Department of the Environment

# TECHNICAL SUPPORT DOCUMENT

## Amendments to COMAR 26.11.13.04 and .05 Control of Gasoline and Volatile Organic Compound Storage and Handling

3-05-14

## Table of Contents

**TSD Summary for Amendments to COMAR 26.11.13 - Control of Gasoline and Volatile Organic Compound Storage and Handling - Alternative Compliance Procedures for Transloading Operations**

COMAR 26.11.13.04 establishes requirements for the use of automatic disconnections for the transfer of gasoline and VOCs with a total vapor pressure greater than 1.5 psia. Affected sources in Maryland do use dry disconnects on transfer equipment used for the handling of gasoline and fuel grade ethanol products (which have vapor pressures of greater than 1.5 psia). The handling of other flammable liquids (such as Hexane) in tank trucks is not so clearly defined for the loading connections and an alternative to the requirement of utilizing dry disconnects on transfer equipment was needed by affected sources.

The development of COMAR 26.11.13.04E - Alternative Compliance Procedures are based upon technical and economic analysis of the transloading operations between rail tank cars and cargo tank trucks. Existing COMAR standards for cargo tank trucks that transfer gasoline, ethanol and other fuels are able to be met by industry as these operations and equipment are standardized throughout the affected industry. COMAR regulation 26.11.13.04D for loading connections that automatically close upon disconnection can be met for these specific operations.

For other flammable VOC containing liquids the standards for transloading connections on cargo tank trucks have not been standardized. COMAR 26.11.13.04E Alternative Compliance Procedures provide the operational flexibility where connections on cargo tank trucks have not been standardized and adaptive connections that automatically close are not available.

Different commodity materials are involved in transloading operations between rail tank car and cargo tank truck. These operations provide considerable transportation cost and emission savings, allowing for the majority of the transportation to be performed by rail, with the last few miles being accomplished by truck.

1. Vapor balance practices are used to transload materials with vapor pressure greater than 1.5 psia. Affected sources in Maryland typically only transfer one product, Hexane, with a vapor pressure greater than 1.5 psia at a Baltimore facility. The amendments to COMAR 26.11.13 allows for better control of VOC emissions and hazardous air pollutants (HAPs), and as a result, provides air quality benefits and reduces worker exposure to HAPs. With vapor balance practices, safety standards are also met. A vapor balance system has a control efficiency of approximately 98.7%.

The alternative compliance procedures for transloading operation for high vapor pressure materials involve an elevated platform, vapor balance and a “fail-closed” configuration which turns off the pump and ceases flow should there be a leaking connection, valve, or hose. Liquid pump(s) are used to empty the hoses upon completion of the transfer operation which minimizes releases to the environment (i.e., spills and evaporation).

Department of the Environment

# Facts About...

## Amendments to COMAR 26.11.13.04 and .05 Control of Gasoline and Volatile Organic Compound Storage and Handling

11/05/13

**Purpose of New Regulation/Amendment**

The primary purpose of this amendment is to provide an alternative equivalent vapor recovery method for the transfer of high vapor pressure materials and to amend incorrect references from regulations .04 and .05.

**Submission to EPA as Revision to Maryland's SIP (or 111(d) Plan, or Title V Program)**

This action will be submitted to the U.S. Environmental Protection Agency (EPA) for approval as part of Maryland's State Implementation Plan.

**Background**

COMAR 26.11.13.04 establishes requirements for the use of automatic disconnections for the transfer of gasoline and VOCs with a total vapor pressure greater than 1.5 psia. Automatic disconnections are typically referred to in the industry as dry disconnects. Affected sources in Maryland do use dry disconnects on transfer equipment used for the handling of gasoline and fuel grade ethanol products (which have vapor pressures of greater than 1.5 psia). These products are typically transported in tank trucks meeting the U.S. Department of Transportation (US DOT) specifications as a MC306 or MC406 type cargo tank. The fuel industry has adopted the use of dry disconnect fittings for loading and unloading hose applications. Affected sources are limited to using dry disconnects on these products to accommodate the tank truck connection fittings on the MC306/406 cargo tanks.

The handling of other flammable liquids in tank trucks is not so clearly defined for the loading connections. These products are handled in US DOT MC407 cargo tanks. The motor carrier and chemical industries do not have an industry standard for the hose connections and trailer fittings beyond regulated safety venting devices. Sources that transfer fuels and liquids do not operate the motor carrier fleets or direct or coordinate the tank truck set up or maintenance. As such affected sources are required to have a high degree of flexibility as to the product and vapor return connections necessary to safely transfer the ordered product. The daily variation for tank truck connection type and size make the development of a standard transfer hose connection challenging. Many motor carriers use a variation of a cam lock “quick connector” type fitting to allow them to meet the end receiver transfer connections. Affected sources in Maryland maintain an inventory of the most commonly used connections to meet daily operating conditions.

Affected sources in Maryland typically only transfer one product with a vapor pressure greater than 1.5 psia at a Baltimore facility. This product is hexane, for which typically approximately 1.5 million gallons are transferred annually. This product is transferred using vapor balance, which has an estimated combined capture and control efficiency of 98.7 percent using EPA AP-42 factors. The total volatile organic compounds (VOC) emissions associated with this transfer are estimated as approximately 114 pounds.

This transfer quantity equates to approximately 53 tank cars of material, and approximately 215 truckloads of material. The tank trucks that are used to transport this material are not equipped with fittings that will accommodate dry disconnects. Because these tank trucks are not owned or operated by transfer facilities, it is outside of affected sources control to equip the tank trucks with such fittings.

**Sources Affected and Location**

This amendment affects the TRANSFLO Terminal Services, Inc. facility located in Baltimore City.

**Requirements**

These amendments provide an alternative equivalent vapor recovery method for the transfer of high vapor pressure materials that must be approved by the Department and the EPA.

**Expected Emissions Reductions**

Air quality emission benefits will be achieved by providing an alternative to the use of dry disconnects for the transfer of high vapor pressure materials. The affected facility has developed a custom transloading operation for high vapor pressure materials such as hexane that involves an elevated platform, vapor balance and a “fail-closed” configuration which turns off the pump and ceases flow should there be a leaking connection, valve, or hose. Liquid pump(s) are used to empty the hoses upon completion of the transfer operation which minimizes releases to the environment (i.e., spills and evaporation).

**Economic Impact on Affected Sources, the Department, other State Agencies, Local Government, other Industries or Trade Groups, the Public**

The proposed amendment will not incur an economic impact on affected sources, the Department, trade association or the public.

**Economic Impact on Small Businesses**

The affected sources do not fit the definition of “small business.”

