0; Vol. V (Spanish Springs), §10.0
❑	NAC 704.5666 Resource plan: Technical appendix.	IRP Technical Appendices A – M (For Vol. I, II, III, IV, V)
❑	NAC 704.5667 Resource plan: Forecasts; inconsistent water sources; changes in methodology of forecasting.	IRP Vol. III (Spring Creek), §3.0; Vol. IV (Cold Springs), §3.0; Vol. V (Spanish Springs), §§2.1, 3.0, 4.3
❑	NAC 704.5668 Resource plan: Information concerning entire system of utility for 10 previous years.	IRP Vol. III (Spring Creek), §3.0; Vol. IV (Cold Springs), §3.0; Vol. V (Spanish Springs), §3.0. *See also* requests for waivers in Application
❑	NAC 704.5669 Resource plan: Assessment of projected reliability of water service; population estimates.	IRP Vol. III (Spring Creek), §§3.0, 4.0; Vol. IV (Cold Springs), §§3.0, 4.0; Vol. V (Spanish Springs), §§3.0, 4.0.

	NAC §	APPLICATION §
❑	NAC 704.567 Conservation plan: General requirements.	IRP Vol. I (Introduction), §6.0, Appendix K (Water Conservation Plan)
❑	NAC 704.5671 Conservation plan: Analysis for potential water shortages.	IRP Vol. I (Introduction), §6.0, Appendix K (Water Conservation Plan)
❑	NAC 704.5672 Conservation plan: Information about reclaimed water.	IRP Vol. I (Introduction), §6.0, Appendix K (Water Conservation Plan)
❑	NAC 704.5673 Water supply and wastewater treatment plan: Options for meeting demand for water and wastewater treatment.	IRP Vol. III (Spring Creek), §§4.0, 8.0; Vol. IV (Cold Springs), §§4.0, 8.0; Vol. V (Spanish Springs), §§4.0, 8.0.
❑	NAC 704.5674 Water supply and wastewater treatment plan: Preferred plan.	IRP Vol. III (Spring Creek), §7.0; Vol. IV (Cold Springs), §7.0; Vol. V (Spanish Springs), §7.0.
❑	NAC 704.5675 Water supply and wastewater treatment plan: Description of system and separate components; map of facilities; description of deficiencies.	IRP Vol. III (Spring Creek), §§2.0, 4.1; Vol. IV (Cold Springs), §§2.0, 4.1; Vol. V (Spanish Springs), §§2.0, 4.1; Appendix D (Service Maps); and Appendix C (Flow Schematics).
❑	NAC 704.5676 Funding plan: Requirement for certain items identified in conservation plan or water supply and wastewater treatment plan.	IRP Vol. I (Introduction), §9.1 (Funding Plan) and Appendix L
❑	NAC 704.5677 Funding plan: Information concerning costs utility will incur during term of action plan.	IRP Vol. I (Introduction), §§9.1, 9.6 (Funding Plan) and Appendix L
❑	NAC 704.5678 Funding plan: Options for defraying expenditures.	IRP Vol. I (Introduction), §9.3 (Funding Plan) and Appendix L

	NAC §	APPLICATION §
❑	NAC 704.5679 Funding plan: Estimates of financial information; assumptions.	IRP Vol. I (Introduction), §§9.2, 9.3, & 9.5 (Funding Plan) and Appendix L
❑	NAC 704.568 Action plan: General requirements.	IRP Vol. III (Spring Creek), §8.0; Vol. IV (Cold Springs), §8.0; Vol. V (Spanish Springs), §8.0 and Appendix I.
❑	NAC 704.5681 Action plan: Budget of planned expenditures.	IRP Vol. III (Spring Creek), §8.0; Vol. IV (Cold Springs), §8.0; Vol. V (Spanish Springs), §8.0 and Appendix I.

PREPARED DIRECT TESTIMONY OF
MARA QUIROGA

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

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In the Matter of:

Application of Great Basin Water Co., Cold Springs, Pahrump, Spanish Springs and Spring Creek Divisions for approval of its 2024 Integrated Resource Plan and to designate certain system improvement projects as eligible projects for which a system improvement rate may be established, and for relief properly related thereto.

Docket No. 24-_____

PREPARED DIRECT TESTIMONY OF

MARA QUIROGA

ON BEHALF OF GREAT BASIN WATER CO.

March 1, 2024

PREPARED DIRECT TESTIMONY OF

MARA QUIROGA

ON BEHALF OF GREAT BASIN WATER CO.

Q.1 PLEASE STATE YOUR NAME AND BUSINESS ADDRESS FOR THE RECORD.

A.1 My name is Mara Quiroga. My business address is 308 N. Curry Street, Suite 200, Carson City, NV 89703-4159.

Q.2 BY WHOM ARE YOU EMPLOYED?

A.2 Lumos & Associates Inc. ("Lumos").

Q.3 WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

A.3 Bachelor of Science Degree in Civil Engineering, University of Nevada, Reno

- Professional Civil Engineer, Nevada, License #26809
- Professional Civil Engineer, California, License #C91948

Employment History:

Jensen Precast, 2015 – 2016

- Analysis and design of precast reinforced concrete structures.

Lumos & Associates, Inc., Carson City, NV, 2016 – current

- Senior engineer for water and wastewater improvement projects from planning and design through construction.
- Hydraulic modeling of water distribution and sewer collection systems for capacity evaluations and master planning.
- Preparation of preliminary engineering reports, alternatives analyses, and master planning documents for public and private utilities.

My areas of expertise in water and wastewater engineering include:

- Preparation of engineering reports, plans, and specifications for wastewater projects including lift stations, gravity sewer mains, force mains, and related civil work.
- Preparation of engineering reports, plans, and specifications for water projects including water transmission mains and distribution pipelines, booster pump stations, and related civil site work.
- Water and wastewater system master planning, including hydraulic modeling
- Cost estimating and capital improvement program development

Q.4 HAVE YOU TESTIFIED BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA (THE "COMMISSION")?

A.4 No, I have not.

Q.5 HAVE YOU TESTIFIED BEFORE ANY OTHER PUBLIC UTILITY COMMISSION?

A.5 No, I have not.

Q.6 WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS DOCKET?

A.6 The purpose of my testimony is to describe Lumos' role in the preparation of the Great Basin Water Co. ("GBWC") 2024 Consolidated Integrated Resource Plan ("2024 IRP" or "2024 Resource Plan") for the Pahrump Division ("GBWC-PD" or the "Pahrump Division") and to provide general summary information regarding the 2024 Resource Plan.

Q.7 PLEASE DESCRIBE THE METHOD OF POPULATION FORECASTING PREPARED BY LUMOS AS IT SPECIFICALLY RELATES TO THE PAHRUMP DIVISION'S WATER SERVICE AREA.

A.7 The 2020 Census was utilized for the existing population within the service area. The *Nevada County Population Projections 2022 to 2041* dated October 1, 2022, prepared by the Nevada State Demographer were used to establish growth rates of the future population and connection projections for the GBWC-PD water service area. The *Nevada County Population Projections 2022 to 2041* shows population growth for Nye County ranging from 1.0% to 1.5% per year.

In estimating the population specific to the GBWC-PD water service area, existing residential water service connection counts were used in conjunction with an occupancy density of 2.36 persons per household (per U.S. Census Bureau QuickFacts for Pahrump Census Designated Place ("CDP"), 2020-2021). Service connection estimates were then projected for the 20-year planning period based on the State Demographer's population growth rates projected for Nye County. Using these rates, the total number of GBWC-PD water service connections would increase from 6,402 in 2022 to 8,332 connections in 2044.

Q.8 PLEASE DESCRIBE THE METHOD OF WATER AND WASTEWATER DEMAND FORECASTING PREPARED BY LUMOS.

A.8 Water demand forecasting for GBWC-PD included an analysis of both meter production and consumption data for each water system (Calvada Valley, Calvada North/Country View Estates, Mountain Falls, Calvada Meadows, and Spring Mountain Motorsports Ranch ("SMMR")). Production data (supply water from the groundwater wells) was used as an indicator of how much water is actually being delivered to the system and was used for the development of peaking factors. Consumption data (customer water usage) was used to develop demand factors by service class. Water production and consumption data were also compared to calculate non-revenue water ("NRW") for each water system.

As previously stated, population and water service connection projections were based on the 2020 U.S. Census, State Demographer's Office project growth rates for Nye County, and the U.S. Census Bureau occupancy density for the Pahrump CDP. The changes in connection counts for the 20-year planning period were then distributed proportionally between the five water systems.

The first step in determining future water demands was to perform a historical analysis of water use in the GBWC-PD service areas. The projection data was analyzed for average use, peak use, and seasonal use. System peaking factors were developed based on an analysis of production data over a 3-year period from 2020-2022 (a standard engineering methodology for developing customer demands reflective of recent trends). Using the maximum month production, the average day of the maximum month ("ADMM") was calculated. A maximum day demand ("MDD") was determined by multiplying the ADMM by 1.25 (a standard of the American Water Works Association [AWWA]). A MDD to average day demand ("ADD") ratio was then generated for each water system. A peaking factor of 1.75 was applied to the MDD to estimate a peak hour demand ("PHD").

Water demand factors for 2020-2022 were calculated based on actual metered consumption data divided by the number of connections for each service class. Service classes evaluated for each water system included residential (single-family and multi-family), commercial, large-scale irrigation, and public use (schools). Using the water demand factors, peaking factors, and connection counts, the projected ADD, MDD, and PHD were developed for the 20-year planning period for the five GBWC-PD water systems. To account for system losses, the projected water demands were increased based on the system-specific percent of NRW (combined unbilled authorized consumption, apparent and real losses as defined by AWWA).

Wastewater flow forecasts were performed for Pahrump's Calvada Valley (Plant 3), Calvada North (Plant F), Mountain Falls (Plant MF), and Spring Mountain Motorsports Ranch (Plant SMMR) service areas. The GBWC-PD service area also contains three small community septic systems that service four customers total. No additional connections will be allowed to these septic systems.

Although wastewater flows are not metered at each individual connection in the GBWC-PD wastewater systems, wastewater generation factors per connection were estimated for each of the four wastewater systems based on influent flow meter records at the treatment plants and wastewater billing records for connection counts. The generation factors per connection were determined based on historical wastewater flow data and connection counts from 2020-2022.

The projected wastewater flows to the wastewater treatment plants were calculated based on the previously determined per connection generation factor applied to the projected wastewater connections to project the future wastewater flows through the 20-year planning period.

Q.9 IS THE METHOD FOR CALCULATING THE WATER AND WASTEWATER DEMAND FORECASTS REASONABLE?

A.9 Yes, the water demand and wastewater flow forecasting methods are reasonable and are consistent with industry standards and regulatory guidelines. The water demand and wastewater flow forecasting was based on an analysis of historical data and projections from the U.S. Census Bureau and State Demographer's Office. It should be noted that forecasts by nature are typically more accurate in the short term with decreasing accuracy over the long term. The GBWC-PD demand and flow forecasts will continue to be validated through the subsequent preparation of future resource plan updates.

Q.10 PLEASE PROVIDE A SUMMARY OF THE WATER SUPPLY EVALUATION FOR THE PAHRUMP DIVISION.

A.10 Water capacity was evaluated based on available well capacity and storage capacity compared to the current and projected future water demands. For GBWC-PD, the five water systems were evaluated separately because the systems are not currently interconnected. The criteria for evaluating adequate supply capacity are based on NAC 445A.6672 which requires that a system that relies exclusively on wells be able to provide a total system capacity sufficient to meet MDD plus fire flow when all wells are operational, or the ADD plus fire flow with the most productive well out of service.

Water storage capacity was calculated based on NAC 445A.6674, 445A.66745, 445A.6675, and 445A.66755.

Total system capacity was calculated based on the requirements of NAC 445A.66725, which state that when analyzing the total system capacity of a public water system with regard to the requirements for MDD, only the alternative pumping capacity and the storage capacity of the public water system may be considered as a source of supply. NAC 445A.6554 defines alternative pumping capacity as those wells equipped with a backup power supply, which in each Division's case included the wells and booster pump stations equipped with permanent emergency backup power. Lumos included Operating Storage of MDD for one day, fire flow storage (dependent on the pressure zone's highest requirement) and emergency reserves of ADD for one day in its system-wide storage assessments.

