Innovative Methods for Emission Inventory Development

Demonstration of the New Reporting Software for Consolidated Reporting of Criteria and Toxic Emissions

NARSTO Emission Inventory Workshop
Innovative Methods for Emission Inventory Development and Evaluation

October 16, 2003

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Background

Annual Emissions Reporting

- Criteria pollutants, 24 toxics and ODCs
- Annual reporting
- Fees based on annual emissions

AB2588 Program

- Public right-to-know program
- Approximately 450 toxics
- Once in 4-year reporting
- Fees based on risks

Why a consolidated program?

- Streamlines the reporting process
- Improves toxics emission data quality
- Minimizes needed resources for both the facilities and the District
- Provides a linkage and consistency between criteria and toxic pollutants
- CARB and EPA also moving toward consolidation

What are the consolidated Annual Emissions Reports Used For?

- Criteria and Toxics Emissions Inventory
- AQMP and Rule Development
- Compliance Verification
- Title V and RECLAIM Programs
- Revenue Projection

Program Responsibilities

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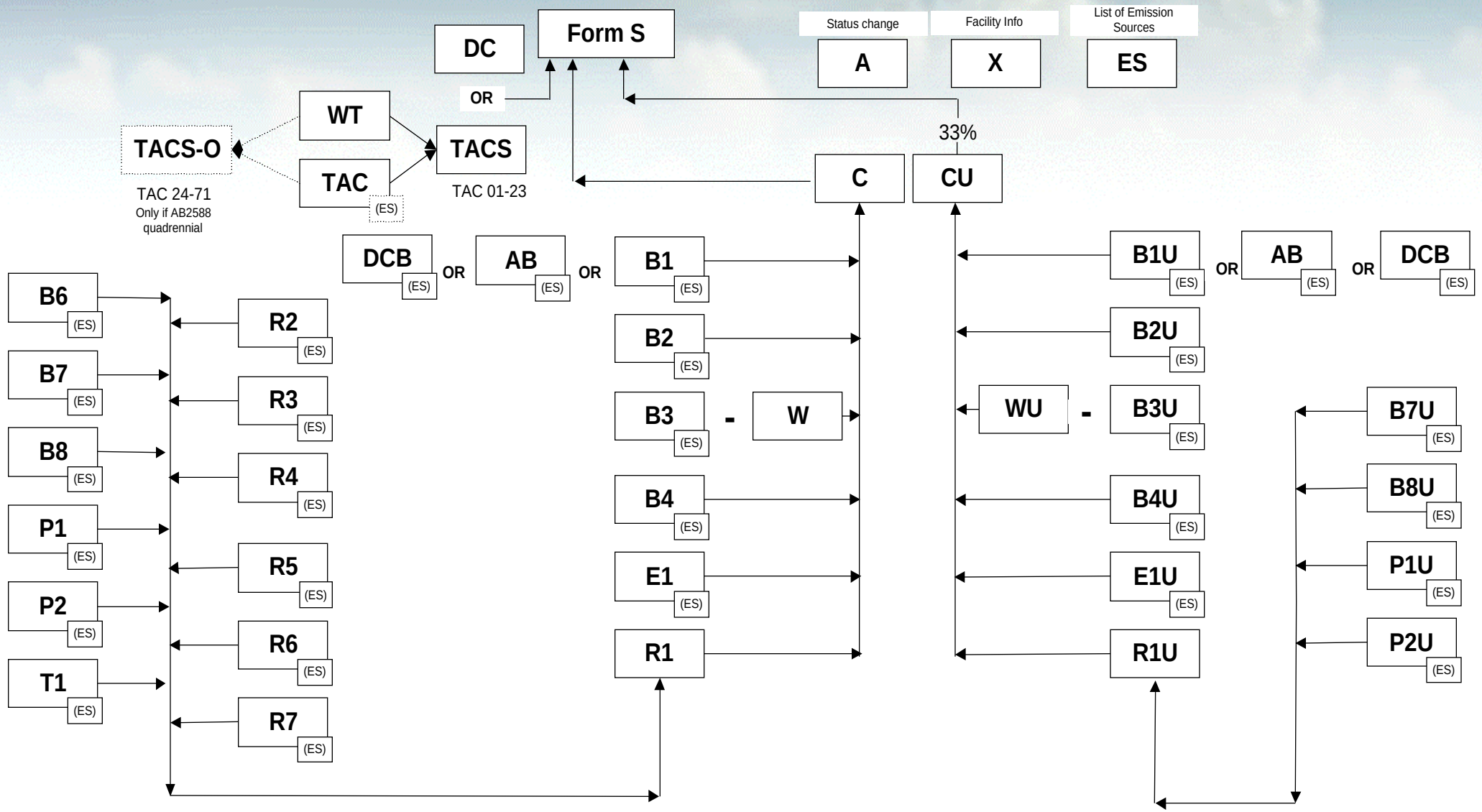
• Inventory Methodology • Rule Interpretation • Filing Requirements • Exemption/Refund Requests • Engineering Review & Audits	• Software Development • Information Dissemination & Public Assistance • Information Tracking & Recordkeeping • Compilation of Emission & Fee Data Files • QA/QC of Data Files

Reporting Process

The AER Program relies on a number of forms that are designed based on the specific type of equipment, process, or industry.

- Read the Instructions
- Identify Applicable Forms
- Collect Fuel, Material Usage & Throughput Records
- Identify Applicable Emission Factors
- Complete Applicable Forms Based on Facility-Specific Data

What Forms Do I Use?



Key Benefits of Software

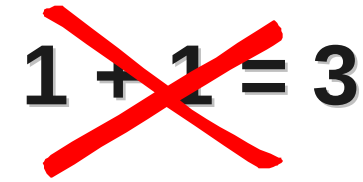
- Interview Process Helps Select Forms
- Offers Suggestions As You Input Information
- User-Friendly (used by over 82% of facilities last year)
- Links criteria and toxic emissions

Key Benefits Of Software (cont.)

- Automatically calculates and transfers Emissions Based on Input Data
- Automatically Generates all Summary Forms
- Built-in Default Emission Factors

Key Benefits Of Software (cont.)

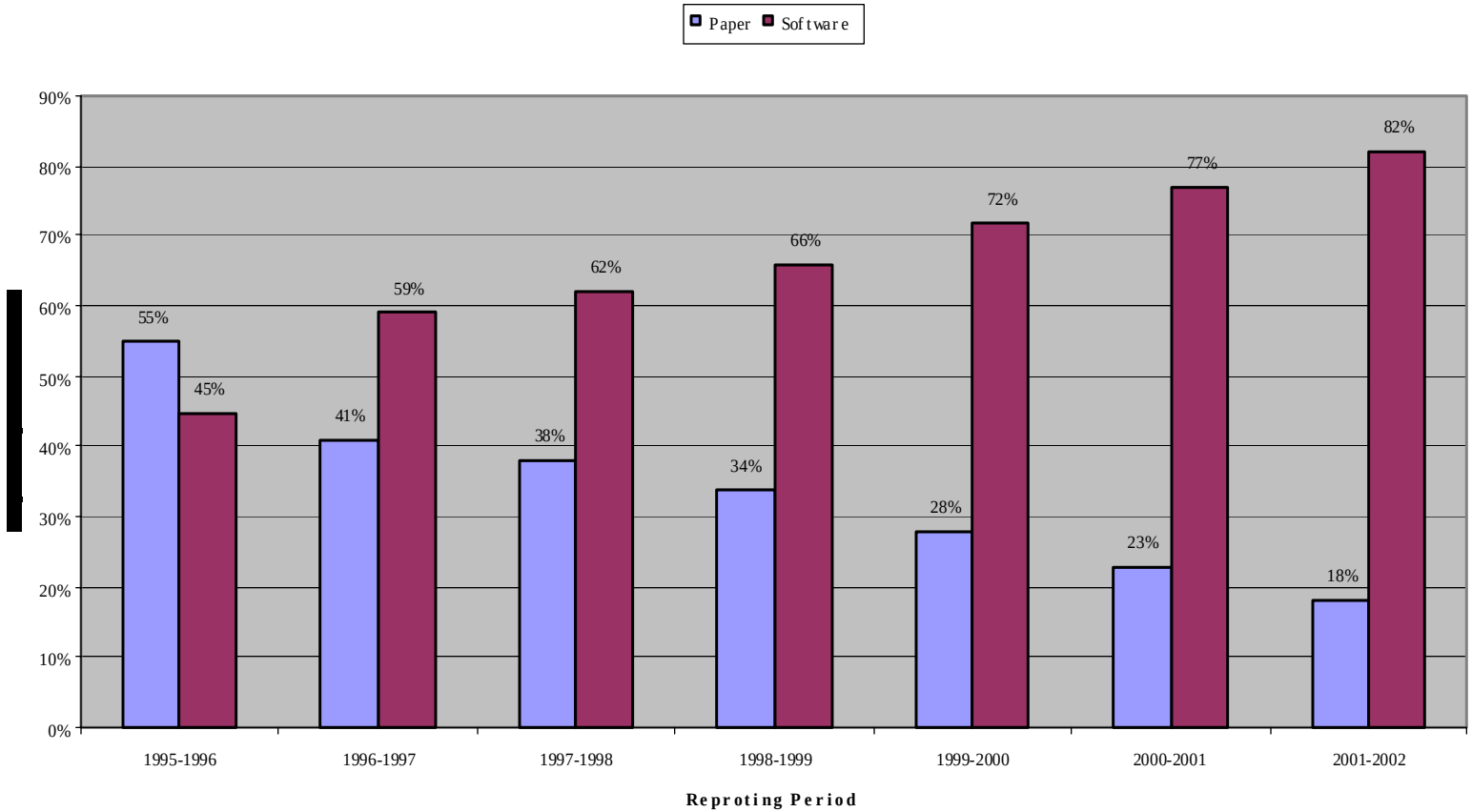
- Improves Data Accuracy
- Reduces Chances for Errors



- Simplifies the Submittal
- “Error Check” and Warning Features Help Identify and Reduce Common Errors

Software Use

- The success of AER reporting software can be measured by the large and constantly growing number of facilities choosing software as a reporting option.



Software Demonstration

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Emissions Reporting Software
Brief Demo Presentation

Emissions Reporting Software

In this brief presentation we will illustrate how to use the AER reporting software to complete the Annual Emissions Report for a facility that has to report the AB2588 quadrennial report and has the following equipment generating air emissions:

12 MMBTU Boiler burning natural gas
Enamel applied by brush on metal
Primer applied by brush on metal
Gasoline Underground storage tank and dispensing used in vehicles
Freon losses from the cooling system

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Emissions Reporting Software

Create New File

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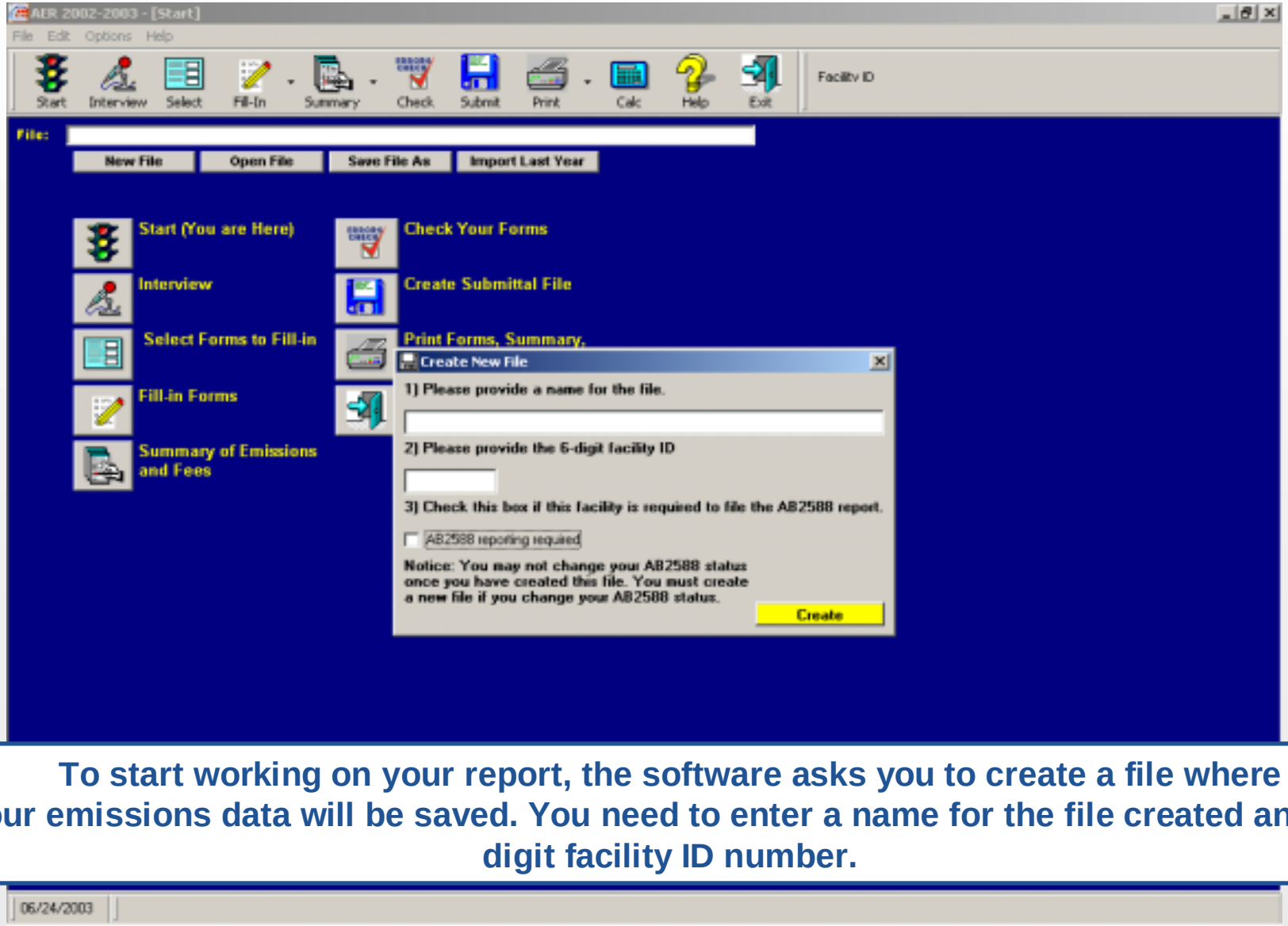
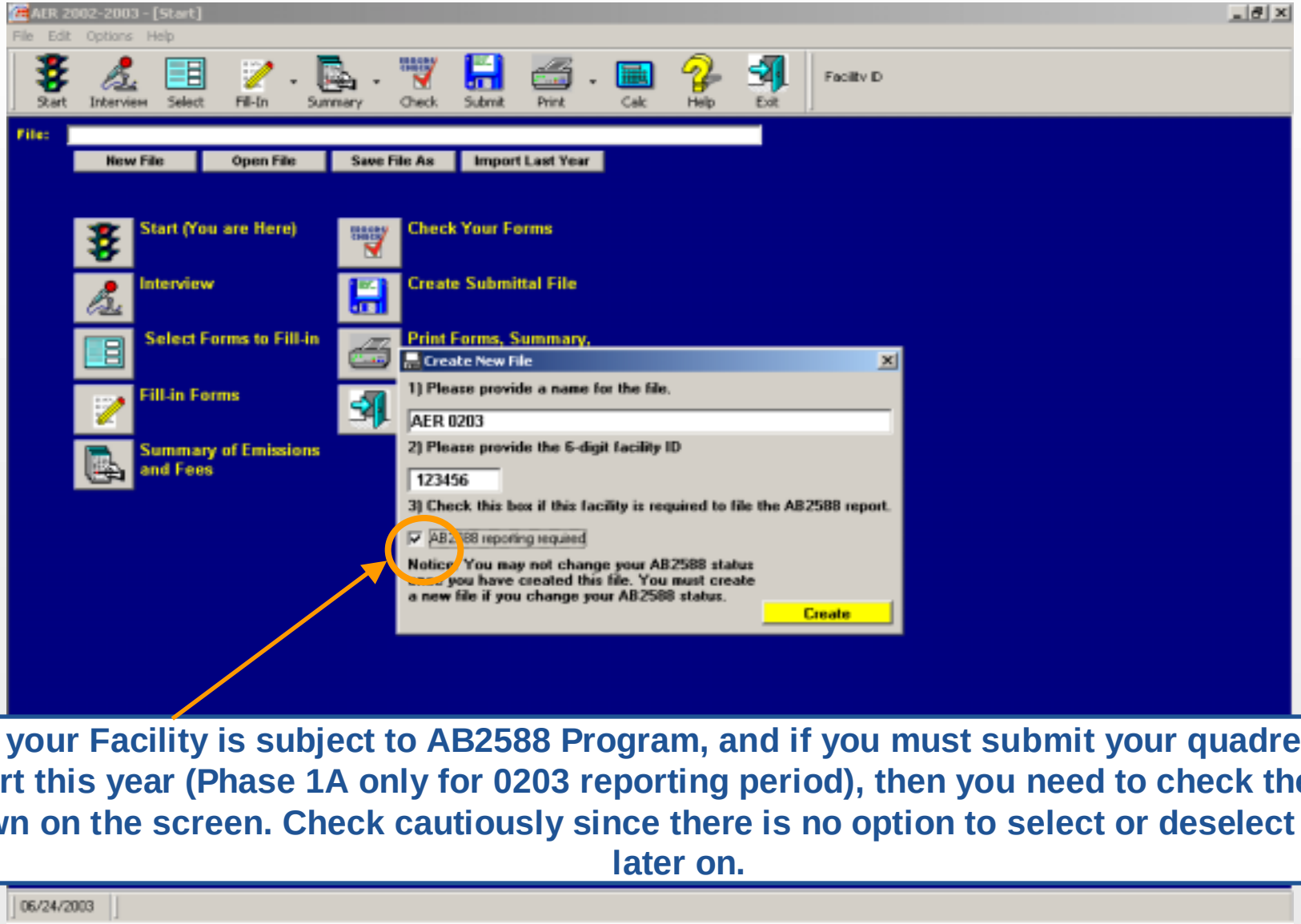


To start working on your report, the software asks you to create a file where all your emissions data will be saved. You need to enter a name for the file created and your 6 digit facility ID number.

Do you have to report AB2588 this Year?



If your Facility is subject to AB2588 Program, and if you must submit your quadrennial report this year (Phase 1A only for 0203 reporting period), then you need to check the box as shown on the screen. Check cautiously since there is no option to select or deselect this box later on.

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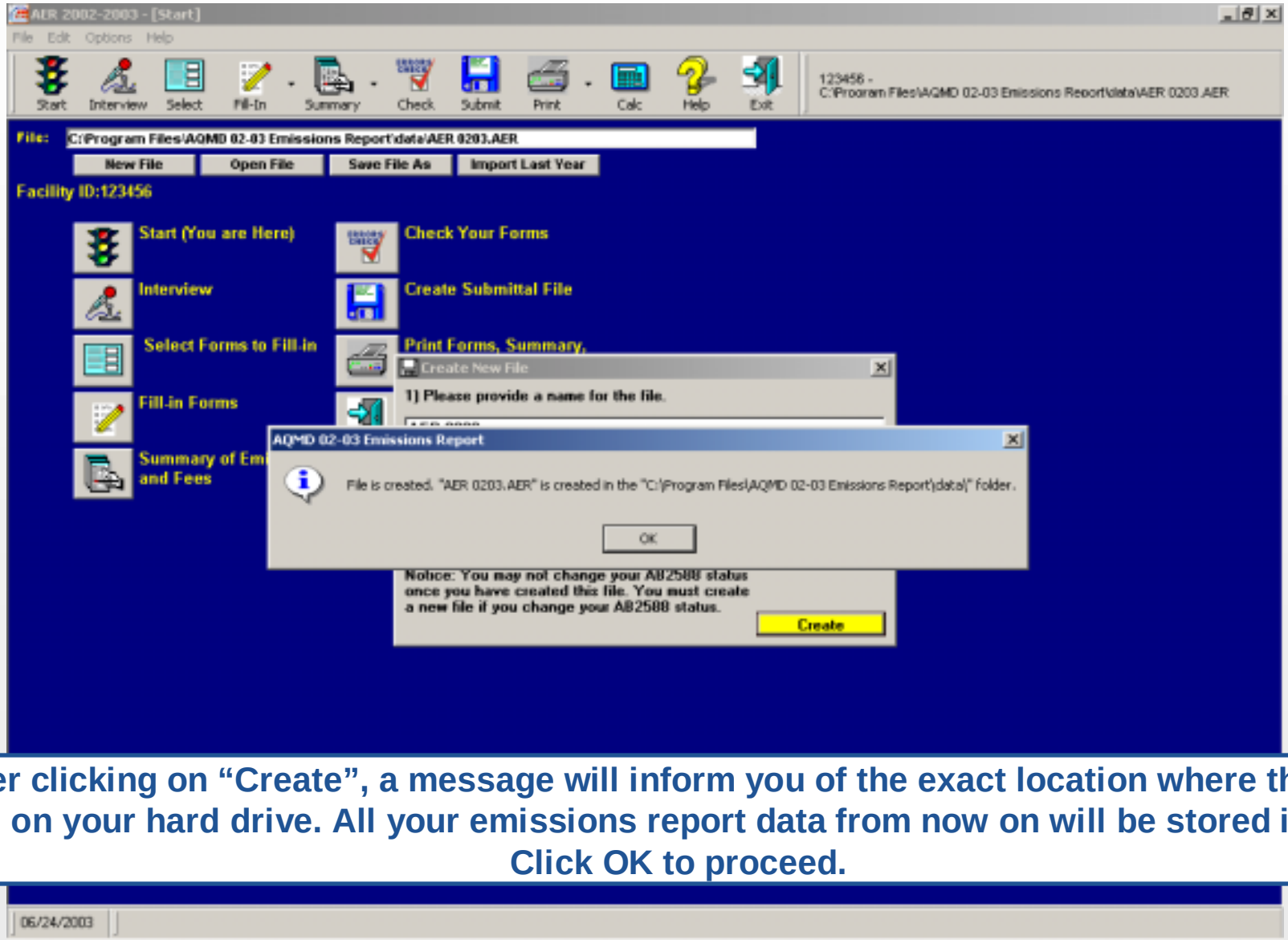
Your file is created



After clicking on “Create”, a message will inform you of the exact location where the file is saved on your hard drive. All your emissions report data from now on will be stored in this file. Click OK to proceed.