**Is there an Equivalent Federal Standard to this Proposed Regulatory Action?**

There is no corresponding federal standard to this proposed action.

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# Title 26 DEPARTMENT OF THE ENVIRONMENT

## Subtitle 11 AIR QUALITY

### Chapter 13 Control of Gasoline and Volatile Organic Compound Storage and Handling

Authority: Environment Article,§§1-101, 1-404, 2-101—2-103, 2-301—2-303, 10-102, and 10-103,

Annotated Code of Maryland

**.01 — .03 (text unchanged)**

**.04 Loading Operations.**

A. Bulk Gasoline Terminals.

(1) — (2) (text unchanged)

(3) Test Procedures.

(a) Testing for leak-tight conditions, as required in §A(1)(b)(ii) of this regulation, shall be conducted as prescribed in Method 1008 of the Department's Technical Memorandum 91-01, "Test Methods and Equipment Specifications for Stationary Sources" **[(]**January 1991**[)]**, *as amended through Supplement 3 (October 1, 1997),* which is incorporated by reference in COMAR 26.11.01.04C.

(b) The test procedures to determine mass emission rate compliance as required in §A(1)(a) of this regulation, shall be as prescribed in Method 1009 of the Department's Technical Memorandum 91-01, "Test Methods and Equipment Specifications for Stationary Sources" **[(]**January 1991**[)]**, *as amended through Supplement 3 (October 1, 1997),* which is incorporated by reference in COMAR 26.11.01.04C.

B. — D. (text unchanged)

*E. Alternative Compliance Procedures. In lieu of satisfying the requirements of §D(1), a person may instead utilize:*

*(a) An overhead loading rack installation which transfers VOC other than gasoline having a TVP of 1.5 psia (10.3 kilonewtons/square meter) from railroad tank car to tank trucks, or vice versa, using drip pans and other spill control equipment to limit the release of any product during post loading disconnections and any one of the following control practices or combination thereof:*

*(i) Walking the hose clear of fluids;*

*(ii) Running a pump to clear the line of fluids;*

*(iii) Application of inert gas to clear the line of fluids; or*

*(b) An alternative equivalent vapor containment method approved by the Department and the EPA as a revision to the Maryland State Implementation Plan.*

**.05 Gasoline Leaks from Tank Trucks.**

A. (text unchanged)

B. Method of Compliance. A person who owns or operates a gasoline tank truck subject to this regulation shall:

(1) (text unchanged)

(2) Use the certification test procedures as prescribed in Method 1007 of the Department's Technical Memorandum 91-01, "Test Methods and Equipment Specifications for Stationary Sources" **[(]**January 1991**[)]**, *as amended through Supplement 3 (October 1, 1997),* which is incorporated by reference in COMAR 26.11.01.04C; and

(3) (text unchanged)

C. Determination of Compliance.

(1) (text unchanged)

(2) The Department may at any time monitor gasoline tank trucks for leak-tight conditions using the procedures described in Method 1008 of the Department's Technical Memorandum 91-01, "Test Methods and Equipment Specifications for Stationary Sources", *January 1991, as amended through Supplement 3 (October 1, 1997),*which is incorporated by reference in COMAR 26.11.01.04C.

D. (text unchanged)

**.06 — .08 (text unchanged)**

**Appendix A** – October 26, 2011 letter from TRANSFLO Inc. to MDE

**October 26, 2011**

Ms. Suna Yi Sariscak
Unit Lead Engineer
Chemical Unit
Air Quality Permits Program
Air and Radiation Management Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230

**RE: Air Permit to Operate Renewal – TRANSFLO Baltimore, Maryland Facility, Permit ID 510-03103 – Equivalency Determination**

Dear Ms. Sariscak:

This letter requests an equivalency determination for the operations currently performed by TRANSFLO Terminal Services, Inc. (TRANSFLO). This equivalency determination was discussed with you via telephone on October 25, 2011[1]. This equivalency determination is requested for the requirements of COMAR 26.22.13.04D, which states:

> *General Standards. A person may not cause or permit gasoline or VOC having a TVP of 1.5 psia (1.3 kilonewtons/square meter) or greater to be loaded into any tank truck, railroad tank car, or other contrivance unless the:*
>
> *(1) Loading connections on the vapor lines are equipped with fittings that have no leaks and that automatically and immediately close upon disconnection to prevent release of gasoline or VOC from those fittings; and*
>
> *(2) Equipment is maintained and operated in a manner to prevent avoidable liquid leaks during loading or unloading operations.*

TRANSFLO performs value added commodity transfer operations for their clients. TRANSFLO does not own or operate either the tank cars or the tank trucks that are used to transport the materials that are transloaded at the facility. Similarly, TRANSFLO does not own the materials that are transferred. Typically, TRANSFLO owns the equipment used to transfer the materials,

[1] Teleconference with Ms. Lisa Wiedemann, TRANSFLO HSE&Q Project Manager, Ms. Suna Yi Sariscak, MDE, and Dr. Mitchell Hait, consultant to TRANSFLO.

although in certain situations TRANSFLO will use customer owned equipment (provided the equipment meets or exceeds TRANSFLO's internal requirements). This distinction of ownership of the tank cars and tank trucks is an essential element of the reason for this request.

The tank cars and tank trucks are designed to have certain types of fittings, which are considered industry standard for a particular type of product (commodity) or classification of tank car or tank truck. TRANSFLO is limited by the various available fittings (e.g., locations, sizes, and types) that are on the various tank cars and tank trucks. TRANSFLO has developed loading procedures that balance the Health, Safety, Environment, and Quality concerns associated with their value added transloading operations. TRANSFLO believes that these procedures are amongst the best, if not the best, in their industry.

COMAR 26.22.13.04D requires the transfer of materials with a vapor pressure of at least 1.5 psia using fittings that have automatic disconnections, and to maintain and operate the fittings to prevent avoidable liquid leaks. After a transfer of material is complete, TRANSFLO procedures include clearing the hoses of material to prevent a release. TRANSFLO procedures also include performing daily sensory (i.e., visual and olfactory) inspections of their transfer operations to identify possible leaks, and to correct these leaks prior to proceeding with transfer operations. TRANSFLO believes their current methods meet the intent of these requirements. TRANSFLO has reviewed their records for the previous two year period, and they had identified zero (0) situations requiring additional attention associated with the approximately 8,750 transfer operations (i.e., individual tank truck loads). This metric is provided to support the assertion that TRANSFLO has an active and effective program for leak identification and correction. TRANSFLO also performs periodic inspections of hoses and fittings, which they believe to also contribute to their successful program.