For the 2024 Resource Plan, the system capacity analysis includes an additional scenario to check the total capacity of the water systems, as defined by NAC 445A.6672. Since the

systems rely exclusively on groundwater wells for their water, it was determined that incorporating a more robust analysis would be the most conservative approach to ensure the systems could successfully provide for the following two scenarios:

- Scenario A: Total system capacity requirements for one day of MDD, emergency reserves, and the most extreme fire flow/demand required in the system area. The system capacity includes any storage tanks and all wells in service with an alternative power source.
- Scenario B: Total system capacity requirement for one day of ADD, emergency reserves, and the most extreme fire flow/demand required in the system area. The system includes all storage tanks and wells with an alternative power source, except for the largest producing well.

It is important to note that the system capacity analysis performed in the previous GBWC consolidated Resource Plans (2018 and 2021) is still being performed in the 2024 IRP under Scenario A. The modification to this analysis was the addition of Scenario B (NAC 445A.6672) to provide insight into possible system vulnerabilities.

Based on the water demand projections presented in the 2024 Resource Plan for the Pahrump Division, each service area capacity was compared to current and projected system demands including:

- Calvada Valley – The existing supply and storage capacity can meet existing and projected 2044 demands under Scenario A described above. The capacity with the largest well out of service (Well 11) meets the required existing and projected 2044 demands under Scenario B described above.
- Country View Estates/Calvada North – The existing supply and storage capacity can meet existing and projected 2044 demands under Scenario A described above.

The capacity with the largest well out of service (Well CVE 48-2) meets the required existing and projected 2044 demands under Scenario B described above.

- Calvada Meadows – The existing supply and storage capacity can meet existing and projected 2044 demands under Scenario A described above. The capacity with the largest well out of service does not meet the required existing and projected 2044 demands under Scenario B described above, due to the fact that the system only has one well and a small hydro-pneumatic tank as storage. A pipeline project is being recommended as part of the Action Plan that would interconnect the Calvada Meadows system with a larger system to provide redundancy and bring the system into compliance with NAC capacity requirements.
- Mountain Falls – The existing supply and storage capacity can meet existing and projected 2044 demands under Scenario A described above. The capacity with the largest well out of service (Well MF 2) meets the required existing and projected 2044 demands under Scenario B described above.
- Spring Mountain Motorsports Ranch – The existing supply and storage capacity can meet existing and projected 2044 demands under Scenario A described above. The capacity with the largest well out of service (Well SMMR 2) meets the required existing and projected 2044 demands under Scenario B described above.

It should be noted that the age of many wells is over 40 years old and several wells appear to be reaching the end of their useful life. GBWC-PD should continue conducting well rehabilitations, replacements, and assessments to evaluate the integrity of wells.

Q.11 PLEASE PROVIDE A SUMMARY OF THE HYDRAULIC MODEL SELECTION AND DEVELOPMENT FOR THE PAHRUMP DIVISION.

A.11 The hydraulic water models for the GBWC-PD water systems were analyzed using the Bentley® WaterCAD® v8i modeling software. The existing models for the water systems

were selected and updated to ensure that all GBWC-PD models matched current demand conditions meeting the existing conditions (ADD, MDD, PHD). Once the GBWC-PD hydraulic model runs for the existing conditions met the current demand condition, the demands were adjusted up to account for projected growth for the planning periods (Action Plan-2027 and Preferred Plan-2044).

The hydraulic modeling scenarios performed included:

- Existing MDD
- Existing MDD with fire flow
- Existing Peak Hour Demand (PHD)
- 3-Year Action Plan (2027) MDD
- 3-Year Action Plan (2027) MDD with fire flow
- 3-Year Action Plan (2027) PHD
- Future (2044) MDD
- Future (2044) MDD with fire flow
- Future (2044) PHD

Q.12 PLEASE PROVIDE A SUMMARY OF THE DISTRIBUTION SYSTEM EVALUATION FOR THE PAHRUMP DIVISION.

A.12 Water models for Calvada Valley, Calvada North/Country View Estates, Mountain Falls, and SMMR were obtained and analyzed for the 2024 IRP effort. In addition, a combined model was prepared to analyze the effects of interconnecting all GBWC-PD systems as well as the impacts of the proposed Manse Ranch development annexation into the Mountain Falls system.

Currently, a working model for the Calvada Meadows service area is not available to Lumos. The effort to skeletonize and calibrate a new WaterCAD model for this small service area is beyond the scope of the 2024 IRP document preparation.

The water distribution system was analyzed by hydraulicly modeling the Calvada Valley, Calvada North/Country View Estates, and Mountain Falls water systems with 2022 demands, 2027 demands, and 2044 demands. The hydraulic models were analyzed on an existing demand basis for ADD, MDD, PHD, and fire flow conditions. The pipeline networks were evaluated based on flow velocities and head losses throughout the distribution system. Where deficiencies were noted, additional modeling was performed with potential changes to the system to determine the most technically feasible and cost-effective solution(s).

The hydraulic models were compared to the design criteria outlined in NAC 445A.6672. A summary of the modeling is as follows:

Calvada Valley

Calvada Valley is currently divided into two pressure zones – the High Zone and the Low Zone. The majority of the high pressures (greater than 100 psi) in the system were observed in the High Zone. Only a small number of the distribution pipes were observed to exceed the maximum headloss requirement (10 feet/1000 feet). Generally, most nodes in the system demonstrated that the system was able to meet fire flow at those nodes. The distribution piping meets the criteria for velocity, with the exception of one pipe, with velocities less than 8 feet per second observed. The hydraulic distribution models for existing conditions, as well as for the three (3) year action plan period and for the 20-year preferred plan period all meet the majority of the design criteria described in Volume II, Section 4, Table 4.15 with the exception of some nodes that appear to be active distribution noes with pressures higher than 100 PSI, most of which were located in the High Pressure Zone.

Calvada North/Country View Estates

The Calvada Valley System is currently divided into two pressure zones, referred to herein as the Calvada North Zone and the Country View Estates Zone. Two nodes within Calvada North/Country View Estates were found to have low pressures (<40 psi) at maximum day demand (MDD). One node is borderline to meet MDD required pressure and is within the margin of error for modeling discrepancies and is not considered an issue until the model can be further calibrated. Several areas were identified as deficient for fire flow requirements. The deficient areas are served by a single radial main without a secondary source; looped pipeline would improve fire flow conditions to these areas. The hydraulic distribution models for existing conditions, as well as for the three (3) year action plan period and for the 20-year preferred plan period all meet the majority of the design criteria described in Volume II, Section 4, Table 4.15 with the exception of two nodes with nodes less than 40 psi at MDD, and radial areas that do not meet fire flow requirements.

Mountain Falls

The Mountain Falls System is divided into two pressure zones, an upper zone that contains the wells and tanks, and a lower zone that contains all distribution nodes. The hydraulic distribution models for existing conditions, as well as for the three (3) year action plan period and for the 20-year preferred plan period all meet the majority of the design criteria described in Volume II, Section 4, Table 4.15 with the exception of several pipelines that exceed maximum velocity.

Section 4.2.2 of the 2024 IRP for the Pahrump Division (Volume II) contains a more detailed discussion of system deficiencies and alternatives for improvements for each of the specific systems. The recommended improvements for these distribution deficiencies are detailed in the Preferred Plan (Section 7) and Action Plan (Section 8) of Volume II of the 2024 IRP relating to the Pahrump Division.

Q.13 PLEASE PROVIDE A SUMMARY OF THE WASTEWATER TREATMENT PLAN.

A.13 The GBWC-PD service area has four active wastewater service areas: the central system in the Calvada Valley area (Plant 3), the northern system in the Calvada North area (Plant F), the southern system in the Mountain Falls area (Plant MF) and the new Spring Mountain Motor Ranch (SMMR) system located northeast of Hwy 160. The SMMR wastewater system facilities have not been accepted by GBWC-PD and are instead working under a memorandum of understanding and Interim Service Agreement, with full dedication of the system expected to occur in 2024. In addition to the four active wastewater service areas, there are three septic systems serving a total of four customers owned and maintained by GBWC-PD. The three septic systems are located on 121 West Calvada Blvd. (serving one customer), a system on 2650 East Feather Street (serving two customers) and a system on 2900 S. Blagg Road (Serving one customer). These are all located within the Calvada Valley main system. No additional connections will be allowed in these three septic systems. If the sewer line is extended past any of these customers, they will be connected to the collection sewer extension. The remainder of the water service area is served by individual septic systems, which are owned and maintained by the property owners.

Each of the four wastewater treatment facilities were evaluated based on capacity, operations, conditions, and effluent disposal, The required capacity is based on per connection wastewater production, which was then extrapolated for future connection projections. This provides a timeline for when additional facilities will be required. NDEP requires that planning for an expansion of a wastewater treatment plant be considered when average daily flows reach 85 percent of design capacity.

The facilities' effluent disposal systems were evaluated for their effectiveness and compliance with State regulatory requirements. Per NAC 445A.275, the effluent quality

required for reuse is secondary treatment defined as meeting 15 mg/L TSS, 15 mg/L BOD, 10 mg/L Nitrogen, pH ranging between 6-9, with a maximum 23 colony forming units (CFU) and an average of 2.2 CFU's.

Plant 3

Based on the current wastewater loading to the Plant 3 wastewater treatment plant and the forecasted flows through the 20-year planning period, the projected wastewater flows will not increase beyond the 85% design capacity (1.28 MGD) by the end of the 2027 Action Plan (0.772 MGD) and the 2044 Preferred Plan (0.956 MGD).

Plant F

Based on the current wastewater loading in the Plant F wastewater treatment plant and the forecasted flows through the 20-years planning period, the projected wastewater flows will not increase beyond the 85% design capacity (0.0425 MGD) by the end of the 2027 Action Plan (0.029 MGD) and the 2044 preferred Plan (0.036 MGD).

Plant MF

Based on the current wastewater loading in the Plant MF wastewater treatment plant and the forecasted flows through the 20-years planning period, the projected wastewater flows will not increase beyond the 85% design capacity (0.6375 MGD) by the end of the 2027 Action Plan (0.137 MGD) and the 2044 preferred Plan (0.169 MGD).

Plant SMMR

Based on the current wastewater loading in the Plant SMMR wastewater treatment plant and the forecasted flows through the 20-years planning period, the projected wastewater flows will not increase beyond the 85% design capacity (0.046 MGD) by the end of the 2027 Action Plan (0.007 MGD) and the 2044 preferred Plan (0.009 MGD).

Q.14 DOES THE PROPOSED RESOURCE PLAN FOR THE PAHRUMP DIVISION MEET THE REQUIREMENTS OF THE COMMISSION'S REGULATIONS?

A.14 Yes, and I have attached to my testimony a checklist that cross references the regulations to the IRP document. Please see Attachment MQ-1 to Exhibit ____. Regulation Checklist.

Action Plan Projects

Q.15 HOW WERE THE ACTION PLAN PROJECTS DEVELOPED FOR THE PAHRUMP DIVISION?

A.15 The recommended Action Plan projects for GBWC-PD target the water and wastewater systems in a way that helps maintain and improve the customer's LOS, provide redundancy to the system, and ensure compliance with NAC regulations. Every option provided in the Action Plan represents the most viable option that is cost-effective and beneficial for both customers and the utility provider. Where multiple alternatives were explored for a project, a recommendation was made in the Resource Plan for the alternative that best balances functionality and expense. For project needs related to a forecasted water demand deficiency or wastewater flow deficiency, Lumos has considered all relevant and required factors in reaching recommendations. The priority options provided in the Action Plan represent the best-valued alternative that would benefit the customers and GBWC.

The three-year Action Plan projects prioritize immediate asset concerns that have been identified through the development of the asset management component, customers LOS, NAC compliance, and staff recommendations.

Q.16 WHY IS THE NEW WELL IN THE HIGH ZONE A PRIORITY?

A.16 The High Zone in the Calvada Valley water system is supplied through a booster pump station from the Low Zone to the High Zone Tank. There are no production wells in the High Zone to serve as redundancy for the supply through the Alfalfa booster pump station.

When the Alfalfa Booster is not running, the pressure in the Low Zone is maintained by the tank. When the Alfalfa Booster is running, Well 12 then turns on to support the draw on system from the booster station. Without Well 12 running and when the booster pump turns on, the system pressures around and below the booster station drop, impacting some of the commercial customers in the area. In addition, Wells 9 and 11 in the Low Zone are nearing the end of useful life and cannot be further rehabilitated or are very limited to traditional acid treatment cleaning methods, which limits future production needs. This project has been established as a Medium Priority project in the Action Plan. The considerations for this project are outlined below.