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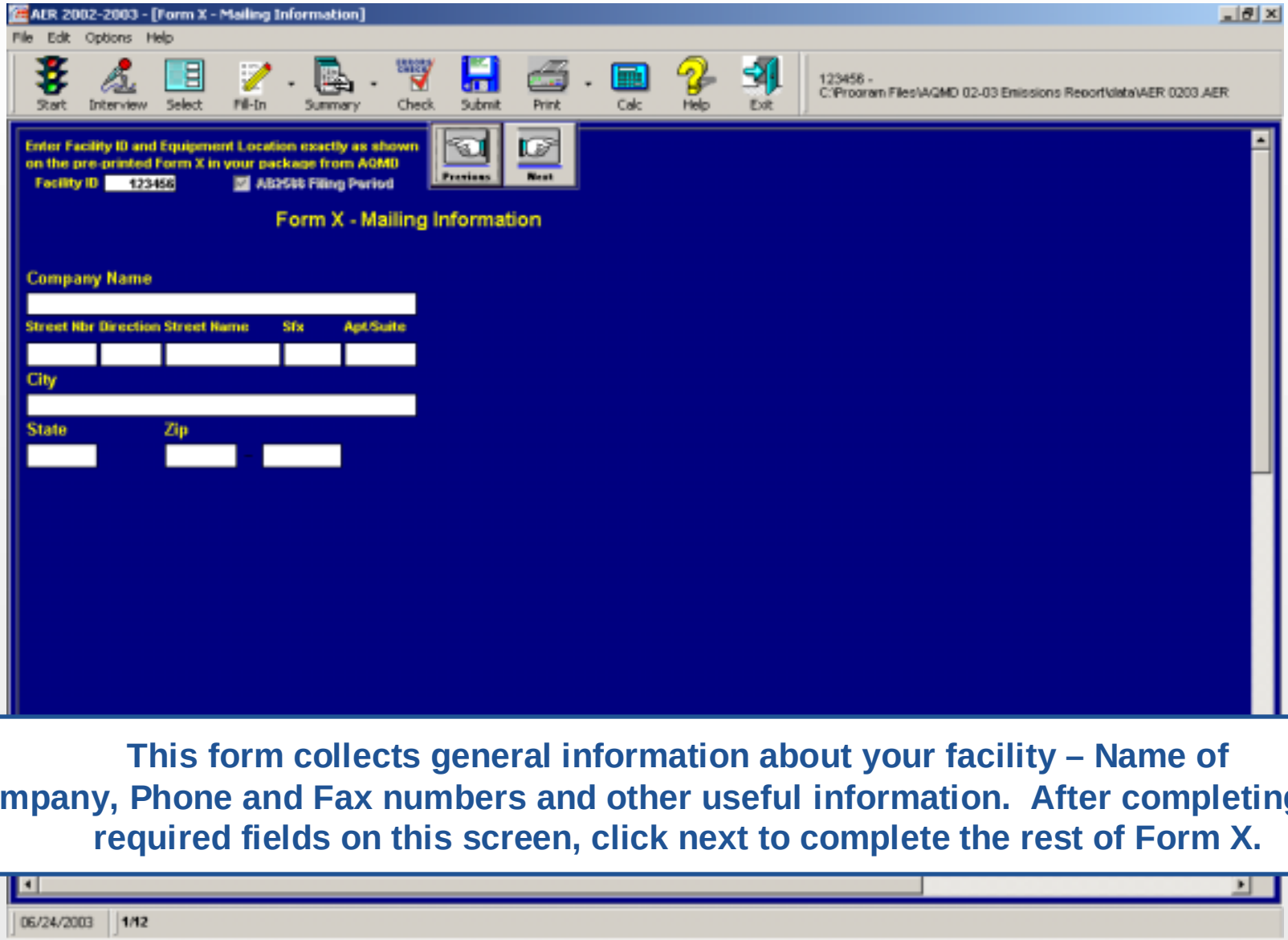
Interview Section - Form X



This form collects general information about your facility – Name of Company, Phone and Fax numbers and other useful information. After completing all the required fields on this screen, click next to complete the rest of Form X.

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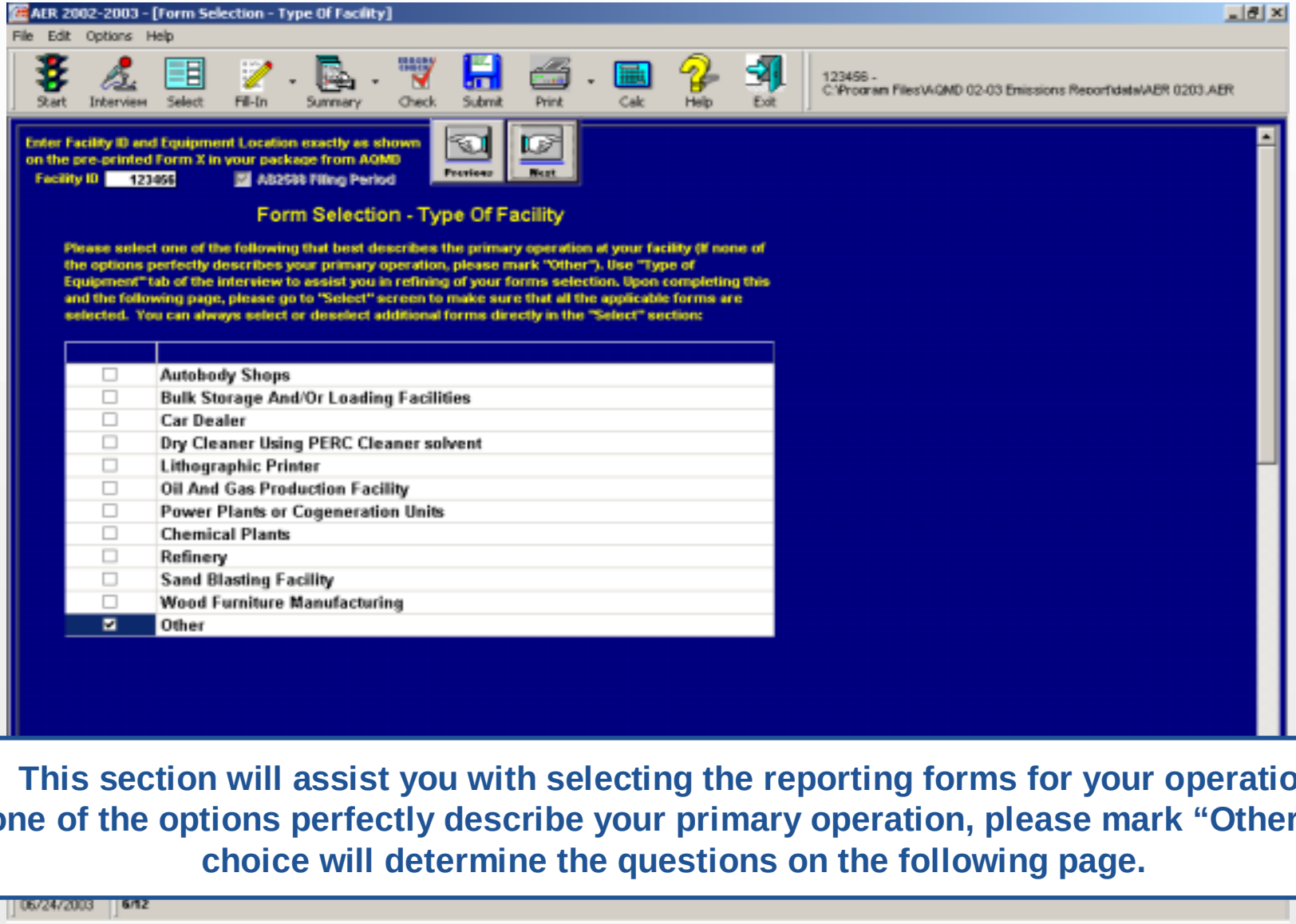
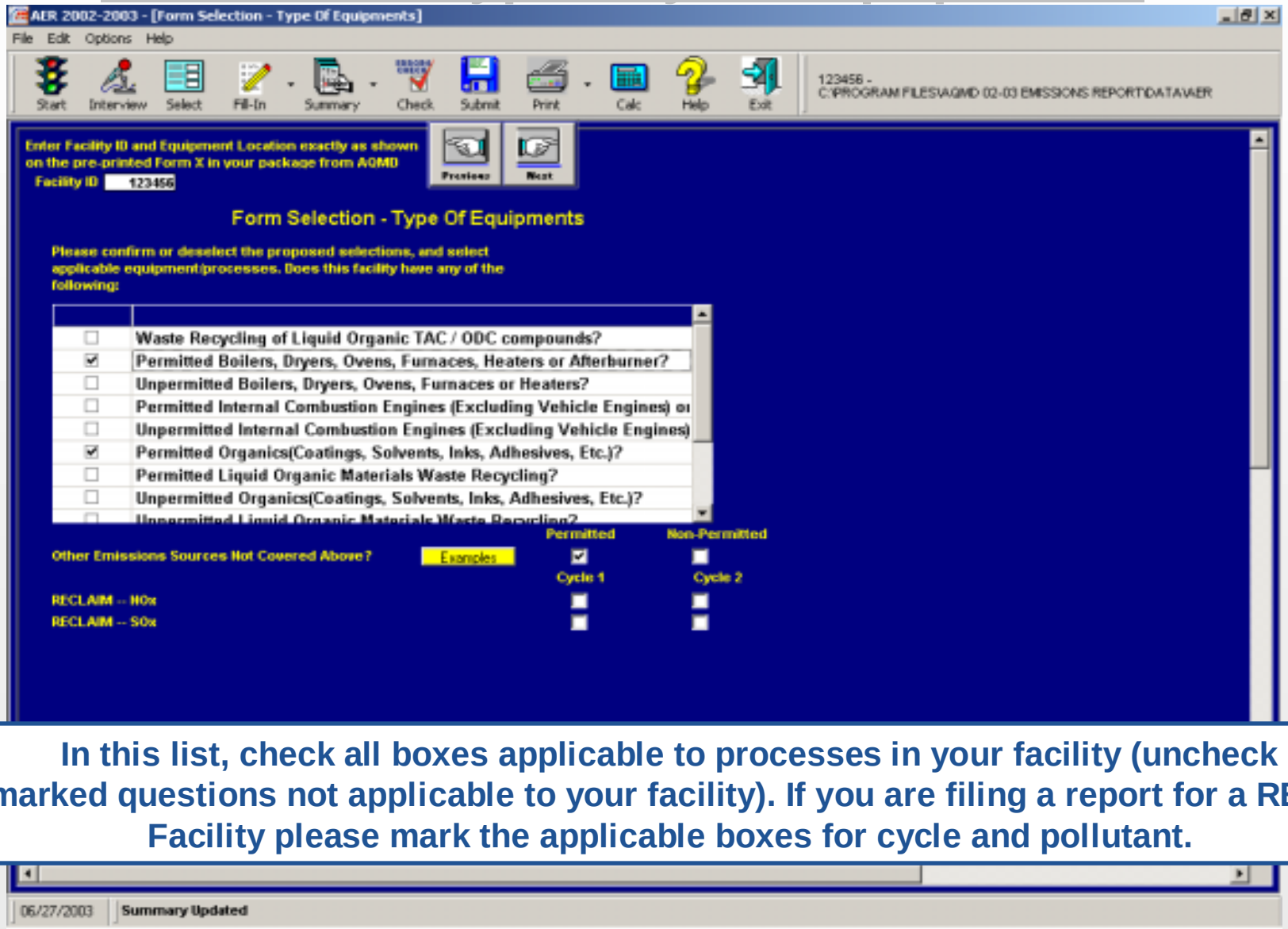
What's the type of your facility?



This section will assist you with selecting the reporting forms for your operation.
If none of the options perfectly describe your primary operation, please mark "Other". Your choice will determine the questions on the following page.

What is the type of your equipment?



In this list, check all boxes applicable to processes in your facility (uncheck all marked questions not applicable to your facility). If you are filing a report for a RECLAIM Facility please mark the applicable boxes for cycle and pollutant.

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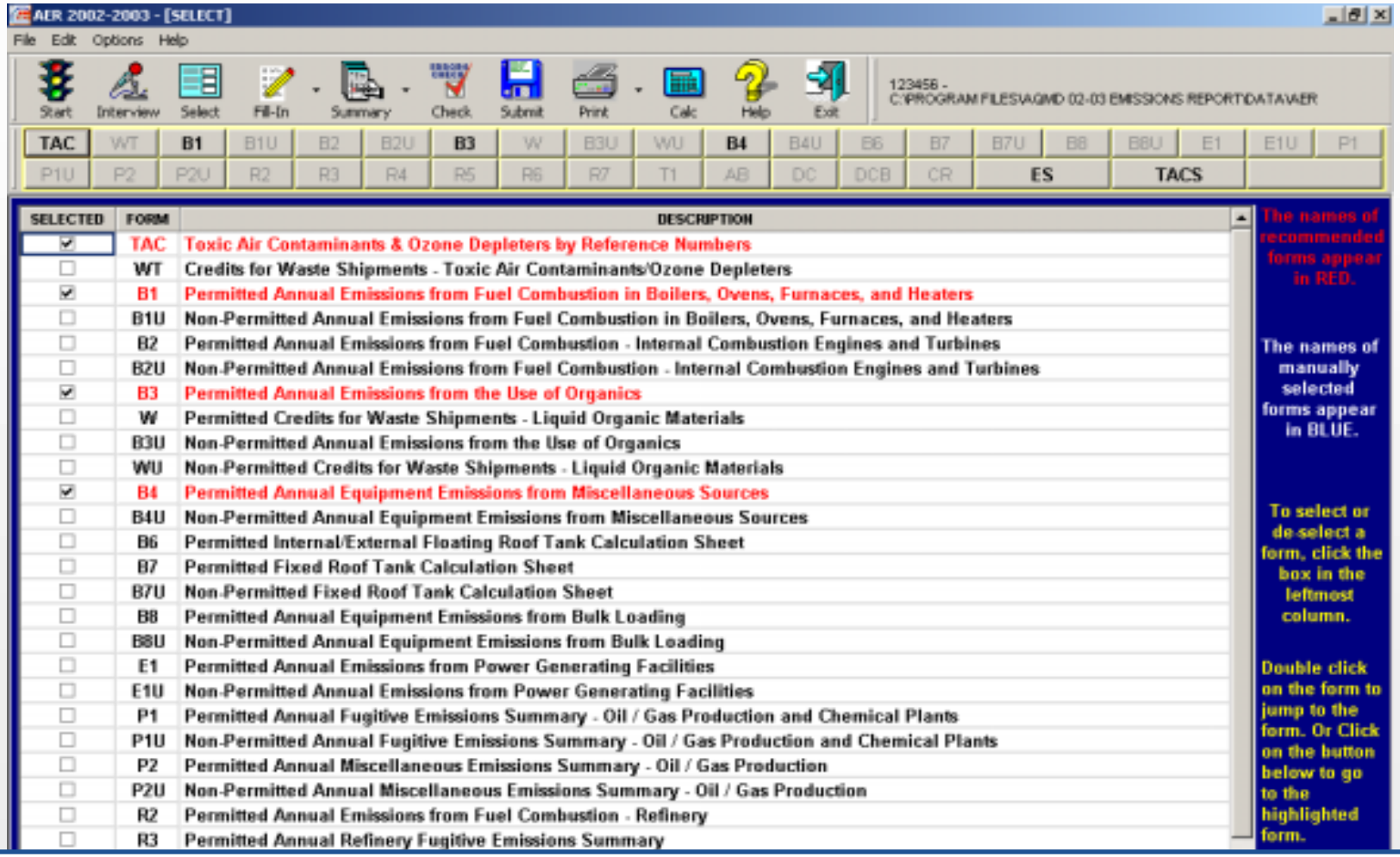
Select Forms



Upon completing the interview, proceed to the "Select Forms" section. Use this complete list of all available forms to fine-tune your form selection. The Software pre-selected some of the forms based on your answers to Interview questions. You can select or deselect additional forms as needed.

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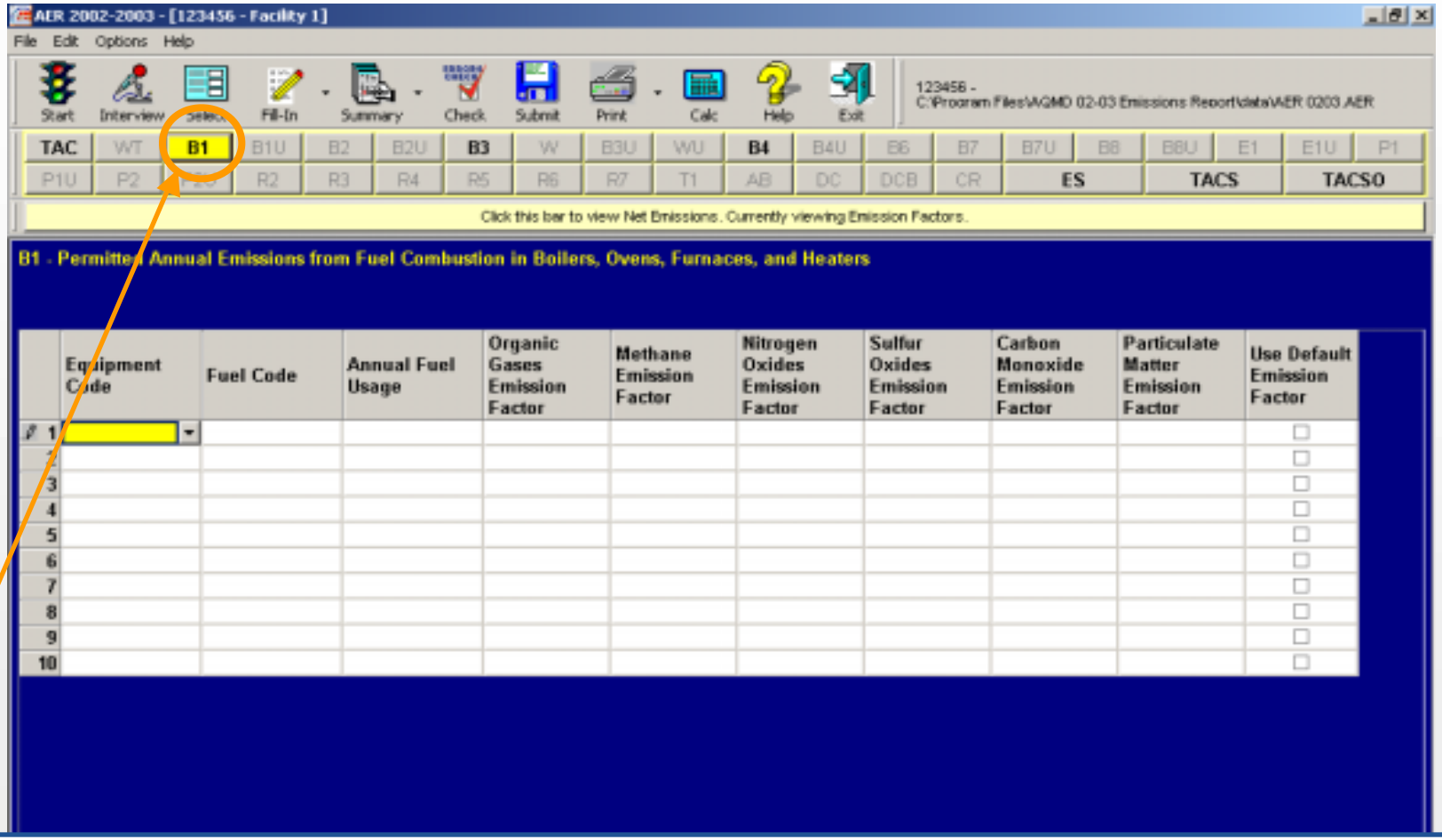
Form B1



If you click on "Fill-In", a bar with all available forms is displayed. The forms that you selected appear in bold font. You should first report the criteria emissions. Click on Form B1 to report your emissions from Permitted Boilers, Ovens, Furnaces and Heaters.

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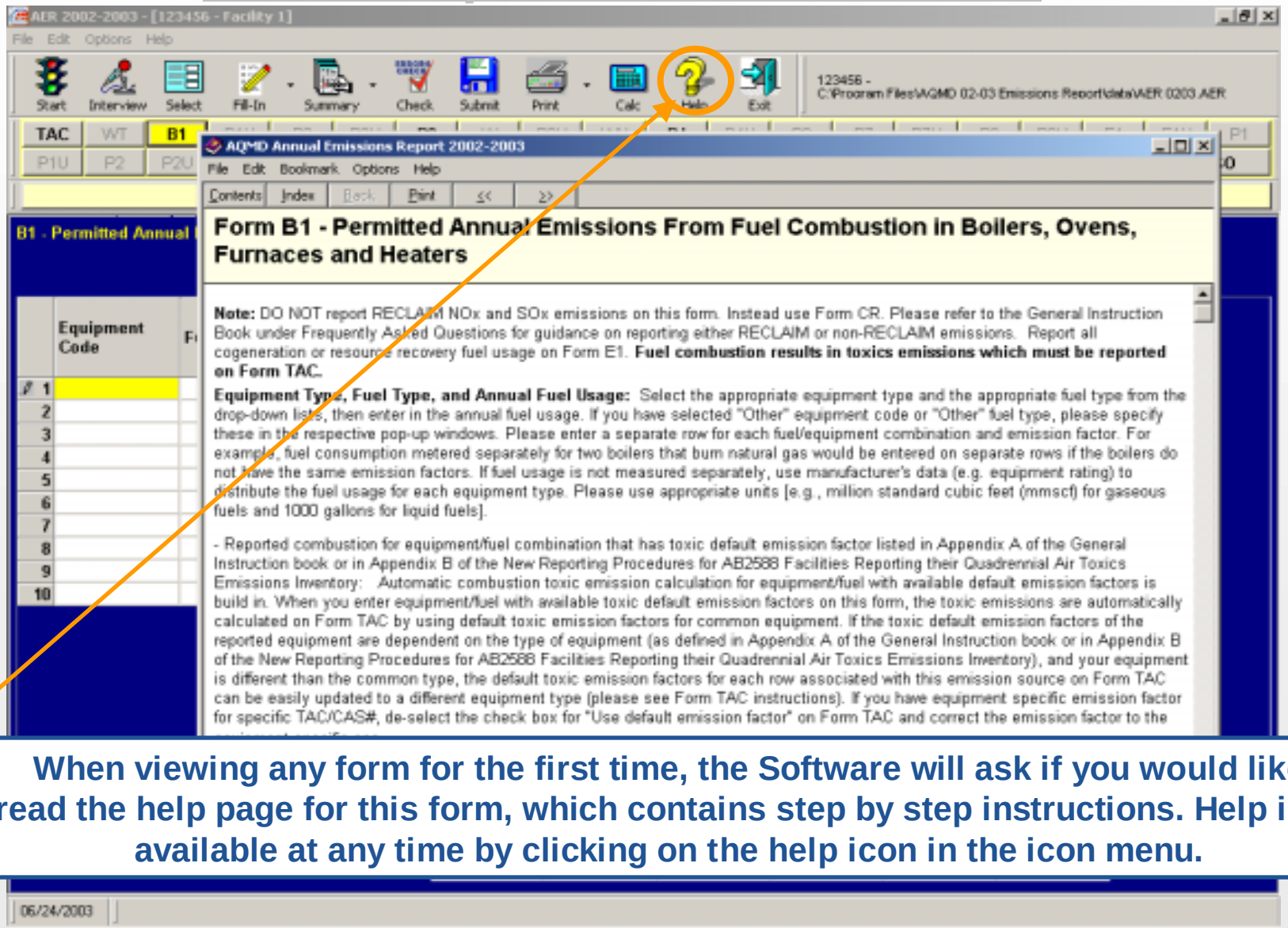
Need Help? Just click on Icon



When viewing any form for the first time, the Software will ask if you would like to read the help page for this form, which contains step by step instructions. Help is also available at any time by clicking on the help icon in the icon menu.

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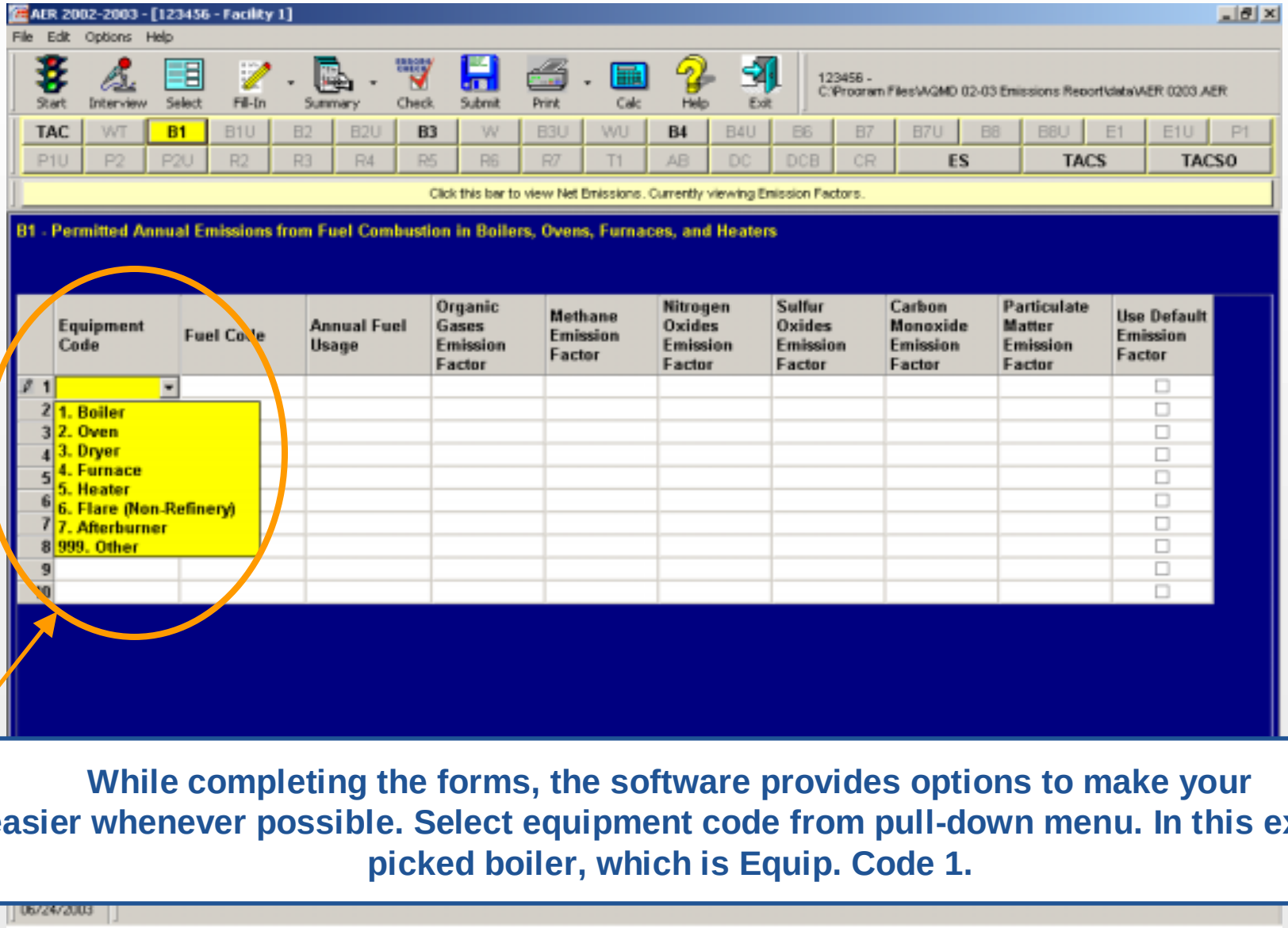
Form B1 – Choose Equipment Code



While completing the forms, the software provides options to make your work easier whenever possible. Select equipment code from pull-down menu. In this example we picked boiler, which is Equip. Code 1.

