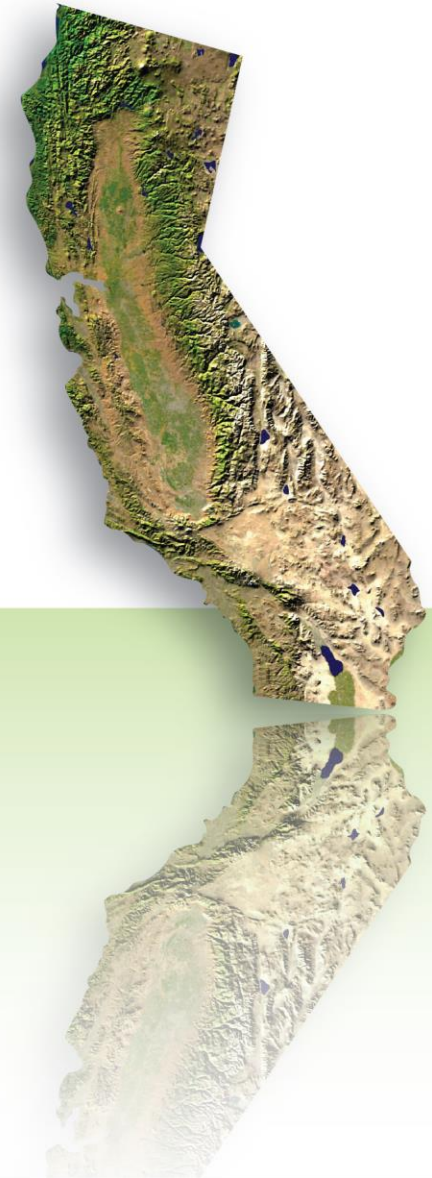
Greenhouse Gas Verifier Accreditation Training

Course 2.2 Transaction Specialty – Suppliers of Transportation Fuels



California Environmental Protection Agency

Air Resources Board

MRR Verifier Accreditation: Course Content and Exams

Course 2: Transactions Specialty

2.1 Electric Power Entities

2.2 Suppliers of Transportation Fuels

2.3 Suppliers of Natural Gas, Natural Gas Liquids, Liquefied Petroleum Gas, CNG and LNG

2.4 Suppliers of Carbon Dioxide (CO2)

Course 2.2 Handouts

- Handout 2.2.1 – Fuel Reporting Overview Diagram
- Handout 2.2.2 – Fuel Supplier Emission Factors
- Handout 2.2.3 – Fuel Supplier Emissions Data Report
- Handout 2.2.4 – Reviewing Bills of Landing to Verify Fuel Supplied at the Rack
- In workbooks folder: Handout 2.2.3b – Fuel Supplier Cal e-GGRT input

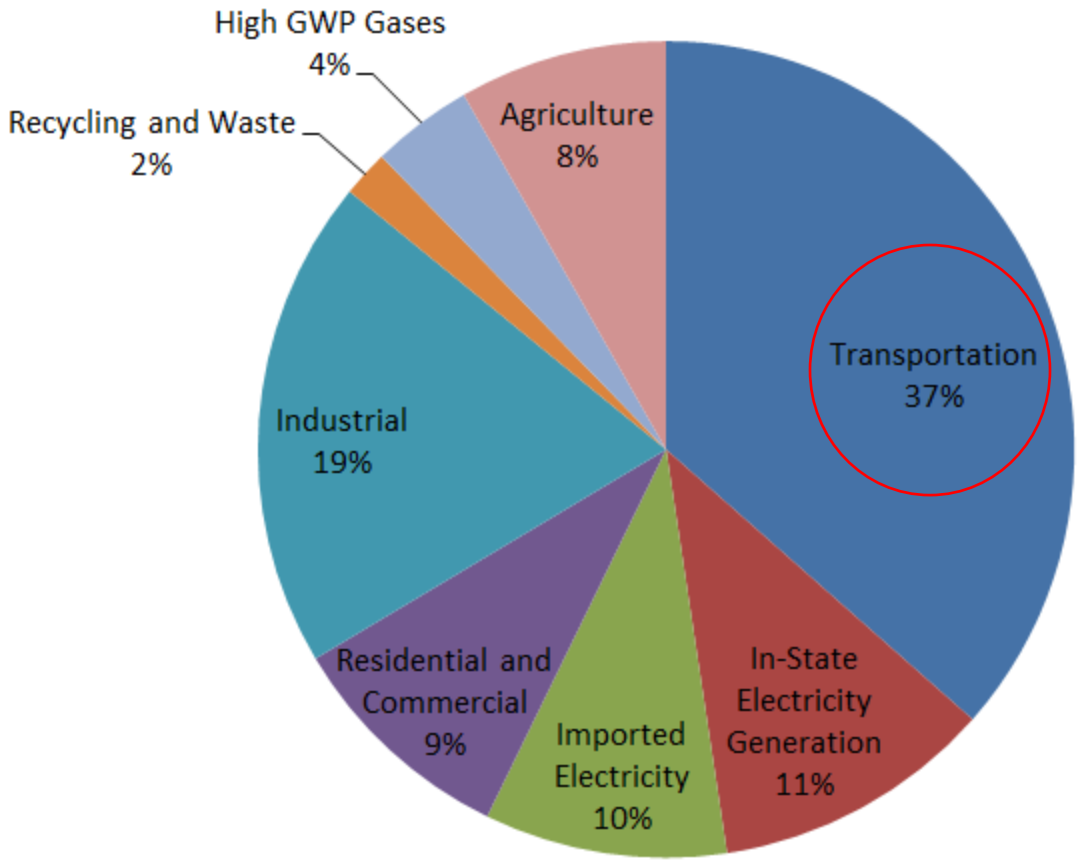
Course 2.2 Suppliers of Transportation Fuels

1. Overview
   - Key Sections of the MRR
   - Applicability
   - Information Reported
   - Types of Fuels
2. Monitoring and Emissions Calculations
3. Verification

