COMPLIANCE DEMONSTRATION FOR THE SOLVENT EXTRACTION FOR VEGETABLE OIL PRODUCTION NESHAP

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Compliance Demonstration for the Solvent Extraction for Vegetable Oil Production NESHAP

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1.0 INTRODUCTION

The purpose of this document is to provide an example of how a vegetable oil production process could demonstrate compliance with the solvent extraction for vegetable oil production NESHAP (40 CFR 63, Subpart GGGG). To comply with these NESHAP, staff at affected vegetable oil production processes need to monitor and record three types of information, as listed below:

1. The HAP loss (gallons) from the vegetable oil production process. An example HAP loss inventory log is shown as Table 1 and is described further in Section 2.0.

2. The quantity (tons) of each oilseed type processed at the vegetable oil production process. Example oilseed processed inventory logs are shown as Tables 2A and 2B and are described in Section 3.0.

3. The determination and status of compliance. An example compliance determination and status log is shown as Table 3 and is described in Section 4.0.

Note: The example logs in this document are provided only as guidance for staff at vegetable oil production processes. These example logs show how required compliance information can be recorded. This guidance document does not contain instructions for how staff at an affected process must record compliance information. Staff at each vegetable oil production process may develop its own recordkeeping logs, as long as all required information is properly recorded.

2.0 HAP LOSS INVENTORY LOG

Table 1 is an example log that shows how staff at a vegetable oil production process may wish to organize and record monitoring information on HAP loss from the process. At a minimum, a HAP Loss Inventory Log should include entries to record the following information:

1. The beginning and ending dates for each operating status period and the process operating status (columns 1 and 2 of Table 1).

2. Beginning and ending solvent inventory in gallons (columns 3 and 4 of Table 1).

3. Total quantity of extraction solvent received at the vegetable oil production process in gallons (column 5 of Table 1).

4. The average HAP content of solvent received at the vegetable oil production process represented as a volume fraction of the solvent (column 6 of Table 1).

5. If applicable, record and justify any adjustments made to the solvent inventory in gallons (column 7 of Table 1).

6. The monthly actual solvent loss in gallons (column 8 of Table 1).

7. The monthly weighted average HAP content of all solvent received represented as a volume fraction of the solvent (column 9 of Table 1).

8. The actual solvent loss for the previous 12 operating months in gallons (column 10 of Table 1).

9. The weighted average HAP content in solvent received for the previous 12 operating months represented as a fraction of the volume of solvent.

Each of these listed entries is discussed in more detail in Sections 2.1 through 2.8.

2.1 Beginning and Ending Dates for Each Operating Status Period and the Process Operating Status

Columns 1 and 2 of Table 1 request the process operating status, and beginning and ending dates for each change in operating status. In §63.2853(a)(2) of the solvent extraction for vegetable oil production NESHAP, five types of process operating status that a vegetable oil production process may experience are listed and described:

1. *normal operating period*,

2. *nonoperating period*,

3. *initial startup period*,

4. *malfunction period*, and

5. *exempt period*.

The dates that define each operating status period include the beginning date of each calendar month and the date of any change in the source operating status. If the vegetable oil production process maintains the same operating status during an entire calendar month, the beginning and ending dates of the calendar month define the operating period. However, a vegetable oil production process may cycle through more than one type of operating status during any given calendar month, as shown in the following example log entries for Table 1:

- An example vegetable oil production process maintains a normal operating status throughout January 2001. Therefore, the example process enters only the first and last days of the month (January 1 through January 31). The entire first calendar month qualifies as an operating month because the example process operated continuously through the month under a *normal operating period*. All solvent information related to

this operating month must be entered into the log no later than the end of the calendar month following this operating month (i.e., by February 28, 2001).

- In February 2001, the example process maintains a normal operating status for most of the month, but has a planned maintenance shutdown in the last few days of the month. The example process must enter the beginning and ending dates of the normal operating period (February 1 through February 25) and designate this interval as a *normal operating period*. Next, the example process enters the beginning and ending dates of the shutdown period (February 26 through February 28) and designates this interval as a *nonoperating period*. Since the example vegetable oil production process operated at least once under a *normal operating period*, the interval from February 1 through February 25 qualifies as an operating month. All solvent information related to this operating month must be entered into this log no later than the end of the calendar month following this operating month (i.e. by March 31, 2001).

- The example vegetable oil production process remains shutdown throughout the entire next calendar month. Thus, the example process enters the first and last days of the month (March 1 through March 31) and continues to designate this interval as a *nonoperating period*. Since the example process did not operate once under a normal operating period during the month of March, this interval is not categorized as an operating month and is excluded from any counts for determining the 12 previous operating months.

- The example vegetable oil production process resumes *normal operations* for all of April 2001 and continues *normal operations* into May (May 1 through May 9). However, the example process experiences an emergency shutdown due to an unforeseen process malfunction in the middle of May (May 10 through May 15, which is designated a *malfunction period*). Since the example process operated at least once under a normal operating period in the month of May (May 1 through May 9 and May 16 through May 31 -- two normal operating periods), then May qualifies as another operating month. Thus, all solvent information related to this operating month must be entered into this log no later than the end of the calendar month following this operating month (i.e., by June 30, 2001).

