QUALITY SERVICE, INC.
Water & Wastewater Operations/ Construction
A General Contractor LIC # 834488
Email: info@qualityserviceinc.net
Website: www.qualityserviceinc.net
Telephone: (209) 838-7842
Fax: (209) 838-0699
Escalon, California

Cross Connection Control Survey

Linden County Water District

18243 E. HWY 26 Linden, CA 95236

Public Water System #3910019

Prepared for

Linden County Water District

18243 E. Hwy 26 Linden, CA 95236

Prepared by

Quality Service, Inc.

27348 E. Hwy 120 Escalon, CA 95320

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Survey Completed by: Jess Zavala of Quality Service, Inc.
Cross Connection Control Program-Specialist #01899

Report Written by: Ian Hellstrom of Quality Service, Inc.

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Water System Overview

The Linden County Water District System office is located at 18243 E. Hwy 26 Linden, CA 95236. The public drinking water system 3910019 is governed and inspected by the California Department of Public Health. This report will utilize four separate phases and indentify locations and cross connections within the water system. The first phase will be to identify any cross connections within the water sources and storage systems that provide water to the district. The second phase will be to indentify the backflow devices that are installed within the water district and verify that the water districts records are current and accurate. Phase three will be to indentify users of the water system that are not providing backflow protection for the water system. Phase four will be to indentify cross connections within the water distribution system that do not have a physical address or customer. Phases three and four will be initially conducted for this report and also will be an ongoing investigation. As items are found as part of the ongoing investigation addendums will be made to this report.

Phase #1:

The Linden County Water District water system consists of (2) ground water sources that are the primary sources of water for the water district. These ground water sources are well #5 located at 18243 E. Hwy 26 and well #7 18575 Monte Vista Drive. Two well sites are used as stand by for emergencies and they are well #3 located at 18473 East Front Street and well #4 located at 16980 East Front Street. Well #6 is located at 19380 East Hwy 26 and is currently not connected to the water system because the well is currently under rehabilitation. Wells #1A and #2 were recorded to been abandoned in September of 1983 and were located 5090 Market Street. This section of the report will identify the primary and stand by wells.

- **Well #5:** One of the primary sources of water for the District, Well #5 is 670 feet deep and consists of a 22 inch diameter casing. Currently a 75-horse power turbine pump is installed and used to transfer the water through a 10 inch galvanized steel pipe through a check valve to a 10,000 gallon hydro-pneumatic pressure tank. Chlorine is injected into the raw water at a point downstream of the check valve and upstream of the hydro-pneumatic tank. The well and chlorine injection system are covered by a small building.

- **Well #7:** One of the primary sources of water for the District, Well #7 is 715 feet deep and consists of a 22 inch diameter casing. Currently a 100-horse power submersible pump is installed and used to transfer the water through a 10 inch galvanized steel pipe through a check valve to a 10,000 gallon hydro-pneumatic pressure tank. Chlorine is injected into the raw water at a point downstream of the check valve and upstream of the hydro-pneumatic tank. The well is fenced and gated while the chlorine injection system is covered to provide protection from sunlight.

- **Well #3:** A stand- by well utilized by the water district. The well is 680 feet deep and has a 10 inch diameter casing. A 10 horse power submersible pump is installed to transfer water though a 6 inch check valve and galvanized steel pipe. The well feeds two 5,000 gallon hydro pneumatic pressure tanks. The water is treated using a chlorine injection pump. Both the well head and chlorination equipment are covered by a building.

- **Well #4:** One of the stand-by sources of water for the District. Well #4 is 450 feet deep and consists of a 10 inch diameter casing. Currently a 30-horse power turbine pump is installed and used to transfer the water through a 6 inch galvanized steel pipe through a check valve to a 3,000 gallon hydro-pneumatic pressure tank. Chlorine is injected into the raw water at a point downstream of the check valve and upstream of the hydro-pneumatic tank. The well and chlorine injection system are covered by a small building.

- **Well #6:** Currently, this well is off line for rehabilitation work. When the work is complete an addendum will be added to this section.

- **Wells #1A and #2:** District records show that both wells were abandoned in September of 1983 per county specifications.

Recommendations Phase 1:

No recommendations for Phase 1 of the cross-connection survey

Phase #2:

Phase #2 involves checking the backflows that are already installed in the distribution system. The list of backflows, that the water district maintains, was field verified for correct locations and serial numbers. These backflows installed are to provide containment protection for the Linden County Water District potable water system. Attached is a list of backflows that are currently installed in the water system that provide containment protection for the Linden County Water District.

