STAFF REPORT

To: Honorable Mayor and Members of Town Council

Through: David L. Corliss, Town Manager

From: Mark Marlowe, P.E., Director of Castle Rock Water
Shawn Griffith, Assistant Director -Operations
Nicolas Van Kooten, SCADA Superintendent

Title: **Resolution Adopting the 2025-2029 Supervisory Control and Data Acquisition (SCADA) Master Plan** *[Serves entire Castle Rock Water Service Area]*

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Executive Summary

This memorandum has been prepared to request Town Council approval of a Resolution to adopt the 2025-2029 SCADA Master Plan (MP), see **Attachment** A. The Castle Rock Water (CRW) SCADAMP is the starting point for the development of the CRW SCADA system functional requirements. This 2025-2029 MP addresses updated cybersecurity requirements, Operational Technology (OT) improvements, telemetry modifications, backhaul high speed communications improvements, updated programmable logic controllers (PLCs), and human-machine interfaces (HMIs). During the planning effort, investigations are performed to determine all desired functions, features, and requirements for each subsystem (PLC, HMI, OT, cybersecurity, telemetry, backhaul). In 2024, Tetra Tech was contracted to update the 2019 SCADA MP. The resulting updated MP identified a number of additional critical projects and programs beyond the recommendations in the 2019 MP to ensure that CRW's SCADA system continues to meet operational and security needs for CRW's water and wastewater systems.

The table below shows the total approved expenditures to date on the 2019 SCADA MP by vendor:

Project	PO	Vendor	Year	Amount
OWL Data Diode	2171	Rexel	2021	$46,856
SCADA Backhaul & Radio Network Implementation	2252	Techneaux	2022	$1,801,157
PLC Hardware for OT Upgrades	2305	Rexel	2021	$91,066

Starwind Software for OT Server Upgrades	n/a	Starwind	2021	$14,000
PCWPF PLC Replacements	n/a	Rexel	2021	$19,573
Founders WTP & Remote Sites OT Equipment Upgrades	2352	Rexel	2022	$32,905
Founders WTP & Remote Sites PLC Upgrades	2369	Rexel	2022	$51,092
Founders WTP & Remote Sites Display Upgrades	2388	Rexel	2022	$72,912
Dell SCADA Clients for PlantPAX	n/a	One Technology	2023	$21,192
Founders WTP & Remotes Sites Upgrade	2474	Techneaux	2023	$1,954,052
Founders Remote Tanks and Pump Station PLC Equipment	2595	Rexel	2023	$78,568
Meadows WTP Remote Sites PLC Upgrade	2579	Rexel	2023	$77,737
Founders WTP & Remote Sites PLC Upgrades	2602	Rexel	2023	$61,838
OWL Data Diode Package	2666	Rexel	2023	$136,523
Miller & Remotes Sites Design Project	2683	Techneaux	2023	$180,000
P&ID Project	2737	Tetra Tech	2023	$61,032
IP Address Update Project	2765	Tetra Tech	2023	$29,338
SCADA Master Plan Phase IV	2787	Tetra Tech	2024	$90,744
Screen Development	2797	LSI	2024	$302,800
Miller WTP PLC Equipment	2805	Rexel	2024	$124,750
O&M Building PLC Equipment	2833	Rexel	2024	$46,327
OWL Data Diode Renewal & Historian	2843	Rexel	2024	$31,704
Remote Sites Screen Development	2854	LSI	2024	$102,630
RFP for SCADA Master Plan Phase IV	2860	Burns & McDonnell	2024	$79,236
Founders Emergency Programming & Commissioning	2907	Techneaux	2024	$72,450
SCADA Master Plan Phase IV Oversight	2937	Burns & McDonnell	2024	$117,241
SCADA All Hazards Assessment	2979	Tetra Tech	2025	$38,765
Subtotal: Completed Projects to Date				**$5,736,488**
Phase IV- Miller WTP & Remote Sites Upgrade	pending	LSI	2024	$5,689,632
Total Expenses				**$11,426,119**

The SCADA system is crucial to the security and efficient operation of CRW's water and wastewater facilities. In 2019, the SCADA MP was completed to assess the system and develop a plan for its upgrade, maintenance, and operation. The Town Council approved the

SCADA MP on December 17, 2019, which identified approximately $12 million (M) in expenditures over seven years.

In late 2023, the SCADA MP implementation cost was reviewed and updated, revealing a 26% increase in equipment and implementation costs since 2019. Additionally, the update included newly identified work not previously covered in the 2019 scope. As a result, the revised estimated cost for full implementation of the plan in 2023 was approximately $15M. An additional update to the SCADA MP has been completed (2025 SCADA MP). Implementation costs have continued to rise as additional work requirements have been added. Total costs are now estimated at $21M with estimated annual expenditures shown below through 2029.