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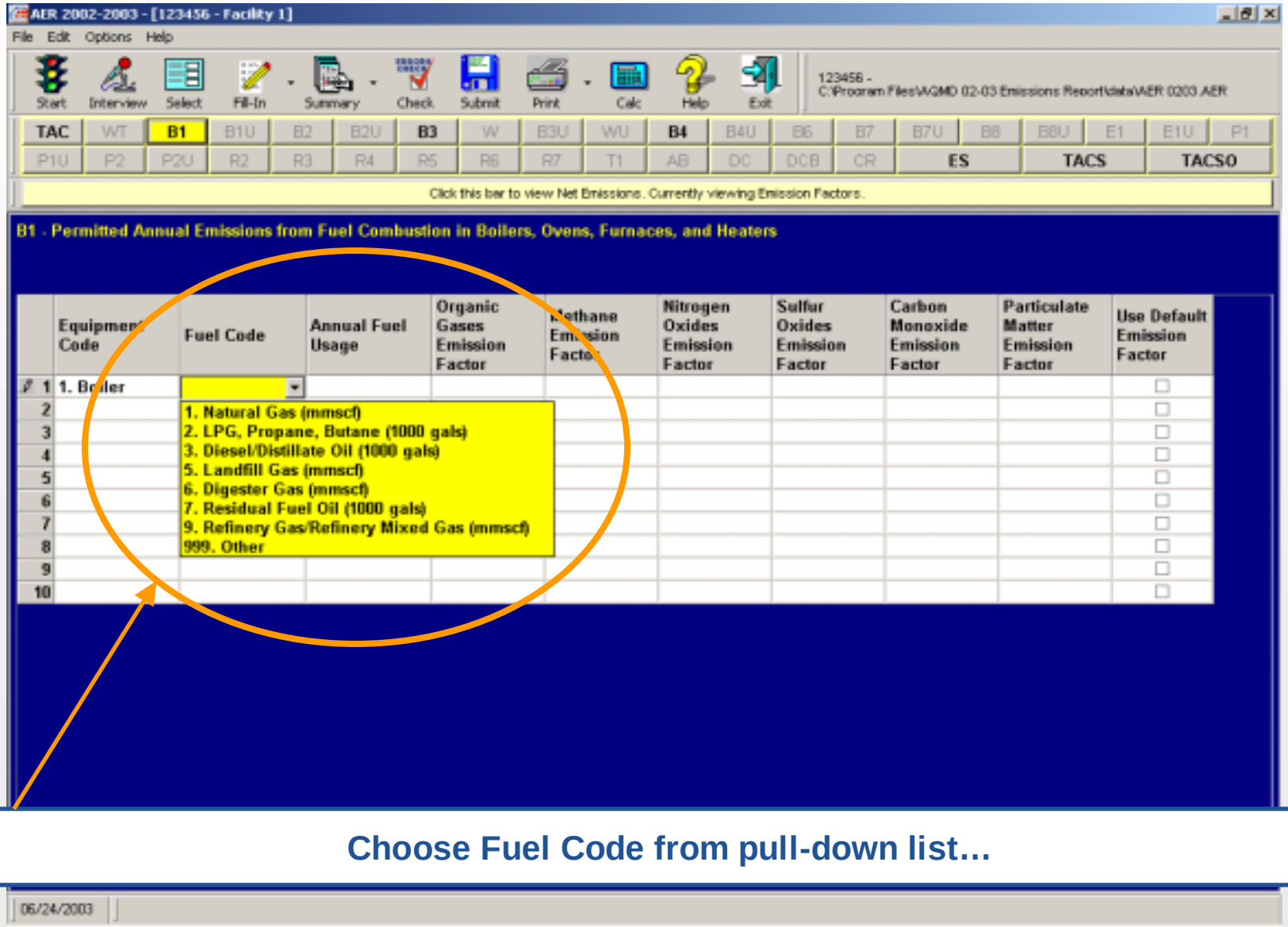
Form B1 – Fuel Code



Choose Fuel Code from pull-down list…

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Form B1 – Annual Fuel Usage

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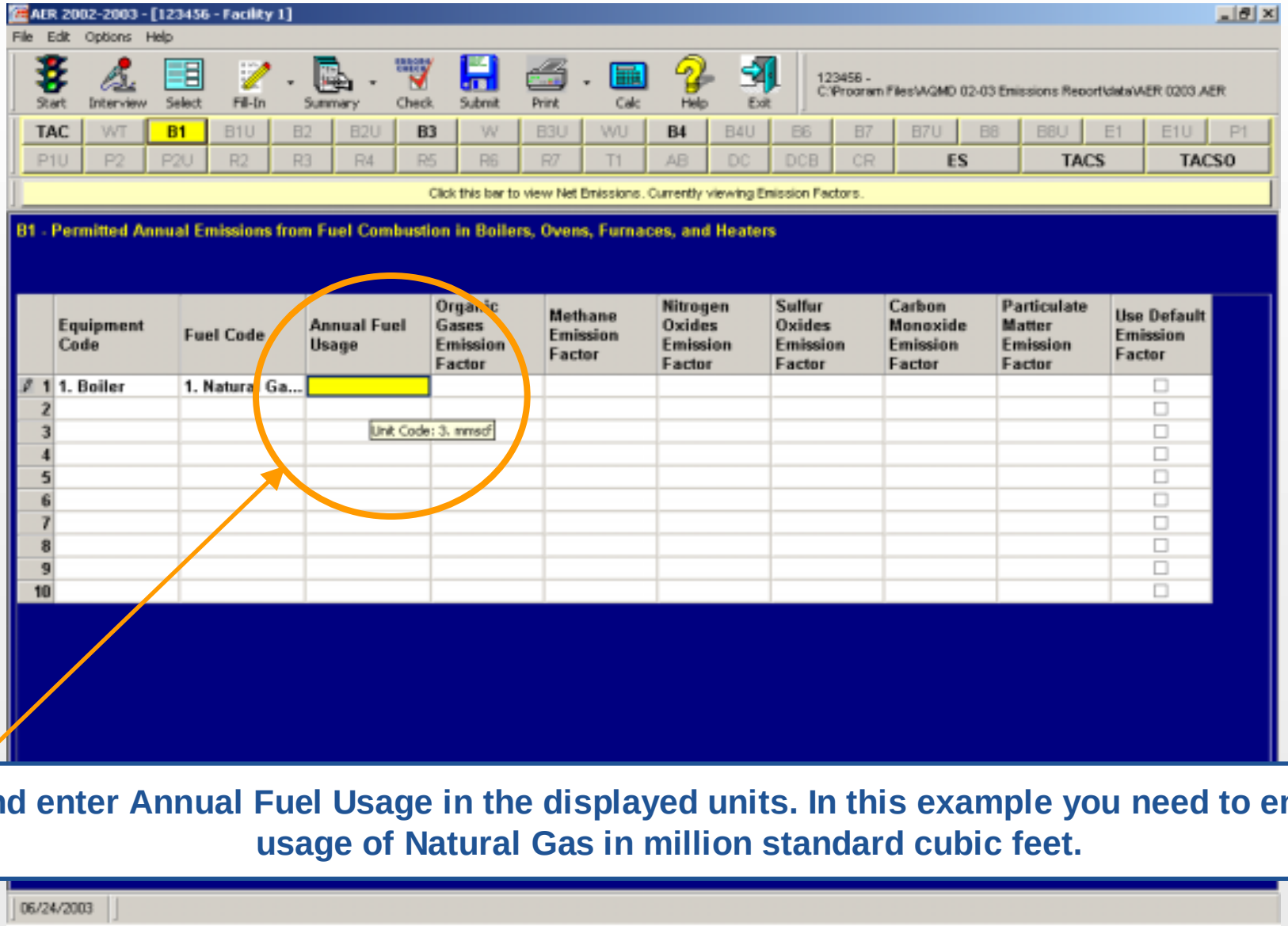

...and enter Annual Fuel Usage in the displayed units. In this example you need to enter the usage of Natural Gas in million standard cubic feet.

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Unit Conversion Calculator

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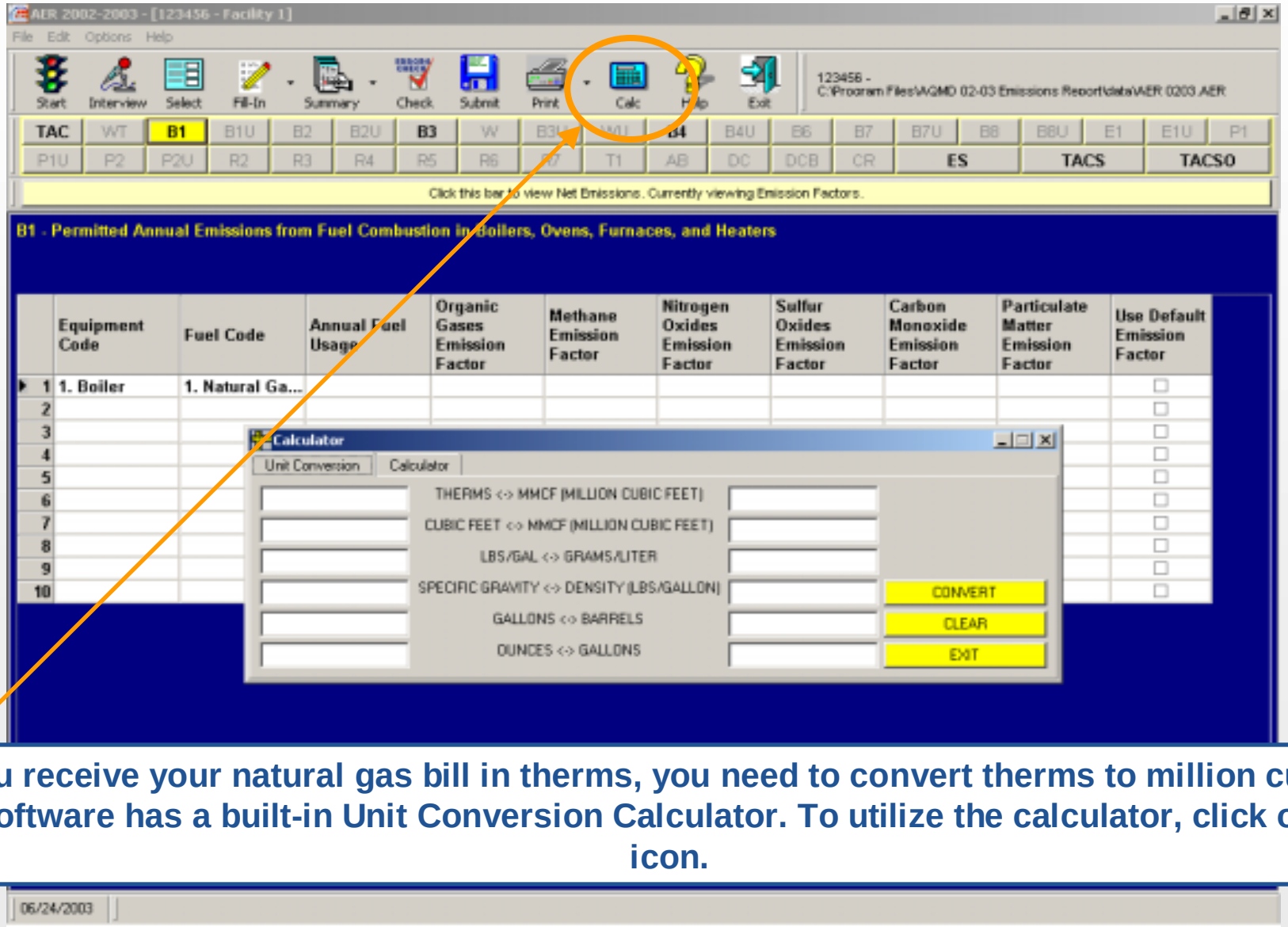
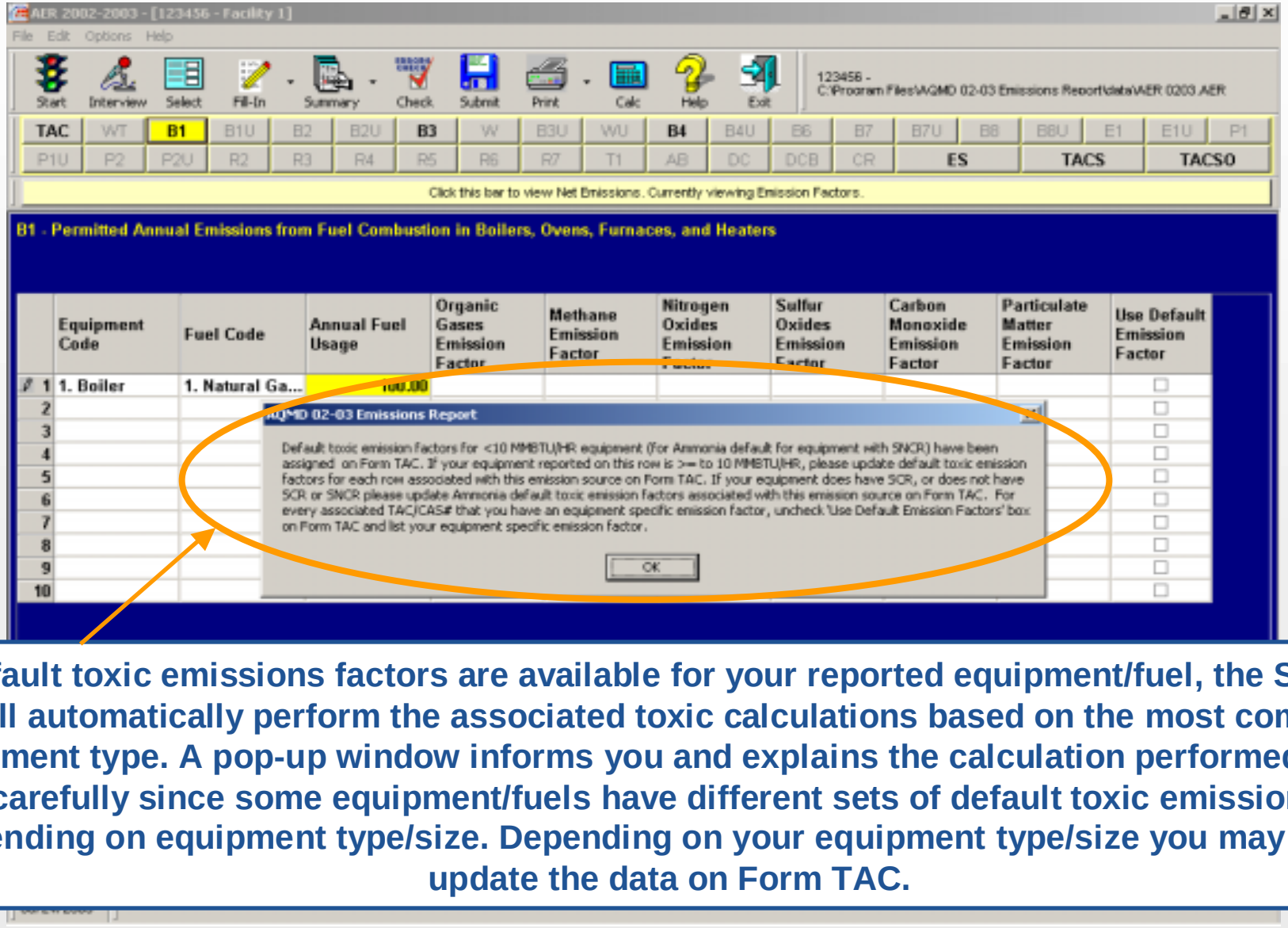


If you receive your natural gas bill in therms, you need to convert therms to million cubic feet. Our software has a built-in Unit Conversion Calculator. To utilize the calculator, click on "Calc" icon.

Form B1 – Assigned Toxic Emission Factors



If default toxic emissions factors are available for your reported equipment/fuel, the Software will automatically perform the associated toxic calculations based on the most common equipment type. A pop-up window informs you and explains the calculation performed. Please read carefully since some equipment/fuels have different sets of default toxic emission factors depending on equipment type/size. Depending on your equipment type/size you may have to update the data on Form TAC.

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Form B1 – Emission Factors

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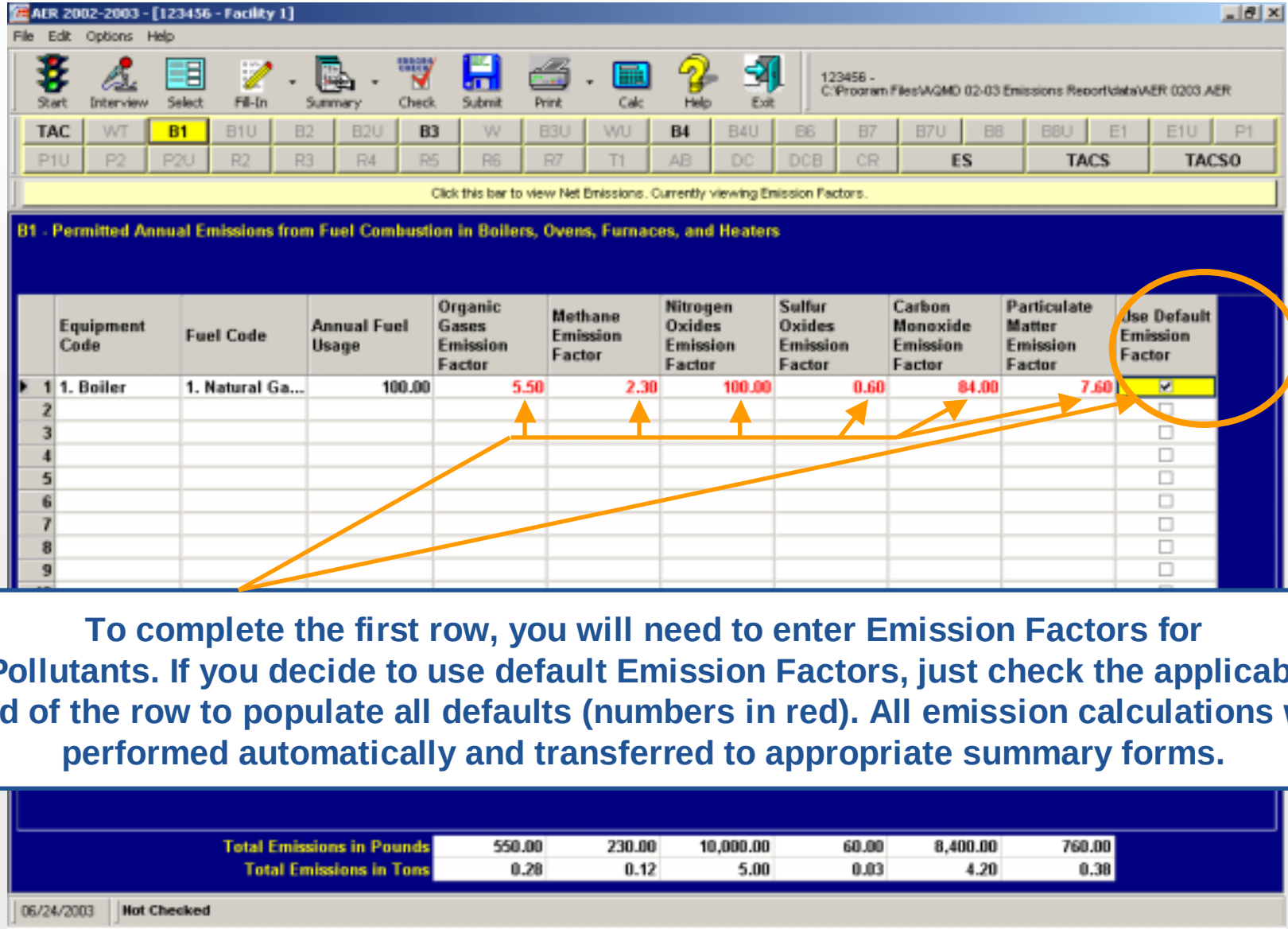

To complete the first row, you will need to enter Emission Factors for Criteria Pollutants. If you decide to use default Emission Factors, just check the applicable box at the end of the row to populate all defaults (numbers in red). All emission calculations will be performed automatically and transferred to appropriate summary forms.