Recommendations Phase 2:

Ensure accurate records are maintained yearly. No problems were identified in Phase 2.

Phase #3

Phase #3 of the survey is to identify businesses that are users of the water system that do not have containment backflow protection. This section will be an on-going annual process to identify new businesses that have no backflow protection and potential cross connections. The current list is as follows:

Business	***Address***
DeVinci's Delicatessen & Catering	18847 Front Street
The Bean Plant Emporium	18915 Front Street
Linden Self Storage	18915 Front Street
The Ritz Salon	18835 East Highway 26
F & M Bank	18836 East Main Street
Whitaker's RV	18974 East Highway 26
Lohrmeyer Enterprises Computer Technologies	19053 East Highway 26
Linden Pharmacy	19047 Main Street
Orchard Medical	4950 Bonham Drive
Appliance Distributors	19011 East Highway 26
Stockton Rubber Manufacturing	5023 Flood Road
Linden Cemetery	Cady Street
Beto's Mexican Restaurant	18985 East Highway 26
Holy Cross Catholic Church	18681 Front street
Zylstra Auto and Hardware	18955 Front Street

Phase #4

Phase #4 is to identify the potential cross connections within the water system that are not associated with a customer's service connection. This section will be an on-going annual process to identify potential areas that have no backflow protection and potential cross connections. As cross connections are discovered addendums to this report will be submitted. There were no cross connections identified during this system review.

Recommendations Phase 4:

Three areas were identified as low use areas: the 2 inch flushing water line in the southwest corner of the cemetery, the service connection at the Diamond Walnut hulling facility near the corner of Front Street and East Highway 26, and the hydrant on the south side of Stockton Rubber Manufacturing at 5023 Flood Road. These three areas should incorporate an increased flushing program because of the low water usage.

REFERENCES:

- Manual of Cross-Connection Control 9th Edition, University of Southern California, 1993
- American Water Works Association Manual, Cross-Connection Control Specialists Required Range of Knowledge, 2003
- State of California Guidance Manual for Cross-Connection Control
- California Code of Regulations Title 24, Sections 603 & 1003, 2007
- California Code of Regulations Title 17, Sections 7583-7605, June 2001
- United States Environmental Protection Agency Cross-Connection Control Manual, 2003

GLOSSARY OF TERMS

Priority 1: Direct cross-connection to a health hazard; should be taken care of as quickly as possible in order to protect the water system.

Priority 2: Direct cross-connection to a non-health hazard; potentially detrimental to the water system; should be taken care of after 1st priority issues are resolved.

Priority 3: Potential cross-connection; under the right circumstances could pose a serious problem; should be taken care of after 1st and 2nd priority issues are resolved.

Accessible: The term "accessible," when referring to a backflow prevention assembly, shall mean capable of being reached for testing and/ or maintenance, but which first may require the removal of an access panel, door, or similar obstruction.

Administrative Authority: The term "administrative authority" shall mean the individual official, board, department or agency established and authorized by a state, county, city or other political subdivision created by la to administer and enforce the provisions of the cross-connection control program.

Air Gap (AG): The term "air gap" shall mean a physical separation between the free flowing discharge end of potable water supply pipeline and an open or non-pressure receiving vessel. An "approved air gap" shall be at least double the diameter of the supply pipe measured vertically above the overflow rim of the vessel-in no case less than 1 inch. (Section 4.3 Air Gap, *Manual of Cross-Connection Control 9th edition).*

To reduce splash the inlet pipeline can be cut at a 45-degree angle; the air gap is measured from the centerline to the top of the rim.

Approved: The term "approved" as herein used in reference to a water supply shall mean a water supply that has been approved by the health agency having jurisdiction.

The term "approved" as herein used in reference to an air gap, a double check valve assembly, a reduced pressure principle backflow prevention assembly or other backflow prevention assemblies or methods shall mean an approval by the administrative authority having jurisdiction.

Atmospheric Vacuum Breaker Backsiphonage Prevention Assembly (AVB): The term "atmospheric vacuum breaker backsiphonage prevention assembly" (also known as the non-pressure type vacuum breaker) shall mean an assembly containing the air inlet valve, a check seat and an air inlet port(s). The flow of water into the body causes the air inlet valve to close the air inlet port(s). When the flow of water stops the air inlet valve falls and forms a check valve against backsiphonage. At the same time it opens the air inlet port(s) allowing air to enter and satisfy the vacuum. A shutoff valve immediately upstream may be an integral part of the assembly, but the assembly shall not be subjected to operating pressure for more than twelve (12) hours in any twenty-four (24) hour period. An atmospheric vacuum breaker is designed to protect against a non-health hazard (i.e., pollutant) or a health hazard (i.e., contaminant) under a backsiphonage condition only.