2.2 Beginning and Ending Solvent Inventory

Columns 3 and 4 of Table 1 request the beginning and ending solvent inventory for each *normal operating period*. Staff at the example vegetable oil production process must measure and record the solvent inventory by following the procedures described in its plan for demonstrating compliance. (Requirements for preparing a plan for demonstrating compliance can be found at §63.2851.) Examples of how the solvent inventory should be recorded under different circumstances are shown below:

- Refer to Table 1 and the example entries for June, July, and August of 2001. The ending solvent inventory for a given operating month is generally the beginning solvent inventory for the following operating month. An exception is when solvent is received during a nonoperating month that separates two operating months (refer to Table 1 entries for February, March, and April of 2001). In this case, the amount of solvent received during March 2001 (a nonoperating month) is added to the beginning solvent inventory of the next operating month.

- The prior mentioned relationship of ending and beginning solvent inventories also applies to solvent loss associated with a *nonoperating period* such as a planned maintenance shutdown of the vegetable oil production process. Refer to Table 1 and the example entries for February 2001 (ending inventory of 2,000 gallons) and April 2001 (beginning inventory of 4,000 gallons). Any solvent lost during this planned shutdown should be included in the solvent inventory for the next operating period and subject to the HAP emission limits of these NESHAP.

- Solvent loss that occurs when a vegetable oil production process operates under a *malfunction period* or an *initial startup period* is excluded from the solvent loss inventory. Refer to Table 1 and the example entry for May 2001. Two *normal operating periods* (May 1 through May 9, and May 16 through May 31) are interrupted by a brief *malfunction period* (May 10 through May 15). The ending solvent inventory for the first *normal operating period* (3,500 gallons) is 500 gallons more than the beginning solvent inventory (3,000 gallons) for the following *normal operating period*. In this example entry, 500 gallons of solvent was lost during the *malfunction period* and excluded from the rolling solvent inventory. During *malfunction* or *initial startup periods*, solvent losses are excluded from the solvent inventory and are not subject to the HAP emission limits. Instead, the solvent losses are subject to control requirements described in the process's startup, shutdown, and malfunction plan. (Requirements for preparing a startup, shutdown, and malfunction plan can be found at §63.2852.)

2.3 Total Quantity and Average HAP Content of Extraction Solvent Received

Columns 5 and 6 of Table 1 request information on the quantity and HAP content of solvent received at the vegetable oil production process. Whenever a shipment of solvent is received at a vegetable oil production process, the volume of solvent received and the average HAP content (expressed as a volume fraction) of the solvent are entered on the HAP Loss Inventory Log. Staff at the vegetable oil production process must determine the HAP content of each solvent receipt by following the procedures described in its plan for demonstrating compliance. Listed below are several examples of how staff should record the quantity and HAP content of solvent received at a vegetable oil production process.

- In March 2001, the example process received a single shipment of solvent (2,000 gallons) with a corresponding HAP volume fraction of 0.70. However, the operational status of the example process was a *nonoperating period* when the solvent delivery was

accepted. Thus, all information on this solvent delivery is recorded in the next log entry for a *normal operating period*. When the solvent inventory for the beginning of April 2001 is determined, the inventory will reflect the 2,000 gallons of solvent added during the *nonoperating period*.

- In May 2001, the example process received two separate solvent shipments (1,000 gallons each). The first solvent delivery was determined to have a HAP volume fraction of 0.75; while the second solvent delivery was determined to have a HAP volume fraction of 0.65. Therefore, the monthly weighted average HAP content of solvent received was determined and recorded as a volume fraction of 0.70.

2.4 Solvent Inventory Adjustments

Column 7 of Table 1 allows staff at a vegetable oil production process to document periodic adjustments to improve the recorded accuracy of the solvent inventory. Section 63.2853(a)(5) of the solvent extraction for vegetable oil production NESHAP allows solvent inventory adjustments to be made as long as an adequate justification for the adjustment is provided. Adjustments to the solvent inventory are expected to be infrequent. Examples of situations that may require adjustments to the total solvent loss include, when solvent is destroyed in a control device and when there are changes in the solvent working capacity of the processing equipment.

2.5 Monthly Actual Solvent Loss

Based on information already recorded in this type of log, staff at a vegetable oil production process must determine its actual solvent loss for each operating month and enter the value, such as under Column 8 of Table 1. The monthly actual solvent loss is the total solvent loss during all *normal operating periods* of an operating month. The monthly actual solvent loss may be determined using Equation 1 of §63.2853:

$$\text{Monthly Actual Solvent Loss} = \sum_{i=1}^{n} (SOLV_B - SOLV_E + SOLV_R \pm SOLV_A)_i \qquad \textit{Eq. 1 of §63.2853}$$

where:

$SOLV_B$ = Gallons of solvent in the inventory at the beginning of normal operating period "i" as determined at §63.2853 (a)(3).