Transportation is a Significant Contributor to California's GHG Emissions

2012 California Emissions Inventory

618 Million MT CO_2e Imported Electricity



Key Sections of MRR Pertaining to Suppliers of Transportation Fuels

- Reporting requirements § 95121
- Applicability § 95101(c)
- Cessation of reporting § 95101(h)(4)
- Cessation of verification § 95101(i)
- Definitions § 95102
- Inventory documentation § 95105(d)

Applicability under § 95121

- A transportation fuel supplier is
  1. A position holder at terminal
  2. An enterer of fuel outside the terminal system
  3. A refiner of fuel in California
  4. A biofuel production facility delivering outside the terminal system
- Reporting threshold - produce, import and/or deliver an annual quantity of transportation fuel that, when completely oxidized, would result in the release of greater than or equal to 10,000 MT
- Verification threshold: 25,000 MT CO_2e for all suppliers[1]
- Transportation fuel supplier must submit separate report from petroleum refinery reporting under § 95113
- About 39 total transportation fuel suppliers are verified

[1]See cessation details in Course 1.1

Definitions (§ 95102(a))

- Position Holder
  - *An entity that holds an inventory position in transportation fuel at a CA fuel terminal*
- Refiner
  - *An entity that delivers transportation fuel to end-users in CA that were produced at an entity or entity-subsidiary owned refinery*
- Enterer
  - *An entity that imports transportation fuel and is the importer of record under federal customs law or the owner of the fuel upon entry into CA*
- *Biofuel Production Facility*
  - *Production facility that produces one or more of the following biomass-derived transportation fuels: ethanol, biodiesel, renewable diesel, rendered animal fat, or vegetable oil*

How § 95121 Fits with Cap-and-Trade

- Transportation fuels capture emissions from downstream combustion—mostly mobile emissions
- Transportation fuel covered by Cap-and-Trade starting January 1, 2015
- Included under the "cap" of Cap-and-Trade beginning in 2015, second compliance period
- Point of regulation minimizes double counting, only captures California-destined fuels, and aligns with Board of Equalization (tax records), to the extent feasible

How § 95121 Fits with Other Federal and State Regulations

- Renewable Fuel Standard (RFS) is a federal standard that encourages the inclusion of biofuels in transportation fuels. Good RFS tracking reduces risk of misreporting biofuels to MRR program

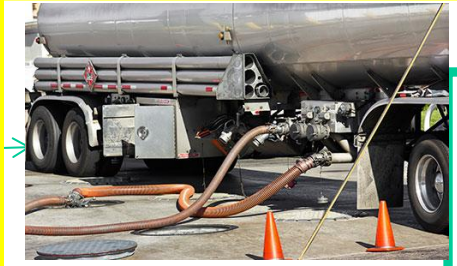
- CARB Low Carbon Fuel Standard seeks to lower the carbon intensity of transportation fuel over time. However, fuel suppliers may use common data management system for reporting to both programs

Oil and Gas Process Diagram

Oil and Gas extraction and processing. (Report Subpart W)

Crude oil

Refinery (Subpart Y, C, and sometimes P)



Transportation fuels supplied via on-site rack. (Subpart MM, reported by refinery operator)

Natural gas (NG) and natural gas liquids (NGLs)

Imported fuels ("enterer"). (Subpart MM if outside terminal system)

Transportation fuels supplied via terminal rack (Subpart MM, reported by position holder at terminal)

NG and NGLs

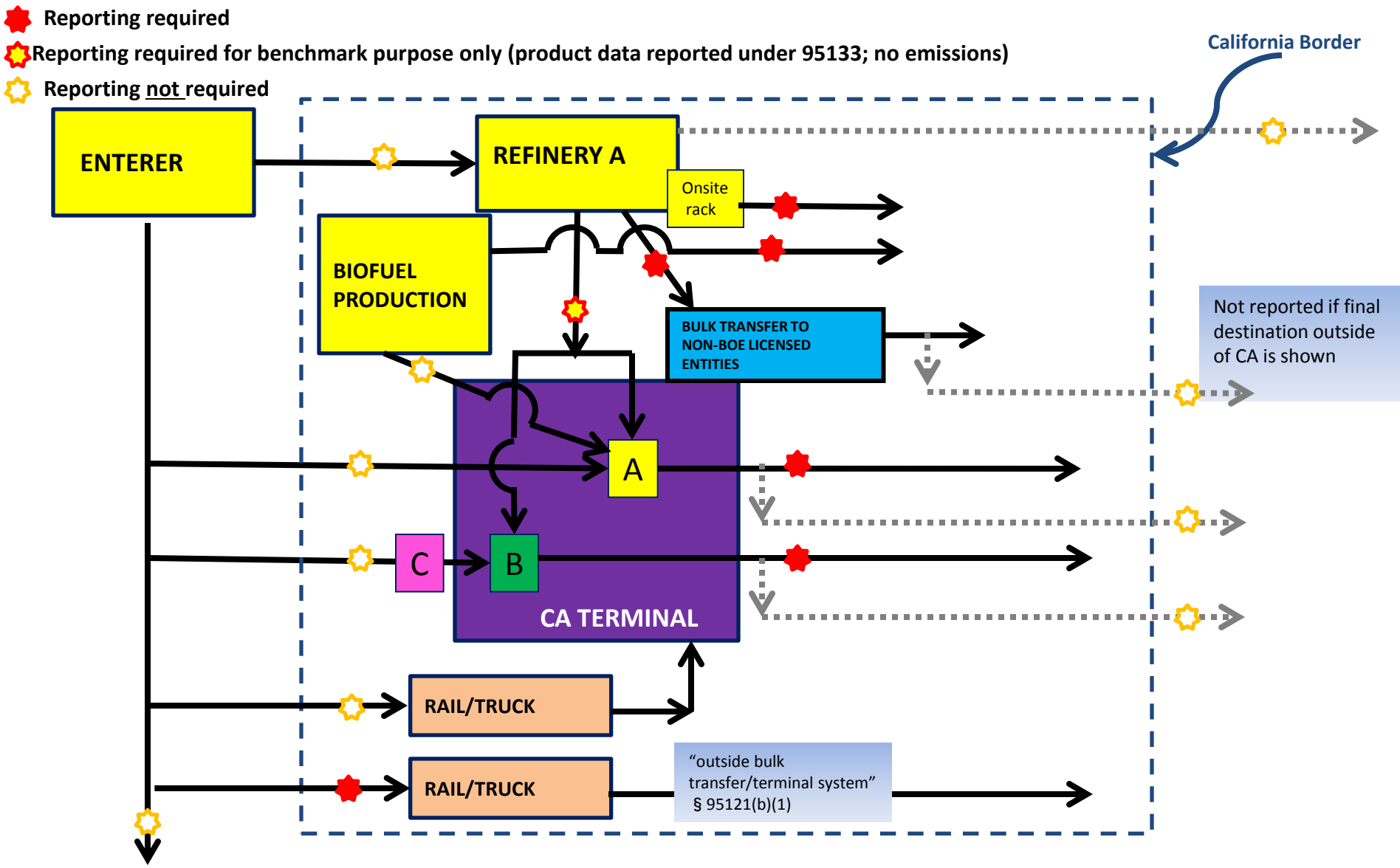
NGL Fractionator (Subpart W and C as direct emissions. Subpart NN for NGLs supplied. Subpart W for product data for NGLs produced.)