Replace Capacity of Aging Wells

Well 9 is located in the Low Zone of the Calvada Valley system. The well was originally drilled in 1958 and partially rehabilitated in 2019. A video survey performed in 2019 prior to the rehabilitation showed that the existing casing is completely deteriorated. Due to the poor condition of the casing, this well cannot be cleaned again and will be run to failure.

Well 11 is located in the Low Zone of the Calvada Valley system. The well was originally drilled in 1979 and rehabilitated in 2018 as an emergency project. The project included an extensive rehabilitation to bring the well back online, which included but not limited to videoing, brushing or cleaning, swabbing, airlifting, initial acid treatment, double swabbing, pump testing, VFD installation, well tie-in, and replacement of the pumping equipment. In addition to what was described above, an analysis of the native gravel pack possibly used for the development of Well 11 was studied. The study was recommended and conducted because of the information received from Great Basin Drilling Company ("GBDC") indicating that the older wells used native limestone gravel pack for well development in the area. GBDC had experienced the dissolving of the limestone gravel pack with the use of too much acid in other well cleaning projects within the area of the

Pahrump Basin. The assumption was the limestone gravel pack was impacting the acid by neutralizing it sooner because the acid was attacking the limestone gravel and dissolving it away. It was confirmed the cleaning of Well 11 with acid was being neutralized sooner and thus limiting future rehabilitations to the well. This well is approaching the end of its useful life and GBWC-PD has elected to continue to monitor the well's production and clean or rehabilitate the well again if possible or allow the well to run to failure.

The capacity from Wells 9 and 11 will need to be replaced within the system when they ultimately fail in order to maintain everyday operation and compliance with NAC capacity requirements. Well 9 does not have backup power so is not considered towards storage and supply capacity, but the loss of Well 11's capacity (1,873,440 gallons per day) would result in deficient capacity in the future (2044) projected conditions.

In lieu of redrilling wells at this time on these existing wells sites, GBWC presented the "Calvada Valley Well 10 to Municipal Compliance Project" in the 2021 Consolidated IRP to the Commission for approval to replace the production of Well 9 or 11. The project was approved by the Commission and is currently under construction. The current proposed well replacement project would utilize the existing Well 13 site as the location for the new production well to replace Well 9 or Well 11 and provide the added benefit of redundancy in the High Zone and reduce the need to constantly pump water from the Low Zone to the High Zone.

<u>High Zone Location</u>

The proposed location at the Well 13 property in the High Zone has the benefit of providing supply redundancy to the zone. Flow is supplied to the High Zone through an existing booster pump station. In the event of failure at this pump station, there is no redundant supply source. In addition, users on the upstream of the existing booster pump station have

complained of low pressures, especially when Well 12 is offline for rehabilitation, which would be exacerbated by a fire event in the High Zone requiring additional flow to be conveyed through the booster pump station. A new well in the zone would alleviate the impact of a high flow event to the Low Zone.

The proposed location for the new well is referred to as the Well 13 site. The property is 0.54 acres owned by GBWC-PD. The site has existing 3 phase power service, a 10-inch water main stubbed to the site, and an adjacent 16-inch water main as a tie in option. Utilizing the Well 13 site eliminates the cost of acquiring property, installing a power service, or installing new main to connect to the distribution system compared to choosing a different site without these characteristics.

Q.17 WHY IS THE CALVADA MEADOWS SYSTEM CONSOLIDATION A PRIORITY?

A.17 The Calvada Meadows system is a standalone water system serving 41 customers. The system is supplied by a 250 gpm well and 3,000-gallon hydropneumatic tank. The system does not currently meet NAC requirements under Scenario B (discussed in A.18) for supply and storage capacity with the largest producer out of service, because there is only a single producer (well). In addition, the well is experiencing increasing sand production that is concerning and could suggest the well is close to failure. The hydropneumatic tank is approaching the end of useful life and the manway opening is too small to allow inspection of the interior. This project to interconnect the Calvada Meadows system has been established as a High Priority project in the Action Plan.

<u>Pipeline Projects</u>

Two pipeline alternatives are proposed to consolidate the Calvada Meadows system. Alternative A would connect to the Calvada Valley system and Alternative B would

connect to the Calvada North/Country View Estates system. GBWC-PD has the ultimate goal of interconnecting all standalone GBWC-PD water systems in order to improve redundancy of the system and reduce reporting obligations, which would be furthered with either pipeline project. Alternative A is the recommended alternative as it is a shorter length and therefore a more cost-effective alternative. The Calvada Valley has sufficient capacity (approximately 2.3 million gallons per day in excess of required storage) to offset the Calvada Meadows system capacity deficiency of approximately 246,000 gallons per day.

Alternative: Bring System into NAC Compliance Without Consolidation

An alternative to interconnecting Calvada Meadows with another GBWC-PD water system would be to install improvements in the system to bring it into NAC compliance while remaining a standalone system. This would require the installation of a larger storage tank to increase storage capacity, a booster pump station to pump water from the tank to a sufficient pressure, rehabilitation or replacement of the existing well, and the construction of a second well to achieve redundancy to meet NAC Scenario B capacity requirements. This option is more costly than the proposed pipeline projects and was therefore not proposed in the Action Plan because it is not considered to be a viable option.

Alternative: Maintain Current Level of Operation

In testimony provided in prior IRP proceedings, Commission Staff has pointed out that there are numerous water systems in Nevada that do not meet nominal fire flow requirements. However, aside from considerations related to fire flow, improvements would need to be made by GBWC-PD to the Calvada Meadows system in order to simply maintain the system and current levels of service. The system's well has seen an increase in sand production that indicates it will fail in the near future. It would be prudent to drill a replacement well prior to failure of the existing well, to avoid extended service interruptions for users. The hydropneumatic tank's access port is too small for human entry

and therefore the tank interior cannot be inspected. However, an ultrasound test was performed in 2020 and indicated there may be significant interior corrosion. A project was approved by NDEP in 2023 to replace the tank but was put on hold pending the IRP, as the replacement would not be necessary if the pipeline project to consolidate the systems is completed. This alternative to maintain the Calvada Meadows system as it currently operates was determined to not be viable as it still presents replacement costs for the system in the near future while still not providing system improvements to the users.

Alternative: Desert Utilities, Inc. System Acquisition

In the 2021 IRP Proceeding, Commission Staff recommended exploring an acquisition of the adjacent Desert Utilities, Inc. water system. The Desert Utilities system has been reported to be in such poor condition that Nye County declined to purchase the system due to the extents of repairs required that would cause undue increase in rates for existing rate payers[1]. Taking on the required improvements in the Desert Utilities system in order to provide a closer interconnect to the Calvada Meadows system is not likely to be a more cost-effective option than the proposed pipeline project at this time.

Q.18 WHY IS THE PLANT 3 INFLUENT PRE-EQ BUILDING AND TANKS PROJECT A PRIORITY?

A.18 Influent wastewater to Plant 3 is conveyed through the headworks and screening to remove solids, then sent to the Pre-Equalization (pre-EQ) tanks. These tanks hold the wastewater and equalize the amount of flow sent to the sequencing batch reactor ("SBR") treatment basins. The tanks consist of two partially above-ground concrete tanks covered by a metal structure. Due to the corrosion present in the concrete and metal structures, it is

1 Robin Hebrock, Pahrump Valley Times, *https://pvtimes.com*, Nye County Declines to Purchase Desert Utilities, October 27, 2021 (https://pvtimes.com/news/nye-county-declines-to-purchase-desert-utilities-106006/)

recommended that the structure be rehabilitated or relocated. This project has been established as a High Priority project in the Action Plan.

Structural Concerns

Despite the age-based condition of the pre-EQ building being “good”, actual conditions are observed to be poor due to the hydrogen sulfide gases present in the enclosed building from the raw wastewater. The gases have corroded the metal building and the concrete tanks and walkways. The valves to isolate the tanks are rusted and falling apart and cannot be operated. The level of corrosion on the walkways inside the building and the exterior of the concrete tanks suggest degradation below the water level in the tanks, but without the ability to isolate the tanks, they cannot be drained to be inspected for the extent of damage.

The metal structure enclosing the pre-EQ tanks is corroded on the visible metal areas and there are areas in the rafters that cannot be observed from the ground and will require additional inspection to determine if there is structural damage. The footers supporting the building were recoated in 2022 due to corrosion. The metal handrails were rehabilitated in 2016.

Capacity Concerns

In 2022 the influent screen was out of service which resulted in the pre-EQ tanks being inundated with debris, reducing the available capacity of the tanks. Without the ability to isolate the tanks, they cannot be drained to remove the debris and restore their full capacity. This reduction in capacity is especially challenging to operations during storm events when I&I in the collection system leads to large spikes in influent.

The impact of failure of the pre-EQ tanks would be a complete disruption to the operations of Plant 3. There is no piping in place to allow flow to bypass the pre-EQ tanks, meaning

flow could not enter the plant from the collection system to be treated if the pre-EQ tanks were offline.

As described in the 2024 IRP Volume II for the Pahrump Division at Section 8.4.1b, an analysis was performed of the possibility of replacing the Pre-EQ tanks by converting the existing aerobic digester tanks as a possible alternative to the Pre-EQ building and tank rehabilitation described above. While it was determined such a project could serve as a long-term solution to the corrosion and deterioration concerns, it was ultimately determined that the added cost ($4,373,750 more than the rehabilitation cost) would be too significant for this to be a viable alternative, and such a project has not been proposed in the Action Plan.

Q.19 WHY IS THE PLANT 3 SAND FILTER REHABILITATION PROJECT A PRIORITY?

A.19 Plant 3 utilizes traveling bridge sand filters, filtering wastewater through sand media. The traveling bridge sand filters are an aging technology with diminishing options for replacement parts. This project proposes rehabilitating the existing filters to extend their useful life. This project has been established as a Medium Priority project in the Action Plan.

In past IRPs, projects were proposed to replace the sand filters with cloth media filters. This project differs from these previous proposals in that it would involve rehabilitating the existing filters rather than replacing them, as a more cost-effective solution to address the aging filters.

When Plant 3 sees an upset condition (such as increased flow during storm events or a decantered SBR) the wastewater entering the sand filters has excess solids present, which

clogs the media. This results in lowered volume of water being treated, recirculating untreated water back to the headworks and treating it again, and increased backwash frequency. In addition, the tanks are showing signs of rust, and the depth of this corrosion is unknown without further inspection – it could be superficial surface rusting or deeper structural damage.

The gearbox motors for the traveling bridges are no longer manufactured. In order to purchase replacements, a sand filter would need to be taken offline, the gearbox removed and taken to a local machinist to be replicated, and a replacement part custom fabricated.

The media in the sand filters needs replacement. Through interviews with operators, the media level in filter 2 was observed to drop approximately 6 inches in the last 8 to 9 years.. The loss of media occurs over time with normal operations and is increased during storm events, which upset the plant and increases the need to backwash the media more often to effectively remove the solids (fine particulates) and function properly. Lost media decreases the treatment capability of the filters by reducing the amount of flow that can pass through the media. These sand filters are shallow bed filters which require specific media sizes that are specialized materials transported from the East coast. The media should also be entirely removed so the underdrain system can be inspected and repaired as needed. Filter media should be replaced approximately every 10 to 20 years to ensure optimal performance. Solids can build up in the media, and properties like roughness, depth, and size distribution can change over time which all impact filter effectiveness. Interviews with operations staff indicate the media has not been fully replaced and the underdrain system inspected in at least 19 years.

Replacing the media, recoating the tanks, and replacing specialty parts will extend the useful life of the sand filters and replace aging equipment to avoid failure during an upset event.

Conclusions and Summary Regarding Action Plan Projects

Q.20 HOW WERE THE PROJECTS IN THE 2024 IRP FOR THE PAHRUMP DIVISION PRIORITIZED BETWEEN THE ACTION PLAN AND THE PREFERRED PLAN?

A.20 Projects in the GBWC-PD Action Plan were prioritized based on current needs to maintain the customers' existing level of service, address aging infrastructure, maintain system efficiencies, and protect critical assets. The New Well in the High Zone Project provides redundancy for aging wells in the system and a supply source in the High Zone which is currently only supplied through storage tanks and a booster pump station. The Calvada Meadows System Consolidation addresses capacity deficiencies in the system and provides redundancy to the users. The Plant 3 Influent Pre-EQ Buildings and Tanks Project and the Plant 3 Sand Filter Rehabilitation Project address aging infrastructure at GBWC-PD's largest wastewater treatment plant to ensure continued operation of the plant and avoid critical failures.