$SOLV_E$ = Gallons of solvent in the inventory at the end of normal operating period "i" as determined at §63.2853 (a)(3).

$SOLV_R$ = Gallons of solvent received between the beginning and ending dates of the normal operating period "i" as determined at §63.2853 (a)(4).

$SOLV_A$ = Gallons of solvent added or removed from the solvent inventory during operating period "i" as determined at §63.2853 (a)(5).

i = An operating period.

n = Number of operating periods within a calendar month.

- Refer to Table 1 and the example entry for May 2001. The example vegetable oil production process experiences two normal operating periods within the same month. The solvent losses corresponding to the first normal operating period (4,500 - 3,500 + 1,000 + 0 = 2,000 gallons) and the second normal operating period (3,000 - 2,000 + 1,000 + 0 = 2,000 gallons) are combined and recorded as the net solvent loss (4,000 gallons) for the entire operating month of May.

2.6 Monthly Weighted Average HAP Content of Solvent

Column 9 of Table 1 offers staff at the affected vegetable oil production process to determine the weighted average HAP content of solvent received during a given month. The monthly weighted average volume fraction of HAP in the extraction solvent is based on all shipments of solvent received since the last operating month, regardless of the operating status at the time of the delivery. The monthly weighted average volume fraction of HAP may be determined using Equation 1 of §63.2854:

$$\text{Monthly Weighted Average HAP Content of Extraction Solvent (volume fraction)} = \frac{\sum_{i=1}^{n} \text{Received}_i * \text{Content}_i}{\text{Total Received}} \qquad \textit{Eq. 1 of §63.2854}$$

where:

$Received_i$ = Gallons of extraction solvent received in delivery "i".

$Content_i$ = The volume fraction of HAP in extraction solvent delivery "i".

Total Received = Total gallons of solvent extraction received since the end of the previous operating month. Note: this includes all solvent deliveries such as deliveries during *nonoperational* and *malfunction periods* that occur between the end of the previous *normal operating period* and the beginning of the next *normal operating period*.

i = The delivery of extraction solvent.

n = The number of extraction solvent deliveries during the operating period.

- For example, in May 2001 the example vegetable oil production process received two separate solvent shipments (1,000 gallons each). The first solvent delivery was determined to have a HAP volume fraction of 0.75; while the second solvent delivery was determined to have a HAP volume fraction of 0.65. Using Equation 1 of §63.2854, a monthly weighted average HAP volume fraction in the solvent for this example entry was determined as 0.70.

2.7 Actual Solvent Loss for the Previous 12 Operating Months

After recording solvent loss information for 12 operating months, Column 10 of Table 1 allows staff at a vegetable oil production process to determine and enter a value for the actual solvent loss from the process for the previous 12 operating months. This solvent loss value is determined by summing the actual solvent losses for the last twelve operating months.

Based on the example information recorded in Table 1, the first set of 12 operating months is actually encompassed by the first 13 calendar months listed in Table 1. This situation is the result of the example process being under a *nonoperating status period* for the entire month of March 2001. Thus, the count for the 12 previous operating months begins in January 2001, skips the entry for March 2001, and continues through to January 2002, where the proper count of operating month is attained. The sum of the monthly actual solvent loss for the first 12 operating months in this example log is 26,500 gallons.

2.8 Weighted Average HAP Content of Solvent for the Previous 12 Operating Months

After recording solvent loss and HAP content information for 12 operating months, Column 11 of Table 1 allows staff at a vegetable oil production process to determine and enter the weighted average HAP content expressed as volume fraction of solvent received at the process for the previous 12 operating months. This volume fraction value is determined using Equation 2 of §63.2854:

$$\text{12-Month Weighted Average HAP Content in Solvent Received (volume fraction)} = \frac{\sum_{i=1}^{12} \text{Received}_i * \text{Content}_i}{\text{Total Received}} \qquad \textit{Eq. 2 of §63.2854}$$

Where:

Received_i = Gallons of extraction solvent received in operating month "i" as determined at §63.2853(a)(4).

$Content_i$ = Monthly average volume fraction of HAP in extraction solvent received in operating month "i" as determined in accordance with §63.2854(b)(2).

Total Received = Total gallons of extraction solvent received during the previous 12 operating months.

i = The operating month.

Based on the example information recorded in Table 1 for the first 12 operating months, the 12-month weighted average volume fraction of HAP, (f), is 0.655.