Backflow: The term "backflow" shall mean the undesirable reversal of flow of water or mixtures of water and other liquids, gases or other substances into the distribution pipes of the potable supply of water from any source or sources.

Backflow Prevention Assembly - Approved: The term "approved backflow prevention assembly" shall mean an assembly that has been investigated and approved by the administrative authority having jurisdiction. The approval of backflow prevention assemblies by the administrative authority shall be on the basis of a favorable laboratory and field evaluation report by an approved testing laboratory recommending such approval.

Backflow Prevention Assembly – Type: The term "backflow prevention assembly" shall mean any effective assembly used to prevent backflow into a potable water system. The type of assembly used shall be based on the existing or potential degree of hazard, and backflow condition. The types of backflow prevention assemblies are:

a. Atmospheric Vacuum Breaker Backsiphonage Prevention Assembly
b. Double Check Valve Backflow Prevention Assembly
c. Double Check – Detector Backflow Prevention Assembly
d. Pressure Vacuum Breaker Backsiphonage Prevention Assembly
e. Reduced Pressure Principle Backflow Prevention Assembly
f. Reduced Pressure Principle – Detector Backflow Prevention Assembly

g. Spill-Resistant Pressure Vacuum Breaker Backsiphonage Prevention Assembly

Backflow Prevention Assembly Tester – Certified: The term "certified backflow prevention assembly tester" shall mean a person who has proven his/ her ability to the satisfaction of the administrative authority having jurisdiction. Each person who is certified to make field tests and make reports on backflow prevention assemblies shall be conversant with applicable laws, rules and regulations and have had experience in plumbing or pipe fitting or have other equivalent qualifications in the opinion of the administrative authority having jurisdiction.
Backpressure: The term "backpressure" shall mean any elevations of pressure in the downstream piping system (by pump, elevation of piping, or steam and/ or air pressure) above the supply pressure at the point of consideration which would cause, or tend to cause, a reversal of the normal direction of flow.

Backsiphonage: The term "backsiphonage" shall mean a form of backflow due to a reduction in system pressure which causes a sub-atmospheric pressure to exist at a site in the water system.

Check Valve - Approved: The term "approved check valve" shall mean a check valve that is drip-tight in the normal direction of flow when the inlet pressure is at least one (1) psi (pound per square inch) and the outlet pressure is zero. The check valve shall permit no leakage in a direction reverse to the normal flow. The closure element (e.g., clapper or poppet shall be internally loaded to promote rapid and positive closure. An approved check valve is only one component of an approved backflow prevention assembly – i.e., pressure vacuum breaker (PVB and SVB), double check valve assembly (DC) or reduced pressure principle assembly (RP).

Consumer: The term "consumer" shall mean the owner or operator of an on-site water system(s) having a service from a public potable water system.

Contamination: The term "contamination" shall mean an impairment of the quality of the water which creates an actual hazard to the public health through poisoning or through the spread of disease by sewage, industrial fluids, waste, etc.

Critical Level: The term "critical level" shall mean the marking (C-L or C/L) on atmospheric vacuum breakers and pressure vacuum breakers that determines the minimum elevation above the flood level rim of the fixture or receptacle served, as well as downstream piping and water uses, at which the unit may be installed. When an AVB, PVB, or SVB does not bear a critical level marking, the bottom of the assembly shall constitute the critical level.

Cross-Connection: The term "cross-connection" shall mean any unprotected actual or potential connection or structural arrangement between a public or a consumer's potable water system and any other source or system through which it is possible to introduce

into any part of the potable system any used water, industrial fluid, gas, or substance other than the intended potable water with which the system is supplied. Bypass arrangements, jumper connections, removable sections, swivel or change-over devices and other temporary or permanent devices through which or because of which backflow can occur are considered to be cross-connections.

a. The term "direct cross-connection" shall mean a cross-connection which is subject to both backsiphonage and backpressure.
b. The term "indirect cross-connection" shall mean a cross-connection which is subject to backsiphonage only.

Cross-Connection – Point of: The term "point of cross-connection" shall mean the specific point or location in a public or a consumer's potable water system where a cross-connection exists.

Double Check Valve Backflow Prevention Assembly (DC): The term "double check valve backflow prevention assembly" shall mean an assembly composed of two independently acting, approved check valves, including tightly closing resilient seated shutoff valves attached at each end of the assembly and fitted with properly located resilient seated test cocks. This assembly shall only be used to protect against a non-health hazard.