Q.21 ARE ALL OF THE PROJECTS IN THE ACTION PLAN FOR THE PAHRUMP DIVISION REQUIRED FOR THE PROPER OPERATION OF THE UTILITIES?

A.21 All of the recommended Action Plan projects for the Pahrump Division are required for GBWC to provide the level of service that GBWC customers experience today. The goal of the Action Plan projects is to maintain this existing level of service, and at the same time replace, refurbish, or improve major assets that need to be addressed in the next 3 years.

Preferred Plan

Q.22 PLEASE DISCUSS THE LONG-RANGE IMPROVEMENTS NECESSARY AS DETAILED IN THE PREFERRED PLAN FOR THE PAHRUMP DIVISION.

A.22 The projects in the Preferred Plan for the Pahrump Division are recommended to keep or bring GBWC into compliance with NAC water and wastewater system standards. The recommended projects provide the greatest improvement at the lowest cost to ratepayers. The improvements are primarily needed to maintain water and wastewater compliance, replace or rehabilitate aging infrastructure, improve operational efficiencies, and increase system redundancy. They include projects to ultimately interconnect all GBWC-PD water systems to improve redundancy and level of service, while streamlining reporting requirements. Projects are also included to replace aging wells and tanks that have reached the end of their useful life. In addition, there are annual budgets for wastewater treatment plants and wastewater collection systems for rehabilitation or replacement of significant subcomponents. The recommended schedule includes spreading the larger capital projects out, so they don't have a significant impact on customer rates (e.g. well replacements every five years). The GBWC-PD Preferred Plan projects are scheduled over the 20-year planning period with a total estimated cost of approximately $53.9 million.

Water Conservation Plan

Q.23 PLEASE SUMMARIZE THE WATER CONSERVATION PLAN THAT HAS BEEN SUBMITTED WITH THE 2024 IRP.

A.23 A Water Conservation Plan ("WCP"), which supports conservation for all GBWC Divisions, is included in this 2024 GBWC IRP for review and approval by the Commission. It has been the goal of GBWC to develop one comprehensive WCP that meets the needs of all the GBWC divisions. The WCP is included in Appendix K of the 2024 GBWC IRP.

Q.24 PLEASE DISCUSS THE USE OF RECLAIMED WATER IN THE PAHRUMP DIVISION'S SERVICE AREA.

A.24 Of the four wastewater treatment facilities, two are currently engaged in providing reclaimed water in their respective service areas. The first is the Mountain Falls MF Plant of which all treated effluent is used at the local golf course to help reduce irrigation needs from wells. The second wastewater treatment facility is Plant 3 in the Calvada Valley service area. Plant 3 sends its reclaimed water to receiving ponds at the Discovery Park property. From the Discovery Park receiving ponds, there is a pump station, which distributes irrigation water throughout the park and a second pump station, which sends some of the flow to the Lakeview Executive Golf Course or the Pahrump High School athletic fields. Two rapid infiltration basins (RIBs) were created at the Discovery Park in 2019, each having a capacity of 625,000 gpd. They are mostly used during the winter months when the Lakeview Executive Golf Course stops taking effluent.

Q.25 WERE THE PAHRUMP DIVISION'S WATER SYSTEMS ANALYZED FOR DROUGHT CONDITIONS?

A.25 The Pahrump Divisions' water supplies for its service areas are solely based on groundwater withdrawals. Unlike surface water, the groundwater supply is much more drought resilient. Having said that, from 2001 through 2023, GBWC-PD has experienced 21 years out of 23 years of "Moderate to Exceptional Drought" conditions. To my knowledge, there has been no recorded reduction in the availability of groundwater in GBWC-PD wells during this period of drought. As such, no additional modeling or analyses were performed to specifically evaluate this condition outside of the restrictions described in the WCP.

Q.26 WERE 10 PREVIOUS YEARS OF INFORMATION PROVIDE FOR EACH WATER AND WASTEWATER SYSTEM?

A.26 Data provided in the GBWC-PD Resource Plan (Volume II) is listed below:

- Peak Demand: 10 years of historical seasonal well production data, including peak season and peak month production, is provided in Table 3.04 of the GBWC-PD IRP (Volume II). The exception is the Spring Mountain Motorsports Ranch system, where the first full year of data collection was 2020.
- Recorded Sales of Water and Wastewater Flows: 10 years of metered water consumption data is provided in Table 3.07 of the GBWC-PD IRP (Volume II). GBWC-PD does not meter wastewater flow data for individual customers. However, 10 years of metered influent wastewater flow data for Plant 3, Plant F, and Plant MF are provided in Table 3.20 of the GBWC-PD IRP (Volume II). Three years of data is presented for Plant SMMR because 2020 was the first full year of data collection.
- Estimated or actual amount of water lost: 10 years of non-revenue water quantities are provided in Table 3.09 of the GBWC-PD IRP (Volume II).
- Estimated or actual amount of water used: 10 years of metered water consumption data is provided in Table 3.07 of the GBWC-PD IRP (Volume II).
- Estimated or actual amount of effluent disposed of by the utility: Three years of data is presented and analyzed for effluent reuse from Plant 3 (see Explanation of Water Analysis, below) in Table 3.22 of the GBWC-PD IRP (Volume II).
- Estimated or actual amount of reclaimed water sold or used by the utility: Does not apply to Plant F or Plant SMMR as they do not sell or reuse effluent. Three years of data (see Explanation of Water Analysis, below) is presented and analyzed for effluent reuse from Plant 3 in Table 3.22 of the GBWC-PD IRP (Volume II).

Explanation of Water Analysis:

Although 10-years of data is provided in the 2024 IRP as outlined above, only the past 3 years of data was used in determining water demand factors, wastewater flow generation factors, and associated peaking factors to reflect current trends in the system for existing and future conditions. A standard engineering practice for assessing utility systems (water and wastewater) is to analyze the past three (3) full years of data and generate a 3-year average for water consumption and wastewater flow generation by service class. Including data up to 10 years old in the calculations will only result in skewing numbers higher or lower due to old operational practices and customer behaviors that may no longer be occurring. Examples of changes that can skew water use (and corresponding wastewater generation patterns) include implementation of water conservation practices, customer awareness, increases in customer rates, and new construction (e.g. low-flow fixtures).

Q.27 DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A.27 Yes, however I reserve the right to supplement or make corrections to this testimony at the time of the hearing in this proceeding.

AFFIRMATION

Pursuant to Section 703.710 of the Nevada Administrative Code, I hereby affirm that the foregoing testimony was prepared by me or under my direction and is correct to the best of my knowledge.

Signed: 

Dated: March 1, 2024

Attachment MQ-1 to Exhibit ___

Great Basin Water Co.
2024 Integrated Resource Plan
Checklist — NAC 704.565, et seq.
(Pahrump Volume II)

	NAC Section	Application Section
❑	NAC 704.5661 Resource plan: Summary.	IRP Vol. I, IRP Executive Summary & Introduction of the IRP.
❑	NAC 704.5662 Resource plan: General requirements.	IRP Vol. I, II § 1.2 (ownership, history & organization of utility) IRP Vol. I, § 1.4 (acknowledgments). IRP Vols. I, II (Pahrump), Table of Contents; List of Figures; List of Tables; List of Technical Appendices; List of Abbreviations (organization of resource plan). IRP Vol. II (Pahrump), §§ 2.1 (service area). IRP Vol. II (Pahrump), §§ 1.3 (Issues for water & sewer). IRP Vol. II (Pahrump), §§ 1.3 (Objectives). IRP Vol. II (Pahrump), §§ 1.2 and Appendix D (Maps of service areas).
❑	NAC 704.5663 Resource plan: Identification of inapplicable regulatory provisions.	See requests for waivers in application.
❑	NAC 704.5664 Resource plan: Written testimony.	IRP Vols. I, II (Pahrump); Testimony of James T. Eason, Michael Hardy, Mara Quiroga, Deborah D. Woodland, Aleksey Dolinko, Terry J. Redmon).

	NAC §	APPLICATION §
❑	NAC 704.5665 Resource plan: Integrated analysis.	"Introduction" - IRP Vol. I, §1.0; Vol. II (Pahrump), §1.0 "Water Supply and/o Wastewater Plan" - IRP Vol. I, §4.0; Vol. II (Pahrump), §4.0 "Emergency Response Plan" - IRP Vol. I, §5.0; Vol. II (Pahrump), §5.0; and Appendix J "Water Conservation Plan" - IRP Vol. I, §6.0; Vol. II (Pahrump), §6.0; and Appendix K "Preferred Plan" - IRP Vol. I, §7.0; Vol. II (Pahrump), §7.0 "Action Plan" - IRP Vol. I, §8.0; Vol. II (Pahrump), §8.0 "Funding Plan" - IRP Vol. I, §9.0; Vol. II (Pahrump), §9.0 "System Improvement Rate Request" - IRP Vol. I, §10.0; Vol. II (Pahrump), §10.0
❑	NAC 704.5666 Resource plan: Technical appendix.	IRP Technical Appendices A – M (For Vol. I, II, III, IV, V)
❑	NAC 704.5667 Resource plan: Forecasts; inconsistent water sources; changes in methodology of forecasting.	IRP Vol. II (Pahrump), §§2.1, 3.0, 4.3
❑	NAC 704.5668 Resource plan: Information concerning entire system of utility for 10 previous years.	IRP Vol. II (Pahrump), §3.0
❑	NAC 704.5669 Resource plan: Assessment of projected reliability of water service; population estimates.	IRP Vol. II (Pahrump), §§3.0, 4.0

	NAC §	APPLICATION §
❑	NAC 704.567 Conservation plan: General requirements.	IRP Vol. I (Introduction), §6.0, Appendix K (Water Conservation Plan)
❑	NAC 704.5671 Conservation plan: Analysis for potential water shortages.	IRP Vol. I (Introduction), §6.0, Appendix K (Water Conservation Plan)
❑	NAC 704.5672 Conservation plan: Information about reclaimed water.	IRP Vol. I (Introduction), §6.0, Appendix K (Water Conservation Plan)
❑	NAC 704.5673 Water supply and wastewater treatment plan: Options for meeting demand for water and wastewater treatment.	IRP Vol. II (Pahrump), §§4.0, 8.0
❑	NAC 704.5674 Water supply and wastewater treatment plan: Preferred plan.	IRP Vol. II (Pahrump), §7.0
❑	NAC 704.5675 Water supply and wastewater treatment plan: Description of system and separate components; map of facilities; description of deficiencies.	IRP Vol. II (Pahrump), §§2.0, 4.1; Appendix D (Service Maps) and Appendix C (Flow Schematics)
❑	NAC 704.5676 Funding plan: Requirement for certain items identified in conservation plan or water supply and wastewater treatment plan.	IRP Vol. I (Introduction), §9.1 (Funding Plan) and Appendix L
❑	NAC 704.5677 Funding plan: Information concerning costs utility will incur during term of action plan.	IRP Vol. I (Introduction), §§9.1, 9.6 (Funding Plan) and Appendix L
❑	NAC 704.5678 Funding plan: Options for defraying expenditures.	IRP Vol. I (Introduction), §9.3 (Funding Plan) and Appendix L

	NAC §	APPLICATION §
❑	NAC 704.5679 Funding plan: Estimates of financial information; assumptions.	IRP Vol. I (Introduction), §§9.2, 9.3, & 9.5 (Funding Plan) and Appendix L
❑	NAC 704.568 Action plan: General requirements.	IRP Vol. II (Pahrump), §8.0 and Appendix I
❑	NAC 704.5681 Action plan: Budget of planned expenditures.	IRP Vol. II (Pahrump), §8.0 and Appendix I

PREPARED DIRECT TESTIMONY OF
DEBORAH D. WOODLAND

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

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In the Matter of: Application of Great Basin Water Co., Cold Springs, Pahrump, Spanish Springs and Spring Creek Divisions for approval of its 2024 Integrated Resource Plan and to designate certain system improvement projects as eligible projects for which a system improvement rate may be established, and for relief properly related thereto.	Docket No. 24-_____

PREPARED DIRECT TESTIMONY OF

DEBORAH D. WOODLAND

ON BEHALF OF GREAT BASIN WATER CO.