TRANSFLO is requesting an equivalency determination for the use of the automatic disconnections, which are typically referred to in the industry as dry disconnects. TRANSFLO does use dry disconnects on transfer equipment used for the handling of gasoline and fuel grade ethanol products (which have vapor pressures of greater than 1.5 psia). These products are typically transported in tank trucks meeting the U.S. Department of Transportation (US DOT) specifications as a MC306 or MC406 type cargo tank. The fuel industry has adopted the use of dry disconnect fittings for loading and unloading hose applications. TRANSFLO is limited to using dry disconnects on these products to accommodate the tank truck connection fittings on the MC306/406 cargo tanks.

The handling of other flammable liquids in tank trucks is not so clearly defined for the loading connections. These products are handled in US DOT MC407 cargo tanks. The motor carrier and chemical industries do not have an industry standard for the hose connections and trailer fittings beyond regulated safety venting devices. As stated above, TRANSFLO does not operate the motor carrier fleets or direct or coordinate the tank truck set up or maintenance. As such TRANSFLO is required to have a high degree of flexibility as to the product and vapor return connections necessary to safely transfer the ordered product. The daily variation for tank truck connection type and size make the development of a standard transfer hose connection challenging. Many motor carriers use a variation of a cam lock "quick connector" type fitting to allow them to meet the end receiver transfer connections. TRANSFLO maintains an inventory of the most commonly used connections to meet daily operating conditions.

Connections on tank cars are also variable based upon tank car owner or shipper tank car configuration specifications. Dry disconnect type fittings are not used in the rail industry on tank cars. The most typical connections are a threaded fitting of varying sizes. From the threaded connection TRANSFLO typically uses an adaptor type fitting for threaded to cam lock to allow quick hose connections for product transfers.

The TRANSFLO transfer procedures and processes use various methods to clear hoses at the end of liquid transfers to limit the amount product remaining in any transfer hose. These include walking the hose clear, running the pump to clear the line, or application of inert gas to clear the line. The use of drip pans and other spill control equipment are intended to further limit the release of any product during post loading disconnections.

During the past 12-months, TRANSFLO has transferred one product with a vapor pressure greater than 1.5 psia at the Baltimore facility. This product is hexane, for which approximately 220 thousand gallons were transferred during this 12-month period. This product is transferred using vapor balance, which has an estimated combined capture and control efficiency of 98.7 percent[2]. The total volatile organic compounds (VOC) emissions associated with this transfer are estimated as approximately 6 pounds.

This transfer quantity equates to approximately 8 tank cars of material, and approximately 30 truckloads of material. The tank trucks that are used to transport this material are not equipped with fittings that will accommodate dry disconnects. Because these tank trucks are not owned or operated by TRANSFLO, it is outside of TRANSFLO's control to equip the tank trucks with such fittings. Additionally, the tank trucks that are used for a particular commodity will vary, based on the customer who is receiving the material, the contract carrier's availability of tank trucks, and the like. Because TRANSFLO is limited in using fittings that work with the industry standard trucks, TRANSFLO is requesting this equivalency determination.

For this liquid hexane product, TRANSFLO uses the liquid pump(s) to empty the hoses upon completion of the transfer operation. This practice is performed to transfer the maximum practical quantity of the customer's product, and to minimize releases to the environment (i.e., spills and evaporation).

We believe that the combined use of vapor balance and the operational practice of clearing the liquid transfer lines is "equivalent" to the COMAR 26.11.13.04D rule requirement. Per our conversation, we request that you review this request with the appropriate parties in your agency. Should the MDE concur, we request that our operating permit include provisions to use our current operational practices of vapor balance combined with clearing the liquid transfer lines as an equivalent method of meeting the requirements of COMAR 26.11.13.04D.

[2] U.S. EPA AP-42, Section 5.2, June 2008.

On behalf of TRANSFLO, we appreciate your consideration of this equivalency determination. Should you have any questions on any of the items in this request, please contact Dr. Mitchell Hait at haitinc@gmail.com or (904) 494-4200, or Ms. Lisa Wiedemann of TRANSFLO at lwiedemann@transflo.net or (904) 359-1337.

Sincerely,

Mitchell J. Hait, P.E., Ph.D.
Principal / Senior Engineer

cc: Ms. Lisa Wiedemann, TRANSFLO HSE&Q Project Manager

**Appendix B** – April 12, 2012 letter from TRANSFLO Inc. to MDE – Equivalency Determination and Additional Information Submittal

**April 12, 2012**

Mr. Husain Waheed
Permitting Manager
Ms. Suna Yi Sariscak
Unit Lead Engineer
Chemical Unit
Air Quality Permits Program
Air and Radiation Management Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230

**RE: Air Permit to Operate Renewal – TRANSFLO Baltimore, Maryland Facility, Permit ID 510-03103 – Equivalency Determination Additional Information Submittal**

Dear Mr. Waheed and Ms. Sariscak:

This letter provides additional information in support of the rule equivalency determination[1] for the TRANSFLO Terminal Services, Inc. (TRANSFLO) Baltimore facility. Per our telephone conversation[2], the U.S. EPA had requested additional cost and process information in support of our request. This additional information is presented in this letter and attachments. As discussed following in this letter, we believe that the use of dry disconnects for the transfer of high vapor pressure materials (such as hexane) is unreasonable based on cost, health and safety, and related environmental impacts.

The use of dry disconnects for products such as gasoline and fuel grade ethanol is reasonable, as the trucking industry has developed appropriate infrastructure (e.g., connectors on gasoline delivery trucks) to provide for ready accommodation and use of these fittings. However, the infrastructure is not in place for other materials, such as hexane, as further described in this letter.

**Current Transloading Process Description**

TRANSFLO has developed a custom transloading operation for high vapor pressure materials such as hexane that balances environmental, safety, and product quality concerns. This transloading

[1] Equivalency determination dated October 26, 2011.
[2] Telephone conversation of February 23, 2012 between Mr. Husain Waheed, Maryland DEP, and Mitchell Hait, TRANSFLO consultant.

arrangement involves an elevated platform, and is described in the following text. The primary environmental benefit from this unloading method is the "fail-closed" features of the equipment configuration. This transfer process was developed as a corrective action arising from an incident involving a leaking railcar bottom outlet valve adapter on a hexane railcar.

A sketch of the current transloading operation is provided in Attachment 1. Pictures of the transfer operation, along with narrative descriptions are included in Attachment 2. These pictures also show some of the differences in the U.S. Department of Transportation (DOT) MC306/406 and MC307/407 specification tank trailers. As was discussed in the prior RACT equivalency determination request, hexane is typically transported using MC307/407 specification tank trailers. Gasoline and fuel grade ethanol is typically transported using MC306/406 specification tank trailers.

