ARB STAFF RESPONSES TO COMMENTS ON TP-201.4 RECEIVED AFTER MARCH 4, 1999 WORKSHOP

1. Comment: In Section 5.2 the flowrates specified do not match those mentioned in Section 8.1.5.

Response: This was an oversight and has been corrected.

2. Comment: Specific flow rates and pressures should not be referenced in the procedure; rather reference should be made to the applicable Executive Order.

Response: The workshop draft was supposed to show the intention of referring compliance determination to the Executive Order clearly. To the best of ARB's knowledge no executive order has been issued which contains flow rates other than 20, 40, 60, 80 and 100 CFH. Measurements of back pressure can be made at all these flow rates rapidly in succession and describe a relation of pressure to flow that is useful for quality assurance purposes. Section 8 has been revised accordingly.

3. Comment: In Section 8.1.2: recommend referring to the Executive Order rather than indicating a specific flow rate.

Response: ARB's intention is to generate a series of evenly spaced and redundant data points for purposes of quality assurance. The Executive Order applicable to the specific system will indicate which of the data points apply in determining compliance.

4. Comment: Flow rates should be limited to a maximum of 10% above the maximum flow rate mentioned in the Executive Order to avoid "blowing out" the piping system (pushing trapped liquid from the piping into the underground tank, thus reducing the pressure drop caused by the liquid).

Response: ARB's intent is that operation reflect normal operating conditions. The changes to the method call for maximum nitrogen flow of 100 CFH. Vapor flow in underground piping will exceed this rate when two dispensers are operating simultaneously and vapor flow through an individual dispenser hose will be about two thirds of this value at 10 gpm dispensing rates. New or modified underground piping may not contain the normal amount of condensate so addition of liquid is necessary to correct for this. Liquid is deliberately drained from the hose before testing to preclude any inappropriate bias due to any recent "topping off", and ARB staff expects little gasoline to be retained in internal dispenser vapor plumbing. The wording related to adding liquid to the vapor return risers and draining the hose has been clarified; staff believes the revised

procedure adequately addresses the concerns voiced in this comment.

5. Comment: A sentence is repeated in Section 12.1.

Response: This has been corrected.

6. Comment: In Figure 4, the field data form should have spaces for entering the vapor recovery system type and Executive Order number.

Response: Spaces for this information have been added.

7. Comment: Support removal of the table of dynamic back pressure requirements at various flow rates from the method and linking compliance to requirements in applicable Executive Orders.

Response: Staff agrees and has modified TP-201.4 to refer to the applicable Executive Order for dynamic back pressure requirements.

8. Comment: In Section 12.1, the last sentence links compliance of installed facilities to pressure drop performance established in certification, which could be different for each system. Gilbarco favors a fixed table of pressure drops at various flow rates to simplify testing, and recommends 0.15 in. W.C. @ 20 CFH, 0.45 in. W.C. @ 40 CFH, and 0.95 in. W.C. @ 100 CFH. Gilbarco also favors a "pressure drop budget".

Response: The allowable dynamic back pressures established in certification are related to emissions control efficiency achieved in certification testing. The purpose of testing dynamic back pressure subsequently is to determine whether a system is operating in a manner consistent with it's operation during certification and the certified emissions control efficiency. Use of nominal back pressure limits applicable to all systems would defeat this purpose. Regarding "pressure drop budgets", protocols for determining the drop across individual components have not been finalized (see discussion elsewhere) and resolution of this issue must be deferred.

9. Comment: Rotameters and Magnahelic gauges must be vertical to work correctly but no requirement for leveling them is included in the test procedure.

Response: This is a valid point, particularly with respect to rotameters, and an appropriate requirement has been added in Section 5.

10. Comment: In section 7.3 the time elapsed since filling the underground tank is irrelevant since the dry break is open during testing.

Response: System behavior after the initial filling of tanks at a new facility may be atypical for a day or so although effects will be minimal since the dry break is open. The section has been

revised to clearly refer to initial deliveries to new facilities.

11. Comment: While two gallons introduced into the riser is sufficient to identify problems in 2 inch diameter underground piping, 5 gallons is better for 3 inch lines.

Response: Adjustment of the amount of gasoline added based on pipe diameter is reasonable since liquid may in fact collect continuously in piping low points and these must be detected with some degree of confidence. A provision has been added to the procedure to support such adjustments.

12. Comment: The procedure calls for waiting 15 minutes for underground piping to drain in Section 7.4.4 but drainage is usually complete within two minutes.

Response: ARB staff considers 15 minutes a reasonable time since this applies to all risers as a group and not each riser individually. This intention has been clarified in the revised procedure.

ARB STAFF RESPONSES TO COMMENTS ON CP-201 RELATING TO DYNAMIC BACKPRESSURE

13. Comment: In Section 4.2.1(1) the table specifying allowable back pressure should include "±0.02" after every pressure value to reflect typical "error of measurement".

Response: Determination of compliance in situations where the likely error of measurement is greater than the difference between the standard and the measured value is addressed in Section 4.3 of Procedure TP201.4. The provisions have been clarified.

14. Comment: In Section 3.1.2(10) it is unclear whether manufacturers of pipe and pipe fittings in the underground piping system must be notified along with manufacturers of other components.

Response: The underground piping system is considered to be a composite component made from standard and interchangeable materials and fittings of non-proprietary design. Unless special purpose parts of proprietary design are included the manufacturer of the pipe and fittings is irrelevant.

15. Comment: Section 3.1.2(1)(d) requires itemization of pressure drop through the system as a whole and each component individually. This could hypothetically be the drops unique to the system, or drops from a CARB-approved "pressure drop budget". A value for the overall drop is essential to ensure cumulative drop is acceptable.

Response: At this point the only "CARB-approved" pressure drop budget is the values given in the table in Section 4.2.1.1 of CP-201 for overall pressure drop, and these values apply to

certification of new systems only. While the drop across individual components needs to be known in configuring a system to predict overall pressure drop, use of a component (for instance a Brand X nozzle) with comparatively high pressure drop can be offset by selection of another component with a comparatively low pressure drop (for instance a Brand Y hose or dispenser) to achieve a desired overall drop. It is thus unreasonably restrictive to set maximum drops for individual types (i.e for nozzles, or for hoses) of components. However, it is reasonable and necessary to require that every specific component (for instance a Brand X nozzle or a Brand Y hose) have a known, predictable maximum pressure drop at any particular flow rate. If a maximum pressure drop value can not be associated with each specific component of a certified system it is not practical to expect that installed examples of that system will have acceptable overall pressure drops.

There is no standard protocol at this point for quantifying pressure drop across individual components independently of the components connected upstream and downstream, and some effects on pressure drop related to selection of upstream and downstream components may be possible. We intend to survey manufacturers regarding possible pressure drop measurement methods and finalize a protocol for quantifying pressure drop across individual components in the future.