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ATTACHMENT L: REQUIRED VAPOR RECOVERY TESTS FOR PHASE I EVR SYSTEMS AND BALANCE PHASE II EVR SYSTEMS LOCATED AT GASOLINE DISPENSING FACILITIES EQUIPPED WITH AN UNDERGROUND STORAGE TANK

X represents the most recent California Air Resources Board (CARB) certification of the applicable vapor recovery system.

VR System ^{1&2}	Pressure Decay ³	Phase I
Phil Tite (VR-101-X) OPW (VR-102-X) CNI (VR-104-X) Emco Wheaton (VR-105-X)	TP-201.3 or TP-96-1	Torque of Phase I Adaptors (TP-201.1B) Integrity of the Drop Tube/Drain Valve (TP-201.1C/ TP-201.1D) Leak Rate and Cracking Pressure of P/V Relief Vent Valves (TP-201.1E) ⁵

VR System ^{1&2}	Pressure Decay ^{3&4}	Phase II ⁶	Phase II Processor ⁶	Phase II ISD ⁶ (VR-204-X)
VST Membrane Processor (VR-203-X/VR-204-X)	TP-201.3 or TP-96-1	Nozzle Vapor Valve Integrity (Exhibit 7) Dynamic Back Pressure (TP-201.4 -Method 1 & Exhibit 6) Liquid Removal Rate (Exhibit 5, Option 1— must conduct flow rate verification for each grade point prior to starting Exhibit 5) Liquid Condensate Trap (Exhibit 16) <i>If applicable</i>	VST Hydrocarbon Verification (Exhibit 8) Vapor Pressure Sensor Verification (Exhibit 10) VST Processor Activation (Exhibit 9)	ISD Operability Test (Exhibit 17)
Veeder-Root Vapor Polisher (VR-203-X/VR-204-X)			Vapor Pressure Sensor Verification (Exhibit 10) Vapor Polisher Operability Test (Exhibit 11) Hydrocarbon Verification (Exhibit 12)	ISD Operability Test (Exhibit 17)
FFS Clean Air Separator (VR-203-X/VR-204-X)			Clean Air Separator Integrity Test (Exhibit 14) ⁷	Vapor Pressure Sensor Verification (Exhibit 10) ISD Operability Test (Exhibit 17)
Hirt Processor (VR-203-X/VR-204-X)			Hirt VCS 100 Processor Operability Test (Exhibit 13)	Vapor Pressure Sensor Verification (Exhibit 10) ISD Operability Test (Exhibit 17)
Emco Wheaton-Hirt VCS (VR-208-A)			Hirt VCS Processor Operability (Exhibit 8)	Vapor Pressure Sensor Verification (Exhibit 10) ISD Operability Test (Exhibit 11)



ATTACHMENT L INSTRUCTIONS AND REQUIREMENTS

¹ Unless otherwise specified by a District's representative, the tests for the vapor recovery Systems specified shall be conducted in the following order:

<u>VST Membrane Processor (VR-203-X /VR-204-X)</u>	<u>Veeder-Root Vapor Polisher (VR-203-X /VR-204-X)</u>	<u>Hirt VCS 100 Processor (VR-203-X/204-X)</u>	<u>FFS Clean Air Separator (VR-203-X /VR-204-X)</u>	<u>Emco Wheaton-Hirt VCS (VR-208-A)</u>
Exhibit 9 of VR-204-X	TP-201.1E	Exhibit 13	Exhibit 14 ⁷	Exhibit 8
TP-201.1E	TP-201.1B	TP-201.1E	TP-201.1E	TP-201.1E
TP-201.1B	TP-201.1C or TP-201.1D	TP-201.1B	TP-201.1B	TP-201.1B
TP-201.1C or TP-201.1D	Exhibit 10	TP-201.1C or TP-201.1D	TP-201.1C or TP-201.1D	TP-201.1C or TP-201.1D
Exhibit 10	Exhibit 7	Exhibit 10	Exhibit 10	Exhibit 11
Exhibit 7	TP-96-1 and Exhibit 4 OR TP-201.3 and Exhibit 4	Exhibit 7	Exhibit 7	Exhibit 7
TP-96-1 and Exhibit 4 OR TP-201.3 and Exhibit 4	Exhibit 16: (if applicable)	TP-96-1 and Exhibit 4 OR TP-201.3 and Exhibit 4	TP-96-1 and Exhibit 4 OR TP-201.3 and Exhibit 4	TP-96-1 and Exhibit 4 OR TP-201.3 and Exhibit 4
Exhibit 16: (if applicable)	Exhibit 5, Option 1 ⁸	Exhibit 16: (if applicable)	Exhibit 16: (if applicable)	Exhibit 5, Option 1 ⁸
Exhibit 5, Option 1 ⁸	TP-201.4 (Methodology 1) & Exhibit 6 of VR-204-X	Exhibit 5, Option 1 ⁸	Exhibit 5, Option 1 ⁸	TP-201.4 (Methodology 1) & Exhibit 6 of VR-204-X
TP-201.4 (Methodology 1) & Exhibit 6 of VR-204-X	Exhibit 17	TP-201.4 (Methodology 1) & Exhibit 6 of VR-204-X	TP-201.4 (Methodology 1) & Exhibit 6 of VR-204-X	Exhibit 10
Exhibit 17	Exhibit 11	Exhibit 17	Exhibit 17	
Exhibit 8	Exhibit 12			

² Test results shall be complete and accurate and submitted on current District test forms located at <http://www.sdapcd.org/comply/vapor/VRforms.html>. Failure to notify the District 15 calendar days prior to the scheduled test date/time or the failure to submit complete and accurate test data may result in the test being considered invalid by the District.

³ When conducting pressure decay testing, the following requirements shall be met:

- a. The CARB Test Procedure TP-201.3 (most recent version) shall be conducted between sundown and a half hour after sunrise to minimize interface from solar effects and barometric pressure changes. The San Diego Air Pollution Control District's TP-96-1 (most recent version) leak detection procedure may be used in lieu of TP-201.3. TP-96-1 can be conducted at any time except when daytime temperatures exceed 100 °F, and there is direct sunlight on exposed metal vent pipe(s) and metal manhole cover(s) that are in contact with vapor space of the storage tanks. The District will also accept the results of leak tests based on soap solution, helium detection or vacuums provided that procedures have prior written District approval. Election of any test method (including optional tests) requires compliance with the performance standard for the test method.⁴ If nitrogen is introduced through the vapor adaptor, the vapor coupler test assembly shall be leak checked in accordance with TP 201.3 (sections 5.5, 6.7-6.7.2) prior to conducting the TP 96-1 test.
- b. If nitrogen is introduced through the vapor adaptor, the vapor coupler test assembly shall be leak checked in accordance with TP 201.3 (sections 5.5, 6.7-6.7.2) prior to conducting the TP 96-1 test.
- c. The nitrogen introduction rate for the TP 96-1 test shall be between 1-5 cubic feet per minute (cfm).
- d. There shall be no vapor to liquid (V/L) (Exb.5/TP 201.5 or equivalent) testing conducted within the twenty-four (24) hour period immediately prior to this test.
- e. The submersible fuel pumps shall be turned off prior to conducting TP 96-1 testing.
- f. If the equipment is identified as BACT in the equipment description, only TP-96-1 will be accepted by the District.
- g. All P/V valves, including the valve installed on the VST Membrane Processor vent, when applicable, have been removed and vent risers capped prior to conducting TP-96-1 and re-install the valves after the test has been completed.

⁴ The pressure decay test for these systems (TP-201.3 or TP-96-1) shall be conducted in conjunction with Exhibit 4 of ARB E.O. VR-203-X or VR-204-X.

⁵ The P/V valve installed on the VST Membrane processor vent is not part of the Phase I system, and testing of this P/V valve is not required.

⁶ While testing per Exhibits 7 and 10 of VR-203-X or VR-204-X and Exhibits 7 the vapor space of the gasoline dispensing facility shall be pressurized to 2.0" WC. This can be completed in conjunction with the pressure decay test. In addition, TP-201.2B may be used in lieu of Exhibit 7 of VR-203-X or VR-204-X.