3.0 OILSEED PROCESSED INVENTORY LOG

An Oilseed Processed Inventory Log must be completed for each oilseed type processed. For this example, vegetable oil production process, it is assumed that the total oilseed processing capacity is below 120,000 tons/year, and two types of regulated oilseed (flax and cottonseed) are processed. The example log Table 2A is completed for the flax inventory and Table 2B is completed for the cottonseed (small) inventory. Tables 2A and 2B show how staff at a vegetable oil production process may wish to organize and record monitoring information documenting the quantity of each oilseed type processed. According to §63.2855, an Oilseed Processed Inventory Log should include entries to record the following information for each operating month:

1. Process operating status and the beginning and ending dates for each change in process operating status,

2. Beginning and ending oilseed inventory,

3. Quantity of each oilseed type received at the process,

4. Oilseed inventory adjustments,

5. Determination of the monthly quantity of each oilseed type processed, and

6. Determination of the quantity of each oilseed type processed for the previous 12 operating months.

Each of these listed entries is discussed in more detail in Sections 3.1 through 3.6.

3.1 Process Operating Status and Beginning and Ending Dates for Each Change in Process Operating Status

Columns 1 and 2 of Tables 2A and 2B request the process operating status, and beginning and ending dates for each change in operating status. The dates and process operating status entered

on the Oilseed Inventory Log must coincide exactly with the dates entered on the HAP Loss Inventory Log.

3.2 Beginning and Ending Oilseed Inventory

Columns 3 and 4 of Tables 2A and 2B request the beginning and ending oilseed inventory for each normal operating period. The example vegetable oil production process must measure the oilseed inventory by following the procedures described in its plan for demonstrating compliance. The oilseed inventory must be recorded at the beginning and ending dates of each *normal operating period* that occurs during an operating month, as shown in the following examples:

- Refer to Table 2A and the example entries for June, July, and August of 2001. The ending oilseed inventory for a given operating month is the beginning oilseed inventory for the following operating month.

- When a vegetable oil production process operates under a *malfunction period* or an *initial startup period*, the quantities of oilseed processed are excluded from the inventory. Refer to Table 2A and the example entry for May 2001. Two *normal operating periods* (May 1 through May 9, and May 16 through May 31) are interrupted by a brief *malfunction period* (May 10 through May 15). The ending oilseed inventory for the first *normal operating period* (5,500 tons of flax) is 500 tons more than the beginning oilseed inventory (5,000 tons of flax) for the following *normal operating period*. In this example entry, 500 tons of flax was processed during the *malfunction period* and excluded from the rolling oilseed inventory. Like the solvent losses, during *malfunction* or *initial startup periods*, quantities of oilseed processed are excluded from the oilseed inventory.

3.3 Quantity of Oilseed Received

Column 5 of Tables 2A and 2B request information on the quantity of oilseed received at the vegetable oil production process. Whenever a shipment of oilseed is received at a vegetable oil production process, the oilseed quantity is entered on the Oilseed Inventory Log. The staff at the process must determine the mass of each oilseed receipt by following the procedures described in its plan for demonstrating compliance. Two examples are described below for entering information on an Oilseed Inventory Log:

- Refer to Table 2A and the entry for March 2001. The example vegetable oil production process received a single shipment of flax (2,000 tons). However, the operational status of the example process was a *nonoperating period* when the flax delivery was accepted. Thus, information on this flax delivery is recorded in the next log entry for a *normal operating period*. When the flax inventory for the beginning of April 2001 is determined, the inventory will reflect the 2,000 tons of flax added during the *nonoperating period*.

- Refer to Table 2A and the entry for May 2001. The example vegetable oil production process received two separate flax shipments (2,000 tons each), for a total of 4,000 tons of flax received at the process during May 2001.

3.4 Oilseed Inventory Adjustments

Column 6 of Tables 2A and 2B allow staff at an affected process to document periodic adjustments to improve the recorded accuracy of the oilseed inventory. In §63.2855(a)(5) of the solvent extraction for vegetable oil production NESHAP, oilseed inventory adjustments can be made, as long as, an adequate justification for the adjustment is provided. Entries to adjust the oilseed inventory are expected to be infrequent. Examples of situations that may require adjustments to the mass of oilseed processed include:

- Oilseed that mold or otherwise become unsuitable for processing.
- Oilseed you sell before it enters the processing operation.
- Oilseed destroyed by an event such as a process malfunction, fire, or natural disaster.
- Oilseed processed through operations prior to solvent extraction such as screening, dehulling, cracking, drying, and conditioning; but that are not routed to the solvent extractor for further processing.
- Inventory corrections due to periodic physical measurements of inventory.

3.5 Monthly Determination of Quantity of Oilseed Processed

Column 7 of Tables 2A and 2B allow staff at a vegetable oil production process to document the quantity of each oilseed processed each operating month. The monthly quantity of oilseed processed is the total of each type of oilseed processed during all normal operating periods of an operating month. The monthly oilseed processed may be determined using Equation 1 of §63.2855:

$$\text{Monthly Quantity of Each Oilseed Processed (tons)} = \sum_{i=1}^{n} (SEED_B - SEED_E + SEED_R - SEED_A)_i \qquad \textit{Eq. 1 of §63.2855}$$

where:

$SEED_B$ = Tons of oilseed in the inventory at the beginning of normal operating period "i" as determined in paragraph §63.2855 (a)(3).