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Form TAC

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AER 2002-2003 - [123456 - Facility 1]

File Edit Options Help

Start Interview Select Fill-In Summary Check Submit Print Calc Help Exit

123456 - C:\Program Files\AQMD 02-03 Emissions Report\data\AER 0203.AER

TAC | WT | B1 | B1U | B2 | B2U | B3 | W | B3U | WU | B4 | B4U | B6 | B7 | B7U | B8 | B8U | E1 | E1U | P1

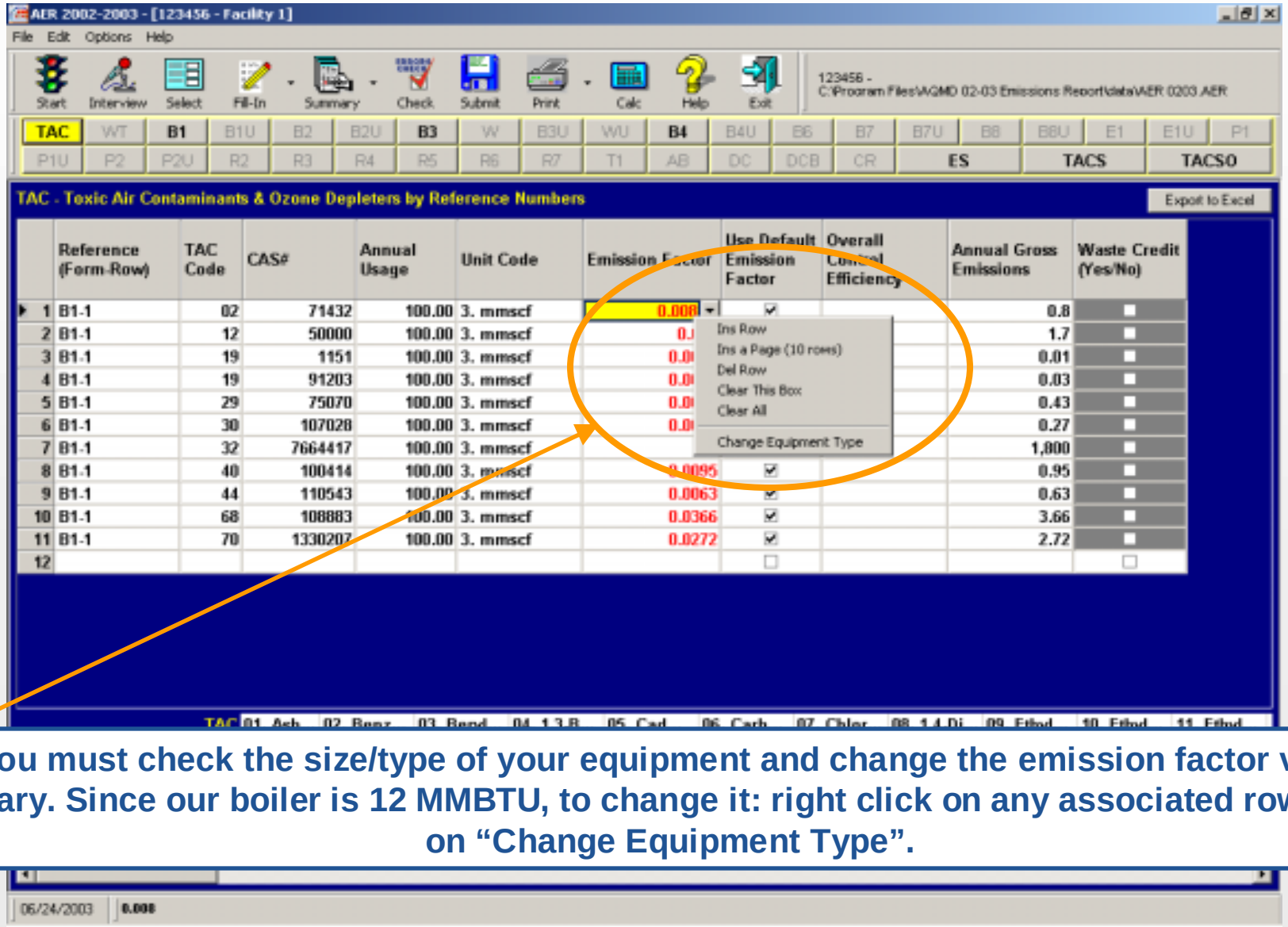
P1U | P2 | P2U | R2 | R3 | R4 | R5 | R6 | R7 | T1 | AB | DC | DCB | CR | ES | TACS | TACSO

TAC - Toxic Air Contaminants & Ozone Depleters by Reference Numbers — Export to Excel

	Reference (Form-Row)	TAC Code	CAS#	Annual Usage	Unit Code	Emission Factor	Use Default Emission Factor	Overall Control Efficiency	Annual Gross Emissions	Waste Credit (Yes/No)
1	B1-1	02	71432	100.00	3. mmscf	0.008	☑		0.8	☐
2	B1-1	12	50000	100.00	3. mmscf	0.017	☑		1.7	☐
3	B1-1	19	1151	100.00	3. mmscf	0.0001	☑		0.01	☐
4	B1-1	19	91203	100.00	3. mmscf	0.0003	☑		0.03	☐
5	B1-1	29	75070	100.00	3. mmscf	0.0043	☑		0.43	☐
6	B1-1	30	107028	100.00	3. mmscf	0.0027	☑		0.27	☐
7	B1-1	32	7664417	100.00	3. mmscf	18	☑		1,800	☐
8	B1-1	40	100414	100.00	3. mmscf	0.0095	☑		0.95	☐
9	B1-1	44	110543	100.00	3. mmscf	0.0063	☑		0.63	☐
10	B1-1	68	108883	100.00	3. mmscf	0.0366	☑		3.66	☐
11	B1-1	70	1330207	100.00	3. mmscf	0.0272	☑		2.72	☐
12							☐			☐

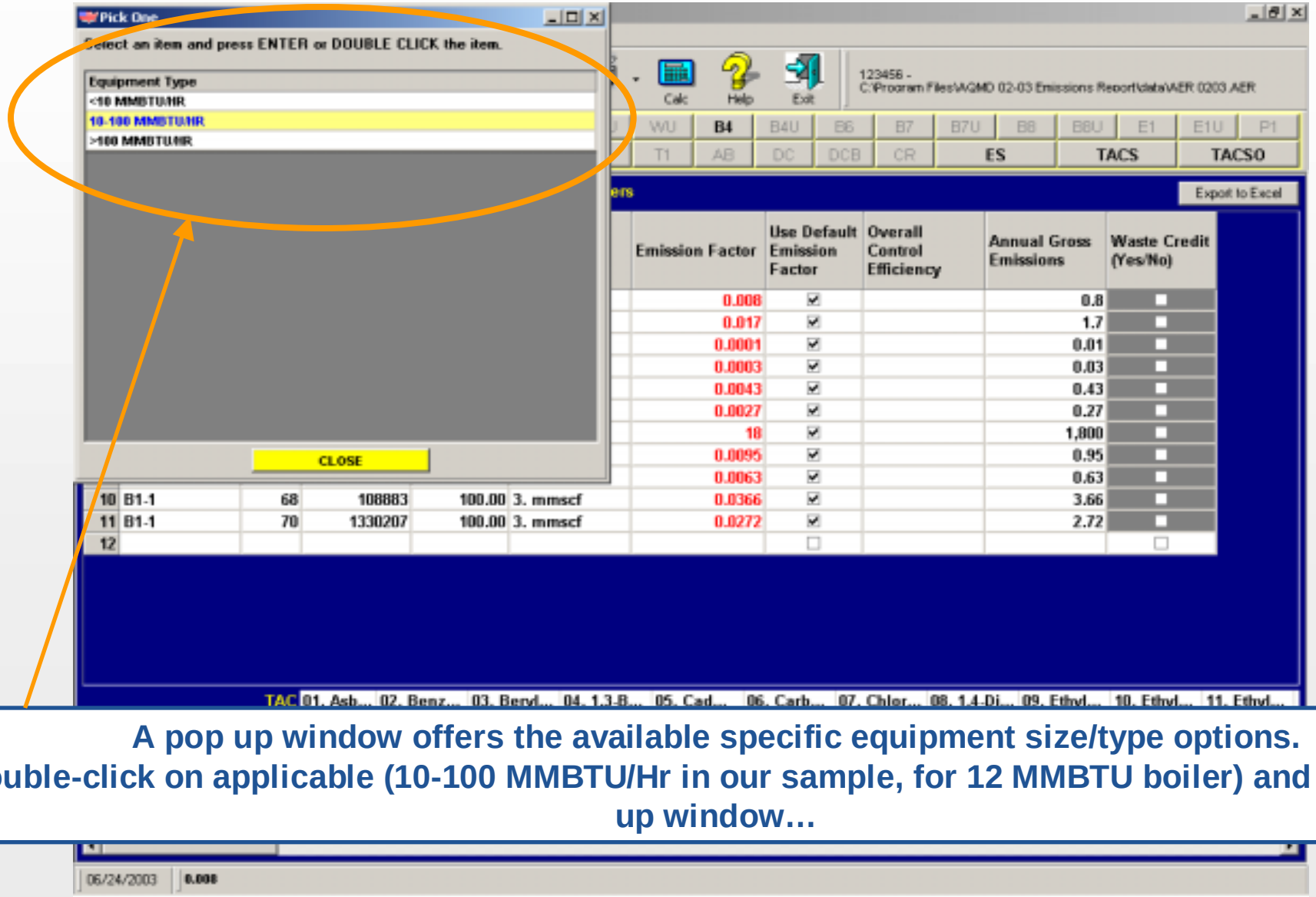
You are required to report your Toxic Air Contaminants and Ozone Depleters emissions on Form TAC . In the example shown previously on Form B-1, a Boiler was reported and you received a pop up message informing you that Default Toxic Emission Factors have been assigned on Form TAC for most common equipment size/type (for boiler, defaults for <10 MMBTU/Hr). Toxic emissions as a result of burning Natural Gas in <10 MMBTU/Hr boiler are calculated by the Software and automatically reported on Form TAC, as shown. However…

Form TAC – Equipment Type Change



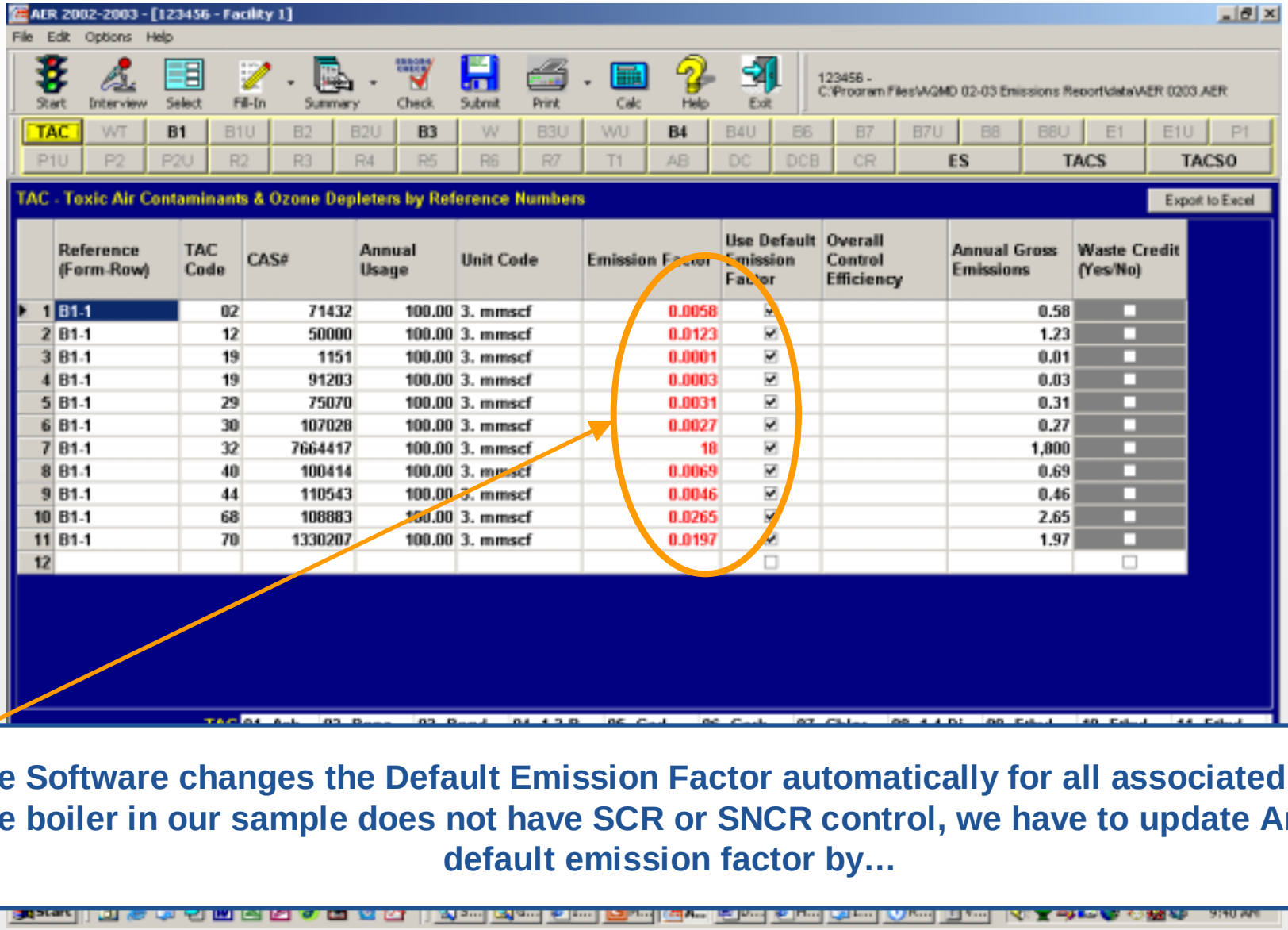
…you must check the size/type of your equipment and change the emission factor value if necessary. Since our boiler is 12 MMBTU, to change it: right click on any associated row and click on “Change Equipment Type”.

Form TAC – Change Equipment Type



A pop up window offers the available specific equipment size/type options.
Double-click on applicable (10-100 MMBTU/Hr in our sample, for 12 MMBTU boiler) and close pop up window…

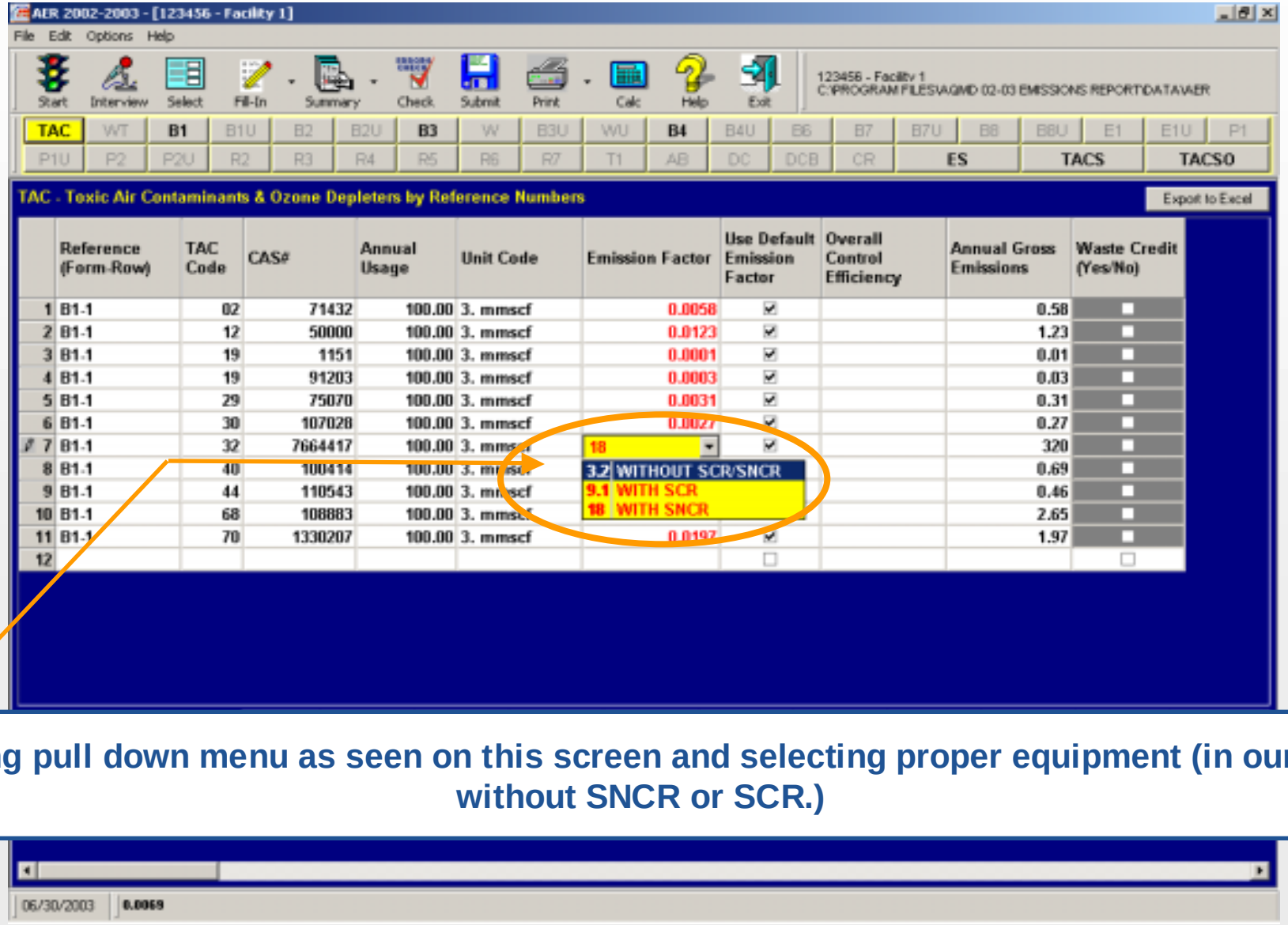
Form TAC – Change Equipment Type



	Reference (Form-Row)	TAC Code	CAS#	Annual Usage	Unit Code	Emission Factor	Use Default Emission Factor	Overall Control Efficiency	Annual Gross Emissions	Waste Credit (Yes/No)
1	B1-1	02	71432	100.00	3. mmscf	0.0058	☑		0.58	☐
2	B1-1	12	50000	100.00	3. mmscf	0.0123	☑		1.23	☐
3	B1-1	19	1151	100.00	3. mmscf	0.0001	☑		0.01	☐
4	B1-1	19	91203	100.00	3. mmscf	0.0003	☑		0.03	☐
5	B1-1	29	75070	100.00	3. mmscf	0.0031	☑		0.31	☐
6	B1-1	30	107028	100.00	3. mmscf	0.0027	☑		0.27	☐
7	B1-1	32	7664417	100.00	3. mmscf	18	☑		1,800	☐
8	B1-1	40	100414	100.00	3. mmscf	0.0069	☑		0.69	☐
9	B1-1	44	110543	100.00	3. mmscf	0.0046	☑		0.46	☐
10	B1-1	68	108883	100.00	3. mmscf	0.0265	☑		2.65	☐
11	B1-1	70	1330207	100.00	3. mmscf	0.0197	☑		1.97	☐
12							☐			☐

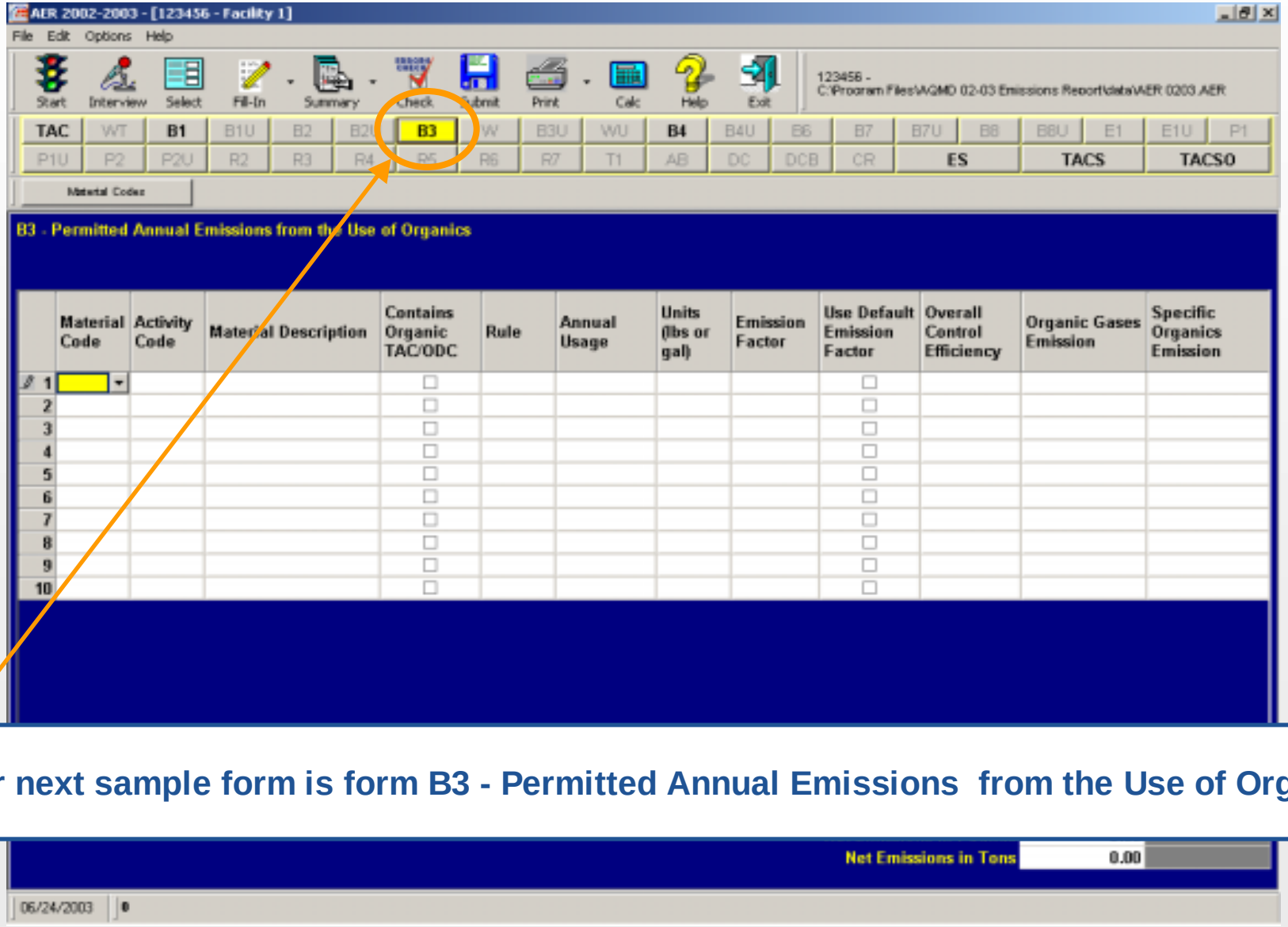
The Software changes the Default Emission Factor automatically for all associated rows. Since boiler in our sample does not have SCR or SNCR control, we have to update Ammonia default emission factor by…

Form TAC – Change Equipment Type for Ammonia



…opening pull down menu as seen on this screen and selecting proper equipment (in our sample without SNCR or SCR.)

Form B3 – Reporting Use of Organics



Our next sample form is form B3 - Permitted Annual Emissions from the Use of Organics.