The MC307/407 trailers are typically equipped with a single rear outlet valve and hose connection point at the ground level. Top fittings include a manway, washout connections, and vapor recovery valves. These trailers are widely used in chemical transportation and are often reloaded with different chemical products for backhauls, increasing the trailer usage and minimizing empty highway miles for the motor carrier. These trailers are rarely dedicated to any one product or shipper and thus require a high degree of flexibility in valve configuration.

As a result the trailers are used by a wide variety of chemical and petrochemical shippers and receivers. The standardization of outlet and hose fittings is not as common as in the gasoline/fuel oil business where MC306/406 trailers move between tank farms and motor fuel dispensing locations such service stations and convenience stores. While the use of dry disconnect fittings is common in the gasoline/motor fuels industry they are not commonly used in general chemical transportation.

**Product Transfer Involving Dry Disconnects**

Assuming that a dry disconnect fitting is to be used, it would be connected to the trailer outlet that is located at the bottom of the trailer. Vapor recovery connections and high level alarm overfill protection devices are applied to the top of the trailer. Due to pump configuration and piping configuration limitations, the use of dry disconnects on the current piping configuration is not practical. The loader would be forced to move between the rear of the trailer and the top of the transfer unit and railcar. Chemical handling industry best practice is to limit the distance between critical operations and product control points to ensure maximum operator transfer control and attendance.

The transfer platform pump would transfer product from the top of the tank car to the bottom of the tank trailer through the dry disconnect fitting. When full the tank trailer valve would be closed and the dry disconnect would be closed. Two serious conditions would then exist:

1. When the dry disconnect fittings on the end of the hose and the truck valve to dry disconnect female fitting are separated, the liquid transfer hose would remain full of product. The pump cannot clear the hose if the pump is mounted on the top of the platform. The trapped liquid would make the hoses difficult to handle due to adding approximately 75 pounds to a typical 30 foot long hose. The hoses would also be a

potential source of product spills. Additionally, it is not good industry practice to leave transfer equipment and hoses full of product when not being used.

2. When the truck valve to dry disconnect fitting is removed it would contain up to 1 gallon of product that would require draining, and probably disposal as hazardous waste.

It is important to note that this overall process of transloading material between railcars and trucks differs considerably from the transfer of material from a delivery truck to a fixed stationary storage tank. For example, if material was to be loaded into a fixed storage tank, the dry disconnect adapter would be permanently installed on the storage tank, and not require installation, removal, and draining with each load transferred.

If a ground mounted pump configuration is used, the main concern is the railcar (tank car) eduction pipe can no longer be used to fully drain the railcar due to pumping limitations. Hence, the bottom valve on the railcar would be utilized for the liquid supply. In the event of a component failure, this configuration is "fail-open" as opposed to the "fail-closed" configuration of the elevated platform. A secondary concern involves the truck valve to dry disconnect fitting that will retain up to one gallon of product that would need to be disposed of as hazardous waste.

**Cost Information**

The product transfer involves two product hoses. One hose connects from the railcar to the pump, and the second hose connects from the pump to the truck. The cost of each hose equipped with a dry disconnect is $1,700, for a total of $3,400. Hoses typically have a lifetime of four years.

The capital costs also involve the purchase of dry disconnect adapters for the receiving truck and the railcar false come lid. The railcar false dome lid requires a 3 inch adapter at a cost of $900. The truck requires a 4 inch adapter at a cost of $1,000 each. Two adapters are required to assure that one adapter will be available for use on site as it is likely that a truck will depart without first removing the adapter.

The use of dry disconnects involves installation and removal of an additional adapter to the delivery truck, adding time to the overall process. It is expected that these two steps will add a total of 10 minutes to each transfer process (i.e., 5 minutes each for adding and removing the adapters). Using a typical operator labor cost of $21.03 per hour, and a 60 percent overhead rate, this equates to an additional cost of approximately $5 per load.

During calendar year 2011, TRANSFLO has transferred one product with a vapor pressure greater than 1.5 psia at the Baltimore facility. This product is hexane, for which approximately 1.67 million gallons were transferred during this 12-month period. This product is transferred using vapor balance, which has an estimated combined capture and control efficiency of 98.7 percent[3]. The total volatile organic compounds (VOC) emissions associated with this transfer are estimated as approximately 127 pounds. This quantity is approximately 60 railcars, or 180 truckloads of hexane. Potential costs are estimated based on a potential throughput of 200 railcars per year.

[3] U.S. EPA AP-42, Section 5.2, June 2008.

**Air Quality Impacts**

The dry disconnects are designed to minimize liquid leaks during the connection and disconnection of hoses during transfer operations. To fully realize these benefits, the receiving container (in this case cargo truck) needs to be equipped with the dry disconnect fittings. As discussed previously, the use of dry disconnects for the transfer of hexane at the Baltimore facility will likely increase air quality emissions, as opposed to decrease the emissions. The increase will be due to the handling (e.g., draining and transfer operations) of residual liquid that remains in the dry disconnect adapter (fitting), pump, and liquid lines.

**Cost Effectiveness**

Typically a cost effectiveness value is expressed in terms of cost (e.g., dollars) per quantity (e.g., ton) of air emissions reduced. For example, cost effectiveness values in the range of $5,000 to $7,000 per ton of VOC emissions reduced are considered reasonable[4] costs.

In this particular case, the use of dry disconnects is expected to increase air quality emissions, as opposed decreasing emissions. This increase in emission leads to a negative value for cost effectiveness, which would not be considered a reasonable cost.

Per the request of the MDE, annualized cost increases are estimated using the standard U.S. EPA control equipment cost format. The values presented following are the additional costs associated with the use of dry disconnects. The detailed cost data are provided in Tables 1 through 3 of Appendix 3. Table 1 provides the actual case for annualized costs, which is $3,676 per year based on 60 railcars per year. Table 2 provides the potential case for annualized costs, which is $6,256 per year based on 200 railcars per year. Table 3 provides underlying site specific cost data, such as the capital recovery cost based on the four year equipment lifetime, and operator labor costs. These costs do not include the likely cost for product waste disposal, which is discussed in the following section.

**Other Environmental, Health and Safety, and Quality Concerns**

As discussed previously, the current equipment configuration provides a "fail-closed" configuration. Should there be a leaking connection, valve, hose, or other component, the flow ceases when the pump is turned off. The dry disconnects would likely cause a change in the configuration of the transfer, as discussed previously. Two options for the transfer were identified earlier in this letter.