$SEED_E$ = Tons of oilseed in the inventory at the end of normal operating period "i" as determined in paragraph §63.2855 (a)(3).

$SEED_R$ = Tons of oilseed received between the beginning and ending dates of the normal operating period "i" as determined in §63.2855 (a)(4).

$SEED_A$ = Tons of oilseed added or removed from the solvent inventory during operating period "i" as determined in §63.2855 (a)(5).

i = An operating period.

n = Number of normal operating periods in the calendar month during which this type of oilseed was processed.

- Refer to Table 2A and the example entry for May 2001. The example process experiences two normal operating periods within the same month. The quantity of flax processed during the first normal operating period (4,000 - 5,500 + 2,000 + 0 = 500 tons) and the second normal operating period (5,000 - 7,000 + 2,000 + 0 = 0 tons) are combined and recorded in Column 7 as the net quantity of flax processed (500 tons) for the entire operating month of May.

3.6 Determining the Quantity of Oilseed Processed for the Previous 12 Operating Months

After recording the quantity of all oilseed types processed for 12 operating months, Column 8 of Tables 2A and 2B offers staff at the affected process to enter the quantity of each oilseed type processed for the previous 12 operating months. This quantity of oilseed processed is determined by summing the monthly quantities of oilseed processed at the vegetable oil production process for the last twelve operating months. Based on the example data provided in Tables 2A, the first, 12-month rolling sum (January 2001 through January 2002) of flax processed includes only 6 months of operating data. In the following month, the second 12-month rolling sum (February 2001 through February 2002) of flax processed now includes only 5 months of operating data.

Based on the example information recorded in Tables 2A and 2B, the first set of 12 operating months is actually encompassed by the first 13 calendar months listed in Table 1. This situation is the result of the example process being under a *nonoperating status period* for the entire month of March 2001. Thus, the count for the 12 previous operating months begins in January 2001, skips the entry for March 2001, and continues through to January 2002, where the proper count of 12 operating months is attained. The quantities of flax and cottonseed processed for the first 12 operating months in this example log are 26,500 and 24,000 tons, respectively.

4.0 COMPLIANCE DETERMINATION AND STATUS LOG

Table 3 is an example log that shows how an affected process may wish to organize and record the input variables for the compliance ratio calculation and the corresponding results. At a minimum, a Compliance Determination and Status Log should include entries to record the following information:

1. Beginning and ending dates defining each operating month,

2. Actual solvent loss for the previous 12 operating months (see Table 1),

3. Weighted average of HAP in solvent for the previous 12 operating months (see Table 1),

4. Quantity of each oilseed type processed for the previous 12 operating months (see Tables 2A and 2B),

5. Determination of the monthly compliance ratio, and

6. Determination of compliance status with the HAP emission limits of these NESHAP.

The 12-month rolling sum of actual solvent loss, weighted average HAP content, and quantity of each oilseed type processed can be determined using the example data recorded in Tables 1, 2A, and 2B. These calculated and recorded values are copied over to Table 3 to support documentation of the compliance ratio calculation.

The compliance ratio is simply the ratio of the "actual" HAP loss in gallons from an affected process to the "allowable" HAP loss in gallons as permitted by the NESHAP.

$$\text{Compliance Ratio} = \frac{\text{"Actual" HAP Loss}}{\text{"Allowable" HAP Loss}}$$

The prior mentioned compliance ratio equation can be re-arranged to accept solvent loss information instead of HAP loss information, as shown in Equation 2 from §63.2840(a)(2):

$$\text{Compliance Ratio} = \frac{f * \text{Actual Solvent Loss}}{0.64 * \sum_{j=1}^{m} [(\text{Oilseed})_j * (\text{SLF})_j]} \qquad \textit{Eq. 2 of §63.2840}$$

Where:

f = The weighted average volume fraction of HAP in solvent received during the previous 12 operating months, as determined in §63.2854, dimensionless. (Refer to Table 3, Column 3)

0.64 = The average volume fraction of HAP in solvent in the baseline performance data, dimensionless.

Actual Solvent Loss = Gallons of actual solvent loss during previous 12 operating months, as determined in §63.2853. (Refer to Table 3, Column 2)

Oilseed = Tons of each oilseed type "j" processed during the previous 12 operating months, as shown in §63.2855. (Refer to Table 3, Column(s) 4 and/or 5)

SLF = The corresponding solvent loss factor (gal/ton) for oilseed "j" listed in Table 1 of §63.2840 of the NESHAP. As a convenience, the list of solvent loss factors has been reprinted in this document as Table 4.

j = Each oilseed type processed.

m = Number of oilseed types processed during the previous 12 operating months.