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Form B3 – Material Code

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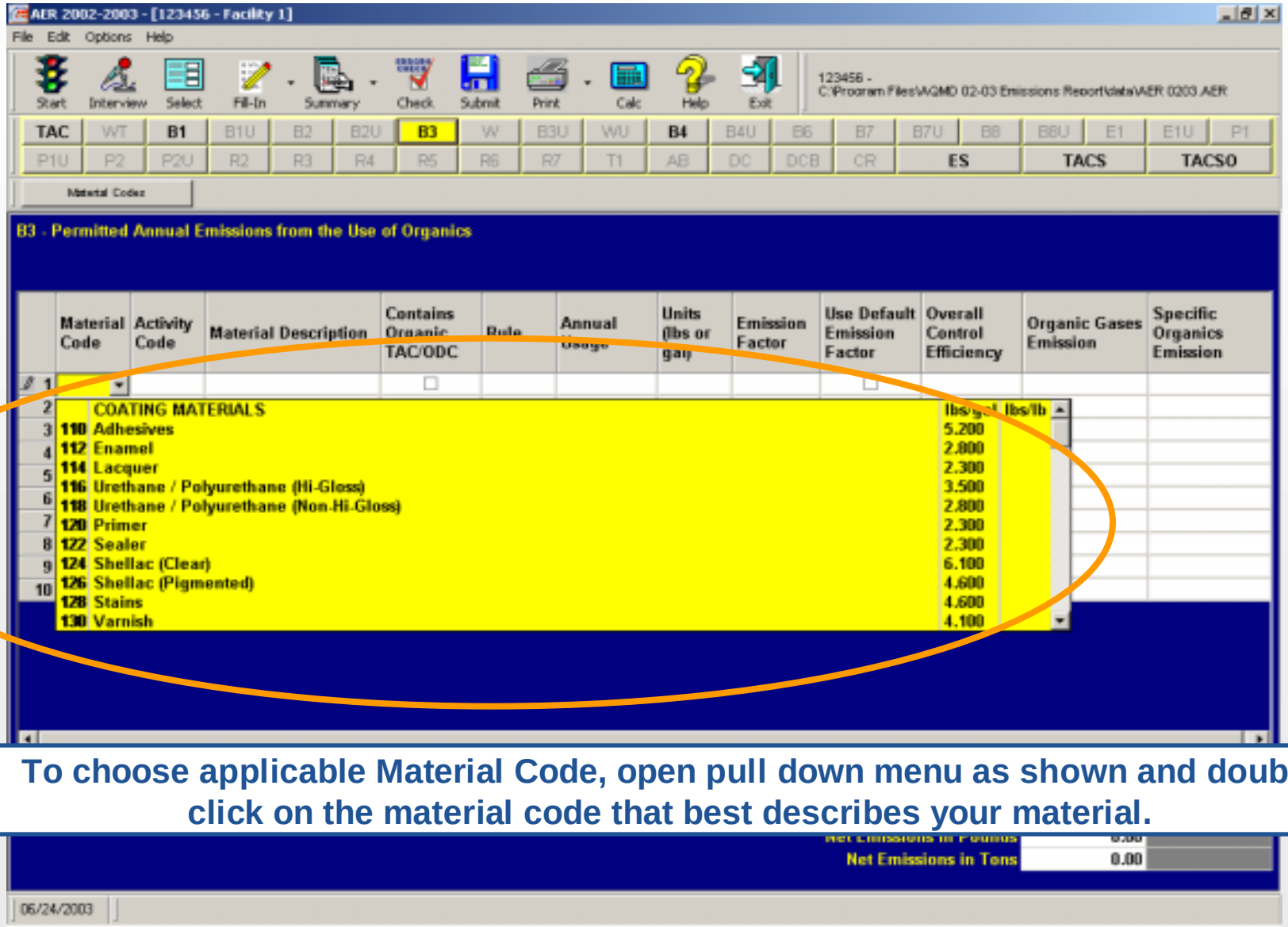
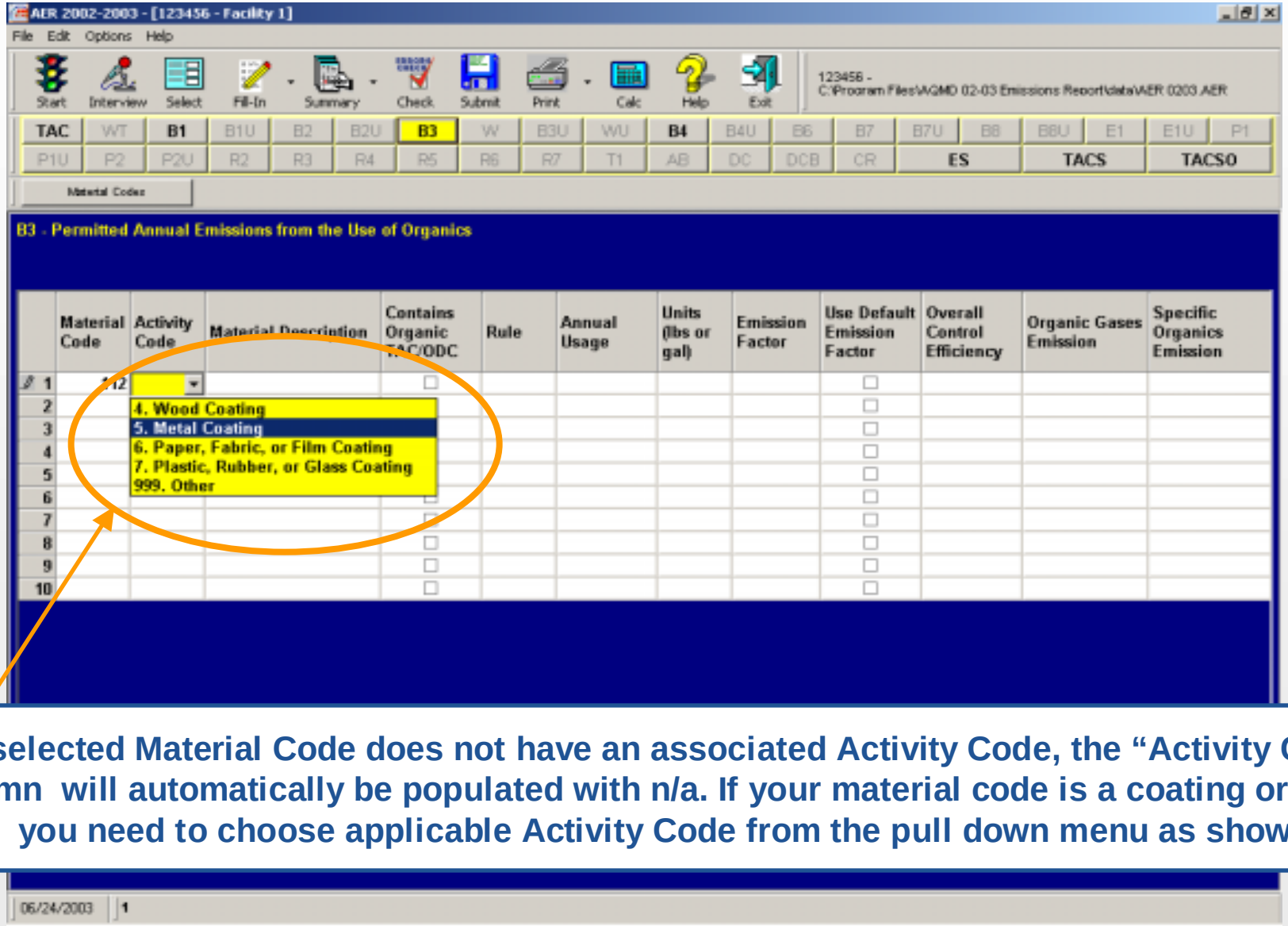


To choose applicable Material Code, open pull down menu as shown and double click on the material code that best describes your material.

Form B3 – Activity Code



If selected Material Code does not have an associated Activity Code, the "Activity Code" column will automatically be populated with n/a. If your material code is a coating or solvent, you need to choose applicable Activity Code from the pull down menu as shown.

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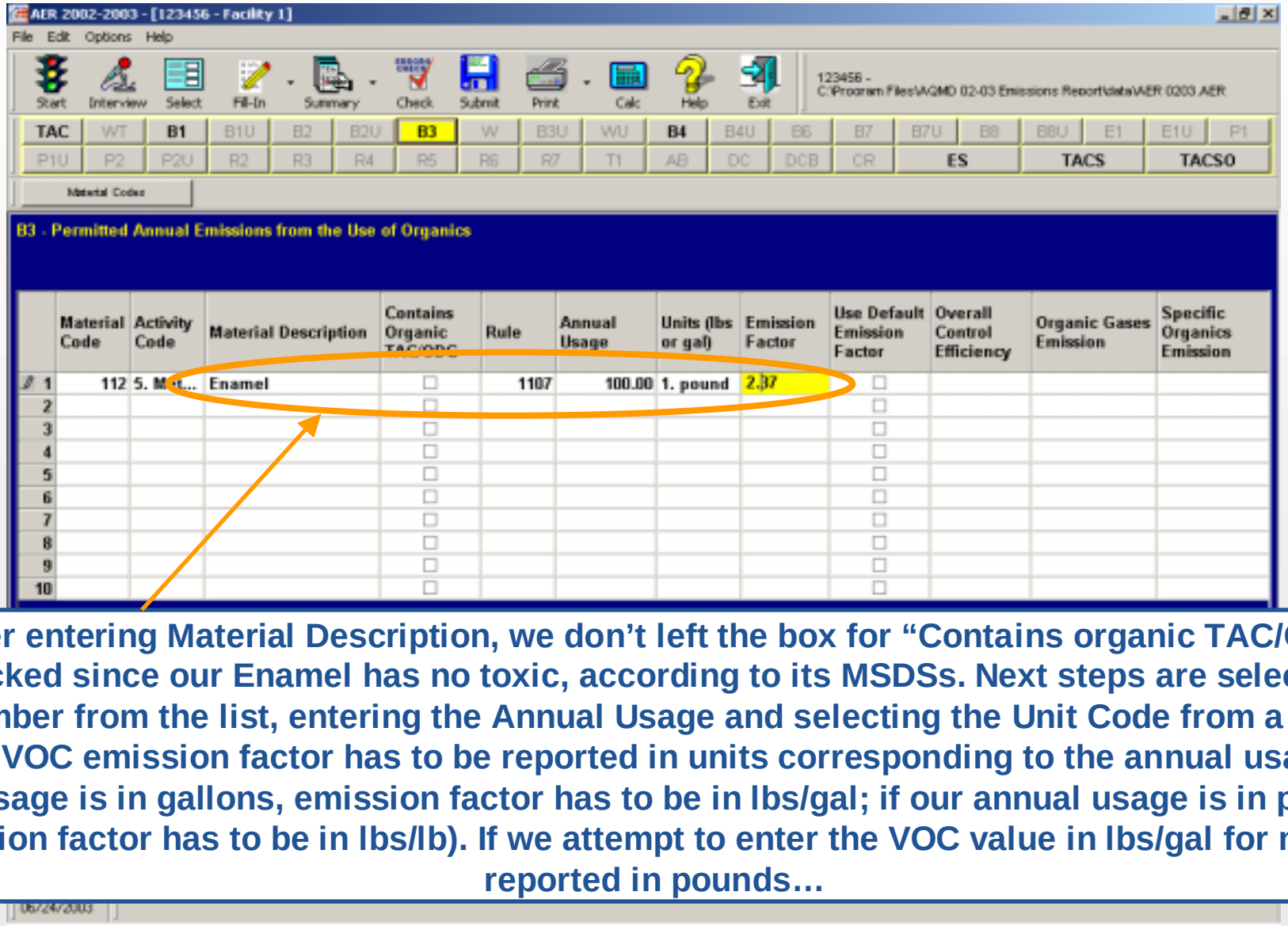
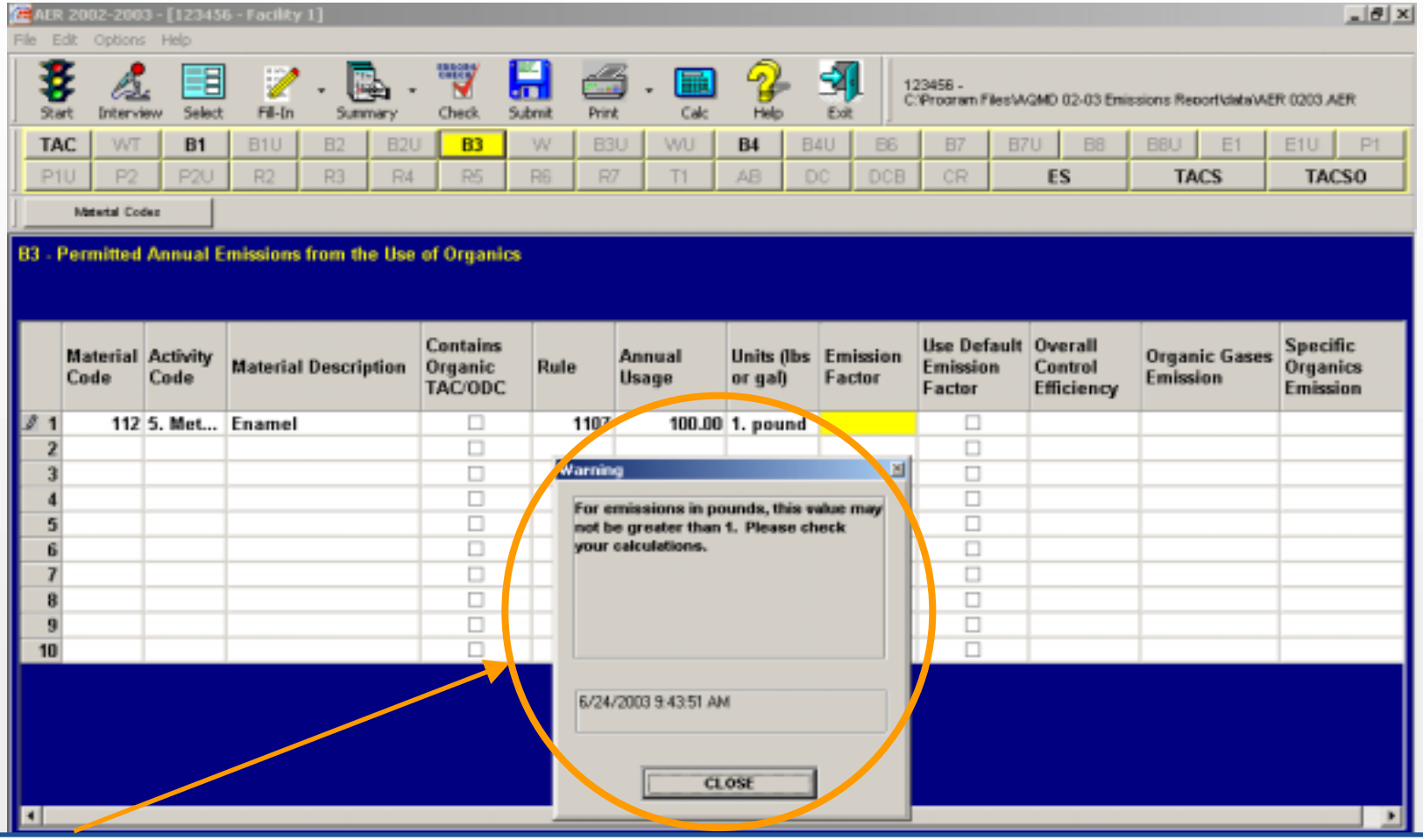
Form B3 – Units and Emission Factor



After entering Material Description, we don't left the box for "Contains organic TAC/ODC" unchecked since our Enamel has no toxic, according to its MSDSs. Next steps are selecting the Rule number from the list, entering the Annual Usage and selecting the Unit Code from a pull down list. The VOC emission factor has to be reported in units corresponding to the annual usage (if our annual usage is in gallons, emission factor has to be in lbs/gal; if our annual usage is in pounds the emission factor has to be in lbs/lb). If we attempt to enter the VOC value in lbs/gal for material reported in pounds…

Form B3 – Units and Emission Factor



A warning pops up to remind us that the Emission Factor cannot be greater than 1, if units are in Pounds (you can not have more that 1 lb of VOC in 1 lb of material). This is a sample of the validation checks that are built-in throughout the software, they prevent the occurrence of obvious mistakes.

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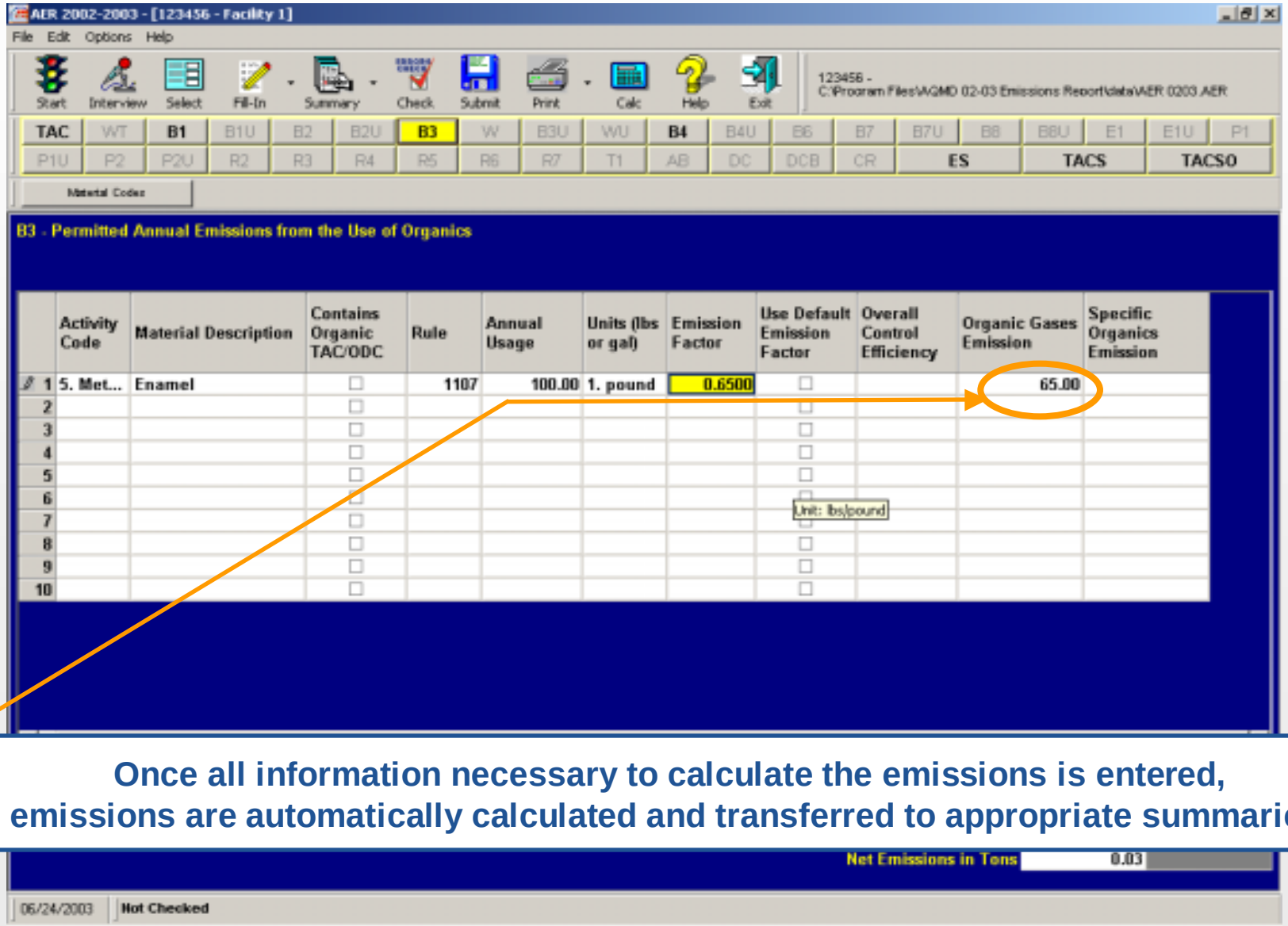
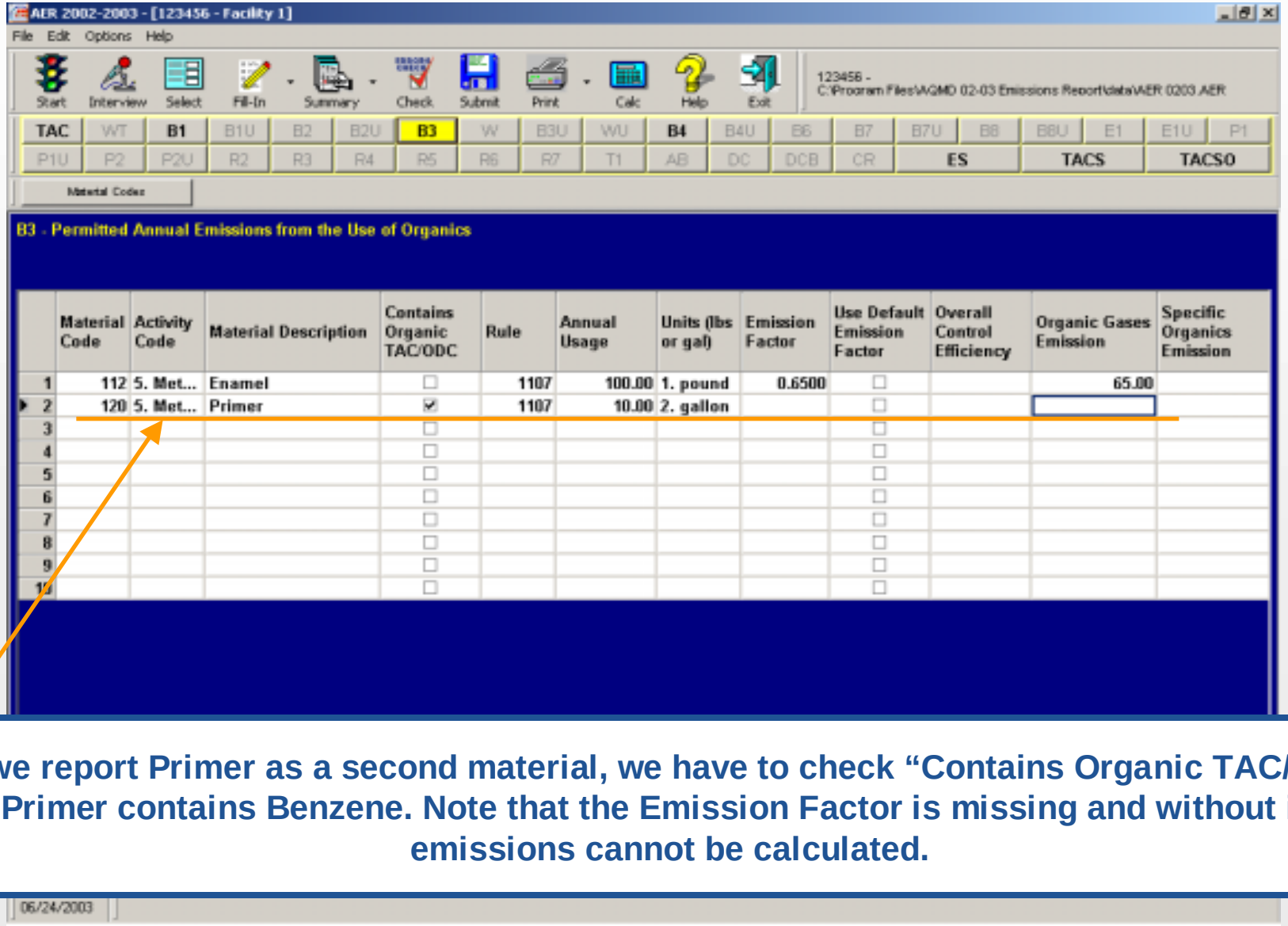
Form B3 – Units and Emission Factor



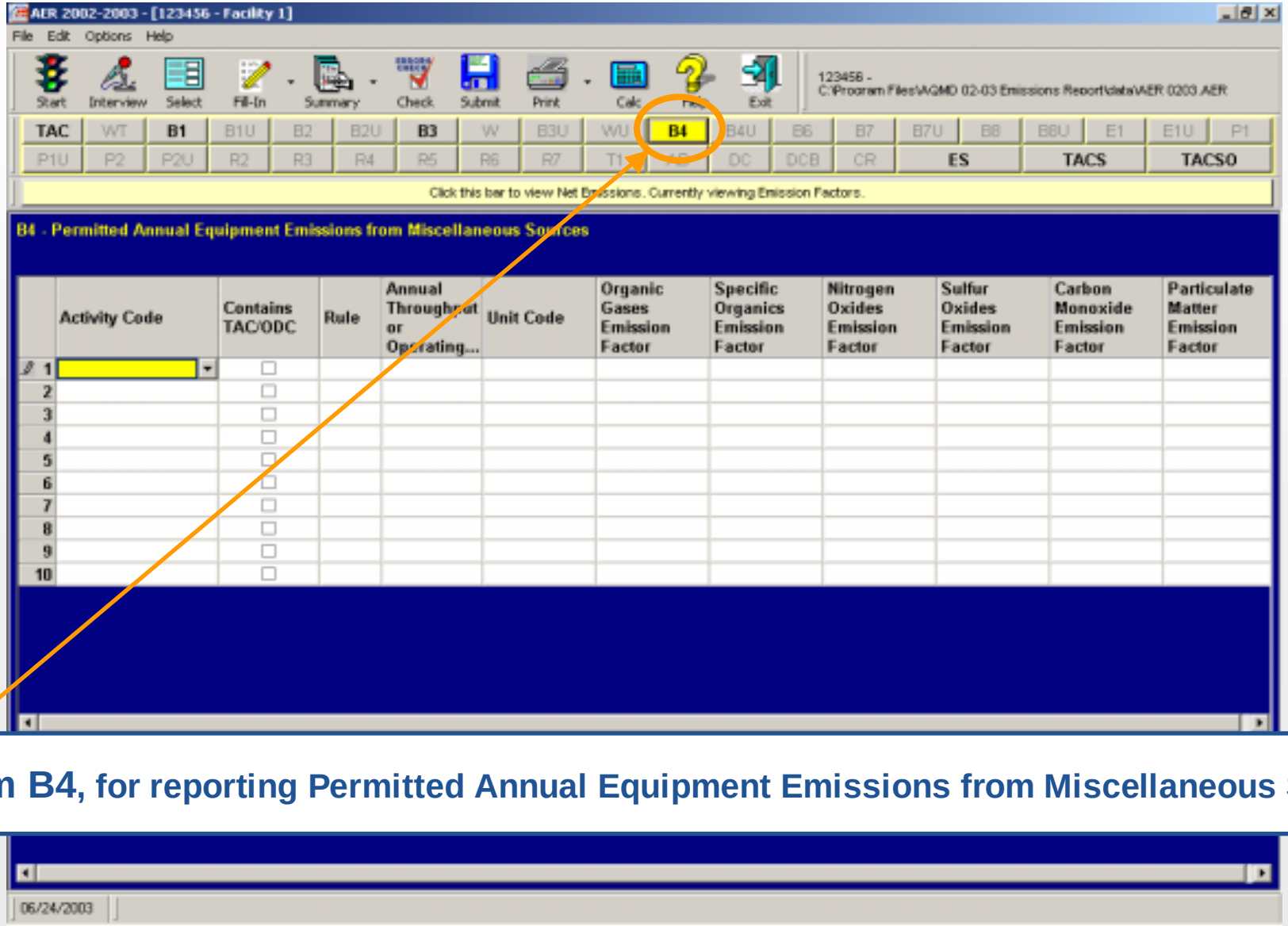
Once all information necessary to calculate the emissions is entered, emissions are automatically calculated and transferred to appropriate summaries.