March 1, 2024

PREPARED DIRECT TESTIMONY OF

DEBORAH D. WOODLAND

ON BEHALF OF GREAT BASIN WATER CO.

Q.1 PLEASE STATE YOUR NAME, PRESENT POSITION AND BUSINESS ADDRESS.

A.1 My name is Deborah D. Woodland, and I am the Water Conservation Coordinator for Great Basin Water Co. ("GBWC" or the "Company"), and Bermuda Water Company ("BWC") in Arizona. My business address is 1240 E. State Street, Suite 115, Pahrump, Nevada 89048.

Q.2 WHAT ARE YOUR DUTIES IN YOUR CURRENT POSITION?

A.2 In my current position, I am responsible for developing, marketing, and then implementing water education and compliance programs in each GBWC division (and BWC). My major duties and responsibilities include the following:

- Administrate and educate customers regarding compliance programs for Water Conservation, Cross Connection, Fats, Oils, & Grease (FOG), and other utility programs.
- Prepare promotional materials, plan, organize, and coordinate community participation in public outreach events.
- Network with local non-profits, for profits, organizations, and event coordinators in each division.
- Suggest policy, including any necessary tariff changes.
- Attend meetings, workshops, and conferences which center on new and innovative conservation practices applicable to our customer base.
- Review complaints, prepare regulatory and non-regulatory submissions.
- Provide support documentation.

- Provide prospective property owners, realtors, and developers the distances to water and sewer infrastructure under the supervision of the Project Manager.

Some specific water conservation activities that I coordinate in my role include:

- Conducting a variety of outreach educational programs to individuals and/or groups of people in a variety of community settings which may include schools, civic and senior centers, camps, and other meeting facilities.
- Conducting informal instructional programs in subject areas such as agriculture, horticulture, community development, health and nutrition, human and family development, and natural resources in urban and rural areas.
- Meeting with clientele to relay information; explain program rules, regulations, policies, and procedures; and interpret policies relating to program areas.
- Collecting information and compiling documents regarding instructional programs, services, and recipients; maintain, update and present statistical information related to program activities and participants.

Q.3 WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

A.3 I graduated from high school in Las Vegas, NV., attended Community College in Las Vegas, Cape Cod, MA., and Pahrump. I opened and managed/owned a drought tolerant plant nursery and water garden business in Pahrump for seven years. In 1999, I was trained to and became a Master Gardener for University of Nevada Cooperative Extension. I accepted the 4-H Coordinator position in September 2004 with the University of Nevada Cooperative Extension office in Pahrump, and in 2010 became the Master Gardener Coordinator until March 4, 2016. In August 2019, I became a MS4 Compliance & Code Enforcement Certified Inspector – Municipal Separate Storm Sewer System (MSS4).

Q.4 HAVE YOU TESTIFIED BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA (THE "COMMISSION")?

A.4 Yes. I have testified in two (2) dockets:

1. Docket No. 18- 03005, *GBWC 2018 Consolidated IRP*.
2. Docket No. 21-03003, *GBWC 2021 Consolidated IRP*.

Q.5 HAVE YOU TESTIFIED BEFORE ANY OTHER PUBLIC UTILITY COMMISSION?

A.5 No.

Q.6 WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS DOCKET?

A.6 The purpose of my 2024 GBWC Integrated Resource Plan ("IRP") testimony is to support the updated GBWC Water Conservation Plan for 2024 ("2024 Water Conservation Plan"). Specifically, my testimony will address:

- Continuing Conservation Incentives
- Continuing Public Outreach Efforts

Q.7 PLEASE SUMMARIZE THE 2024 WATER CONSERVATION PLAN.

A.7 The 2024 Water Conservation Plan applies to all four of GBWC's divisions and was developed in compliance with NRS 704.662 – 6624 and NAC 704.567 - .5672. This Water Conservation Plan promotes water conservation through public education, system management and other specific conservation measures. As shown in the 2024 Water Conservation Plan at Section 6.9, gallons per day per capita decreased year over year in each of GBWC's Cold Springs, Spanish Springs, and Spring Creek divisions between 2020 and 2022.

In addition to information presented in my testimony, the Water Conservation Plan is also supported by the Direct Testimonies of James Eason and Michael Hardy.

CONSERVATION INCENTIVES

Q.8 DOES THE 2024 WATER CONSERVATION PLAN ADDRESS GBWC'S CONTINUING USE OF REBATES AND PLUMBING RETROFITS TO ENCOURAGE WATER CONSERVATION?

A.8 Yes. As in GBWC's 2021 Water Conservation Plan, the 2024 Water Conservation Plan addresses water conservation through current rebates for residential, commercial, and industrial premises as bill credits for the installation of high-efficiency toilets, washing machines, salt cedar removal, water efficient bathroom faucets, water efficient showerheads, weather-based irrigation controllers, WaterSense Labeled Flushometer Valves, and WaterSense Labeled Urinals, for all GBWC divisions. All rebates are available in every GBWC division.

Q.9 IS GBWC INTRODUCING NEW REBATES IN ITS 2024 WATER CONSERVATION PLAN?

A.9 No, GBWC is not introducing any new or additional rebates in the 2024 GBWC Water Conservation Plan. The rebates described in the 2021 Water Conservation Plan all remain in effect and available in all of GBWC's divisions. GBWC plans to continue to encourage customers to take full advantage of available rebates and other water conservation incentives through its ongoing public outreach.

PUBLIC OUTREACH

Q.10 WHY IS PUBLIC AWARENESS IMPORTANT?

A.10 Public awareness of water conservation is necessary to increase Nevadan's knowledge of water resources, water use, and the protection of water resources, and more likely

customers will participate in water conservation programs. Conservation is a cost-effective means of securing future water supplies for all Nevadans.

Q.11 DOES THE 2024 WATER CONSERVATION PLAN ADDRESS GBWC'S CONTINUING USE OF PUBLIC OUTREACH TO ENCOURAGE WATER CONSERVATION ?

A.11 Yes. The 2024 Water Conservation Plan discusses GBWC's historical public outreach strategies and customer communication and education initiatives, including that it identifies several programs that were impacted by the Covid-19 pandemic. GBWC will continue to promote water conservation through established public outreach strategies.

Q.12 HAS THE 2024 WATER CONSERVATION PLAN BEEN UPDATED TO REFLECT THE MOST CURRENT AVAILABLE DATA?

A.12 Yes.

Q.13 DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A.13 Yes, however I reserve the right to supplement or make corrections to this testimony at the time of the hearing in this proceeding.

AFFIRMATION

Pursuant to Section 703.710 of the Nevada Administrative Code, I hereby affirm that the foregoing testimony was prepared by me or under my direction and is correct to the best of my knowledge.

Signed: _____

Dated: March 1, 2024

PREPARED DIRECT TESTIMONY OF
ALEKSEY V. DOLINKO

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

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In the Matter of:

Application of Great Basin Water Co., Cold Springs, Pahrump, Spanish Springs and Spring Creek Divisions for approval of its 2024 Integrated Resource Plan and to designate certain system improvement projects as eligible projects for which a system improvement rate may be established, and for relief properly related thereto.

Docket No. 24-_____

PREPARED DIRECT TESTIMONY OF

ALEKSEY V. DOLINKO

ON BEHALF OF GREAT BASIN WATER CO.

March 1, 2024

PREPARED DIRECT TESTIMONY

OF ALEKSEY V. DOLINKO

ON BEHALF OF GREAT BASIN WATER CO.

Q.1 PLEASE STATE YOUR NAME, PRESENT POSITION AND BUSINESS ADDRESS.

A.1 My name is Aleksey Dolinko, and I am the Director of Financial Planning and Analysis ("FP&A") for the Great Basin Water Co. ("GBWC" or the "Company" or the "Utility"). My business address is 500 W. Monroe St., Chicago, Illinois 60661.

Q.2 WHAT ARE YOUR DUTIES IN YOUR CURRENT POSITION?

A.2 As the Director of FP&A, I perform the budgeting, forecasting and analytical processes that support an organization's financial health and business strategy. I combine analysis of both operational and financial data to help align business processes and strategies with financial goals, and to evaluate progress toward those goals. I also lead regulatory filings with the Public Utilities Commission of Nevada (the "Commission"), including but not limited to rate cases, System Improvement Rate filings, and decoupling filings.

Q.3 WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

A.3 I graduated from the University of Illinois at Chicago ("UIC") in 2008 with Bachelor's Degrees in Finance and Information Decision Sciences. In 2013, I completed my Master's in Business Administration from the University of Chicago, Booth School of Business.

I have worked for GBWC since September 2016. During this time I have supported the business operations in Nevada and Arizona. Prior to joining GBWC, I worked for Allstate Insurance for eight (8) years; I started as a Financial Analyst and left the company as a Finance Manager.

Q.4 HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA (THE "COMMISSION")?

A.4 Yes. I have testified in twenty-four (24) dockets:

1. Docket No. 16-12006, *GBWC Spring Creek Meter Reading.*
2. Docket No. 16-12037, *GBWC Pahrump GRC.*
3. Docket No. 17-12022, *GBWC Spring Creek GRC.*
4. Docket No. 18-03005, *GBWC 2018 Consolidated IRP.*
5. Docket No. 18-11014, *GBWC Cold Springs /Spanish Springs GRC.*
6. Docket No. 19-12029, *GBWC Pahrump GRC.*
7. Docket No. 20-07005, *Pahrump Decoupling #1*
8. Docket No. 20-07015, *GBWC Cold Springs GRC.*
9. Docket No. 20-07017, *GBWC Spring Creek GRC.*
10. Docket No. 20-08021, *Spanish Springs Decoupling #1*
11. Docket No. 20-08023, *Cold Springs Decoupling #1*
12. Docket No. 21-03042, *SIR Well 2 PD.*
13. Docket No. 21-06009, *SIR Dewatering PD.*
14. Docket No. 21-08019, *Spanish Springs Decoupling #2*
15. Docket No. 21-08020, *Cold Springs Decoupling #2*
16. Docket No. 21-12025, *GBWC 2021 Consolidated GRC*
17. Docket No. 22-02028, *Pahrump Decoupling #3*
18. Docket No. 22-08026, *Spanish Springs Decoupling #3*
19. Docket No. 22-10007, *Annual SIR Compliance*
20. Docket No. 23-02032, *Pahrump Decoupling #4*
21. Docket No. 23-09015, *Pahrump SIR Firebird Circle Loop*
22. Docket No. 23-10017, *NV Consolidated Decoupling #1*
23. Docket No. 23-12020, *Pahrump SIR – Mountain Falls Tanks 1 Floor Replacement*
24. Docket No. 24-02018, *Spring Creek SIR – Pipeline Replacement Phase 4*

Q.5 HAVE YOU TESTIFIED BEFORE ANY OTHER PUBLIC UTILITIES COMMISSION?

A.5 Yes. I have testified before the Arizona Corporation Commission in two (2) dockets:

1. Docket No. W-01812A-20-0109, *Bermuda Water Co 2020 Rate Case*
2. Docket No. W-01812A-22-0256, *Bermuda Water Co 2022 Rate Case*

Q.6 WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS DOCKET?

A.6 The purpose of this testimony is to support the Funding Plan (Section 1) and provide information on the financial impact of the IRP Action Plan on utility's customers (Sections 2 and 3).

SECTION 1 – FUNDING PLAN

Q.7 WHAT IS THE FUNDING PLAN?

A.7 Under Nevada Administrative Code ("NAC") 704.5653, the Funding Plan means the plan developed by a utility that demonstrates the financial impact of an IRP Action Plan on the utility and its customers. The Action Plan is the Utility's three-year plan to build or purchase and place into service its preferred projects for its water and/or sewer systems. In addition, under NAC 704.5678, the Funding Plan must include options for defraying the expenditures identified in the Utility's Action Plan.

Q.8 WHAT SOURCES OF FUNDING DID THE UTILITY CONSIDER TO FUND THE UTILITY'S ACTION PLAN?

A.8 The regulations require the GBWC to include options for funding that will defray the expenditures of the proposed projects. Such options considered must include a combination of (1) revenue from customer surcharges; (2) revenue from customer hook-up fees; (3) capital investment by the utility; (4) debt financing by the utility; and (5) other

prudent and reasonable means of defraying the expenditures. The Utility considered these options in formulating its funding plan.