Double Check-Detector Backflow Prevention Assembly (DCDA): The term "double check-detector backflow prevention assembly" shall mean a specially designed assembly composed of a line-size approved double check valve assembly with a bypass containing a specific water meter and an approved double check valve assembly. The meter shall register accurately for only very low rates of flow up to 3 gpm (gallons per minute) and shall show a registration for all rates of flow. This assembly shall only be used to protect against a non-health hazard (i.e., pollutant). The DCDA is primarily used on fire sprinkler systems.

EEWSS: Emergency Eye Wash/ Shower Station

Hazard – Degree of: The term "degree of hazard" shall mean either a pollutional (non-health) or contamination (health) hazard and is derived from the evaluation of conditions within a system.

Hazard – Plumbing: The term "plumbing hazard" shall mean an internal or plumbing type cross-connection in a consumer's potable water system that may be either a pollutional or a contamination type hazard. Plumbing type cross-connections can be located in many types of structures including homes, apartment houses, hotels and commercial or industrial establishments. Such a connection, if permitted to exist, must be properly protected by an appropriate type of backflow preventions assembly.

Hazard – System: The term "system hazard" shall mean an actual or potential threat of severe danger to the physical properties of the public or the consumer's potable water

system or of a pollution or contamination which would have a protracted effect on the quality of the potable water in the system.

Health Agency: The term "health agency" shall mean the health authority having jurisdiction.

Hospital: The term "hospital" shall mean any institution, place, building, or agency which maintains and operates facilities for one or more persons for the diagnosis, care and treatment of human illness, including convalescence and care during and after pregnancy or which maintains and operates organized facilities for any such purpose, and to which persons may be admitted for overnight stay or longer. The term "hospital" includes sanitarium, nursing home and maternity home.

Industrial Fluids: The term "industrial fluids" shall mean any fluid or solution which may be chemically, biologically or otherwise contaminated or polluted in a form or concentration which would constitute a health, system, pollutional or plumbing hazard if introduced into an approved water supply. This may include, but not be limited to: polluted or contaminated used waters; all types of process waters and used water originating from acids and alkalies; circulated cooling water connected to an open cooling tower and/ or cooling water that are chemically or biologically treated or stabilized with toxic substances; contaminated natural water such as from wells, springs, streams, rivers, bays, harbors, seas, irrigation canals or systems, etc.; oils, gases, glycerine, paraffins, caustic and acid solutions and other liquid and gaseous fluids used industrially, for other processes, or for fire fighting purposes.

Industrial Piping System – Consumer's: The term "consumer's industrial piping system" shall mean any system used by the consumer for transmission of or to confine or store any fluid, solid or gaseous substance other than an approved water supply. Such a system would include all pipes, conduits, tanks, receptacles, fixtures, equipment and appurtenances used to produce, convey or store substances which are or may be polluted or contaminated.

Internal Protection: The term "internal protection" shall mean the appropriate type or method of backflow prevention within the consumer's potable water system at the pint of use, commensurate with the degree of hazard.

Laboratory – Approved Testing: The term "approved testing laboratory" shall ean the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California or any other laboratory having equivalent capabilities for both the laboratory and field evaluation of backflow prevention assemblies.

Pollution: The term "pollution" shall mean an impairment of the quality of the water to a degree which does not create a hazard to the public health but which does adversely and unreasonably affect the aesthetic qualities of such waters for domestic use.

Pressure Vacuum Breaker Backsiphonage Prevention Assembly (PVB): The term "pressure vacuum breaker backsiphonage prevention assembly" shall mean an assembly containing an independently operating internally loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly is to be equipped with properly located resilient seated test cocks and tightly closing resilient seated shutoff valves attached at each end of the assembly. This assembly is designed to protect against a non-health hazard (i.e., pollutant) or a health hazard (i.e., contaminant) under a backsiphonage condition only.

Readily Accessible: The term "readily accessible" when referring to a backflow prevention assembly, shall mean capable of being reached for testing and/ or maintenance, without the need of removing ay access panel, door, or similar obstruction.

Reclaimed Water: The term "reclaimed water" shall mean water which, as a result of treatment of wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur, and is not safe for human consumption.

Reduced Pressure Principle Backflow Prevention Assembly (RP): The term "reduced pressure principle backflow prevention assembly" shall mean an assembly containing two independently acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and at the same time below the first check valve. The unit shall include properly located resilient seated test cocks and tightly closing resilient seated shutoff valves at each end of the assembly. This assembly is designed to protect against a non-health (i.e., pollutant) or a health hazard (i.e., contaminant). This assembly shall not be used for backflow protection of sewage or reclaimed water. (Note: Check with local administrative authority for acceptable uses).