For the transfer option that uses the elevated platform, the pump would not be able to clear the hoses at the end of the transfer due to the dry disconnect fittings. Hence, the product hoses would be full of liquid at the end of the operation. Assuming a 30 foot product hose (typical length), approximately 11 gallons of liquid product will be retained, adding approximately 75 pounds to the weight of each hose. This material retention would violate TRANSFLO's established operating procedures. It also introduces the following concerns:

[4] Reasonable in the sense of RACT or BACT control technology evaluation. The cost effectiveness determination is a case-by-case evaluation, with no bright line for establishing cost controls. The cost values expressed are typical based on general experience, and are not intended to imply what would be considered reasonable in this particular situation.

1. Health and safety concerns associated with the handling of a heavy hose;

2. The addition of a male segment of the dry disconnect to the false dome will add weight to the false dome lid, and will decrease the clearance to the "bathtub" spill containment structure on the top of the truck. The added weight and reduced clearance adversely affect worker ergonomic issues. This item is compounded with the elevated platform having restricted space.

3. Product hold up in the hose has the potential to add to product quality and cross contamination issues;

4. Clearing of product lines would be accomplished away from the receiving vessel, and the product cleared would likely be disposed of as hazardous waste, considerably increasing the amount of hazardous waste generated from the site;

5. The truck valve to dry disconnect fitting will retain up to one gallon of product that would need to be disposed of as hazardous waste;

6. Increasing the likelihood of spills and leaks due to the additional number of valves and handling issues with the hoses and the fitting that will likely retain liquid; and,

7. Cost of the product itself that is retained in the hoses and potentially disposed of as waste.

**Closing**

On behalf of TRANSFLO, we appreciate your consideration of this equivalency determination. Should you have any questions on any of the items in this request, please contact Dr. Mitchell Hait at haitinc@gmail.com or (904) 494-4200, or Ms. Becky Heilman of TRANSFLO at bheilman@transflo.net or (904) 359-1337.

Sincerely,

Mitchell J. Hait, P.E., Ph.D.
Principal / Senior Engineer

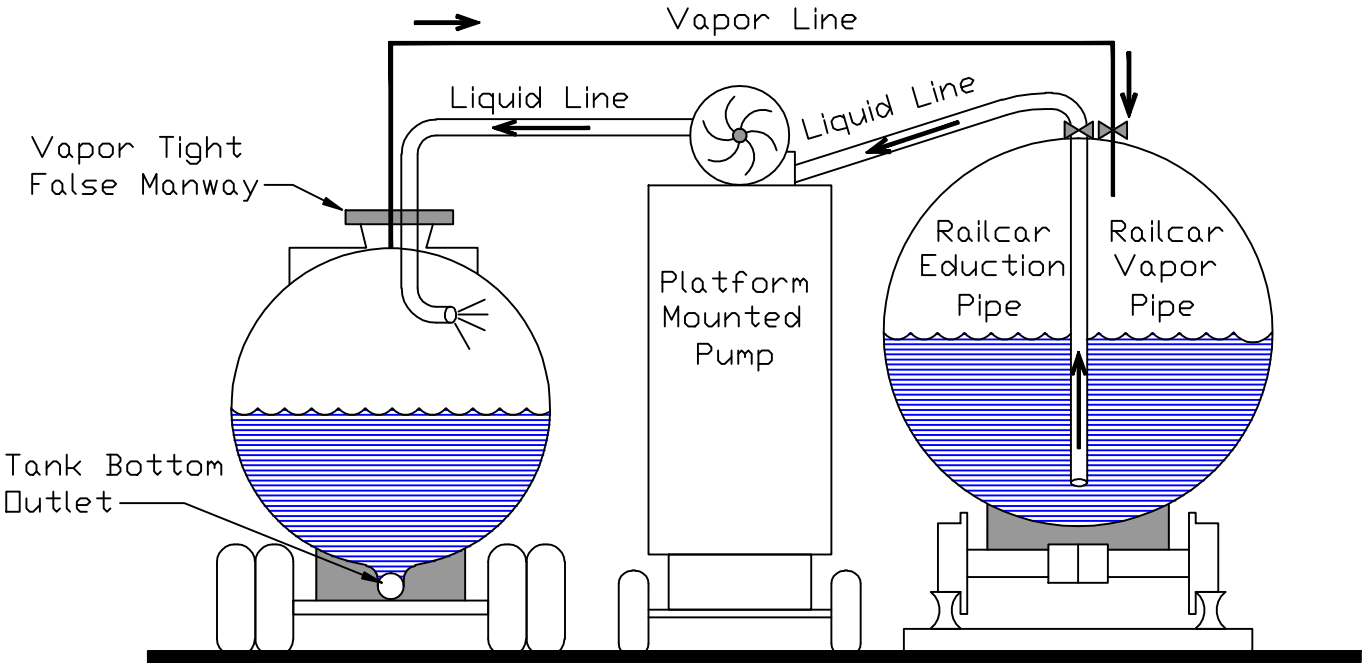
cc: Ms. Becky Heilman, TRANSFLO HSE&Q Project Manager
Ms. Jan Barnes, Director, HSE&Q

Attachments

1 – Current Transloading Configuration (Sketch)
2 – Transloading Equipment and Fittings
3 – Cost Data Tables

# Attachment 1 – Current Transloading Configuration (Sketch)

TRANSFLO®

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| DATE: 04/04/2012<br>REV: N/A<br>CHECKED: GRS<br>DRAWN: MJH<br>SCALE: N.T.S. | **Mitchell J. Hait, Ph.D., P.E., Inc.** | **General Arrangement - Hexane Transloading Operations**<br>TRANSFLO Terminal Services, Inc.<br>Baltimore, Maryland | FIGURE:<br>**1** |

Map Document: X:\gscott\AutoCad\Mitchell Hait\process_diagram.dwg

# Attachment 2 – Transloading Equipment and Fittings

**TRANSFLO Terminal Services**
**Transloading Equipment and Fittings**

## Typical Transfer Platform

**This unit has stairs to allow loaders to access top of tank car without climbing ladder. Tools and fittings are stored on top of unit. Unit has two "wings" that fold out to access tank car and truck. Hose jib holds hoses and limits need to pull hoses up car and across to truck. Pump is mounted on platform to increase suction capacity on partially loaded tank cars. Top mounted pump also allows hoses and fittings to fully drain by gravity into truck or rail tank car post loading.**

**Truck- MC407 Cargo Tank (trailer)**


MC407 tank trailer- single compartment, typically 5000-8000 gal. capacity.

These have a single rear outlet with truck valve.