Q.9 WHAT FUNDING OPTION IS THE UTILITY SELECTING FOR THE PROPOSED ACTION PLAN PROJECTS?

A.9 As with previous IRPs, GBWC is selecting a mix of capital investment and debt financing provided by GBWC parent company: Corix Regulated Utilities (US), Inc. ("CRUUS").

Q.10 WHAT OTHER FUNDING OPTIONS DID GBWC CONSIDER?

A.10 As described in Section 9 of the IRP, the following options were considered:

1. Debt financing by GBWC directly (not through CRUUS).
2. Financing from the State of Nevada Revolving Funds program
3. Customer Hook-Up Fees and Capacity Fees
4. Customer Sur-charges

Q.11 WHY ARE THE FOUR (4) ALTERNATIVE FUNDING OPTIONS NOT OPTIMAL FOR THE ACTION PLAN PROJECTS?

A.11 As referenced in Section 9.3 of the IRP the 4 alternative options have the following limitations.

1. Debt financing by GBWC directly (not through CRUUS) → due to the size of GBWC compared to its parent, the cost of debt would be significantly higher if issued to GBWC.
2. Financing from the State of Nevada Revolving Funds program → this program is targeted at municipalities and their publicly owned utility systems.
3. Customer Hook-Up Fees and Capacity Fees → these fees are generally charged for infrastructure related to growth and the projects being proposed in the Action Plan are not related to customer growth.

4. Customer Sur-charges → sur-charges are used by smaller utilities that have limited access to capital or debt financing. This funding mechanism is also not ideal since it is more administratively burdensome. Additionally, sur-charges require a payment by customers upfront for infrastructure that is not yet placed in service.

Q.12 IS GBWC REQUESTING A SYSTEM IMPROVEMENT RATE FOR PROJECTS?

A.12 Yes, GBWC is requesting system improvement rate (SIR) for all projects with an expected cost greater than $500,000.

Q.13 WHAT IS THE DIFFERENCE BETWEEN SIR AND CUSTOMER SUR-CHARGES?

A.13 SIR is not a funding mechanism, but a recovery mechanism. Funding for SIR projects will be provided as combination of capital and debt from CRUUS. The cost of these projects will be eligible for recovery through the SIR mechanism as outlined in Nevada Revised Statutes ("NRS") 704.663 and NAC 704.6339.

SECTION 2 – FINANCIAL MODELING METHODOLOGY

Q.14. PLEASE DESCRIBE THE PROCESS OF ESTIMATING THE IMPACT THAT THE ACTION PLAN HAS ON THE UTILITY AND CUSTOMERS?

A.14. The Action Plan covers the period from 2025 through 2027 and as such will impact both the rate base of the utility and income statement. For this IRP, GBWC has developed a new approach of projecting the rate base and income statement components. In developing this new approach GBWC met with representatives from Commission Staff ("Staff") and Bureau of Consumer Protection ("BCP") to share the approach and working files. The meetings took place on the following dates:

- Meeting with Staff on March 8th, 2023

- Meeting with Staff and BCP on October 11th, 2023

The second meeting satisfied the Commissions Directive #7 from the Commission's Order in the 2021 IRP (Docket No. 21-03003).

During these meetings GBWC discussed the assumptions, simplification, calculations, and limitations of the models.

Q.15. PLEASE DESCRIBE THE ASSUMPTIONS AND SIMPLIFICATIONS MADE IN THE NEW MODEL.

A.15. Any model that projects the future requires certain assumptions and simplifications. That is done both out of necessity (i.e. we don't have the data to predict electric costs in 2027) and to make the model easier to understand and not overly cumbersome to update and review. The following are assumptions and simplifications. These were discussed with both Staff and BCP, and no concerns were expressed by either party in the meetings.

1. Two rate cases are assumed in the model: 2024 Rate Case and 2027 Rate Case.
2. The starting point for all calculations/projections are the stipulated revenue requirement models from the 2021 Consolidated Rate Case ("2021 Rate Case"), Docket No. 21-12025
3. In order not to over complicate the model, the SIR revenues are not reflected in this model. SIR revenues smooth out rate shock to customers (and expedites recovery for the utility), but are ultimately reflected in future rate cases through base and volumetric rates. Individual SIR sur-charge calculations are provided by Mr. Redmon.
4. While GBWC is pursuing the goal of rate consolidation across its divisions, the rate impacts in this IRP are reflected based on individual revenue requirements as approved by the Commission in the 2021 Rate Case. GBWC is committed to reaching out to Staff and BCP prior to filing the 2024 Rate Case in order to discuss potential consolidation options. The projections used in this IRP, will be the basis

for those discussions.

5. Rate Base assumptions/simplifications
    a. Increase in Gross CIAC is expected to continue at an average monthly pace for all the projected years.
    b. CIAC will amortize based on the rate approved in the 2021 Rate Case through 2027.
    c. Projections were only made for the following 4 account categories: (1) Plant in Service, (2) Accumulated Depreciation, (3) CIAC, and (4) Accumulated Amortization CIAC. All other categories are assumed to remain identical to the 2021 Rate Case stipulation. The 4 categories listed above account for the majority of the GBWC's Rate Base.
    d. The 4 categories above are first updated with May 2023 actuals, and then projected forward based on current trends and IRP Action Plan Projects.
    e. Projection of Plant in Service includes prior approved IRP projects, requested Action Plan projects in this IRP, and general plant spend. This is the first time GBWC is including general plant spend capital projections in calculating future rate base.
6. Revenue Assumptions
    a. Customer Counts have been updated as of May 2023; no additional growth has been forecasted. If additional growth takes place it will result in lower rate case increases and lower average bills. Thus, this is a conservative assumption.
    b. Consumption per customer is based on the stipulated rate design from the 2021 Rate Case. The 2021 Rate Case utilized a 3-year average and thus we believe is still a valid approach.
    c. Misc Revenues are based on annualized results from October to December 2023.

7. Operating Expense Assumptions

   a. Salaries and Wages assumes a 3% merit increase every year since the 2021 Rate Case. The first merit increase not captured in the rate case took place in April 2022.

   b. Employe Pensions and Benefits is calculated as a percentage of Salaries and Wages, with the percentage consistent with the stipulation in the 2021 Rate Case.

   c. Electric Power and Chemical costs are updated with 2023 actuals and inflated by 2.6% in all subsequent years.

   d. Depreciation Expense is updated to reflect capital investment since the last rate case and expected capital spend into the future.

   e. Bad Debt as a percentage of revenues is recalculated as of year end 2023. Please note that the Pahrump division has seen a significant increase in bad debt in 2023. If bad debt levels come back to more historic levels, the rate impact of the 2024 rate case will be mitigated.

   f. All other Operating Expense categories are assumed to be identical to the 2021 Rate Case stipulation.

   g. Impacts from the merger of Corix and SouthWest Water are not quantifiable at this time and are thus not reflected in the models.

Q.16. DOES THE 2024 IRP IMPACT THE REVENUE INCREASES EXPECTED IN THE 2024 RATE CASE?

A.16. Since the 2024 IRP Action Plan is for 2025 through 2027, the projects deemed prudent by the Commission in the 2024 IRP will have no impact on the 2024 Rate Case.

Q.17. IF THE 2024 IRP DOES NOT IMPACT THE 2024 RATE CASE, WHY IS IT BEING CALCULATED?

A.17. The 2024 IRP will impact the requested revenue requirement in the 2027 rate case. As such it is important to understand the starting point of the 2027 Rate Case, which will be the 2024 Rate Case.

Q.18. WHEN CALCULATING THE CHANGE IN PLANT IN SERVICE OVER TIME, ARE JUST THE ACTION PLAN PROJECTS INCLUDED IN THE INCREASE TO PLANT IN SERVICE?

A.18. No. As part of the redesigned approach to projecting rate base, GBWC is including in its forecast general non-project related capital spend. This spend includes the day-to-day replacement of GBWC's infrastructure. Some examples of this infrastructure includes, but is not limited to, installation of pipe due to breaks, meters, pumps, motors, fencing, tools, new services (offset by CIAC), etc. In some cases, this general spend represents a large portion of total capital spend for the division. For example, it is expected that the Spring Creek water division will spend $950,000 in general plant spend in 2024, mainly related to replacement of mains and service line related to breaks.

Q.19. IS GBWC LOOKING FOR A PRUDENCY DETERMINATION FOR GENERAL PLANT SPEND?

A.19. No. GBWC will request recovery of all general plant spend in its rate cases and is not seeking prudency determination in this IRP. While the dollar amounts of the general spend are high, the cost is made up of hundreds of individual decisions to make the investment and it would not be practical to include each potential instance in the IRP. Additionally, much of general plant spend is for emergency purposes.

Q.20. IF GBWC IS NOT SEEKING RECOVERY, WHY IS IT INCLUDED IN THE MODELING?

A.20. Not including general plant spend in the modeling would result in underestimating the rate

impact of action plan projects.

Q.21. WHAT NEW FUNCTIONALITY IS INCLUDED IN THE MODELS FOR THIS IRP?

A.21. GBWC has tried to make the models more interactive. First, a "Yes/No" drop down is available for all Action Plan projects, so that a project can easily be excluded from revenue requirement and rate design, thus making it easier to understand an impact of each individual project.

Second, rate design has been incorporated into the same file as revenue requirement, making the analysis more dynamic: as revenue requirement changes, so does the rate design.

Third, a user can adjust inflation to different levels, thus gaining an understanding of what different inflation levels do to revenue requirement.

Fourth, while not fully dynamic with the revenue requirement calculations, it is possible to simulate the impact of different growth levels on the required revenue increase in rate cases. This is a bit more complex to accomplish in the model, but if any party is interested in how to do it, I am happy to walk them through it. As mentioned earlier, the models are conservative and do not project growth past May 2023.

Q.22. ARE THE MODELED RATE INCREASES REPRESENTED IN NOMINAL OR REAL PERCENTAGES?

A.22. The percentage increases are represented in nominal values, meaning that they are not expressed in today's dollars. For example, if we are looking at an increase of 15% in 2027

in the model it represents only a 4%[1] increase in 2027 dollars.

SECTION 3 – FINANCIAL MODELING RESULTS

Q.23. WHAT ARE THE RESULTS OF THE FINANCIAL MODELING RELATED TO RATE BASE AND EXPECTED REVENUE INCREASES?

A.23. Please see Tables 1 and 2 below for projected Rate Base and Revenue Increase Percentage respectively.

Table 1 – Rate Base Predictions ($0.0M)

Utilty Type	Division	2024	2027
Water	Cold Springs	$ 7.8	$ 11.8
Water	Spanish Springs	$ 2.4	$ 3.4
Water	Spring Creek	$ 28.9	$ 35.6
Water	Pahrump	$ 24.4	$ 29.5
Sewer	Spring Creek	$ 0.4	$ 1.1
Sewer	Pahrump	$ 12.4	$ 17.0

Table 2 – Expected Revenue Increase %

Utilty Type	Division	2024 Nominal	2027 Nominal	2027 Real*
Water	Cold Springs	11%	22%	11%
Water	Spanish Springs	20%	23%	12%
Water	Spring Creek	16%	15%	4%
Water	Pahrump	19%	13%	2%
Sewer	Spring Creek	2%	51%	40%
Sewer	Pahrump	3%	16%	5%

*Assumes 4 years of inflation at 2.6%

Q.24. PLEASE DESCRIBE THE BILL IMPACT OF THE PROJECTED 2024 AND 2027 RATE CASES?

[1] Assumes 4 years of inflation (2024, 2025, 2026, 2027) at 2.6% → 4% = 15% - [(1.026%)^4-1]

A.24. Table 3 below illustrates the average monthly bill for a residential customer under current rates, rates effective the 2024 rate case, and rates effective after the 2027 rate case. Table 4 takes the values in Tables 3 and adjusts them to today's dollars.