- Based on the example information recorded in Tables 1, 2A, and 2B for the first 12 operating months, the result of the first compliance ratio calculation is 0.84. An example calculation of how this compliance ratio was determined is shown below:

$$\text{ompliance Ratio} = \frac{0.66 * 26{,}500 \text{ gal.}}{0.64 * [(26{,}500 \text{ tons} * 0.6 \text{ gal/ton}) + (24{,}000 \text{ tons} * 0.7 \text{ gal/ton}}$$

$$\text{Compliance Ratio} = \frac{17{,}490 \text{ gal. HAP}}{20{,}928 \text{ gal. HAP}} = 0.84$$

When the value of the compliance ratio, as determined above, is less than 1.00, then the affected vegetable oil production process is in compliance with the allowable HAP emissions under these NESHAP. The word, "Yes," can then be entered under Column 7 of Table 3. When the compliance ratio is greater than 1.00, then the affected process is not in compliance with the allowable HAP emissions under these NESHAP. The word, "No," should then be entered under Column 7 of Table 3.

- In Table 3, all of the example data show that all of the monthly compliance ratio values are below 1.00. Thus, the example vegetable oil production process is in compliance with the allowable HAP emissions under these NESHAP for the period of 12/01/01 to 02/28/02.

- Note: In a case where an affected process handles two or more oilseed types, it is not a requirement for compliance to determine or record a "weighted average" SLF value. The above compliance ratio equation requires only the substitution of the SLF (from Table 4 of this document) that corresponds to each oilseed type processed and the quantity (in tons) of each oilseed type processed over the previous 12 operating months. The above compliance ratio equation format has the advantage of simplifying the procedure for comparing the "actual" HAP loss to the "allowable" HAP loss from a vegetable oil production process. Thus, there is no need to determine a "weighted average" SLF value.

TABLE 1. HAP LOSS INVENTORY LOG

[1] Dates of Each Operating Status Period §63.2853 (a)(1)	[2] Operating Status §63.2853 (a)(2)	Solvent Inventory (gallons) §63.2853(a)(3)		[5] Total Extraction Solvent Received (gallons) §63.2853 (a)(4)	[6] Average HAP Content of Solvent Received (Volume fraction) §63.2854 (b)	[7] Solvent Inventory Adjustments [+/-] (gallons) §63.2853 (a)(5)	[8] Monthly Actual Solvent Loss (gallons) §63.2853 (b)	[9] Monthly Weighted Average HAP Content of Solvent (Volume fraction) §63.2854 (b)(2)	For the Previous 12 Operating Months	
		[3] Beginning	[4] Ending						[10] Actual Solvent Loss (gallons) §63.2853 (c)	[11] f (Volume fraction) §63.2854 (b)
1/1-31/01	Normal	4,000	3,000	1,000	0.70	0	2,000	0.70		
2/1-25/01	Normal	3,000	2,000	2,000	0.70	0	3,000	0.70		
2/26-28/01	Non-operating	---	---	0	---					
3/1-31/01	Non-operating	---	---	2,000 gal. were received but it is recorded in next operating month	0.70 recorded in next operating month	0	---	0.70 recorded in next operating month		
4/1-30/01	Normal	4,000	4,500	2,000	0.70	0	1,500	0.70		
5/1-9/01	Normal	4,500	3,500	1,000	0.75	0				
5/10-5/15	Malfunction	---	---	0	---	0	4,000	0.70		
5/16-31/01	Normal	3,000	2,000	1,000	0.65	0				
6/1-30/01	Normal	2,000	1,000	2,000	0.70	0	3,000	0.70		
7/1-31/01	Normal	1,000	2,000	3,000	0.70	0	2,000	0.70		
8/1-31/01	Normal	2,000	1,000	0	---	0	1,000	0.70		

TABLE 1. HAP LOSS INVENTORY LOG

[1] Dates of Each Operating Status Period §63.2853 (a)(1)	[2] Operating Status §63.2853 (a)(2)	Solvent Inventory (gallons) §63.2853(a)(3)		[5] Total Extraction Solvent Received (gallons) §63.2853 (a)(4)	[6] Average HAP Content of Solvent Received (Volume fraction) §63.2854 (b)	[7] Solvent Inventory Adjustments [+/-] (gallons) §63.2853 (a)(5)	[8] Monthly Actual Solvent Loss (gallons) §63.2853 (b)	[9] Monthly Weighted Average HAP Content of Solvent (Volume fraction) §63.2854 (b)(2)	For the Previous 12 Operating Months	
		[3] Beginning	[4] Ending						[10] Actual Solvent Loss (gallons) §63.2853 (c)	[11] f (Volume fraction) §63.2854 (b)
9/1-30/01	Normal	1,000	1,000	2,000	0.60	0	2,000	0.60		
10/1-31/01	Normal	1,000	1,000	2,000	0.60	0	2,000	0.60		
11/1-30/01	Normal	1,000	1,000	2,000	0.60	0	2,000	0.60		
12/1-31/01	Normal	1,000	1,000	2,000	0.60	0	2,000	0.60		
1/1-31/02	Normal	1,000	1,000	2,000	0.60	0	2,000	0.60	**26,500**	**0.655**
2/1-28/02	Normal	1,000	1,000	1,000	0.60	0	1,000	0.60	**25,500**	**0.650**
3/1-31/02	Normal	1,000	1,000	2,000	0.60	0	2,000	0.60	**24,500**	**0.641**