Pipeline NG

Pipeline natural gas

Natural gas distribution company/utility (Subpart NN)

Transportation Fuel Reporting Overview



Guidance to Review

- **Guidance for Fuel Supplier Greenhouse Gas Reporting**
  - http://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/fuel_supplier.pdf
  - Will be updated for 2015

Fuels Included in "Transportation Fuels"

- Gasoline blend stocks
- Diesel fuels (defined in MRR; both on- and off-road)
  - Diesel is distillate fuel #1 and #2, each defined in MRR
- Ethanol fuels
- Biodiesel/renewable diesel fuels
- LPG from refiners (even if not used in transportation)
- **Excluded – fuels used in marine vessels and aviation; fuels exported from California**
- See Handout # 2.2.2 for a listing of applicable fuels and emission factors

Information Reported by Transportation Fuel Suppliers (1 of 2)

- CO_2, CH_4, N_2O, and CO_2e emissions that would result from the complete combustion, oxidation, or use of transportation fuels and LPG
  - CO_2 from biomass derived fuels is excluded from covered emissions
- Fuels and products distributed from refineries to entities that are not registered by the California Board of Equalization (BOE) as a "Supplier"
  - http://www.boe.ca.gov/sptaxprog/spftrpts.htm
- Terminal and refinery racks fuels delivered from rack for distribution
- Fuels distributed by importers to California consumers and entities

Information Reported by Transportation Fuel Suppliers (2 of 2)

- Emissions must be reported for the individual blendstocks, diesel fuels and biomass-derived fuels listed in 40 CFR Part 98 Tables MM-1 and MM-2
- Fuel suppliers report cost of implementation fee data, subject to conformance review
- Excluded fuels:
  - Fuels and products for which a final destination outside California can be demonstrated
  - Fuels where an exclusive use in marine or aviation applications can be demonstrated
  - Guidance includes new information on excluded fuels

Data Reporters

- **Position Holders -** Must report all transportation fuels that are <u>delivered across the rack at California terminals</u>
  - Fuels that change ownership upstream of a terminal rack (e.g. pre-terminal or inter-terminal transactions) are reported by the position holder that has ownership of the fuel as it is delivered across the rack
- **Enterers** - *Only* required to report fuels imported <u>outside of the bulk transfer/terminal system</u>
  - All imported fuel delivered to a California fuel terminal is reported by the position holder, not the enterer (unless they are the same entity)
- **Refiners of fuel** - Only required to report fuels supplied via on-site *rack*, that are not destined for BOE-registered terminal
  - Fuel supplier must be separate entity from refinery

Types of Fuel - Gasoline Blendstocks

- Gasoline Blendstocks
  - RBOB is equivalent to CARBOB (generally combined with 10% ethanol to make “motor gasoline”)
  - CBOB is generally not legal for use as a vehicle fuel in California, so any CBOB emissions should be carefully examined by verifier
  - Ethanol (biomass-derived fuel) is typically mixed with RBOB at the fuel terminal to produce E10 motor gasoline (10% ethanol, 90% RBOB). All blendstocks must be reported separately
    - Example: 100 barrels (bbls) of E10 would be reported as 90 bbl RBOB, 10 bbl ethanol
- **Verifier red flags**
  - CBOB reported
  - Gasoline to ethanol ratio is significantly different from 90:10

Types of Fuel - Diesel and LPG

- **Diesel Fuel**
  - Only fuel that meets the definition of diesel (distillate) # 1 or # 2 is reported
  - Includes both undyed (on-road) and dyed (off-road)
  - CARB diesel may contain up 5% biodiesel. Only reportable if supplier has information to substantiate quantity
- **LPG (Liquid Petroleum Gas)**
  - Components of LPG must be reported separately
    - Ethane, Ethylene, Propane, Propylene, Butane, Butylene, Isobutene, Isobutylene, Pentanes Plus
    - Different emission factors for each
- **Verifier Red Flag**
  - More diesel #1 than #2 is reported