⁷ If the station pressure is -2.00" wc or more negative, a vacuum test must be performed followed by a pressure test. If the pressure is less negative than -2.00" wc, a pressure test must be performed. Anytime a vacuum test is conducted a subsequent pressure test shall also be conducted immediately after the vacuum test.

⁸ Must conduct flow rate verification for each grade point prior to starting Exhibit 5, Option 1.



**ATTACHMENT L-1
INSTRUCTIONS AND REQUIREMENTS FOR
RESPONDING TO PMC/ISD/PROCESSOR ALARMS**

**Veeder-Root In-Station Diagnostic (ISD) and Pressure Management Control (PMC) Alarm
Troubleshooting Summary**

Displayed Message	ISD/PMC Monitoring Category	Veeder-Root Indicator Light	Cause	Troubleshooting Tests/Inspections ^{a, d}
ISD VAPOR LEAKAGE WARN	Containment	Yellow	7-Day Vapor Leakage Detection test warning	TP-96-1, TP-201.1E, TP-201.1C or TP-201.1D, as applicable; Exhibits 10 & 14 of VR-204-X, Verify the VR Vapor Polisher valve is operating in accordance with Table 6 of Section 12 of VR-204-X IOM,
ISD VAPOR LEAKAGE FAIL	Containment	Red	7-Day Vapor Leakage Detection test - 8th consecutive failure	
ISD GROSS PRESSURE WARN	Containment	Yellow	7-Day Gross Over Pressure test warning	Check processor ball valve positions, verify processor is in the on and automatic vapor processor mode; Inspect boots for damage; Verify the VR Vapor Polisher valve is operating in accordance with Table 7 of Section 12 of VR-204-X IOM The following test procedures as listed in ARB E.O. VR-204-X: Exhibit 9, Exhibit 10, & Exhibit 11
ISD GROSS PRESSURE FAIL	Containment	Red	7-Day Gross Over Pressure test -8th consecutive failure	
ISD DEGRD PRESSURE WARN	Containment	Yellow	30-Day Degradation Over Pressure test warning	
ISD DEGRD PRESSURE FAIL	Containment	Red	30-Day Degradation Over Pressure test - 30th consecutive failure	
ISD VP STATUS WARN ^c	Processor	Yellow	1-Day Warning of VP Emissions or Duty Cycle	See Emissions and Duty Cycle troubleshooting guidelines
ISD VP STATUS FAIL ^c	Processor	Red	1-Day VP Status failure - 2 nd consecutive failure	
VP EMISSION WARN ^b	Processor	Yellow	1-Day Mass Emission warning	<u>Vapor Polisher</u> Check processor ball valve positions, verify processor is in the on and automatic vapor processor mode; Inspect boots for damage; Verify the VR Vapor Polisher valve is operating in accordance with Table 4 of Section 15 of VR-203-X IOM or Table 7 of Section 12 of VR-204-X IOM The following test procedures as listed in ARB E.O. VR-203-X/VR-204-X: Exhibit 10, and Exhibit 11
VP EMISSION FAIL ^b	Processor	Red	1-Day Mass Emission failure – 2 nd consecutive failure	<u>VST (Membrane)</u> The following test procedures as listed in ARB E.O. VR-203-X/VR-204-X: Exhibit 8 and Exhibit 9
VP DUTY CYCLE WARN ^{b, c}	Processor	Yellow	1-Day Duty Cycle warning	TP-96-1, The following test procedures as listed in ARB E.O. VR-203-X/VR-204-X: Exhibit 9, Exhibit 10, Section 12 of VR-204-X IOM (Setup Procedure)
VP DUTY CYCLE FAIL ^{b, c}	Processor	Red	1-Day Duty Cycle failure – 2 nd consecutive failure	
Hnn: FLOW COLLECT WARN	Collection	Yellow	1-Day vapor flow collection warning	Inspect boots for damage. Conduct the following tests from ARB E.O. VR-204-X: Ex. 5 - Option 1; Ex 6 & TP 201.4 Methodology 1; and Exhibit 17
Hnn: FLOW COLLECT FAIL	Collection	Red	1-Day vapor flow collection failure - 2nd consecutive failure	
PMC Sensor Fault/Communication Alarm ^b	Self-Test	Yellow	Component failed or reported error condition	See Table 5 found in Section 15 of IOM for VR-203-X
PMC Setup ^b	Self-Test	Red	Component missing or not configured	PMC Setup Diagnostic Checklist in Troubleshooting Section, found in Section 15 of IOM for VR-203-X