TABLE 2A. OILSEED PROCESSED INVENTORY LOG

OILSEED TYPE: ***FLAX***

[1] Dates of Each Operating Status Period §63.2855(a)(1)	**[2]** Operating Status §63.2855 (a)(2)	**[3]** Beginning Inventory (tons) §63.2855(a)(3)	**[4]** Ending Inventory (tons) §63.2855(a)(3)	**[5]** Oilseed Received (tons) §63.2855(a)(4)	**[6]** Oilseed Inventory Adjustments [+/-] (tons) §63.2855(a)(5)	**[7]** Quantity of Flax Processed (tons) §63.2855(b)	**[8]** "Oilseed" 12-Month Rolling Sum of Flax (tons) §63.2855(c)
1/1-31/01	Normal	6,500	5,000	4,500	0	6,000	
2/1-25/01 2/26-28/01	Normal Non-operating	5,000	4,000	5,000	0	6,000	
3/1-31/01	Non-operating	---	---	2,000 tons were received but it is recorded in next operating month	0	---	
4/1-30/01	Normal	6,000	4,000	2,000	0	4,000	
5/1-9/01 5/10-15/01 5/16-31/01	Normal Malfunction Normal	4,000 --- 5,000	5,500 --- 7,000	2,000 0 2,000	0 0 0	500	
6/1-30/01	Normal	7,000	4,000	3,000	0	6,000	

TABLE 2A. OILSEED PROCESSED INVENTORY LOG

OILSEED TYPE: ***FLAX***

[1] Dates of Each Operating Status Period §63.2855(a)(1)	**[2]** Operating Status §63.2855 (a)(2)	**[3]** Beginning Inventory (tons) §63.2855(a)(3)	**[4]** Ending Inventory (tons) §63.2855(a)(3)	**[5]** Oilseed Received (tons) §63.2855(a)(4)	**[6]** Oilseed Inventory Adjustments [+/-] (tons) §63.2855(a)(5)	**[7]** Quantity of Flax Processed (tons) §63.2855(b)	**[8]** "Oilseed" 12-Month Rolling Sum of Flax (tons) §63.2855(c)
7/1-31/01	Normal	4,000	10,000	10,000	0	4,000	
8/1-31/01	Normal*	10,000	10,000	0	0	0	
9/1-30/01	Normal*	10,000	10,000	0	0	0	
10/1-31/01	Normal*	10,000	10,000	0	0	0	
11/1-30/01	Normal*	10,000	10,000	0	0	0	
12/1-31/01	Normal*	10,000	10,000	0	0	0	
1/1-31/02	Normal*	10,000	10,000	0	0	0	**26,500**
2/1-28/02	Normal*	10,000	10,000	0	0	0	**20,500**
3/1-31/02	Normal*	10,000	10,000	0	0	0	**14,500**

* Although the quantity of flax processed is zero for this calendar month, the operating status of the example vegetable oil production process is "normal" because another type of oilseed (cottonseed, refer to Table 2B) is being processed.

TABLE 2B. OILSEED PROCESSED INVENTORY LOG

OILSEED TYPE: ***COTTONSEED - SMALL (<120,000 tons of total oilseed/year processed)***

[1] Dates of Each Operating Status Period §63.2855(a)(1)	**[2]** Operating Status §63.2855 (a)(2)	**[3]** Beginning Inventory (tons) §63.2855(a)(3)	**[4]** Ending Inventory (tons) §63.2855(a)(3)	**[5]** Oilseed Received (tons) §63.2855(a)(4)	**[6]** Oilseed Inventory Adjustments [+/-] (tons) §63.2855(a)(5)	**[7]** Quantity of Cottonseed Processed (tons) §63.2855(b)	**[8]** "Oilseed" 12-Month Rolling Sum of Cottonseed (tons) §63.2855(c)
1/1-31/01	Normal*	0	0	0	0	0	
2/1-25/01 2/26-28/01	Normal* Non-operating	0	0	0	0	0	
3/1-31/01	Non-operating	---	---	2,000 tons were received but it is recorded in next operating month	0	---	
4/1-30/01	Normal*	0	0	0	0	0	
5/1-9/01 5/10-15/01 5/16-31/01	Normal* Malfunction Normal*	0 --- 0	0 --- 0	0 0 0	0 0 0	0	
6/1-30/01	Normal*	0	0	0	0	0	
7/1-31/01	Normal*	0	0	0	0	0	

TABLE 2B. OILSEED PROCESSED INVENTORY LOG

OILSEED TYPE: ***COTTONSEED - SMALL (<120,000 tons of total oilseed/year processed)***