Form B3 – Reporting next material



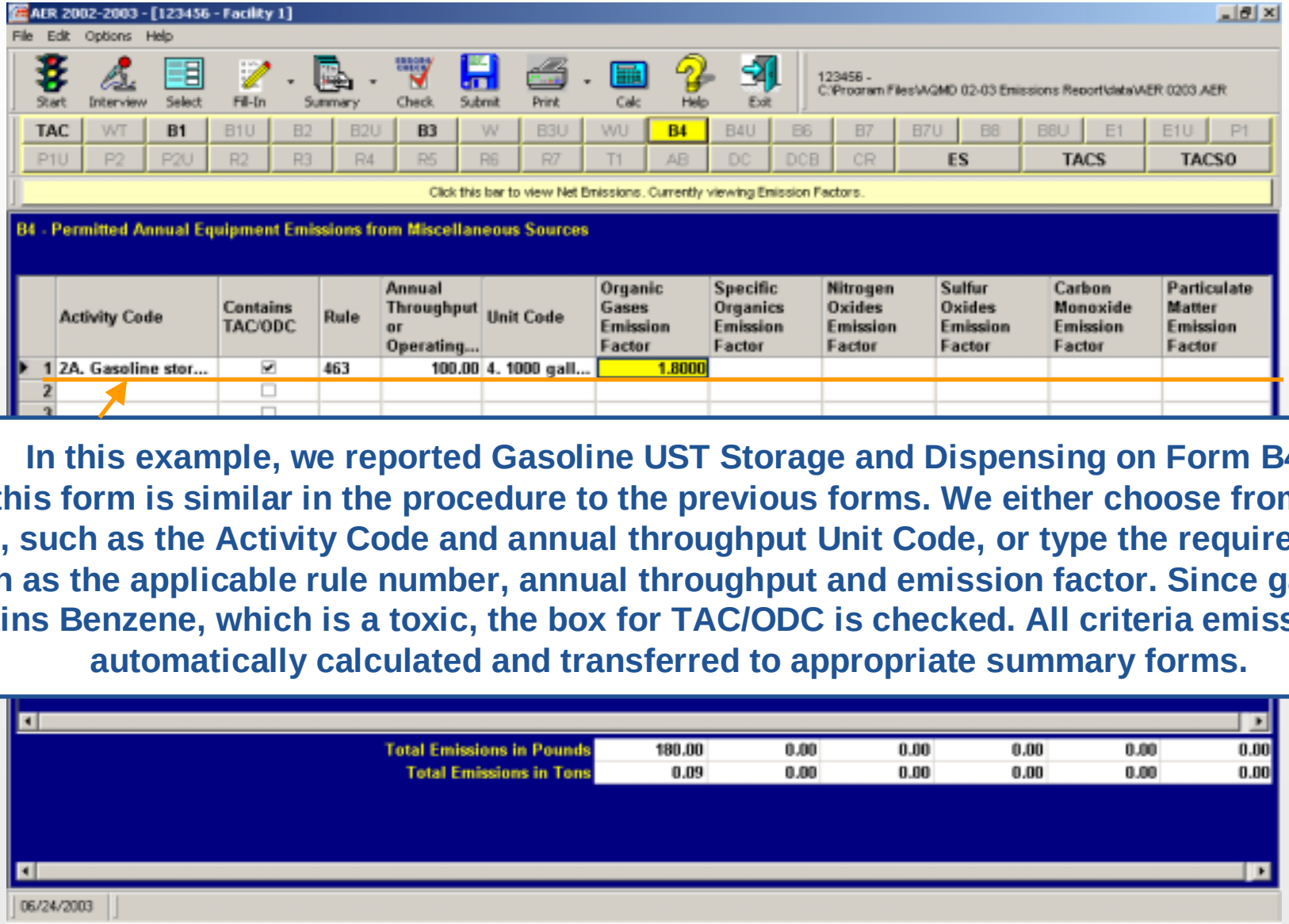
If we report Primer as a second material, we have to check "Contains Organic TAC/ODC" since Primer contains Benzene. Note that the Emission Factor is missing and without it, Primer emissions cannot be calculated.

Form B4 – Emissions from Misc. Sources



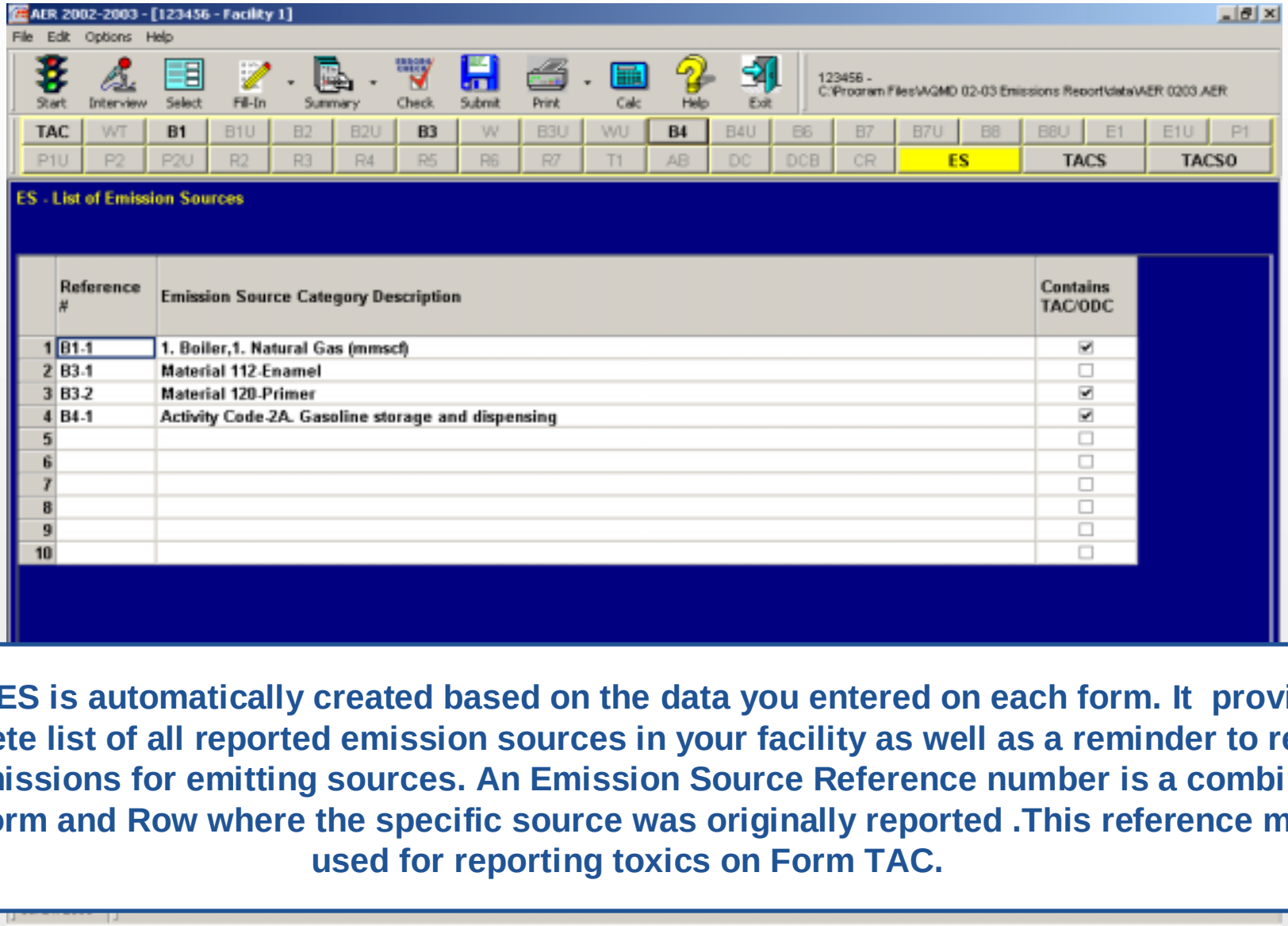
Form B4, for reporting Permitted Annual Equipment Emissions from Miscellaneous Sources.

Form B4 – Emissions from Misc. Sources



In this example, we reported Gasoline UST Storage and Dispensing on Form B4. Filling this form is similar in the procedure to the previous forms. We either choose from the built-in list, such as the Activity Code and annual throughput Unit Code, or type the required values such as the applicable rule number, annual throughput and emission factor. Since gasoline contains Benzene, which is a toxic, the box for TAC/ODC is checked. All criteria emissions are automatically calculated and transferred to appropriate summary forms.

Summary Forms – Form ES



Form ES is automatically created based on the data you entered on each form. It provides a complete list of all reported emission sources in your facility as well as a reminder to report toxic emissions for emitting sources. An Emission Source Reference number is a combination of the Form and Row where the specific source was originally reported .This reference must be used for reporting toxics on Form TAC.

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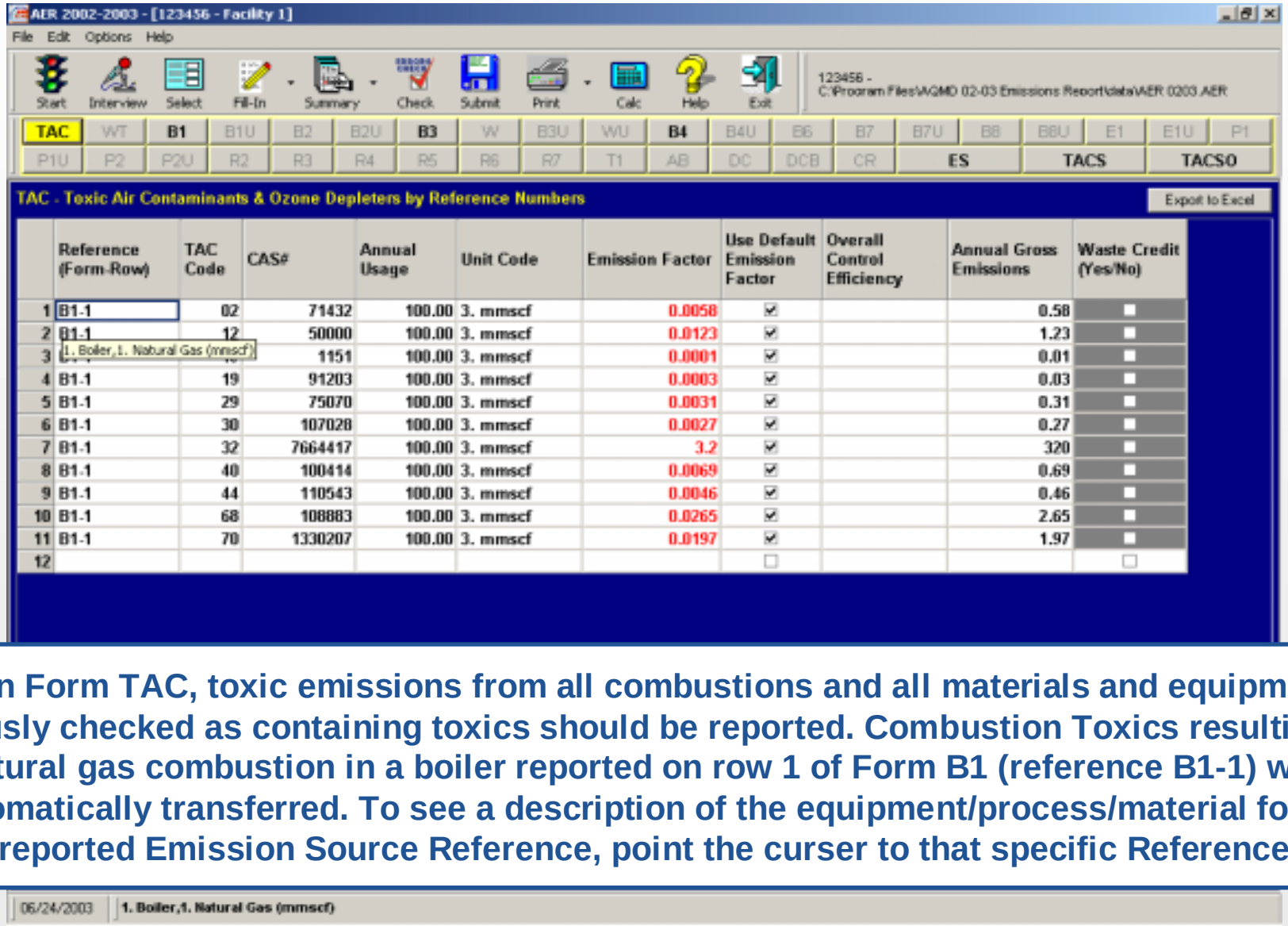
Form TAC – Reporting Toxics



	Reference (Form-Row)	TAC Code	CAS#	Annual Usage	Unit Code	Emission Factor	Use Default Emission Factor	Overall Control Efficiency	Annual Gross Emissions	Waste Credit (Yes/No)
1	B1-1	02	71432	100.00	3. mmscf	0.0058	☑		0.58	☐
2	B1-1	12	50000	100.00	3. mmscf	0.0123	☑		1.23	☐
3			1151	100.00	3. mmscf	0.0001	☑		0.01	☐
4	B1-1	19	91203	100.00	3. mmscf	0.0003	☑		0.03	☐
5	B1-1	29	75070	100.00	3. mmscf	0.0031	☑		0.31	☐
6	B1-1	30	107028	100.00	3. mmscf	0.0027	☑		0.27	☐
7	B1-1	32	7664417	100.00	3. mmscf	3.2	☑		320	☐
8	B1-1	40	100414	100.00	3. mmscf	0.0069	☑		0.69	☐
9	B1-1	44	110543	100.00	3. mmscf	0.0046	☑		0.46	☐
10	B1-1	68	108883	100.00	3. mmscf	0.0265	☑		2.65	☐
11	B1-1	70	1330207	100.00	3. mmscf	0.0197	☑		1.97	☐
12							☐			☐

On Form TAC, toxic emissions from all combustions and all materials and equipment previously checked as containing toxics should be reported. Combustion Toxics resulting from natural gas combustion in a boiler reported on row 1 of Form B1 (reference B1-1) were automatically transferred. To see a description of the equipment/process/material for the reported Emission Source Reference, point the curser to that specific Reference.

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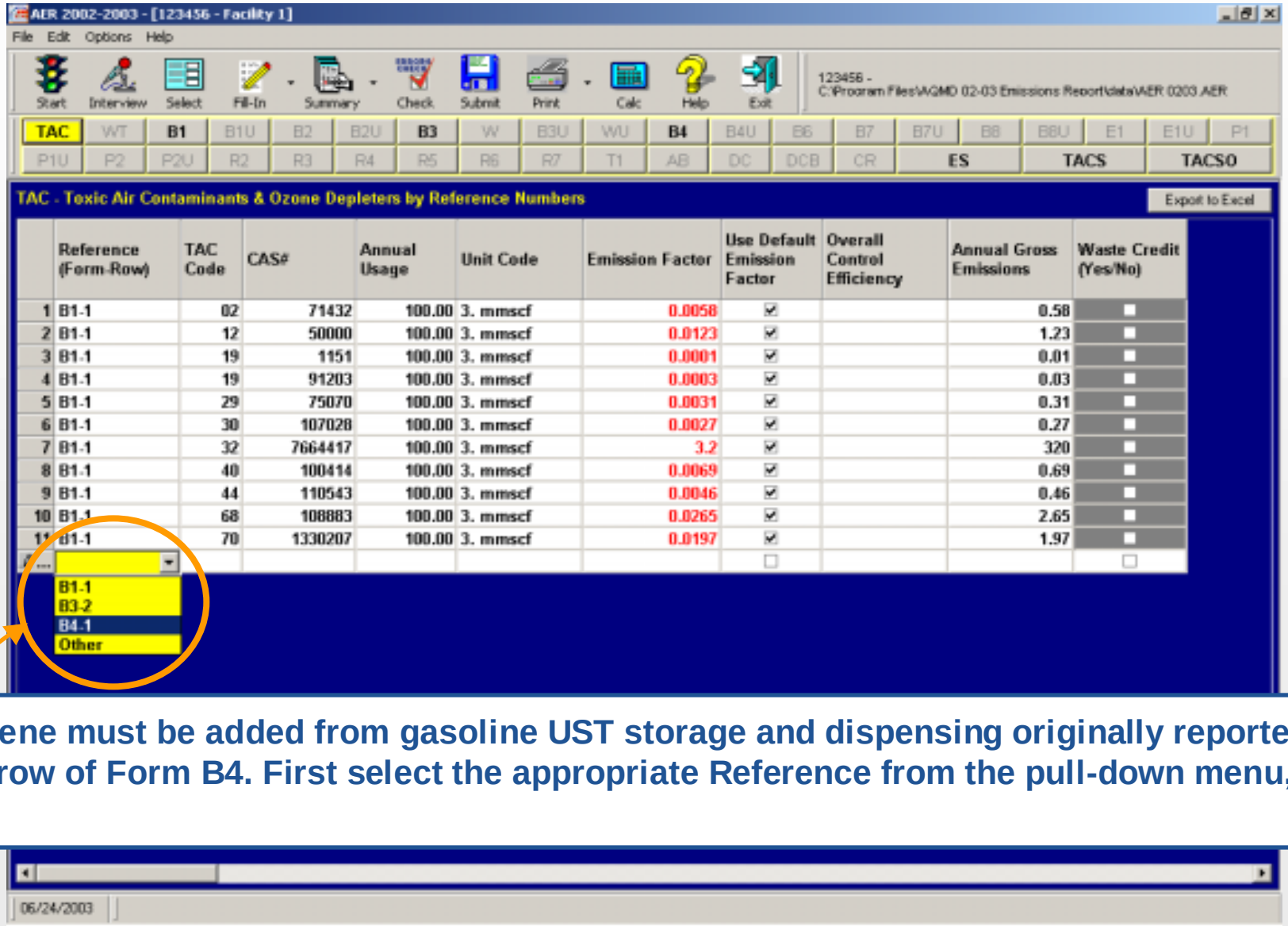
Form TAC – Reporting Toxics



Benzene must be added from gasoline UST storage and dispensing originally reported on the 1st row of Form B4. First select the appropriate Reference from the pull-down menu, then...

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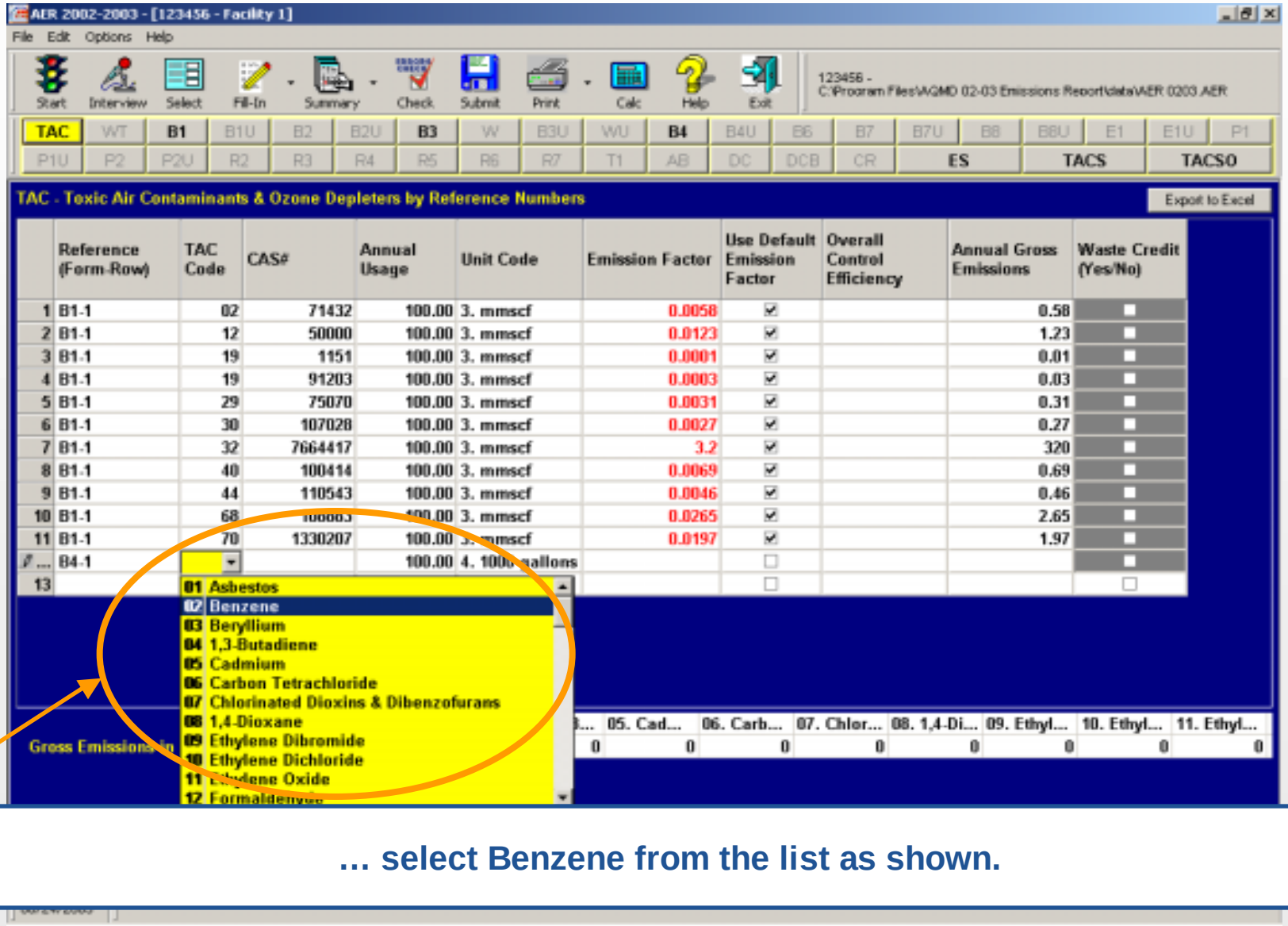
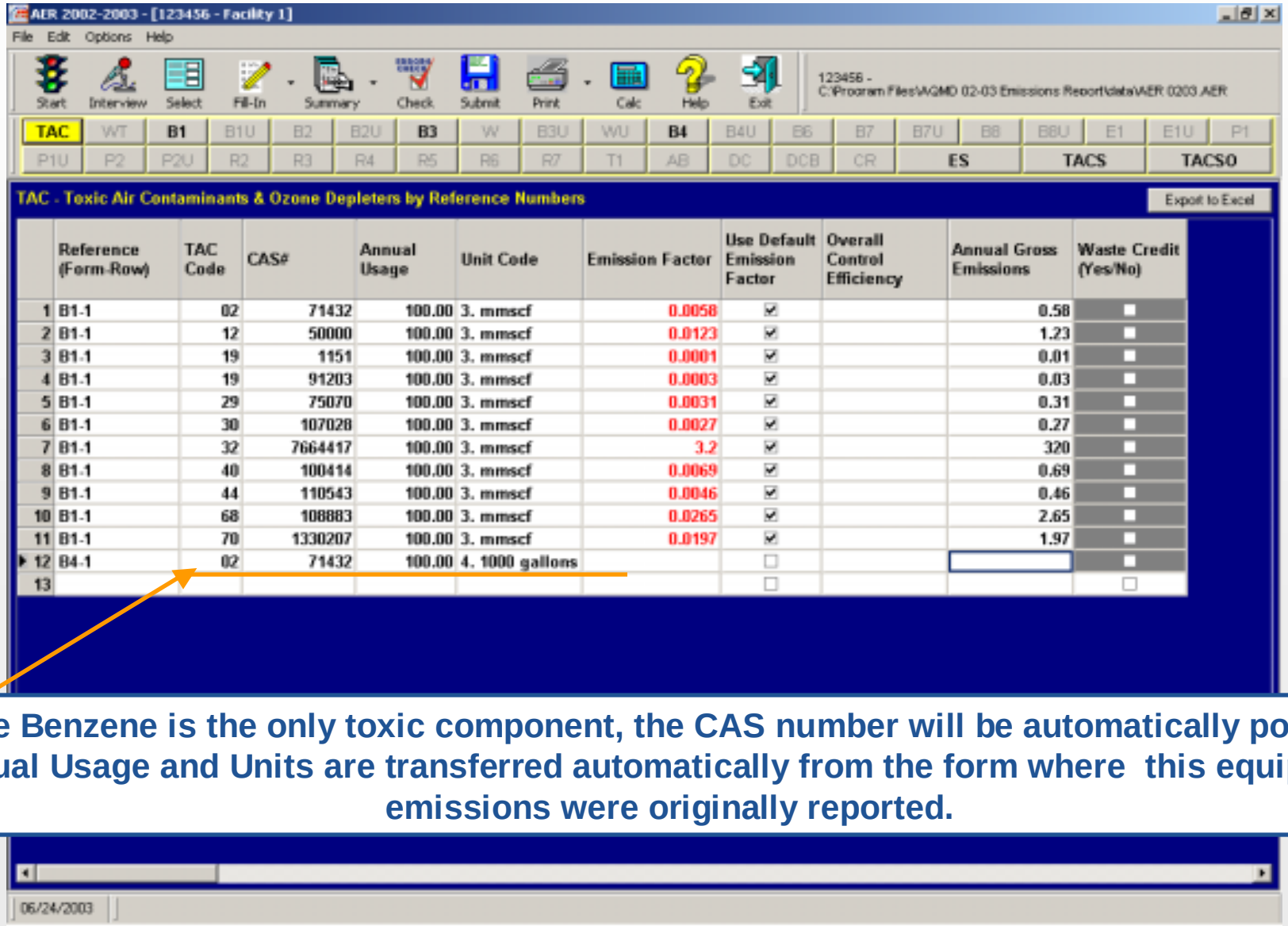
Form TAC – Reporting Toxics



… select Benzene from the list as shown.