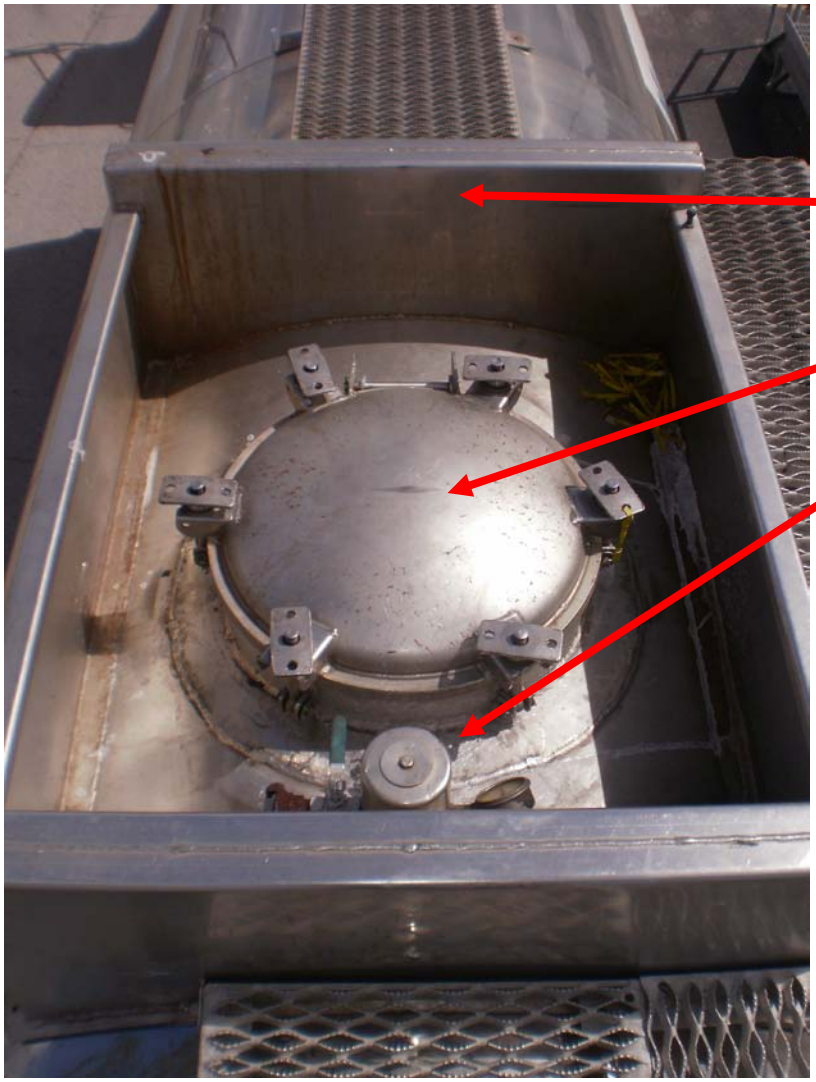
If a dry disconnect was required it would have to be a 3" cam lock to dry disconnect adaptor fitting as these trucks do not use dry disconnect fittings. This would trap liquid inside fitting once pump was stopped and valves closed.

Side view showing no belly valves on sides of trailers unlike a MC306 gasoline type trailer.

**MC 407 Trailer- no bottom fittings in center of trailer.**

**MC306/406 trailer- multiple outlets.**

**Truck fittings:**



MC 407 Truck top connections:

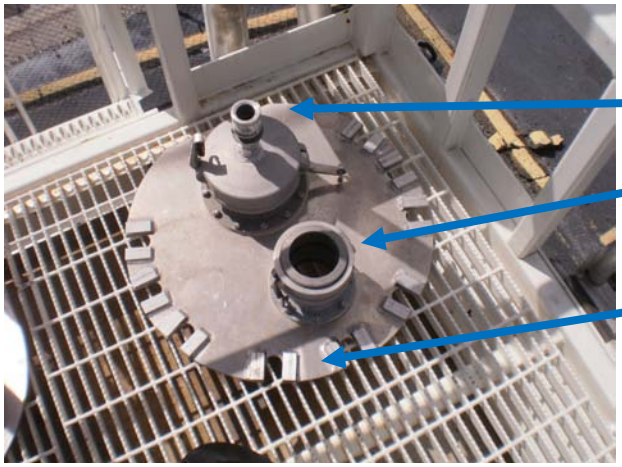
All fitting in a “bath tub” for spill control.

Primary opening is large manway secured with screw type dogs.

Other fitting is an air line and safety vent assembly.

(Trailer is set up for air or nitrogen pressure unload.)

**False Manway Fitting For Application to Truck Manway**

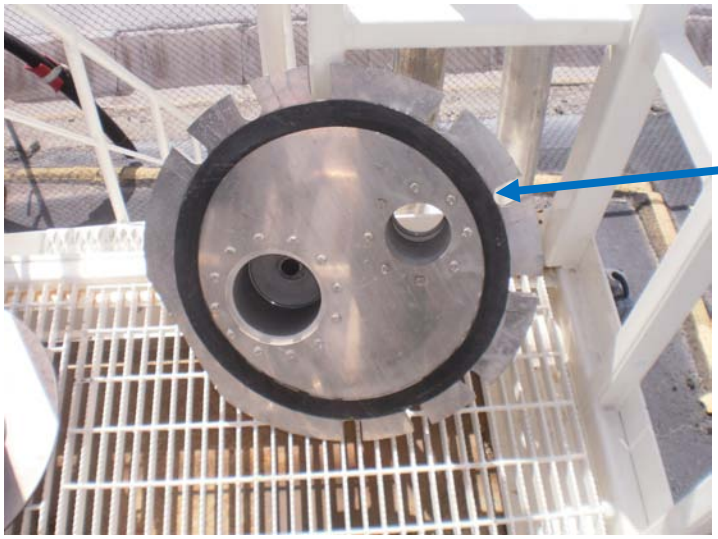


Truck False Manway with:

Vapor Recovery connection

Liquid tube insert connection

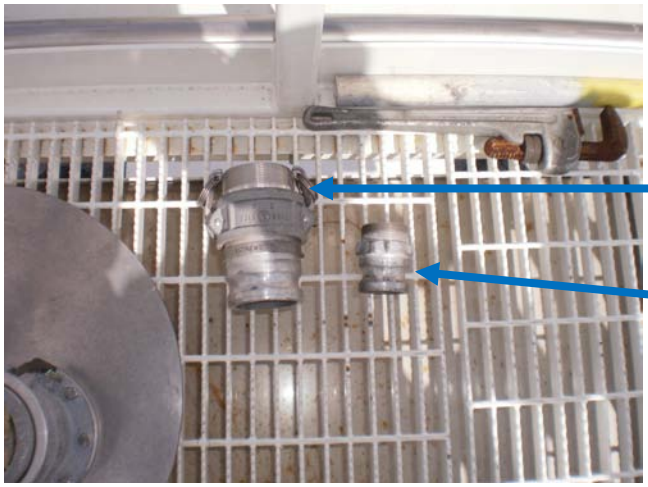
False manway “ears cutouts” for truck dogs to secure to truck.