The 2025-2029 SCADA MP identified critical cybersecurity enhancements required for CRW to meet upcoming regulatory requirements from the United States Environmental Protection Agency (US EPA). These enhancements need to be in progress and certified to US EPA by CRW by December 31, 2025. The enhancements required by year end include additional staffing. Costs for this staffing are $342,000.00 in the first year and have been incorporated into a 1st Quarter Budget Amendment, see **Attachment B**. A cybersecurity risk assessment is also required by year end. Details on that work are provided in **Attachment C**. Design and bidding services for Phase V of the SCADA MP capital improvements are addressed in **Attachment D**.

Notification and Outreach Efforts

This project is a security-sensitive project and no outreach is anticipated.

History of Past Town Council, Boards & Commissions, or Other Discussions

CRW Commission was provided with a presentation on the 2019 SCADA MP on December 11, 2019, and voted to recommend Council approval. Town Council adopted the 2019 SCADA MP on December 17, 2019.

CRW Commission was provided with a presentation on the 2025-2029 SCADA MP on January 22, 2025. The Commission unanimously recommended Town Council approval of the 2025-2029 SCADA MP.

Discussion

Master planning provides a road map to address deficiencies within the existing SCADA system, considers new technologies, and documents present and future system requirements. This high-level path was fully initiated with the onboarding of Jacobs Engineering in 2019. They were contracted to conduct a complete evaluation of the SCADA system at the time. They interviewed CRW staff in an attempt to address all the needs of the stakeholders, including engineering, operations, maintenance, safety, security, management, and the customers of CRW.

The 2025-2029 SCADA MP provides an updated and modernized version of the previous SCADA MP. On January 18, 2024, CRW received Town Manager approval for Tetra Tech to update the MP for 2025-2029. This update considers several factors that warrant additional

clarification and review. It identifies the status of the recommended projects from the previous MPs and recommends new projects to optimize CRW's performance and resiliency.

The 2019-2024 MP identified infrastructure elements including PLCs, HMI, communication backhaul, and telemetry, that were outdated due to the changing landscape of cybersecurity regulations and evolving technology. As a result, technology specifications were updated again in the 2025-2029 MP version.

The new MP recommends nine specific goals, to be completed within the next four years:
1. Outstanding Project Closure
2. Cybersecurity
3. SCADA Standardization
4. Complete Facility List
5. Documentation and Procedure Standardization
6. Physical Security
7. Staffing
8. Data Study
9. Computerized Maintenance Management System (CMMS)

Staff has begun working on the most urgent goals of Cybersecurity and Staffing. The Cybersecurity Projects Addendum review serves multiple functions, the foremost of which is the All-Hazards Assessment, assigned to Tetra Tech in January of 2025. This will examine CRW's OT vulnerabilities for America's Water Infrastructure Act (AWIA) compliance certification due to US EPA by December 31, 2025.

The MP update also addressed the need for specific OT specialty staff members. The new MP addresses staffing and recommends the need for seven OT Support Positions:
1. PLC Programming Engineer
2. HMI Systems Engineer
3. Field Instrument Technicians
4. Network Engineer
5. Systems Administrator Engineer/Server Specialist
6. Cybersecurity Engineer
7. Chief Information Security Officer (CISO)

These OT Support positions are unique to the Water Utility SCADA Industry and are not to be confused with Information Technology positions. SCADA controls are subject to strict local and national regulations requiring staff with advanced water and wastewater system knowledge. CRW currently employs staff with some of the above skills, but staffing levels are not adequate to ensure that operational and cybersecurity needs are met.

The 2025-2029 SCADA MP identified the need to hire an Operational Technology (OT) "Network Engineer", as the individual who maintains the network and maintains CRW's SCADA/OT servers as well as an OT "Systems Administrator". These two positions will ensure that cybersecurity and staffing levels are met.

All MPs are guidance documents for organizations to follow. CRW is committed to providing safe and reliable water to Town residents. To do so, a safe, reliable, and secure SCADA

system must be in place. The SCADA MP 2025-2029 provides staff a compass to use when expanding, upgrading, and protecting CRW's SCADA system.

Staff Recommendation

Staff recommends the adoption of the 2025-2029 SCADA Master Plan.

Proposed Motion

"I move to approve the Resolution as introduced by title."

Alternative Motions

"I move to approve the resolution as introduced by title, with the following conditions: (list conditions).

"I move to continue this item to the Town Council meeting on _____ date to allow additional time to (list information needed)."

Attachments

Attachment A: Resolution
Attachment B: Cybersecurity update
Attachment C: Staffing Update
Attachment D: SCADA Phase 5