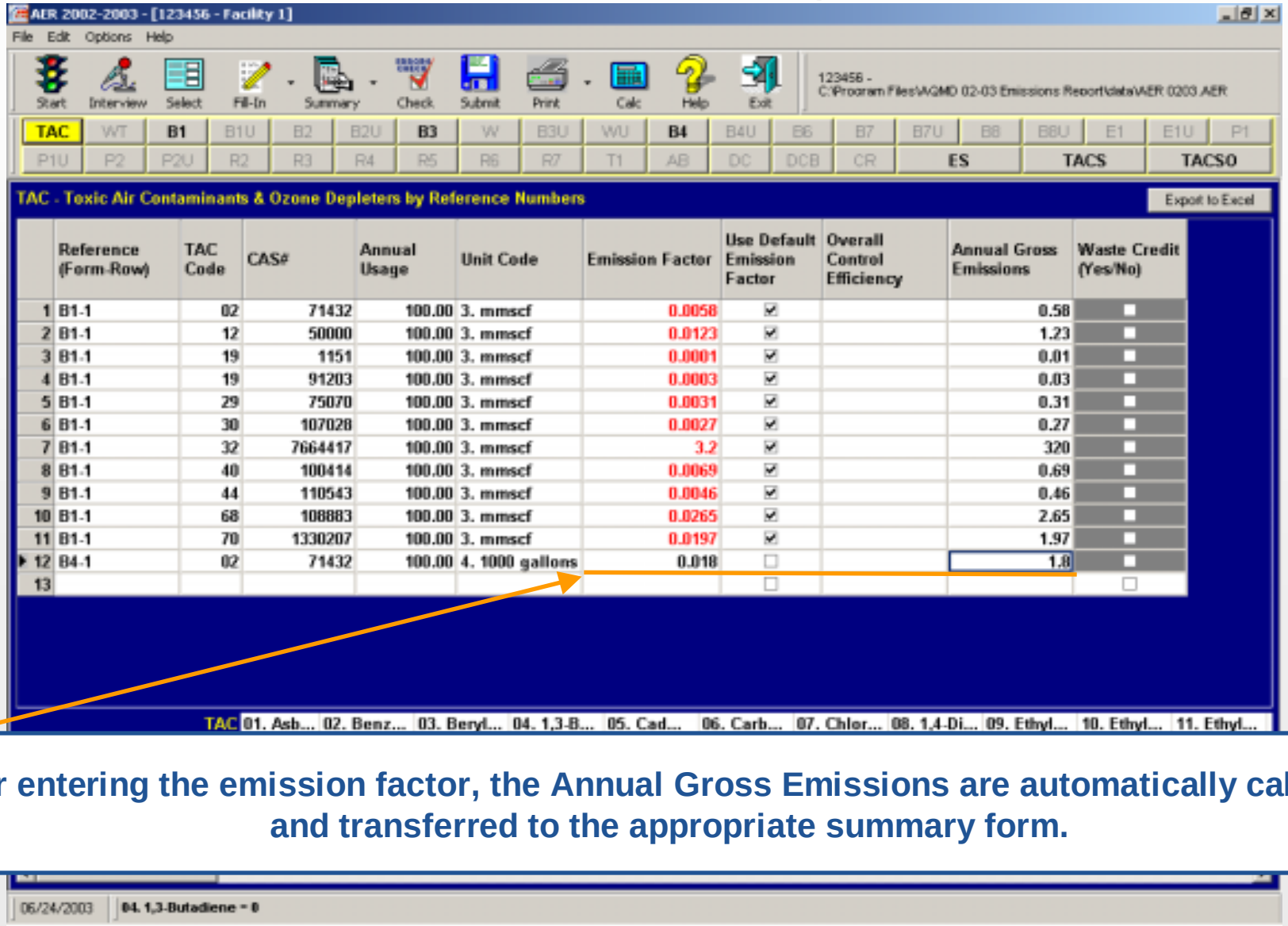
Form TAC – Reporting Toxics



	Reference (Form-Row)	TAC Code	CAS#	Annual Usage	Unit Code	Emission Factor	Use Default Emission Factor	Overall Control Efficiency	Annual Gross Emissions	Waste Credit (Yes/No)
1	B1-1	02	71432	100.00	3. mmscf	0.0058	☑		0.58	☐
2	B1-1	12	50000	100.00	3. mmscf	0.0123	☑		1.23	☐
3	B1-1	19	1151	100.00	3. mmscf	0.0001	☑		0.01	☐
4	B1-1	19	91203	100.00	3. mmscf	0.0003	☑		0.03	☐
5	B1-1	29	75070	100.00	3. mmscf	0.0031	☑		0.31	☐
6	B1-1	30	107028	100.00	3. mmscf	0.0027	☑		0.27	☐
7	B1-1	32	7664417	100.00	3. mmscf	3.2	☑		320	☐
8	B1-1	40	100414	100.00	3. mmscf	0.0069	☑		0.69	☐
9	B1-1	44	110543	100.00	3. mmscf	0.0046	☑		0.46	☐
10	B1-1	68	108883	100.00	3. mmscf	0.0265	☑		2.65	☐
11	B1-1	70	1330207	100.00	3. mmscf	0.0197	☑		1.97	☐
▶ 12	B4-1	02	71432	100.00	4. 1000 gallons		☐			☐
13							☐			☐

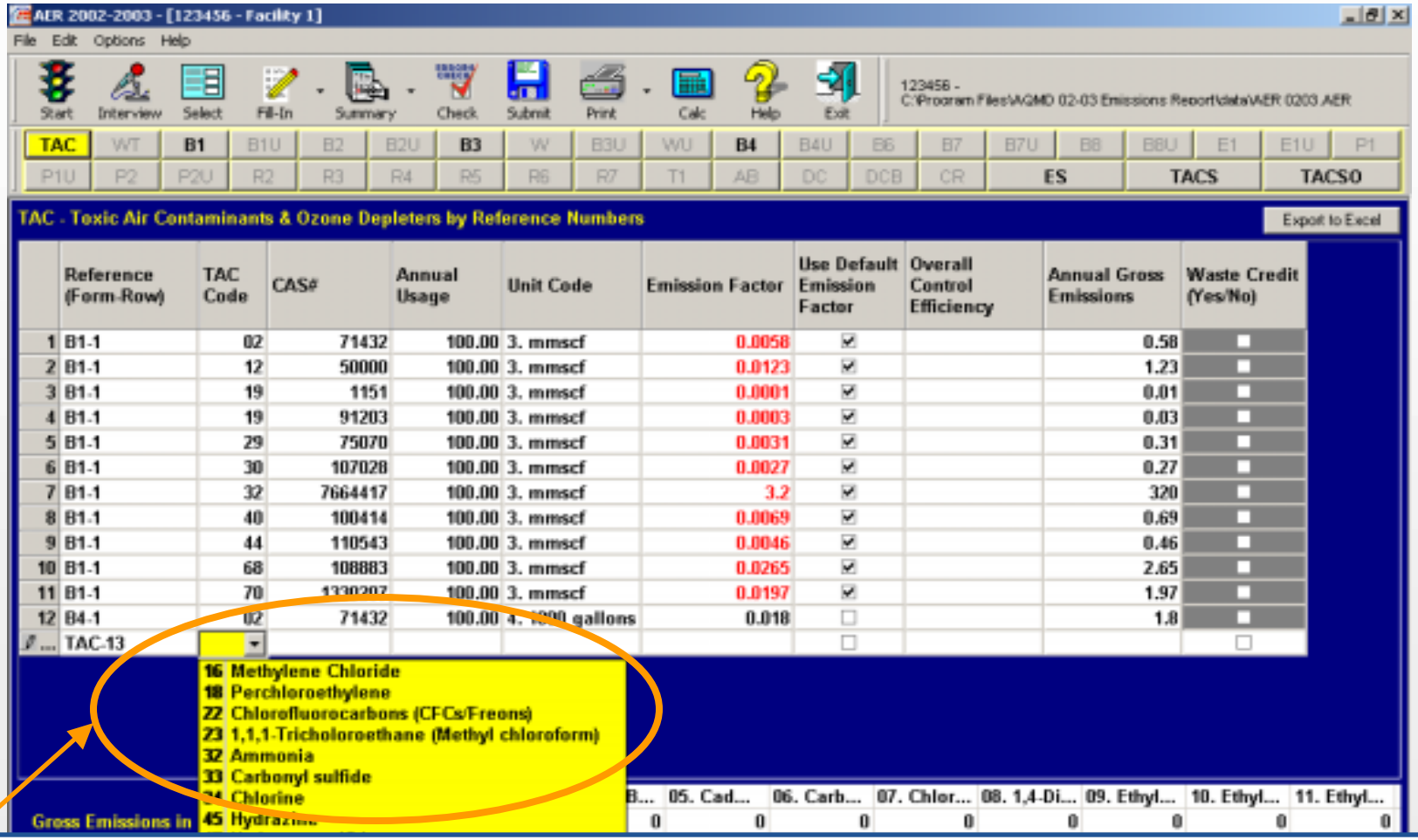
Since Benzene is the only toxic component, the CAS number will be automatically populated. Annual Usage and Units are transferred automatically from the form where this equipment's emissions were originally reported.

Form TAC – Reporting Toxics



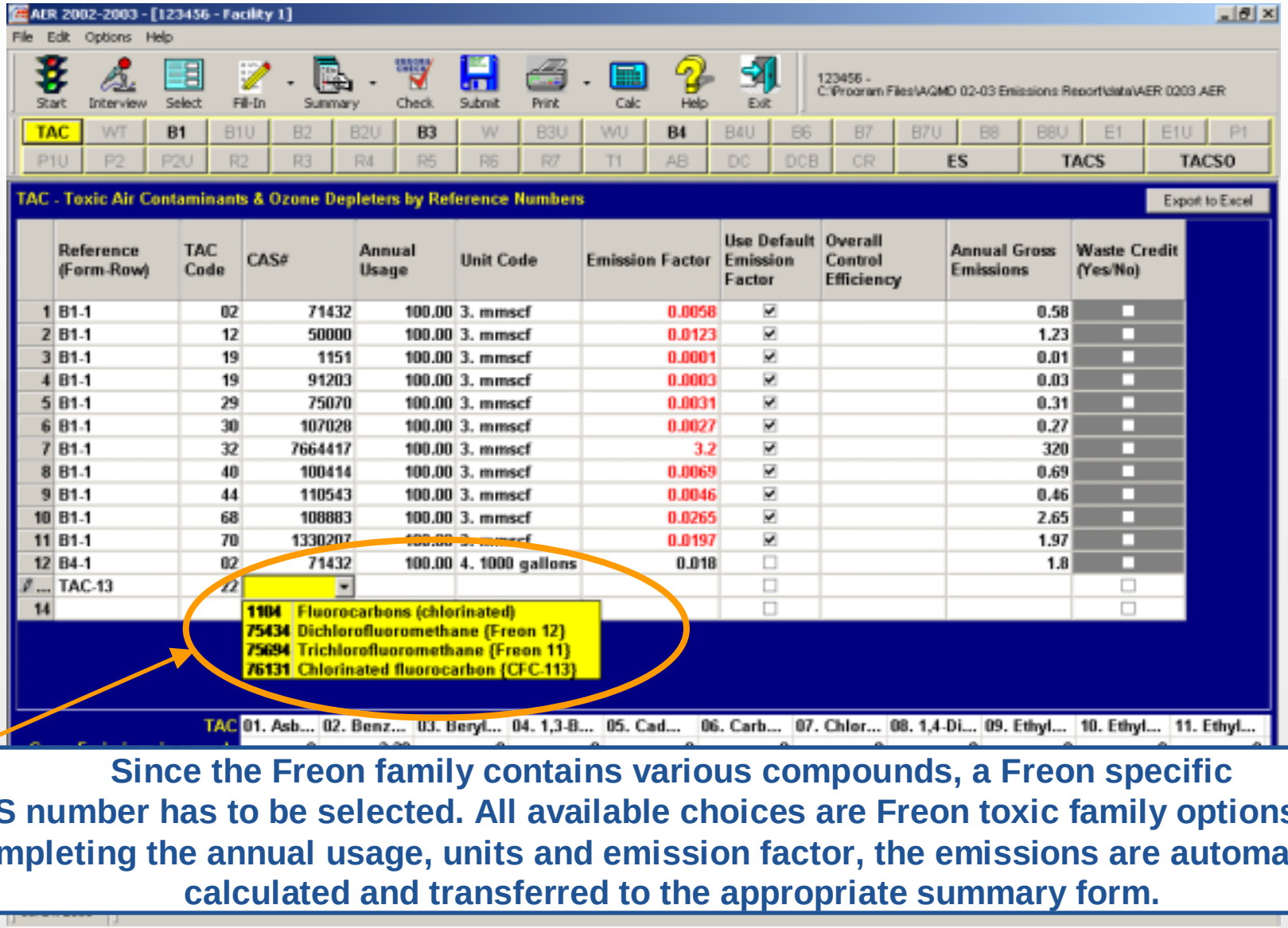
After entering the emission factor, the Annual Gross Emissions are automatically calculated and transferred to the appropriate summary form.

Form TAC – Reporting Toxics



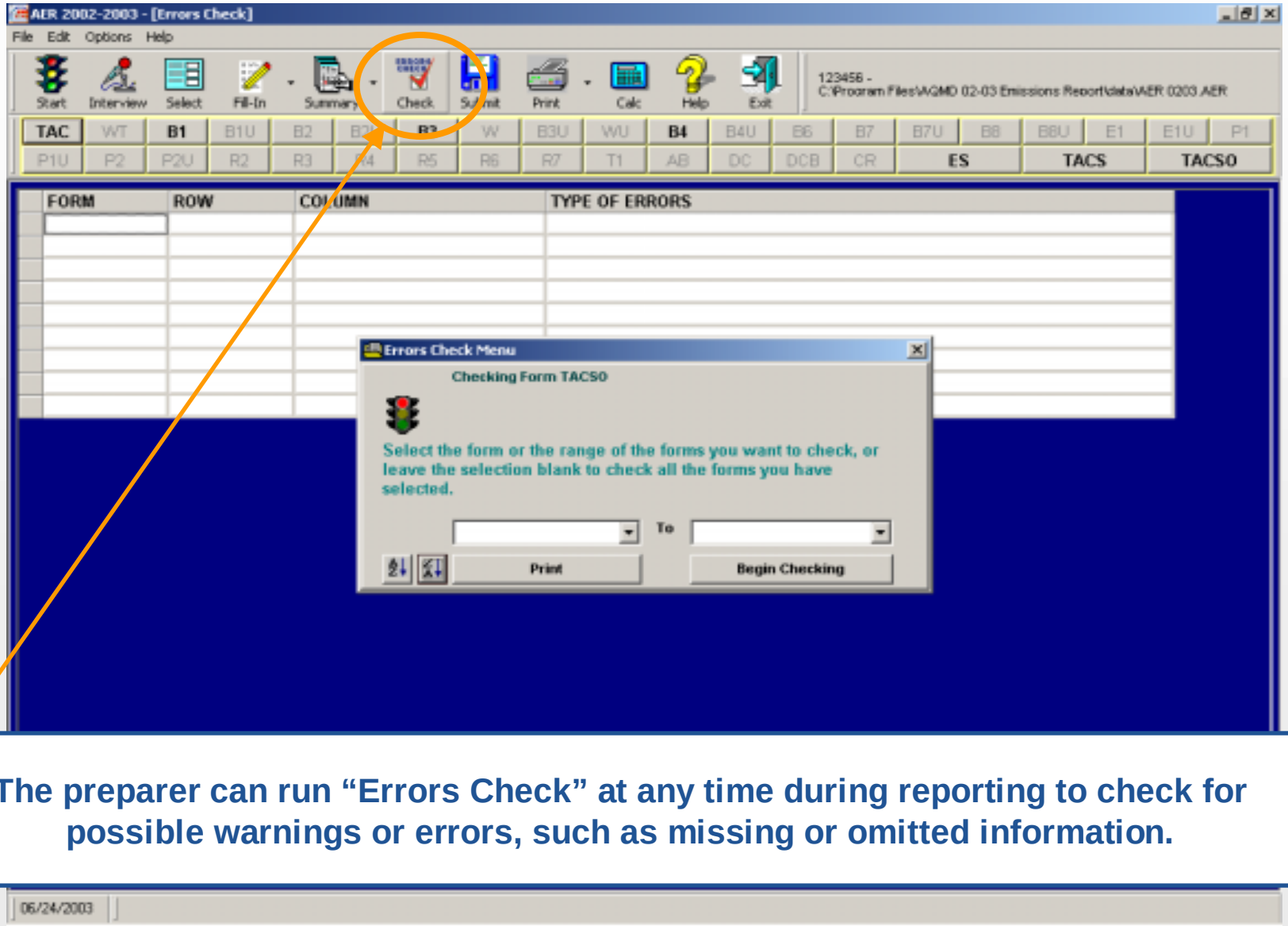
Since Freon is classified as “Only ODC” it has to be directly reported on Form TAC. For Reference choose “Other” (which results in a TAC-row Reference), then choose Freon toxic family. Note that if you choose “Other” Reference, your only options for “TAC Code” are materials that are classified as only TAC or ODC.

Form TAC – Reporting Toxics



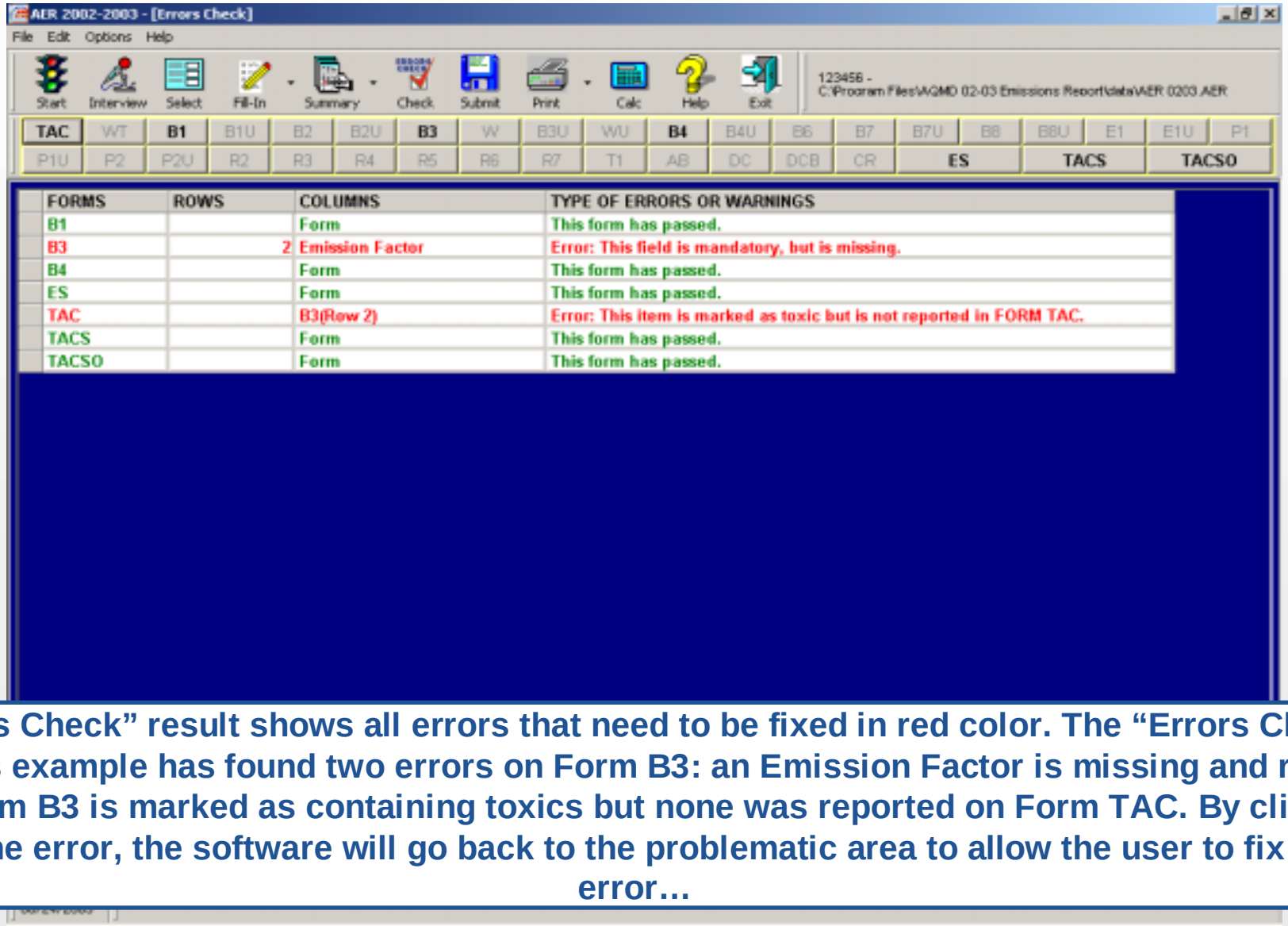
Since the Freon family contains various compounds, a Freon specific CAS number has to be selected. All available choices are Freon toxic family options. After completing the annual usage, units and emission factor, the emissions are automatically calculated and transferred to the appropriate summary form.

Errors Check



The preparer can run “Errors Check” at any time during reporting to check for possible warnings or errors, such as missing or omitted information.