Underside of false manway showing sealing gasket.

These fittings are stored on the top of the transfer platform for ease of handling and moving to the top of the tank truck.

**Rail tank car connections**

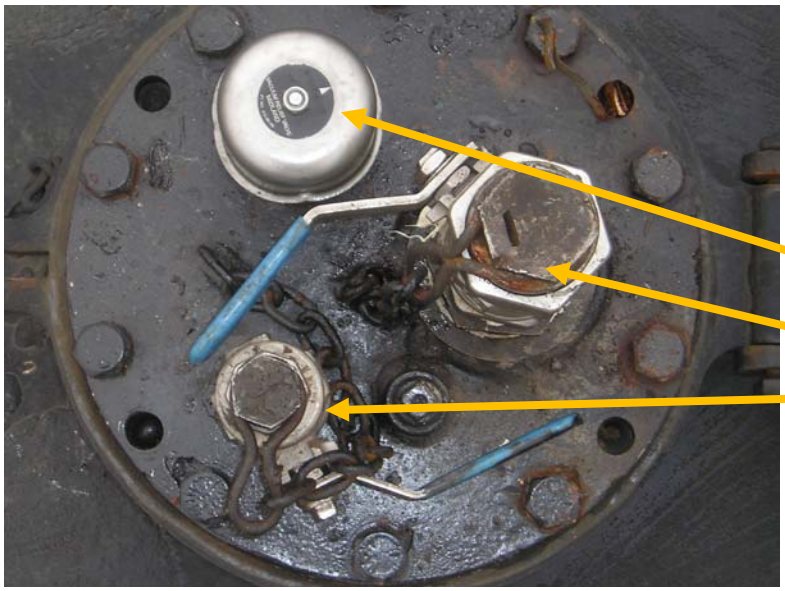


Rail tank car adaptor fittings

2” threaded to cam lock male fitting (liquid)

1” threaded to cam lock male fitting (vapor return)

These fittings are stored on the top of the transfer platform.



Rail tank car fittings

Vacuum relief device

2” liquid eduction line valve

1” air/vapor valve

# Attachment 3 – Cost Data Tables

**Table 1**
**Dry Disconnect**
**Annual Cost Data, Actual Case (60 Railcars per Year)**

| Cost Items | Cost Factors[a] | Cost ($) |
|---|---|---|
| **DIRECT CAPITAL COSTS (DCC):** | | |
| **Purchased Equipment Cost (PEC)** | | |
| Hoses w/ dry disconnects (two hoses total) | John Scheeter, TRANSFLO | $3,400 |
| Rail Car Adapter 4" (two) | John Scheeter, TRANSFLO | $2,000 |
| Manway Adapter 3" (one) | John Scheeter, TRANSFLO | $900 |
| Auxiliary equipment | Not Applicable | $0 |
| Total Equipment | | **$6,300** |
| Instrumentation and Controls | Not Applicable | $0 |
| Freight | 5% of "Total Equipment" | $315 |
| Taxes | State / Local sales tax | $378 |
| **Total PEC:** | | **$6,993** |
| **Direct Installation Costs (DIC)** | | |
| Foundation and Structure Support | 0% of PEC | $0 |
| Handling & Erection | 0% of PEC | $0 |
| Electrical | 0% of PEC | $0 |
| Piping | 0% of PEC | $0 |
| Insulation for Ductwork | 0% of PEC | $0 |
| Painting | 0% of PEC | $0 |
| **Total DIC:** | | **$0** |
| **Total DCC:** | **PEC + DIC** | **$6,993** |
| **INDIRECT CAPITAL COSTS (ICC):** | | |
| Engineering | 10% of PEC | $699 |
| Construction and Field Expenses | 0% of PEC | $0 |
| Contractor Fees | 0% of PEC | $0 |
| Start-up (Procedures) | 2% of PEC | $140 |
| Performance Test | 0% of PEC | $0 |
| Contingencies | 3% of PEC | $210 |
| **Total ICC:** | | **$1,049** |
| **TOTAL CAPITAL INVESTMENT (TCI):** | **DCC + ICC** | **$8,042** |

**Table 1**
**Dry Disconnect**
**Annual Cost Data, Actual Case (60 Railcars per Year)**

| Cost Items | Cost Factors[a] | Cost ($) |
|---|---|---|
| **DIRECT OPERATING COSTS (DOC):** | | |
| Operating Labor | | |
| Operator[b] | 10 min / load x 600 loads / year x operator cost $/hr | $701 |
| Supervisor | 15% of operator cost | $105 |
| Maintenance | | |
| Labor | Not Applicable | $0 |
| Materials | 100% of "Maintenance Labor" | $0 |
| Replacement Parts, Hoses / Valves (4-year lifetime) | | |
| Replacement Labor | Included in "Maintenance Labor" | $0 |
| Hoses / Disconnects (annualized) | PEC * CRF | $2,064 |
| Utilities | | |
| Not Applicable | Not Applicable | $0 |
| **Total DOC:** | | **$2,871** |
| **INDIRECT OPERATING COSTS (IOC):** | | |
| Overhead | 60% of "Operating Labor", "Maint. Labor", & "Maint. Materials" | $484 |
| Property Taxes | 1% of TCI | $80 |
| Insurance | 1% of TCI | $80 |
| Administration | 2% of TCI | $161 |
| **Total IOC:** | | **$805** |
| **CAPITAL RECOVERY COSTS (CRC):** | Not Applicable (included in above) | **$0** |
| **ANNUALIZED COSTS (AC):** | **DOC + IOC + CRC** | **$3,676** |

Footnotes:

[a] Unless otherwise specified, factors and cost estimates reflect OAQPS Cost Manual, Section 6, Chapter 3, Sixth edition.