[1] Dates of Each Operating Status Period §63.2855(a)(1)	**[2]** Operating Status §63.2855 (a)(2)	**[3]** Beginning Inventory (tons) §63.2855(a)(3)	**[4]** Ending Inventory (tons) §63.2855(a)(3)	**[5]** Oilseed Received (tons) §63.2855(a)(4)	**[6]** Oilseed Inventory Adjustments [+/-] (tons) §63.2855(a)(5)	**[7]** Quantity of Cottonseed Processed (tons) §63.2855(b)	**[8]** "Oilseed" 12-Month Rolling Sum of Cottonseed (tons) §63.2855(c)
8/1-31/01	Normal	10,000	8,000	2,000	0	4,000	
9/1-30/01	Normal	8,000	5,000	3,000	0	6,000	
10/1-31/01	Normal	5,000	4,000	1,000	0	2,000	
11/1-30/01	Normal	4,000	6,000	8,000	0	6,000	
12/1-31/01	Normal	6,000	4,000	2,000	0	4,000	
1/1-31/02	Normal	4,000	4,000	2,000	0	2,000	**24,000**
2/1-28/02	Normal	4,000	6,000	4,000	0	2,000	**26,000**
3/1-31/02	Normal	6,000	5,000	1,000	0	2,000	**28,000**

* Although the quantity of cottonseed processed is zero for this calendar month, the operating status of the example vegetable oil production process is "normal" because another type of oilseed (flax, refer to Table 2A) is being processed.

TABLE 3. COMPLIANCE DETERMINATION AND STATUS LOG

[1] *See Table 1* Dates Defining Each Operating Month §63.2853 (a)(1)	**[2]** *See Table 1* Actual Solvent Loss for Previous 12 Operating Months (gallons) §63.2853 (c)	**[3]** *See Table 1* f, Weighted Average HAP Content in Solvent Received for Previous 12 Operating Months (weight %) §63.2854(b)	The SLF for Flax is **0.6 gal/ton** *See Table 1 of §63.2840* **[4]** *See Table 2A* Quantity of Flax Processed for Previous 12 Operating Months (tons) §63.2855(c)	The SLF for Cottonseed is **0.7 gal/ton** *See Table 1 of §63.2840* **[5]** *See Table 2B* Quantity of Cottonseed Processed for Previous 12 Operating Months (tons) §63.2855(c)	**[6]** Compliance Ratio §63.2840(b)	**[7]** Is Your Source in Compliance? (i.e., is the compliance ratio ≤ 1.00?) §63.2840(c)
1/1-31/01						
2/1-25/01						
4/1-30/01						
5/1-9/01 and 5/16-31/01						
6/1-30/01						
7/1-31/01						
8/1-31/01						
9/1-30/01						
10/1-31/01						
11/1-30/01						
12/1-31/01	26,500	0.66	26,500	24,000	0.84	Yes
1/1-31/02	25,500	0.65	20,500	26,000	0.86	Yes
2/1-28/02	24,500	0.64	14,500	28,000	0.89	Yes

TABLE 4. OILSEED SOLVENT LOSS FACTORS FOR DETERMINING ALLOWABLE HAP LOSS

Type of Oilseed Processed	A Source that...	Oilseed Solvent Loss Factor (gal/ton)	
		Existing Sources	New Sources
1. Corn Germ, Wet Milling	processes corn germ that has been separated from other corn components using a "wet" process of centrifuging a slurry steeped in a dilute sulfurous acid solution	0.4	0.3
2. Corn Germ, Dry Milling	processes corn germ that has been separated from the other corn components using a "dry" process of mechanical chafing and air sifting.	0.7	0.7
3. Cottonseed, Large	processes 120,000 tons or more of a combination of cottonseed and other listed oilseeds during all normal operating periods in a 12 operating month period.	0.5	0.4
4. Cottonseed, Small	processes less than 120,000 tons of a combination of cottonseed and other listed oilseeds during all normal operating periods in a 12 operating month period.	0.7	0.4
5. Flax	processes flax	0.6	0.6
6. Peanuts	processes peanuts	1.2	0.7
7. Rapeseed	processes rapeseed	0.7	0.3
8. Safflower	processes safflower	0.7	0.7
9. Soybean, Conventional	uses a conventional style desolventizer to produce crude soybean oil products and soybean animal feed products.	0.2	0.2
10. Soybean, Specialty	uses a special style desolventizer to produce soybean meal products for human and animal consumption.	1.7	1.5
11. Soybean, Combination Plant with Low Specialty Production	processes soybeans in both specialty and conventional desolventizers and the quantity of soybeans processed in specialty desolventizers during normal operating periods is less than 3.3 percent of total soybeans processed during all normal operating periods in a 12 operating month period. The corresponding solvent loss factor is an overall value and applies to the total quantity of soybeans processed.	0.25	0.25
12. Sunflower	processes sunflower	0.4	0.3

TECHNICAL REPORT DATA

(Please read Instructions on reverse before completing)

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15. SUPPLEMENTARY NOTES

16. ABSTRACT

This documents provides an example scenario for how a facility can demonstrate compliance with the Solvent Extraction for Vegetable Oil Production NESHAO

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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