Types of Fuel - Biodiesel

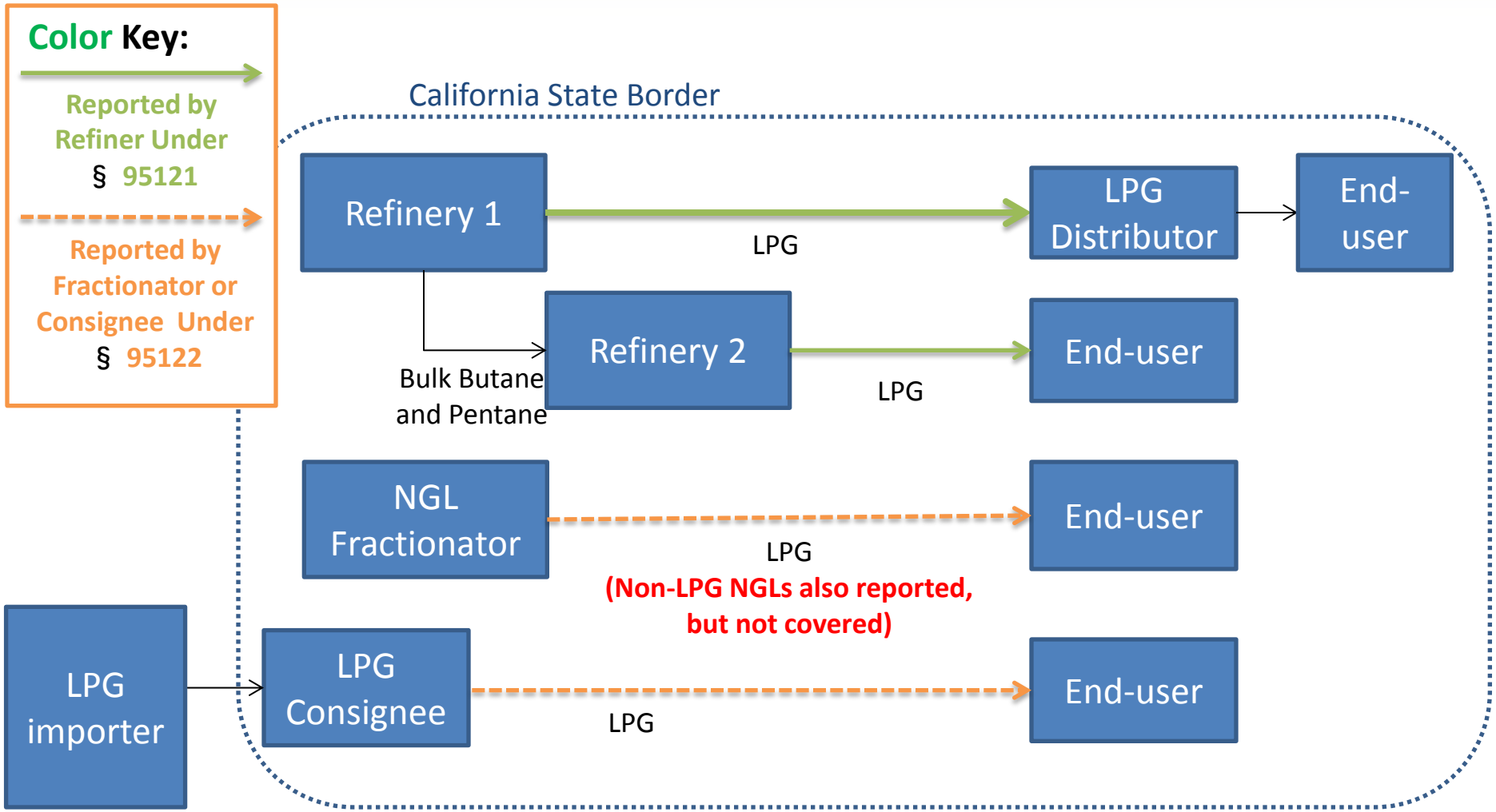
Biodiesel/renewable diesel (biomass-derived fuel)

- Bio- or renewable diesel (biodiesel) is produced for distribution as pure biodiesel (B100) or biodiesel blends such as B20 (20% biodiesel, 80% fossil derived diesel)
- Renewable diesel often blended upstream and transacted as "regular" CARB diesel (discussed in guidance doc)
- All biodiesel, whether blended or unblended, must be reported by the position holder or producer delivering the fuel across the rack
- Volumes of biodiesel should be carefully documented and considered in your sampling plan
- "Pure" biodiesel may have <1% diesel blending. Per MRR, this can be considered 100% biodiesel

Liquefied Petroleum Gas

- Refiners must report LPG produced and delivered in California as described in § 95121
- Refiners should only report LPG and LPG components that are produced and sold or delivered in <u>mixtures that could be used as a fuel by an end-user</u>
  - Bulk Butanes/Pentanes etc. sold to other refineries for use as feedstock do not fit the definition of LPG and are not reported as fuel for purposes of emissions calculations
  - All LPG and bulk butanes and pentanes are reported as product data under § 95113 but are not covered

Reporting Emissions from LPG



ARB Comments and Questions

Bulk Transfer to Other Fuel Suppliers

- Refiners commonly trade (buy/sell) bulk transportation fuel products with other fuel suppliers
- Refiners should not report fuel delivered in bulk via pipeline (or, rarely, trucked) to other fuel suppliers
  - Verifier must confirm that the purchaser is a licensed fuel supplier with the California Board of Equalization (BOE)
  - If this cannot be confirmed, the refiner must report the fuel delivered in bulk to the unlicensed entity
- If a fuel sold across a rack is re-blended and re-sold across a subsequent rack, only the position holder upstream of first rack is responsible for reporting. (Discussed in guidance doc)
- Contact ARB staff for assistance determining BOE status if it is unclear

Fuel Supplier Data vs. Petroleum Refinery Product Data

- Fuel volumes reported under § 95121 are used to calculate emissions from combustion of fuel by California end-users
- Refinery product volumes (including transportation fuels) are reported under § 95113 and may be used for Cap-and-Trade allowance allocation
- **Product data is not equivalent to fuel volume data reported under § 95121**

Data Monitoring and Meter Accuracy

- Request GHG Monitoring Plan, as described in § 95105(c), meeting 40 CFR § 98.3(g)(5) requirements
- Most meters used by fuel suppliers are financial transaction meters that do not need to meet calibration requirements if they meet the exemption criteria in § 95103(k)(7) and § 95121(c)(1)
  - Verifiers should confirm that meters are exempt and meet financial transaction requirement
  - Non-exempt meters must meet all calibration and accuracy requirements in § 95103(k)

Meter Calibration Requirements in MRR § 95121(c)

Do fuel suppliers and receiving entity have common or affiliated ownership?