Table 3 – Residential Customer Bill Impact (Nominal)

Utilty Type	Division	Meter Size	Current Rates	After 2024 Rate Case	After 2027 Rate Case
Water	Cold Springs	3/4"	$42	$47	$58
Water	Spanish Springs	3/4"	$95	$114	$140
Water	Spring Creek	3/4"	$80	$94	$108
Water	Pahrump	3/4"	$40	$48	$54
Sewer	Spring Creek	All	$50	$51	$77
Sewer	Pahrump	3/4"	$57	$58	$67

Table 4 – Residential Customer Bill Impact (Real[2])

Utilty Type	Division	Meter Size	Current Rates	After 2024 Rate Case*	After 2027 Rate Case**
Water	Cold Springs	3/4"	$42	$46	$52
Water	Spanish Springs	3/4"	$95	$111	$126
Water	Spring Creek	3/4"	$80	$91	$98
Water	Pahrump	3/4"	$40	$47	$49
Sewer	Spring Creek	All	$50	$50	$69
Sewer	Pahrump	3/4"	$57	$57	$61

*Assumes 1 year of inflation at 2.6%

** Assumes 4 years of inflation at 2.6%

Table 5 illustrates what 5,000 gallons of water would cost for a residential customer.

[2] In 2023 dollars utilizing a 2.6% inflation

Table 5 – Cost of 5,000 gallons for a Residential Customer

Nominal Dollars					
Utilty Type	**Division**	**Meter Size**	**Current Rates**	**After 2024 Rate Case**	**After 2027 Rate Case**
Water	Cold Springs	3/4"	$27	$33	$39
Water	Spanish Springs	3/4"	$26	$31	$36
Water	Spring Creek	3/4"	$40	$47	$54
Water	Pahrump	3/4"	$34	$40	$46
Real Dollars (Adjusted for Inflation)					
Utilty Type	**Division**	**Meter Size**	**Current Rates**	**After 2024 Rate Case***	**After 2027 Rate Case****
Water	Cold Springs	3/4"	$27	$32	$36
Water	Spanish Springs	3/4"	$26	$30	$33
Water	Spring Creek	3/4"	$40	$46	$49
Water	Pahrump	3/4"	$34	$39	$41

*Assumes 1 year of inflation at 2.6%

** Assumes 4 years of inflation at 2.6%

Q.25 HOW DID YOU APPROACH THE RATE DESIGN?

A.25 The rate design is unchanged from the stipulation to the 2021 Rate Case, with one exception. Currently base rates for residential, multi-residential, irrigation, and non-residential customers are the same across Pahrump, Spanish Springs, and Spring Creek divisions. The base rates for 5/8" and 3/4" customers are lower for the Cold Springs division. In order to further GBWC's goal of rate consolidation, the 2024 and 2027 rate design brings Cold Springs base rates inline with the other 3 divisions.

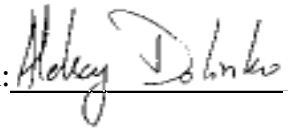
At this time, GBWC is not recommending any changes to the tier structure. Ultimately, rate design is less meaningful in the context of an IRP vs a rate case. GBWC will re-evaluate the current rate design in its upcoming 2024 rate case, and make proposal for modification if deemed necessary.

Q.26 DOES THIS CONCLUDE YOUR TESTIMONY?

A.26 Yes, however I reserve the right to supplement or make corrections to this testimony at the time of the hearing in this proceeding.

AFFIRMATION

Pursuant to Section 703.710 of the Nevada Administrative Code, I hereby affirm that the foregoing testimony was prepared by me or under my direction and is correct to the best of my knowledge.

Signed: 

Dated: March 1, 2024

PREPARED DIRECT TESTIMONY OF
TERRY J. REDMON

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

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In the Matter of: Application of Great Basin Water Co., Cold Springs, Pahrump, Spanish Springs and Spring Creek Divisions for approval of its 2024 Integrated Resource Plan and to designate certain system improvement projects as eligible projects for which a system improvement rate may be established, and for relief properly related thereto.	Docket No. 24-_____

PREPARED DIRECT TESTIMONY OF
TERRY J. REDMON, CPA
ON BEHALF OF GREAT BASIN WATER CO.

March 1, 2024

PREPARED DIRECT TESTIMONY OF

TERRY J. REDMON, CPA

ON BEHALF OF GREAT BASIN WATER CO.

Q.1 PLEASE STATE YOUR NAME AND PROVIDE YOUR BUSINESS ADDRESS.

A.1 My name is Terry J. Redmon. My business address is 245 E. Liberty Street, Suite 250, Reno, Nevada 89501.

Q.2 ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A.2 I am testifying on behalf of the applicant, Great Basin Water Co. ("GBWC" or the "Company"). The Company has filed this Application for approval of its 2024 Integrated Resource Plan (the "Application" or "IRP"). Through the Application, the Company requests that the Public Utilities Commission of Nevada (the "Commission") approve its IRP.

Q.3 BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A.3 I am a self-employed Certified Public Accountant and have been retained by GBWC as a consultant in this matter. I am assisting the Company with preparing and prosecuting the Application, and am providing supporting testimony in this proceeding.

Q.4 HAVE YOU PROVIDED YOUR CURRICULUM VITAE AS AN EXHBIT TO YOUR TESTIMONY?

A.4 Yes, please see Attachment TJR-1 to Exhibit ___.

Q.5 WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A.5 I am sponsoring a portion of the Company's Funding Plan in the Application. The Funding Plan is included in the IRP document in Section 9 of Volume 1. Specifically, I sponsor the

Present Worth Revenue Requirement calculations for each project in the action plan. In addition, I sponsor the System Improvement Rate ("SIR") calculations for each project for which the Company is seeking a Commission determination of certain projects SIR eligibility.

Q.6 WHO IS SPONSORING THE OTHER PORTIONS OF THE FUNDING PLAN?

A.6 Mr. Aleksey Dolinko is sponsoring the remainder of the Funding Plan, including the general rate impacts of the action plan projects.

Q.7 WHAT PROJECTS IN THE COMPANY'S ACTION PLAN WILL NEED TO BE FUNDED AND OVER WHAT PERIOD OF TIME DOES THIS PLAN COVER?

A.7 A complete list of the Company's proposed action plan projects is included in Tables 9-1.a through 9-1.d in the Funding Plan. Tables 9-1.a through 9-1.d, one table for each operating entity, detail the cost of each Action Plan project, and the estimated time period such expenditures would be made. These tables are presented in Appendix L of the IRP.

These projects will provide new plant, enhancements, and replacements to the Company's water and sewer plant and operations and provide necessary tools for the Utility to better serve its customers. As noted, these projects are listed in Tables 9-1.a through 9-1.d of the Funding Plan (see Appendix L of the IRP) along with each project's resultant costs with and without an allowance for funds used during construction ("AFUDC") and a schedule of the estimated present worth revenue requirements ("PWRR's") associated with each project is included seat Tables 9-2.a through 9-2.d in Appendix L of the IRP.

Q.8 IS THE COMPANY REQUESTING THAT CERTAIN PROJECTS BE APPROVED AS BEING ELIGIBLE FOR A SYSTEM IMPROVEMENT RATE ("SIR") CHARGE?

A.8 Yes, the Company is requesting the Commission approve the following projects for eligibility to be allowed as System Improvement Rate ("SIR") projects:

Pahrump Division

- New Well in High Zone at Well 13 Property
- Calvada Meadows System Consolidation Pipeline Alternative A
- Calvada Meadows System Consolidation Pipeline Alternative B
- Influent Pre-EQ Building & Tanks
- Sand Filter Rehabilitation Project

Spring Creek Division

- New Well 12
- Continued Pipeline Replacements
- Replace Tract 200 High Zone Water Tank, or
- Rehab Tract 200 High Zone Water Tank, or
- Booster Pump Tract 200
- WWTP Reconditioning

Cold Springs Division

- Tank 2 Replacement, or
- Tank 2 Factory Rehabilitation

Spanish Springs Division

- Rehabilitation of Well 2 (Suki)

This request is based on NRS 704.663, and the implementing regulations adopted by the Commission, including NAC 704.6339.

Q.9 WHAT IS THE COST OF TRADITIONAL COMPANY FUNDING?

A.9 The cost associated with traditional utility company funding is the cost of money to the Company or its weighted cost of capital. The most recently Commission approved

weighted average cost of money is 7.127% - which is a combination of the weighted cost of debt and equity. As a component of cost of capital, the weighted average cost of debt is 2.359%. The current weighted cost of equity is 4.768%.

Since internal funding would be a combination of both debt and equity financed by the Company, the rate would be the sum of these two weighted cost values or 7.127%. These amounts and rates were approved by the Commission in Docket No. 21-12025, the Company's most recent consolidated rate filing application for its four divisions.

Q.10 WHAT OTHER ASSUMPTIONS DID THE COMPANY USE IN THE DERIVATION OF THE PWRR'S IN ITS FUNDING PLAN?

A.10 Other assumptions used in the development of the PWRR's in the Funding Plan include the escalation rate (inflation rate), AFUDC rate, service lives of the proposed plant projects, applicable federal tax rate, and discount rate used to calculate the present value of the revenue requirements related to the project costs.

The escalation or inflation rate used is the average inflation rate of 2.60% over the Action Plan period. This rate is the average of the rates predicted by the Philadelphia Federal Reserve publication of its Fourth Quarter 2023 Survey of Professional Forecasters.

The Company's current AFUDC rate is 7.127%, the same as its current rate of return. This rate is used in the computation of AFUDC costs in the Funding Plan. In the PWRR calculations, a mid-quarter convention was used to compute AFUDC costs.

The applicable federal tax rate for the Company is 21%. This rate is the corporate rate beginning for tax years after 2017 due to HR-1 being signed into law on December 22, 2017. This is the rate used in the Funding Plan.

Tax depreciation is computed using the required straight-line method as prescribed in Internal Revenue Code Section 168 for water/sewer utility plant using the GDS service life of 25 years. Book depreciation is computed based on the straight-line rate over the asset's useful life. Appropriate deferred taxes are computed due to the differences between book and tax depreciation rates.

Finally, the discount rate used, is, again, the Company's rate of return from its last rate case in Docket No. 21-12025 as was stipulated in the Company's last IRP case in Docket No. 21-03003. It was stipulated in that case that the Company would use its WACC (ROR) as the discount rate in future IRP application submittals. This rate was not adjusted for the rate of inflation as the stipulation does not appear to have addressed that subject.

This rate was used in the PWRR computations to illustrate the present values of these projects' costs and their impact on each project's revenue requirements at this discount rate. The summary of those values is seen in Tables 9-2.a through 9-2.d of the Funding Plan. (See Appendix L in the IRP).

Q.11 WOULD IT BE PROPER TO ADJUST THE COMPANY'S ROR WITH THE INFLATION RATE MAKING IT A NOMINAL RATE?

A.11 I think so. As Staff witness Dr. Ronald Knecht noted in his direct testimony in Docket No. 09-03003[1], the discount rate should be adjusted for inflation when using it to present value project costs that are also adjusted for inflation. To do otherwise, would create a mis-match distortion.

Q.12 DID DR. KNECHT SUPPORT USE OF A COMPANY'S WACC AS THE

[1] See direct testimony of Ronald Knecht in Docket No. 09-03003, Q&A's 21 & 32.

DISCOUNT RATE FOR THESE PURPOSES?

A.12 No, he spent a large portion of his testimony explaining why that would not be appropriate and instead use of his consumer real discount rate was his preferred approach.[2]

Q.13 IN CONTRAST, WHAT DID STAFF PROPOSE IN THE COMPANY'S LAST IRP CASE IN DOCKET NO. 21-03003?

A.13 In that case, Ms. Swetha Venkat, discussed the discount rate in her direct testimony . Her recommendation was that the most recently approved WACC should be used as the discount rate for purposes of computing present worth revenue requirements[3].

Q.14 GIVEN STAFF'S TWO DIFFERENT PERSPECTIVES, CONCERNING THE DISCOUNT RATE TO BE USED IN THE DERIVATION OF PROJECT PWRR'S, HOW DID YOU DECIDE TO USE THE COMPANY'S RATE OF RETURN (WACC), UNADJUSTED FOR INFLATION, TO COMPUTE THE PWRR'S IN THIS FILING?

A.14 I used the Company's ROR from Docket No. 21-12025, unadjusted for inflation, because that is what was stipulated to be used in Docket No. 21-03003 for the Company's future IRP filings.

Q.15 WHAT DISCOUNT RATE WOULD YOU HAVE USED, BUT FOR THE STIPULATION IN DOCKET NO. 21-03003?

A.15 I probably would have continued to use the consumers' real discount rate computed by Dr. Knecht in Docket No. 09-03003 as being representative of what consumers' real discount rate is, adjusted to be a nominal rate with the rate of inflation. While I acknowledge that a current analysis could yield a different real discount rate for consumers – the persons who

[2] See direct testimony of Ronald Knecht in Docket No. 09-03003, Q&A's 22-31.