Reduced Pressure Principle – Detector Backflow Prevention Assembly (RPDA): The term "reduced pressure principle – detector backflow prevention assembly" shall mean a specially designed assembly composed of a line-size approved reduced pressure principle backflow prevention assembly with a bypass containing a specific water meter and an approved reduced pressure principle backflow prevention assembly. The meter shall register accurately for only very low rates of flow up to 3 gpm and shall show a registration for all rates of flow. This assembly shall be used to protect against a non-health hazard (i.e., pollutant) or a health hazard (i.e., contaminant). The RPDA is primarily used on fire sprinkler systems.

RO: Reverse Osmosis drinking units

Sanitary Sewer: The term "sanitary sewer" shall mean the pipe that carries sewage.

Service Connection: The term "service connection" shall mean the terminal end of a service conection from the public potable water system, (i.e., where the water purveyor may lose jurisdiction and sanitary control of the water at its point of delivery to the

consumer's water system). If a water meter is installed at the end of the service connection, then the service connection shall mean the downstream end of the water meter.

Service Protection: The term "service protection" shall mean the appropriate type or method of backflow protection at the service connection, commensurate with the degree of hazard of the consumer's potable water system.

Spill-Resistant Pressure Vacuum Breaker Backsiphonage Prevention Assembly (SVB): The term "spill-resistant pressure vacuum breaker backsiphonage prevention assembly" shall mean an assembly containing an independently operating internally loaded check valve and independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly is to be equipped with a properly located resilient seated test cock, a properly located bleed/ vent valve, and tightly closing resilient seated shutoff valves attached at each end of the assembly. This assembly is designed to protect against a non-health hazard (i.e., pollutant) or a health hazard (i.e., contaminant) under a backsiphonage condition only.

Water – Potable: The term "potable water" shall mean water from any source which has been investigated by the health agency have jurisdiction, and which has been approved for human consumption.

Water Purveyor: The term "water purveyor" shall mean the public or private owner or operator of the potable water system supplying an approved water supply to the public.

Water Supply – Approved: The term "approved water supply" shall mean any public potable water supply which has been investigated and approved by the health agency. The system must be operating under a valid health permit. In determining what constitutes an approved water supply, the health agency has final judgment as to its safety and potability.

Water Supply – Auxiliary: The term "auxiliary water supply" shall ean any water supply on or available to the premises other than the water purveyor's approved public potable water supply. These auxiliary waters may include water from another purveyor's public potable water supply or any natural source which as a well, spring, river, stream, harbor, etc. They may be polluted or contaminated or they may be objectionable and constitute an unacceptable water source over which the water purveyor does not have sanitary control.

Water Supply – Unapproved: The term "unapproved water supply" shall mean a water supply which has not been approved for human consumption by the health agency having jurisdiction.

Water System(s) – Consumer's: The term "consumer's water system(s)" shall include any water system located on the consumer's premises whether supplied by a public

potable water system or an auxiliary water supply. The system or systems may be either a potable water system or an industrial piping system.

Water System – Consumer's Potable: The term "consumer's potable water system" shall mean that portion of the privately owned potable water system lying between the point of delivery and the point of use. This system includes all pipes, conduits, tanks, receptacles, fixtures, equipment and appurtenances used to produce, convey, store or utilize the potable water.

Water System – Public Potable: The term "public potable water system" shall mean any publicly or privately owned water system operated as a public utility under a valid health permit to supply water for domestic purposes. This system will include all sources, facilities and appurtenances between the source and the point of delivery such as valves, pumps, pipes, conduits, tanks, receptacles, fixtures, equipment and appurtenances used to produce, convey, treat or store potable water for public consumption or use.

Water – Used: The term "used water" shall mean any water supplied by a water purveyor from a public potable water system to a consumer's water system after it has passed through the service connection and is no longer under the control of the water purveyor.

Water Supervisor: The term "water supervisor" shall mean the consumer or a person on the premises appointed by the consumer charged with the responsibility of maintaining the consumer's water system(s) on the property free from cross-connection and other sanitary defects, as required by regulations and laws. A certified backflow prevention assembly tester may act as a water supervisor of he/ she is a full-time employee of the consumer having the day-to-day responsibility for the installation and use of pipelines and equipment on the premises and for avoidance of cross-connections.

Water Vessel: Any open or non-pressure receiving tank (i.e. make up tank; stainless steel product tanks).