- No – then they do not need to meet calibration requirements
- Yes – then they do not need to meet calibration requirements only if <u>any</u> of the follow conditions exist
  - Fuel supplier does not operate the fuel billing meter
  - Billing meter is also used by unaffiliated companies
  - Billing meter is sealed by County sealer of weights and measures

Emissions Calculations (1)

- **Key to correct emissions is reporting correct volumes!**
  - In workbook, entities cannot alter EF or HHV
- Reporting entities enter volume quantities into an XML spreadsheet where emissions are automatically calculated
- Spreadsheet is then uploaded to Cal e-GGRT

Emissions Calculations (2)

Blendstock, Distilate Fuel Oil or Biomass-Derived fuel	[Product] Annual volume of product "i" supplied or imported into California by the reporting party. Report CARBOB as RBOB. (barrels).
TOTAL	0
CBOB—Summer	
Regular	
Midgrade	
Premium	
CBOB—Winter	
Regular	
Midgrade	
Premium	
RBOB—Summer	
Regular	
Midgrade	

Spreadsheet is available here:

http://www.ccdsupport.com/confluence/download/attachments/112035331/Suppliers+of+Transportation+Fuels+Calculation+and+Reporting+Tool.xls?version=8&modificationDate=1362614750000

Workbook - Calculation of Emissions (1)

- Calculation of CO_2 emissions - Eq. MM-1, emissions factors from Table MM-1, column C

(Eq. MM-1) $CO_{2i} = Product_i * EF_i$

- Calculation of CH_4 and N_2O emissions - Use Eq. C-8 (subpart C, 40 CFR Part 98),
  - **Exception - Table 1 (§ 95121(b)(3)) in lieu of HHV*EF**

(Eq. C-8) $$CH_4 \text{ or } N_2O = 1 \text{ x } 10^{-3} * Fuel * HHV * EF$$

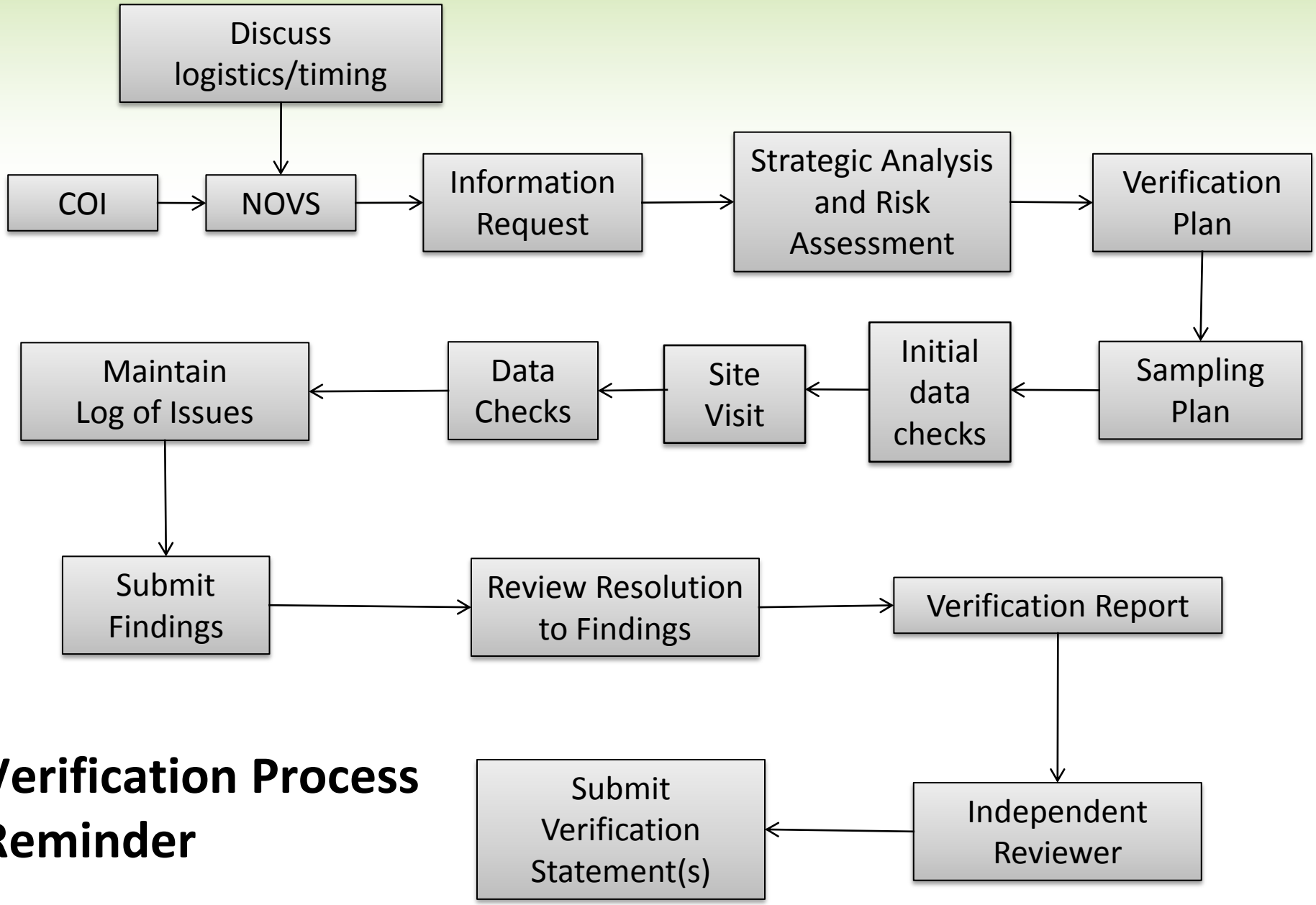
Workbook - Calculation of Emissions (2)

- Converting CH_4 and N_2O to CO_2e
- Calculation of CO_2e is in § 95121(b)(4)