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INSTRUCTIONS AND REQUIREMENTS FOR
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INCON In-Station Diagnostic (ISD) Alarm Troubleshooting Summary

INCON Vapor Recovery Monitor (VRM)	Type	Cause	Troubleshooting Tests/Inspection ^{a, d}
Daily Vapor Collection, Fueling Point (n)	Warning	1-Day Gross A/L Test warning	Inspect boots for damage. Conduct the following tests from ARB E.O. VR-204-X: Ex. 5 - Option 1; Ex 6 & TP 201.4 Methodology 1; & Ex 10
	Failure	1-Day Gross A/L Test - 2nd consecutive failure	
Weekly Ullage Pressure	Warning	7-Day Gross Over Pressure test warning	Perform a check on the processor and make sure it is turned on and processing vapors; Check processor ball valve positions; Inspect boots for damage; Exhibits 10 and 13 of VR-204-X
	Failure	7-Day Gross Over Pressure test -8th consecutive failure	
Monthly Ullage Pressure	Warning	30-Day Degradation Over Pressure test warning	
	Failure	30-Day Degradation Over Pressure test - 30th consecutive failure	
Weekly Ullage Pressure Leak Test	Warning	7-Day Vapor Leakage Detection test warning	TP-96-1, TP-201.1E, TP-201.1C or TP-201.1D, as applicable; Exhibits 10 & 13 of VR-204-X
	Failure	7-Day Vapor Leakage Detection test - 8th consecutive failure	
Vapor Processor Warning	Warning Only	Processor run time exceeds 62 continuous minutes, or processor is shutoff, or input to ISD console is disconnected	Exhibit 13 of ARB E.O. VR-204-X TP-96-1
Vapor Processor Malfunction	Warning	1-Day Over Pressure test warning	Exhibit 13 of ARB E.O. VR-204-X TP-96-1
	Failure	1-Day Over Pressure test - 2 nd consecutive failure	

Alarm Troubleshooting Summary for Hirt VCS 100 Processor

VCS 100 Indicator Panel	Light	Cause	Troubleshooting Tests/Inspections ^d
OVERPRESSURE LIGHT	Red	UST ullage pressure is positive for at least 1 continuous hour.	GDF Owner/Operator Responsibilities: Sections 2 & 5 of VR-204-X IOM Exhibit 7 of E.O. VR-204-X Certified Contractor Responsibilities: Follow VCS 100 Troubleshooting Guide ^e TP-96-1 Exhibit 13 of E.O. VR-204-X

^a Troubleshooting tests and inspections also include, but are not limited to, the lists referenced in the Veeder-Root ISD Troubleshooting Manual P/N 577013-819 located at http://www.veeder.com/page/isd_manuals, the VST ISD Troubleshooting Guide located at http://www.vsthose.com/carbs_components.aspx, and the INCON VRM Troubleshooting and Diagnostics Guide located at <http://www.franklinfueling.com>.

^b Facilities equipped with only PMC shall refer to these alarms. Facilities equipped with ISD shall refer to all alarms listed in the table, excluding the PMC Sensor Fault & PMC Setup alarms.

^c Applicable to facilities equipped with a VST Membrane Processor only.

^d The permittee and/or designated contractor shall not clear alarm conditions upon any ISD/PMC/PROCESSOR alarm unless, at minimum, the applicable troubleshooting tests and inspections listed above have been successfully conducted in order to verify the cause of the ISD/PMC/PROCESSOR alarm and recorded in the maintenance and repair log. Other tests and/or inspections may be performed in lieu of those cited above provided the same ISD/PMC/PROCESSOR alarm does not occur within the next consecutive assessment period after resetting the alarm. All test results shall be maintained onsite for three (3) years from test date and made available to the District upon request.

^e Contact Hirt by either Phone: (562) 692-6970 or by email: HirtVCS@aol.com to order the guide.