[3] See direct testimony of Swetha Venkat in Docket No. 21-03003, Q&A 15.

ultimately pay the cost of these projects through rates. It would, however, be appropriate to adjust whatever real rate is determined to be appropriate by the same inflation rate as is used to escalate the project costs.

Q.16 DID THE COMPANY INCLUDE ADDITIONAL OPERATING COSTS OR SAVINGS FOR ANY OF THESE PROJECTS IN ITS ANALYSES?

A.16 Yes, where there were known and measurable incremental operating costs and savings, the Company has included those costs and savings in the Funding Plan PWRR analyses. All projects included in the Action Plan have factors for property taxes and insurance included in the analyses. These factors were derived from historical data based on the ratio of these costs to gross plant in service from the same period. The resulting ratio was then applied to each of the projects' PWRR calculations. Similarly, factors for mill taxes and bad debts were formulated with use of historical booked data for each expense summed and divided by gross revenues for the relevant operating division. The mill tax and bad debt factors are included in each project's PWRR. Moreover, federal income tax was also included as a major component of each analysis.

As explained in the Company's Funding Plan, only three of the instant projects contain any provision for cost savings and three projects include additional costs for operating and maintenance. All are detailed in the Funding plan in Section 9.6.

Q.17 IS THE COMPANY REQUESTING THAT CERTAIN ACTION PLAN PROJECTS BE DESIGNATED AS ELIGIBLE FOR A SYSTEM IMPROVEMENT RATE ("SIR") IN THE COMPANY'S 2024 IRP?

A.17 Yes, as previously mentioned, GBWC is requesting that certain Action Plan projects for all four operating entities be designated as eligible for a SIR based on NRS 704.663(3), and the implementing regulations adopted by the Commission, including NAC 704.6339.

Q.18 ARE THESE PROJECTS INCLUDED IN THE COMPANY'S RATE BASE?

A.18 None of these projects have yet received Commission approval, and as such, are not included in the Company's current rate base.

Q.19 HOW WILL THE UTILITY FINANCE THESE PROJECTS?

A.19 The Company will provide traditional sources of debt and equity financing to pay for these projects. The Company requests that the Commission approve these projects as being SIR eligible.

Q.20 THE COMPANY IS REQUIRED TO PROVIDE AN ESTIMATE OF THE SIR TO ITS CUSTOMERS THAT THE COMPANY WILL REQUEST WHEN IT MAKES ITS APPLICATION TO THE COMMISSION FOR APPROVAL OF SIR (IN NAC 704.63395(1)). WHAT ARE THE ESTIMATED RATES THAT WILL BE REQUESTED IN SUCH AN APPLICATION?

A.20 I have estimated the SIR's for the operating entities for both water and sewer operations, where applicable. I computed the SIR's by applying the Company's carrying charge (ROR) to the projects' cost total and added depreciation expense for each asset making adjustments for income tax and deferred income tax as called for under the regulation. As previously mentioned, the carrying charge is the Company's currently approved rate of return and depreciation expense was based on the useful lives of the assets. Adjustment for deferred income taxes captures the difference between the tax lives and book lives of the assets. The associated cost of each asset is seen in the PWRR worksheets (see Appendix L) for each project included in the Company's Action Plan. Water SIR development is based on total water consumption for each operating division divided by the FV of the project costs within each operating division, respectively. Sewer SIR development is computed by multiplying a factor determined by allocating revenue by

customer class to total revenue, based on annualized customer counts, for each division by the FV of the individual sewer project cost in each division, respectively. The estimated System Improvement Rates are detailed and presented in the SIR tables in Appendix L-2 of the IRP.

Q.21 WHY DID YOU USE THE FUTURE VALUE ("FV") INSTEAD OF PRESENT VALUE ("PV") ADJUSTED REVENUE REQUIREMENTS IN COMPUTING THE SYSTEM IMPROVEMENT RATES, AS WAS DONE IN PREVIOUS COMPANY IRP FILINGS?

A.21 In previous Company IRP filings, the Company utilized PV adjusted revenue requirements in computing SIR's. Staff did not agree with this approach in the last IRP filing in Docket No. 21-03003 and instead recommended that FV adjusted revenue requirements be used in deriving SIR's. Staff noted that use of FV numbers matches what ratepayers will pay when the projects go into service.[4] While I understand Staff's logic here and agree such FV numbers are what estimated costs ratepayers will pay at that future point in time, I believe use of PV numbers is in line with the purpose of the IRP filing – determining PV numbers so the Commission can make considered decisions on the overall cost of each action plan project as detailed in the PWRR's in present value terms. In any case, use of either PV or FV numbers, as long as either method is applied consistently, will provide the Commission with a set of relative values for its deliberations in determining whether to approve a project for SIR eligibility. The Company has chosen to use the FV adjusted revenue requirements for each SIR project in this filing but could compute the PV adjusted estimated SIR's if the Commission would like to see those values as well.

Q.22 PLEASE EXPLAIN HOW LONG THESE RATES WOULD BE IN PLACE.

A.22 System Improvement Rates would only be in effect after the Commission approves the

[4] See Lopez testimony in Docket No. 21-03003, Q&A's 20-21.

Company's SIR application for that SIR-eligible asset and until the Company's next filed general rate change is approved by the Commission. At that time, the SIR's would cease being charged to consumers and the remaining un-depreciated plant balance would be included in general rates charged to consumers. Use of only the un-depreciated plant balance ensures there will be no over-collection from consumers.

Q.23 DOES THIS COMPLETE YOUR TESTIMONY AT THIS TIME?

A.23 Yes, it does; however, I reserve the right to revise or correct my testimony when I take the witness stand.

AFFIRMATION

Pursuant to Section 703.710 of the Nevada Administrative Code, I hereby affirm that the foregoing testimony was prepared by me or under my direction and is correct to the best of my knowledge.

Signed: 

Dated: March 1, 2024

Attachment TJR-1 to Exhibit ___

TERRY J. REDMON
Certified Public Accountant

I am a Certified Public Accountant and provide accounting and attestation services, litigation support, business valuation, business consulting, and tax planning and preparation services. In addition, I provide consulting services for various entities and individuals including: regulatory audits, estate probate administrations, public utility rate and tariff filings; litigation proceedings; and business consulting and valuation engagements. I am an expert in public utility regulation and have assisted in the preparation, presentation and litigation of numerous general rate and integrated resource plan applications. I perform forensic accounting and have been qualified and testified as an expert witness on numerous occasions in Nevada District Courts and before Nevada regulatory agencies. I also perform independent financial, compliance and internal control audits for profit and non-profit entities. I provide accounting, and tax planning and preparation services for numerous non-profit entities, individuals, corporations, partnerships, estates and trusts.

For the period of 1989 to 2009, I was an instructor of college level accounting courses with the University of Nevada System.

From 1997 – 1999, I worked for Nevada Bell Telephone Co., (now AT&T, Inc.) a wholly owned subsidiary of SBC Communications, Inc., as Associate Director of Regulatory Affairs providing both state and federal regulatory management support to Nevada Bell.

From 1989 – 1994, and again from 1995 – 1997, I was employed as a regulatory technical expert and senior regulatory technical expert of the State of Nevada Attorney General's Office of the Consumer Advocate (now the Bureau of Consumer Protection). During my tenure with the Office, I represented Nevada consumers before the Public Utilities Commission of Nevada and Nevada courts. I performed investigations and evaluations of water, gas, electric, telecommunications and sewer utility rate and tariff filings. I investigated fuel and energy purchasing practices, affiliate transactions, trade secret issues, and consumer fraud. I was responsible for the direction of case preparation and presentation.

TERRY J. REDMON
Certified Public Accountant

During the period of 1994-1995, I served as the CFO/Controller of Neuffer Homes & Development, Inc., a large development company. I was responsible for the financial and personnel management of this company.

After graduating with distinction from the University of Nevada in 1986 with a Bachelor of Science degree in Business Administration – major in Accounting, I worked for Kafoury, Armstrong & Co. (now Eide Bailly, LLP), a public accounting firm. I performed and supervised financial and compliance audits on state and local governmental entities, non-profit entities, financial institutions, and various other clients. I also performed management and computer consulting services and provided a variety of tax planning and preparation services. I have been licensed to practice as a Certified Public Accountant in Nevada since July, 1988.

Prior to my employment at Kafoury, Armstrong & Co., I worked in the financial institution industry, primarily in bank computer system installations and operations.

I am a member or past member of the following organizations:

- American Institute of Certified Public Accountants (Member)
- National Association of Certified Valuation Analysts (Past Member)
- Faith Lutheran Church (Past Council Member & Treasurer)
- Gymnastics Nevada Boosters (Past Board Director, President & Treasurer)
- Flips USA Gymnastics (Past Treasurer and Board Director)
- The Honor Society of Phi Kappa Phi (Member)
- Beta Alpha Psi National Accounting Fraternity (Past Member)
- Northern Nevada Dental Society Peer Review Board (Past Member)
- National Association of State Utility Consumer Advocates Tax & Accounting Committee (Past Member)
- National Association of Regulatory Utility Commissioners Staff Subcommittee on Accounts (Past Member - Observer)

TERRY J. REDMON
Certified Public Accountant

PARTIAL PRIOR TESTIMONIES

I have presented expert testimony in Nevada District Court on four separate occasions. In addition, I was deposed in another case that went to trial but settled during trial. Three (3) cases involved divorce actions; one (1) case involved a civil dispute between a debtor and creditor; and, one (1) case involved the request for a temporary restraining order and preliminary injunction against the Public Utilities Commission of Nevada. The case docket numbers are:

Docket No. CV11-02372 in the Second Judicial District Court of the State of Nevada (testified as an expert witness)
Docket No. 06-01017A in the First Judicial District Court of the State of Nevada (testified as an expert witness)
Docket No. DV00-03019 in the Second Judicial District Court of the State of Nevada (testified as an expert witness)
Docket No. DV01-01559 in the Second Judicial District Court of the State of Nevada (testified as an expert witness)
Docket No. 040I0515 in the Ninth Judicial District Court of the State of Nevada (testified in deposition as an expert witness)

I filed an expert witness report on behalf of Wells Fargo Home Mortgage, Inc., with the United States District Court of Nevada, however, the case was resolved without need of my testimony.

In the Matter of Wes Johnson v. Wells Fargo Home Mortgage, Inc., a California Corporation, dba America's Servicing Co., et. al. (2007)

In addition, during the preceding fifteen (15) years, I have prepared, filed and, in most cases, presented testimony before the Public Utilities Commission of Nevada and the Washoe County Board of Equalization. The cases before the Public Utilities Commission of Nevada involved tariff, rate and integrated resource plan filings, and the instance of testimony before the Board of Equalization involved property tax assessment and valuation. The case docket numbers are:

Docket No. 06-01001 before the PUCN
Docket No. 06-01002 before the PUCN
Docket No. 06-12023 before the PUCN
Docket No. 07-06022 before the PUCN
Docket No. 08-06028 before the PUCN
Docket No. 08-06036 before the PUCN
Docket No. 09-06037 before the PUCN
Docket No. 09-12017 before the PUCN

Docket No. 11-03002 before the PUCN
Docket No. 11-06016 before the PUCN
Docket No. 12-02023 before the PUCN
Docket No. 12-03003 before the PUCN
Docket No. 12-12033 before the PUCN
Docket No. 13-06017 before the PUCN
Docket No. 13-12040 before the PUCN
Docket No. 14-02043 before the PUCN
Docket No. 14-12033 before the PUCN
Docket No. 15-01029 before the PUCN
Docket No. 15-03004 before the PUCN
Docket No. 15-06063 before the PUCN
Docket No. 16-03006 before the PUCN
Docket No. 16-12037 before the PUCN
Docket No. 17-02048 before the PUCN
Docket No. 17-12022 before the PUCN
Docket No. 18-03005 before the PUCN
Docket No. 18-11014 before the PUCN
Docket No. 19-12029 before the PUCN
Docket No. 20-07015 before the PUCN
Docket No. 20-07017 before the PUCN
Docket No. 20-03003 before the PUCN
Docket No. 21-03003 before the PUCN
Docket No. 21-12025 before the PUCN
Docket No. N/A before the Washoe County Board of Equalization

Prior to fifteen (15) years ago, I prepared and presented testimony before the Public Utilities Commission in approximately twenty (20) separate cases including: electric, gas, telecommunications and water/wastewater dockets.