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i$$

ARB Comments and Questions

Verification Process Reminder



Verifying Emissions for Transportation Fuels

- Review Cal e-GGRT report
- Request additional data:
  - Review data in Reporting Tool
- Strategic Analysis and Risk Assessment
- Verification Plan
- Sampling Plan
  - Consider sampling based on volume of product, type of product and calculated emissions for each product
  - Remember qualitative considerations and exports out-of-state and exclusions for aviation and marine fuels

Verifying Emissions for Transportation Fuels Site Visit (1)

- Interview staff early in the site visit. Include questions like
  - Do they understand the MRR requirements and give confidence that the data was input correctly?
  - What QA checks or final reconciliations were done?
  - If volumes listed in different data sources disagree, which value is reported and why?
  - Are these steps documented in GHG Monitoring Plan?
- If possible, visually trace how the fuel moves to and from the rack or pipeline
- Identify product measurement and calibration points, even if they are financial meters
- Identify responsibility for calibration and operation of meters

Verifying Emissions for Transportation Fuels Site Visit (2)

- After obtaining database of transactions maintained by reporter
  - Compare database to data reported to ARB
  - Discuss with staff how database is maintained, what other purposes it serves and what queries/filters are applied prior to reporting to ARB
  - Ask staff to recreate any queries or filters for one month of data (or more if you consider it warranted)
  - Ask about reconciliations and original vs. final values

- Select a percentage of invoices to review, focusing on high risk sources identified in sampling plan
  - Both quantitative and qualitative

Verifying Emissions for Transportation Fuels Site Visit (3)

- Review bills of lading for any shipments that were excluded due to out-of-state destination, aviation or marine use
- After site visit
  - Cross-check vs. BOE tax data found here: http://www.boe.ca.gov/sptaxprog/spftrpts.htm
  - Ask about differences identified – maintain your issues log
- Spend ample time on tracking and reconciliation
  - What is the origin of final data reported?
  - Is it reconciled to other sources?
  - When sources are in conflict, which one is selected and why?

Verifying Excluded Fuels

- Verifiers should determine what fuels were excluded due to export or marine/aviation usage
- For fuel exported from California:
  - How was export amount determined?
  - Do bills of lading show destination outside of California?
  - Are exported fuels CARB fuels (CARB diesel, CARBOB), or fuels not used in California? (Non-CARB fuel exports are lower risk)

Verifying Excluded Fuels

- For aviation/marine fuels:
  - Is it a reportable fuels? If not, low risk.
    - (Many aviation fuels (jet fuel A, aviation gasoline) are not reportable
  - Review GHG Monitoring Plan—this should be discussed
  - Do bills of lading show marine-only terminal? How is that documented?
  - Do they use separate fuel codes and customer accounts for marine fuel? How is this documented? What controls are in place?

Missing Data Substitutions

- "Missing" or invalid data is unlikely to be encountered, since the values verifiers see are likely already the result of established billing procedures
- However, verifiers should ask how invalid data would be reconciled; any terminal/refinery racks that are not two-party financial transactions should be discussed
- Worth requesting a copy of their financial audit
  - Even if audit from prior year, any major issues with revenue could be a flag to consider missing/invalid data

Case Study 1

Verifying a Fuel Supplier

Risk-Based Sampling for Bob's Fuel Supplier

The next three slides are an example of how the verifier might consider risk in a verification, which was discussed during the training. This is not a template.

(In barrels)	RBOB Summer Regular	RBOB Winter Premium	RBOB Winter Regular	Diesel #2 (next slide)
Sales at Terminal 1 – from entity-owned refinery	450,000	110,000	315,000	86,500
Sales at Terminal 1 – purchased upstream from Company A	0	0	40,000	20,000
Remote Terminal 2 – purchased upstream from Company B	35,900	12,500	0	211,000

Individually confirm with both engineering and financial staff how transactions were compiled from raw data/invoices; Check June & August; Visually trace fuel line and metering from rack; Test one day of past year's accounts.

Detailed recalculation of Feb-March sales; validate with all other in-house data sets.

Remote terminal managed by different group; Risk of mishandling data; Check completeness.

Purchase invoices are well-documented; review system; check subset of invoices.

Data Checks for Diesel Fuel

	Diesel #2 (in barrels)	# of Invoices or Records to Review	Risk Ranking
Terminal #1 Sales	106,500	440	High
Terminal #2 Sales	211,000	160	Medium