[b] Operator labor based on incremental time required to connect / disconnect dry disconnect adapters on trucks

**Table 2**
**Dry Disconnect**
**Annual Cost Data, Potential Case (200 Railcars per Year)**

| Cost Items | Cost Factors[a] | Cost ($) |
|---|---|---|
| **DIRECT CAPITAL COSTS (DCC):** | | |
| **Purchased Equipment Cost (PEC)** | | |
| Hoses w/ dry disconnects (two hoses total) | John Scheeter, TRANSFLO | $3,400 |
| Rail Car Adapter 4" (two) | John Scheeter, TRANSFLO | $2,000 |
| Manway Adapter 3" (one) | John Scheeter, TRANSFLO | $900 |
| Auxiliary equipment | Not Applicable | $0 |
| Total Equipment | | **$6,300** |
| Instrumentation and Controls | Not Applicable | $0 |
| Freight | 5% of "Total Equipment" | $315 |
| Taxes | State / Local sales tax | $378 |
| **Total PEC:** | | **$6,993** |
| **Direct Installation Costs (DIC)** | | |
| Foundation and Structure Support | 0% of PEC | $0 |
| Handling & Erection | 0% of PEC | $0 |
| Electrical | 0% of PEC | $0 |
| Piping | 0% of PEC | $0 |
| Insulation for Ductwork | 0% of PEC | $0 |
| Painting | 0% of PEC | $0 |
| **Total DIC:** | | **$0** |
| **Total DCC:** | **PEC + DIC** | **$6,993** |
| **INDIRECT CAPITAL COSTS (ICC):** | | |
| Engineering | 10% of PEC | $699 |
| Construction and Field Expenses | 0% of PEC | $0 |
| Contractor Fees | 0% of PEC | $0 |
| Start-up (Procedures) | 2% of PEC | $140 |
| Performance Test | 0% of PEC | $0 |
| Contingencies | 3% of PEC | $210 |
| **Total ICC:** | | **$1,049** |
| **TOTAL CAPITAL INVESTMENT (TCI):** | **DCC + ICC** | **$8,042** |

**Table 2**
**Dry Disconnect**
**Annual Cost Data, Potential Case (200 Railcars per Year)**

| Cost Items | Cost Factors[a] | Cost ($) |
|---|---|---|
| **DIRECT OPERATING COSTS (DOC):** | | |
| Operating Labor | | |
| Operator[b] | 10 min / load x 600 loads / year x operator cost $/hr | $2,103 |
| Supervisor | 15% of operator cost | $316 |
| Maintenance | | |
| Labor | Not Applicable | $0 |
| Materials | 100% of "Maintenance Labor" | $0 |
| Replacement Parts, Hoses / Valves (4-year lifetime) | | |
| Replacement Labor | Included in "Maintenance Labor" | $0 |
| Hoses / Disconnects (annualized) | PEC * CRF | $2,064 |
| Utilities | | |
| Not Applicable | Not Applicable | $0 |
| **Total DOC:** | | **$4,483** |
| **INDIRECT OPERATING COSTS (IOC):** | | |
| Overhead | 60% of "Operating Labor", "Maint. Labor", & "Maint. Materials" | $1,451 |
| Property Taxes | 1% of TCI | $80 |
| Insurance | 1% of TCI | $80 |
| Administration | 2% of TCI | $161 |
| **Total IOC:** | | **$1,773** |
| **CAPITAL RECOVERY COSTS (CRC):** | Not Applicable (included in above) | **$0** |
| **ANNUALIZED COSTS (AC):** | **DOC + IOC + CRC** | **$6,256** |

Footnotes:

[a] Unless otherwise specified, factors and cost estimates reflect OAQPS Cost Manual, Section 6, Chapter 3, Sixth edition.

[b] Operator labor based on incremental time required to connect / disconnect dry disconnect adapters on trucks

**TABLE 3**
**SITE-SPECIFIC COST DATA**

| Cost Item | Cost Factor and Units | Comments |
|---|---|---|
| Sales Tax | 6.00% Percent | http://www.baltimorecountymd.gov/Agencies/economicdev/gateway/countygov/taxes.html |
| Labor | | |
| Operator | $21.03 Dollars per hour | J. Scheeter TRANSFLO, $70 k / yr loaded, 60% OH rate per EPA Cost Manual |
| Maintenance | $21.03 Dollars per hour | J. Scheeter TRANSFLO, $70 k / yr loaded, 60% OH rate per EPA Cost Manual |
| Utilities | | |
| Electricity | $0.148 Dollars per kWh | Not Used |
| **Capital Recovery Factors (CRF):** | | |
| Hoses (4 year life, 7% interest) | 0.2952 Annual $ per Capital $ | |

Note - Operator and Maintenance labor use the same rates as workers are cross trained.

**Appendix C** – October 8, 2013 Hexane Transfer and Emissions Worksheet

**Table 1: Current Volumes / Railcars / Trucks**
**Baltimore, Maryland**

**Hexane Transfer**
**October 2013**
**Actual and Potential Transfer and Emission Rates**

This worksheet provides annual throughput rates for supporting information to the MDE Rule Amendment Fact Sheet

| Parameter | Value | Units | Notes / Source |
|---|---|---|---|
| Annual Hexane Transfer (Actual) | 1,474,529 | Gallons / year | CY 2012 |
| Annual Hexane Transfer (Actual) | 1,326,332 | Gallons / year | 4/1/2012 through 3/31/2013 |
| Annual Hexane Transfer (Actual) | 1,330,681 | Gallons / year | 9/1/2012 through 8/31/2013 |
| Average recent annual volume | 1,377,181 | Gallons / year | Average of above values |
| Maximum volume, rounded up | 1,500,000 | Gallons / year | CY 2012 |
| | | | |
| Truck volume | 7,000 | gallons / truck | Greg Rhoads |
| Trucks per year | 215 | Trucks / year | (gal/yr) / (gal/truck) |
| Railcar volume | 28,500 | gallons / railcar | typical |
| Railcars per year | 53 | railcars/year | (gal/yr) / (gal/railcar) |
| | | | |
| **Actual Emissions (Based on rounded up recent maximum value)** | | | |
| VOC Emission Factor (uncontrolled) | 5.848314 | lb / kgal | AP-42 Section 5.2, Eqn. 1 |
| Annual uncontrolled VOC emissions | 8,772 | lb / year | AP-42 Section 5.2, Eqn. 1 |
| Control efficiency (vapor balance) | 98.7% | percent | AP-42 Section 5.2, NSPS level for truck inspection |
| Controlled VOC emissions | 114 | lb / year | Uncontrolled * ( 1 - control efficiency) |
| | | | |
| **Potential Emissions** | | | |
| Annual Hexane Transfer (Potential) | 4,200,000 | Gallons / year | Based on 600 trucks / year, 7,000 gallons per truck |
| Annual uncontrolled VOC emissions | 24,563 | lb / year | AP-42 Section 5.2, Eqn. 1 |
| Control efficiency (vapor balance) | 98.7% | percent | AP-42 Section 5.2, NSPS level for truck inspection |
| Controlled VOC emissions | 319 | lb / year | Uncontrolled * ( 1 - control efficiency) |