Larger number of samples

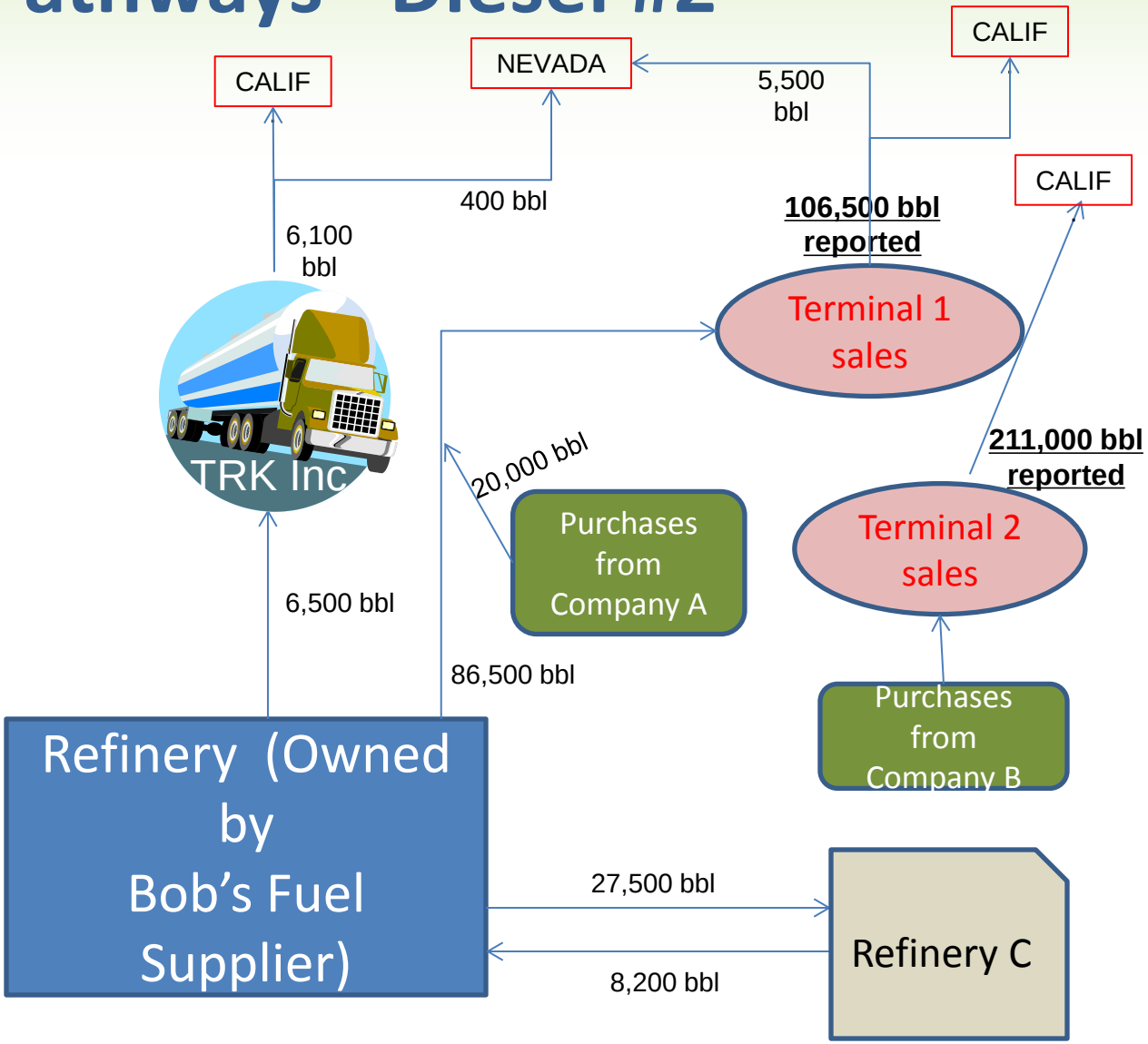
Smaller number of samples

Check annual total; Check monthly totals; Drill-down to daily data using BOL or invoices. Ensure financial purchase agreements or contracts with no evidence of fuel movements are excluded.

Check completeness; Spot check several invoices at random.

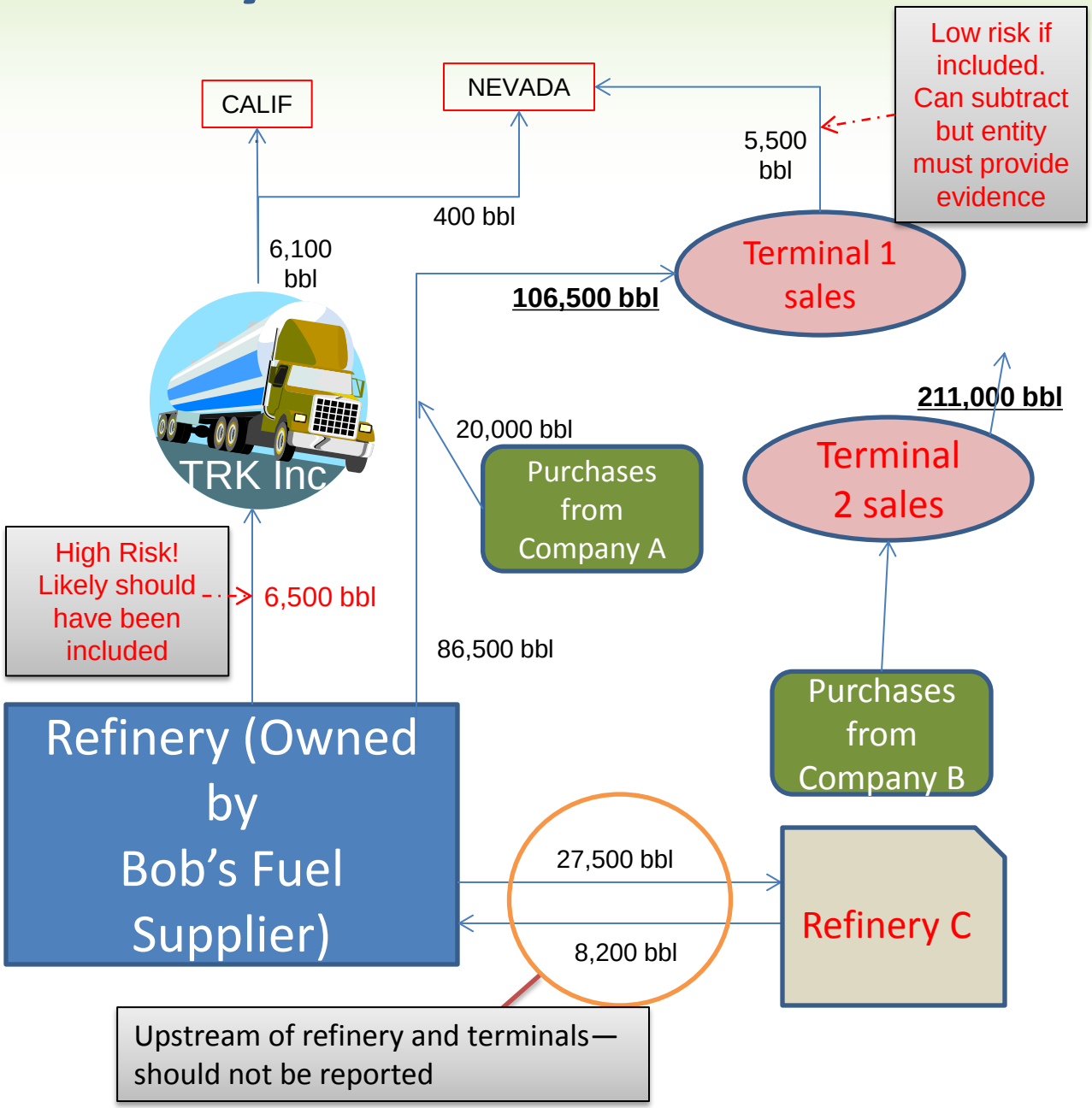
Tracing Fuel Pathways - Diesel #2

Terminal #1 Sales	Reported
Terminal #2 Sales	Reported
Purchases from A	Included in terminal #1 sales
Refinery C Sales	Not reported
Purchases from Refinery C	Not reported
Sales to TRK Inc.	Not reported



Tracing Fuel Pathways - Diesel #2 – Solution

Terminal #1 Sales	Correctly Reported
Terminal #2 Sales	Correctly Reported
Purchases from A	Correctly included in terminal #1 sales
Refinery C Sales	Correctly Excluded
Purchases from Refinery C	Correctly Excluded
Sales to TRK Inc.	Not reported



Participation Exercise 2.2.1

- See subpart MM emissions data report and data upload spreadsheet in handouts and zip file included with training materials
- How would you approach a risk assessment and sampling plan if you had this data?
- Identify any particular issues or red flag that you would sample.
- (Same data is included in emissions data report and spreadsheet)

Case Study 2: Review Bills of Lading for Use in Evaluating Fuel Throughput Data

- See Handout #2.2.4

Case Study 2 : Review Bills of Lading for Use in Evaluating Fuel Throughput Data - Solution

	Bills of lading		
Trans #	Fuel	Bbl	Destination
CARBOB1	RBOB summer regular	40	South Lake Tahoe, CA
CARBOB2	RBOB summer regular	50	Sacramento, CA
CARBOB4	RBOB summer regular	46	Orland, CA
CARBOB5	RBOB summer regular	84	Perris, CA
~~CARBOB6~~	~~RBOB summer regular~~	~~118~~	~~Lake Tahoe, NV~~
~~CARBOB7~~	~~RBOB summer regular~~	~~100~~	~~Medford, OR~~
DistULS6	Distillate #1 ULS	114	Riverside, CA
DistULS7	Distillate #1 ULS	92	Merced, CA
~~DistULS8~~	~~Distillate #1 ULS~~	~~116~~	~~Tucson, AZ~~
DistULS9	Distillate #1 ULS	120	Salinas, CA
~~DistULS9~~	~~Distillate #1 ULS~~	~~125~~	~~Las Vegas, NV~~
DistULS12	Distillate #2 ULS	90	Emeryville, CA
~~DistULS13~~	~~Distillate #2 ULS~~	~~100~~	~~Phoenix, AZ~~
DistULS15	Distillate #2 ULS	70	Rialto, CA
DistULS17	Distillate #2 ULS	130	Bakersfield, CA
~~DistULS19~~	~~Distillate #2 ULS~~	~~150~~	~~Reno, NV~~

Transactions in black text, strikethrough represent transactions with destinations outside of California, which were appropriately excluded from the emissions data report.

Transactions in blue text, strikethrough represent transactions with destinations outside of California, which were included from the emissions data report. Reporting entities may exclude transactions for which they can provide evidence that they are destined for outside California, but their inclusion does not represent a correctable error. (The calculation of material misstatement is shown both ways on the following slides.)

The transaction in red text was erroneously excluded, and represents a correctable error.

Case Study 2 : Review Bills of Lading for Use in Evaluating Fuel Throughput Data – Solution (2) if excluding out-of-state

	Bills of lading		
Trans #	Fuel	Bbl	Destination
CARBOB1	RBOB summer regular	40	South Lake Tahoe, CA
CARBOB2	RBOB summer regular	50	Sacramento, CA
CARBOB4	RBOB summer regular	46	Orland, CA
CARBOB5	RBOB summer regular	84	Perris, CA
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DistULS17	Distillate #2 ULS	130	Bakersfield, CA
~~DistULS19~~	~~Distillate #2 ULS~~	~~150~~	~~Reno, NV~~

220 bbl CARBOB x .3686 $MTCO_2$/bbl = 81.09 $MTCO_2$

326 bbl DFO #1 x .4264 $MTCO_2$/bbl = 139.00 $MTCO_2$

290 bbl DFO #2 x .4296 $MTCO_2$/bbl = 152.58 $MTCO_2$

= 374.67 $MTCO_2$ verifier total

(382.1 $MTCO_2$ total reported)

(374.23 – 382.1)/ 382.1
= -2.06% error

No material misstatement, but correctable errors are present. Requires correction; otherwise, adverse verif statement

Case Study 2 : Review Bills of Lading for Use in Evaluating Fuel Throughput Data – Solution (3) if including out-of-state

	Bills of lading		
Trans #	Fuel	Bbl	Destination
CARBOB1	RBOB summer regular	40	South Lake Tahoe, CA
CARBOB2	RBOB summer regular	50	Sacramento, CA
CARBOB4	RBOB summer regular	46	Orland, CA
CARBOB5	RBOB summer regular	84	Perris, CA
~~CARBOB6~~	~~RBOB summer regular~~	~~118~~	~~Lake Tahoe, NV~~
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DistULS12	Distillate #2 ULS	90	Emeryville, CA
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DistULS15	Distillate #2 ULS	70	Rialto, CA
DistULS17	Distillate #2 ULS	130	Bakersfield, CA
~~DistULS19~~	~~Distillate #2 ULS~~	~~150~~	~~Reno, NV~~

338 bbl CARBOB x .3686 $MTCO_2$/bbl = 124.59 $MTCO_2$

442 bbl DFO #1 x .4264 $MTCO_2$/bbl = 188.47 $MTCO_2$

290 bbl DFO #2 x .4296 $MTCO_2$/bbl = 124.58 $MTCO_2$

= 437.64 $MTCO_2$ verifier total

(382.1 $MTCO_2$ total reported)

(437.64 – 382.1)/382.1
= 14.5% difference

Exclusion of DistULS17 represents correctable error

ARB Comments and Questions