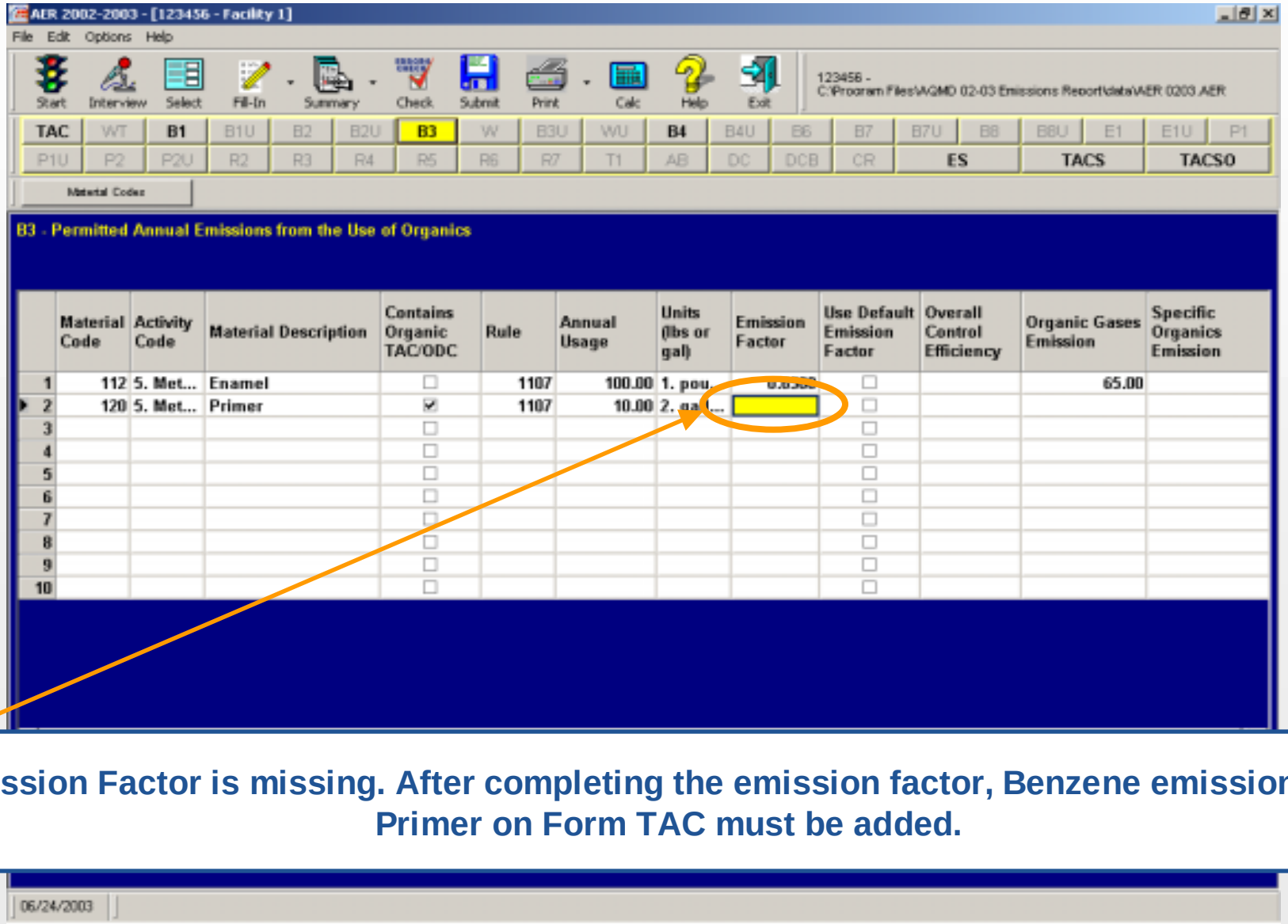
Errors Check results



FORMS	ROWS	COLUMNS	TYPE OF ERRORS OR WARNINGS
B1		Form	This form has passed.
B3	2	Emission Factor	Error: This field is mandatory, but is missing.
B4		Form	This form has passed.
ES		Form	This form has passed.
TAC		B3(Row 2)	Error: This item is marked as toxic but is not reported in FORM TAC.
TACS		Form	This form has passed.
TACSO		Form	This form has passed.

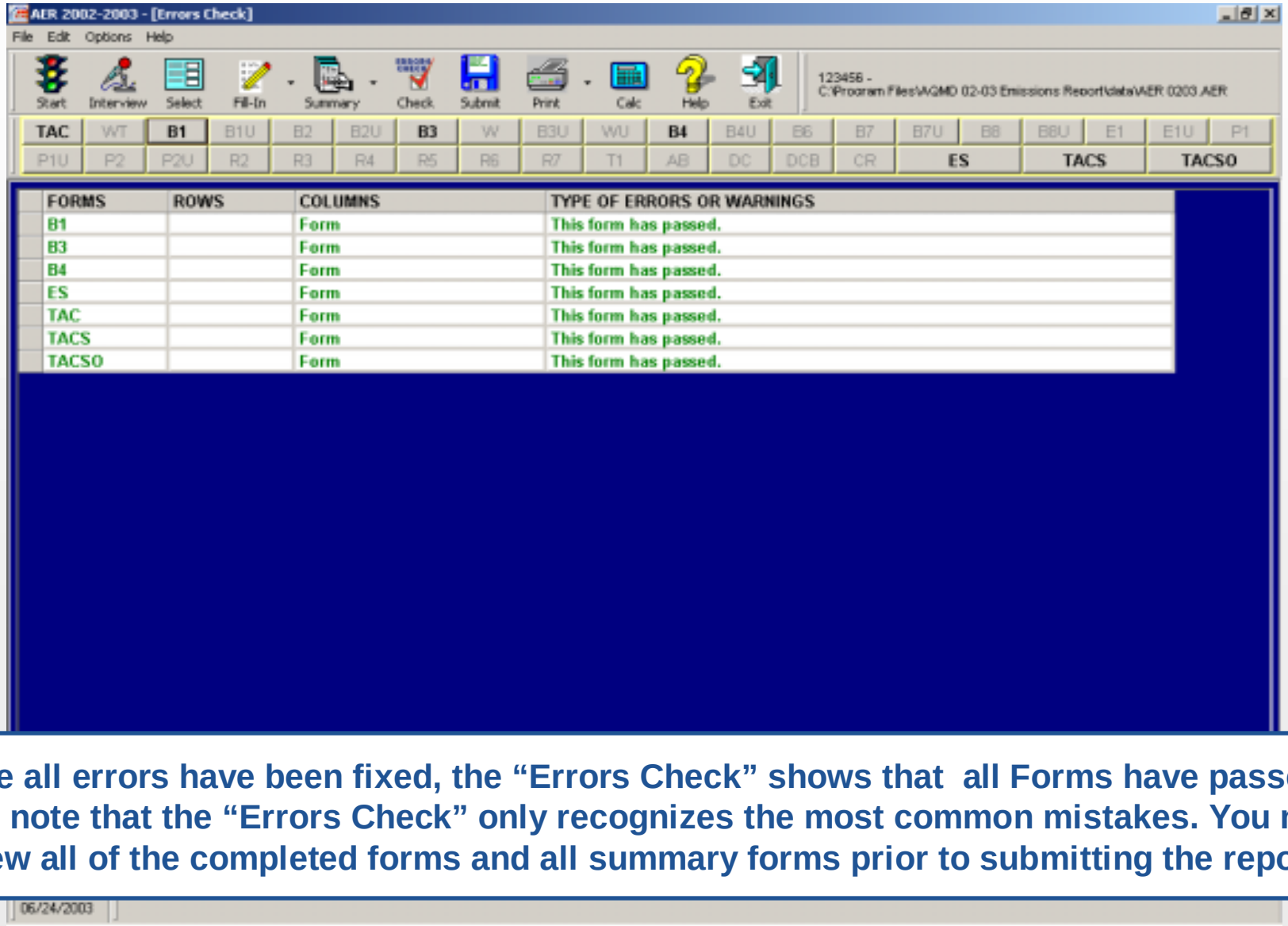
"Errors Check" result shows all errors that need to be fixed in red color. The "Errors Check" In this example has found two errors on Form B3: an Emission Factor is missing and row 2 on Form B3 is marked as containing toxics but none was reported on Form TAC. By clicking on the error, the software will go back to the problematic area to allow the user to fix the error…

Form B3 - Fixing mistake found by Errors Check



Emission Factor is missing. After completing the emission factor, Benzene emissions from Primer on Form TAC must be added.

Successful Errors Check



Once all errors have been fixed, the “Errors Check” shows that all Forms have passed. Please note that the “Errors Check” only recognizes the most common mistakes. You must review all of the completed forms and all summary forms prior to submitting the report.

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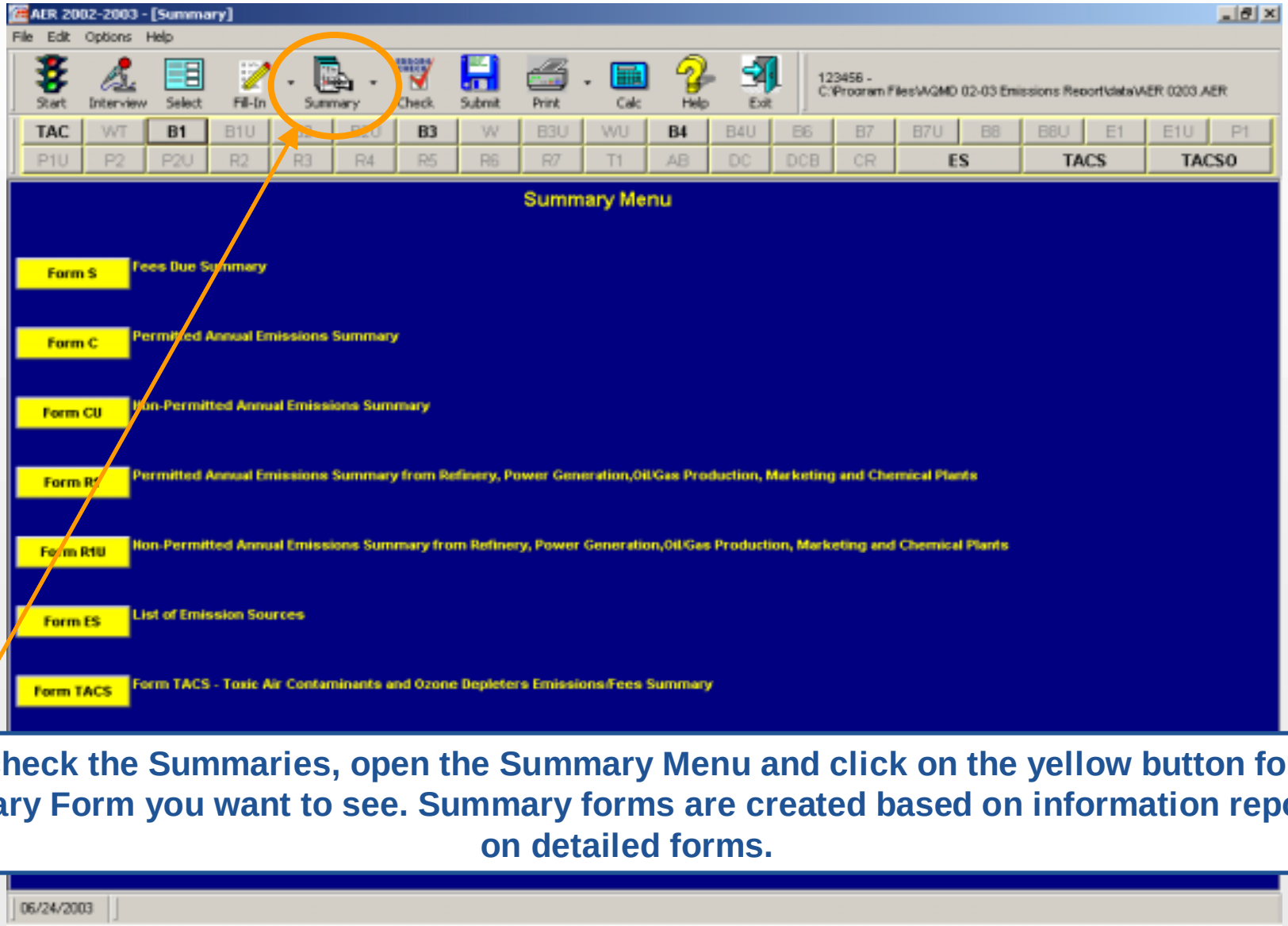
Summary Forms



To check the Summaries, open the Summary Menu and click on the yellow button for the Summary Form you want to see. Summary forms are created based on information reported on detailed forms.

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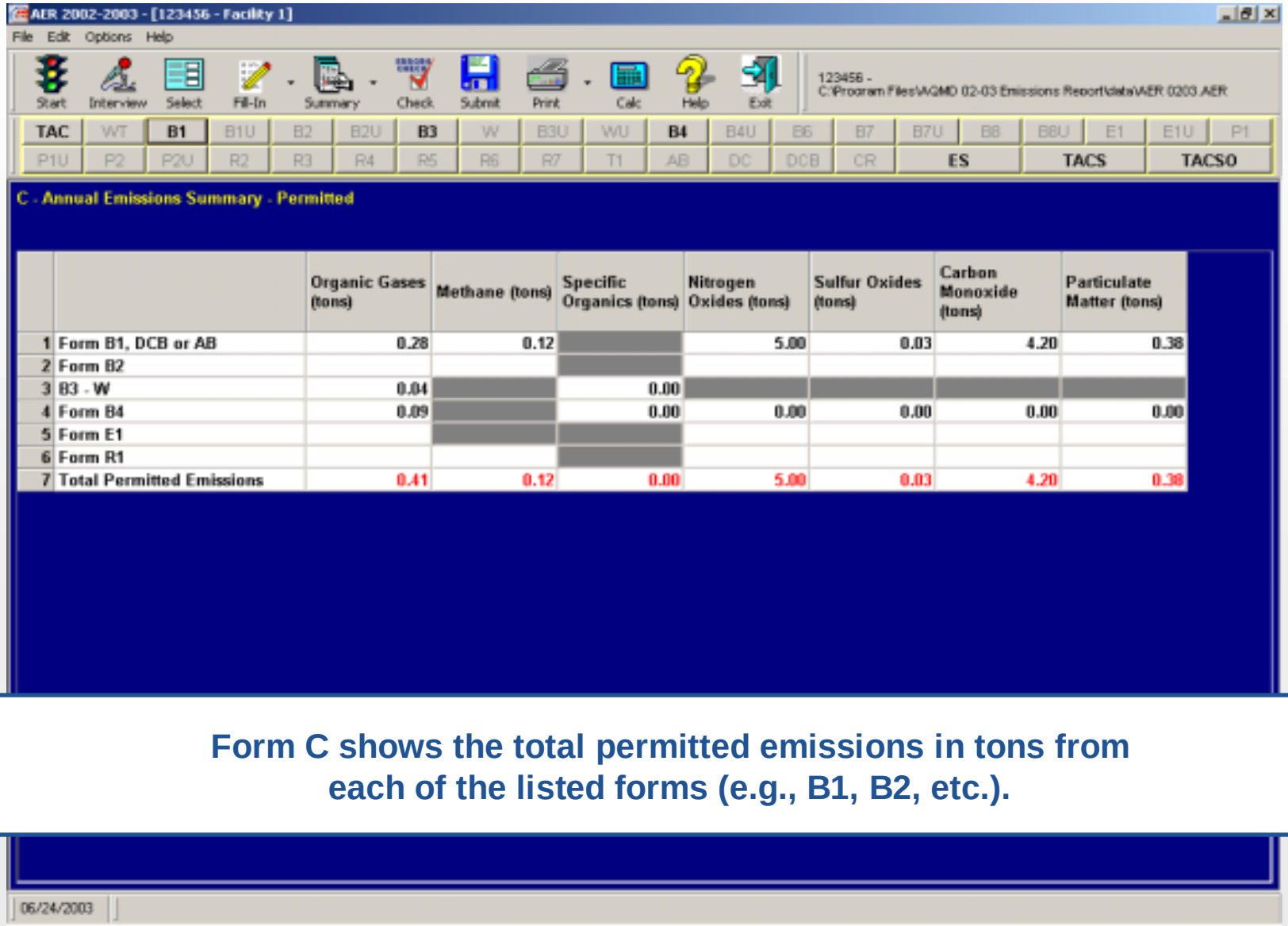
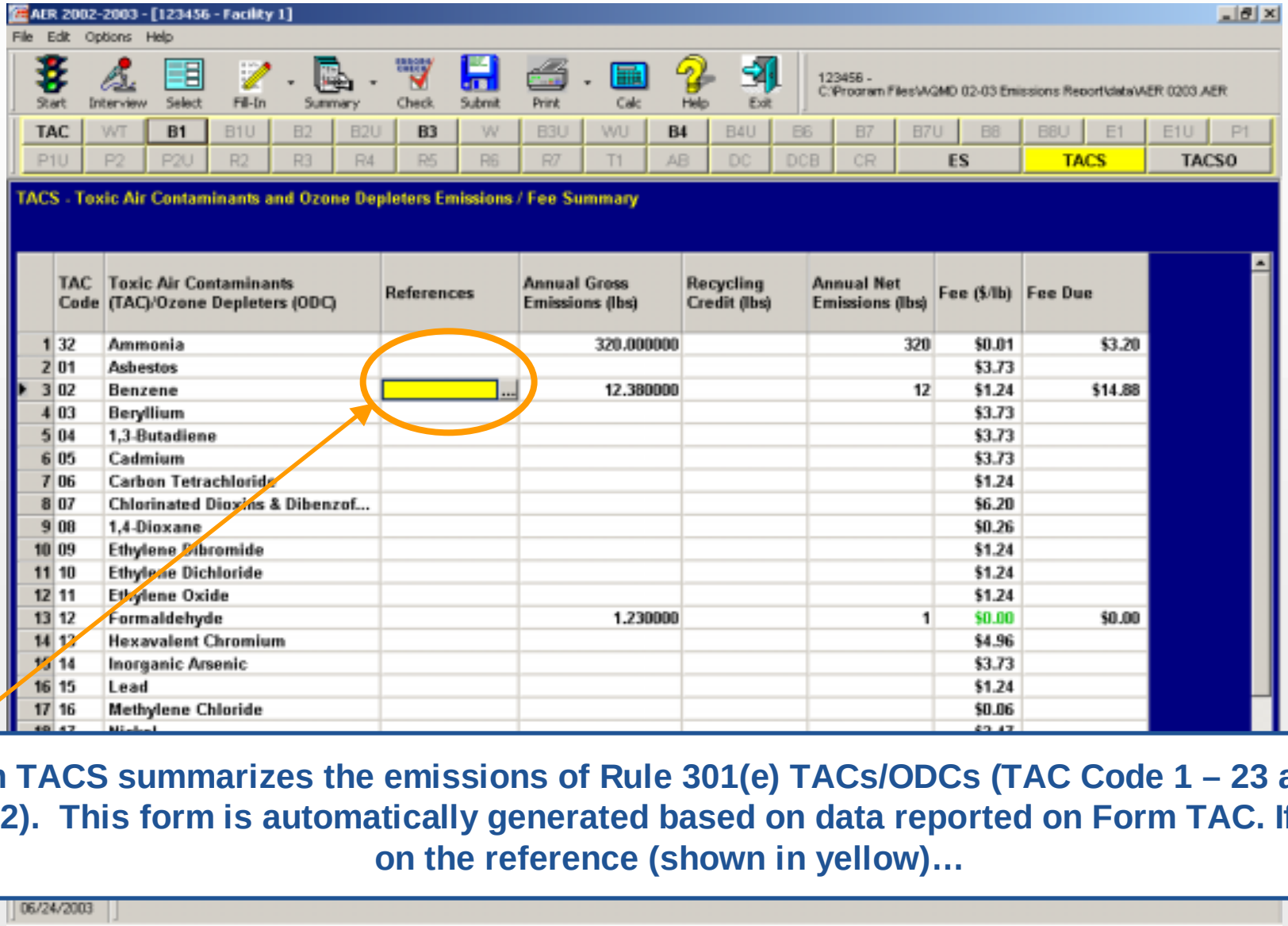
Summary Forms – Form C



		Organic Gases (tons)	Methane (tons)	Specific Organics (tons)	Nitrogen Oxides (tons)	Sulfur Oxides (tons)	Carbon Monoxide (tons)	Particulate Matter (tons)
1	Form B1, DCB or AB	0.28	0.12		5.00	0.03	4.20	0.38
2	Form B2							
3	B3 - W	0.04		0.00				
4	Form B4	0.09		0.00	0.00	0.00	0.00	0.00
5	Form E1							
6	Form R1							
7	Total Permitted Emissions	0.41	0.12	0.00	5.00	0.03	4.20	0.38

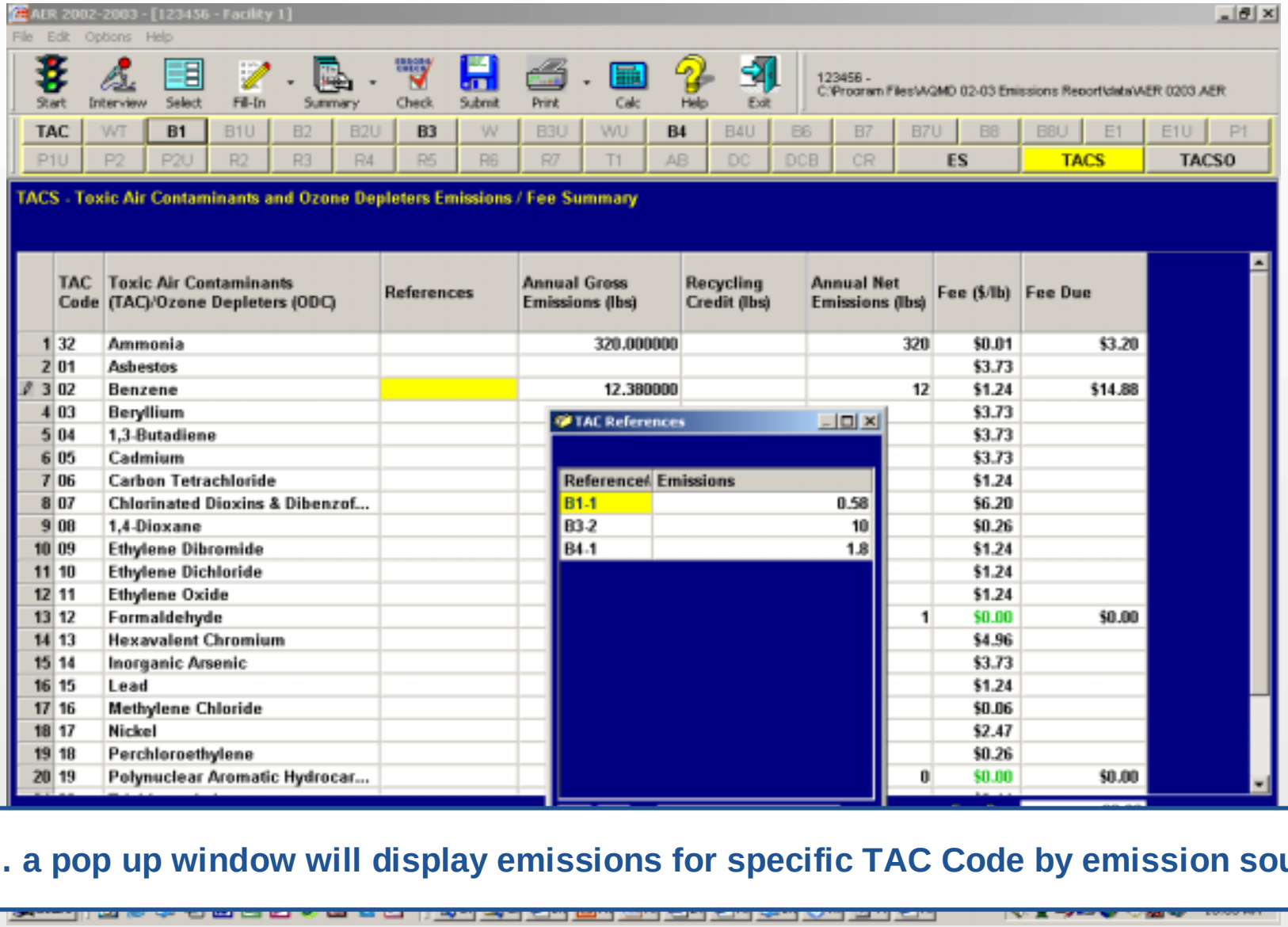
Form C shows the total permitted emissions in tons from each of the listed forms (e.g., B1, B2, etc.).

Summary Forms – Form TACS



Form TACS summarizes the emissions of Rule 301(e) TACs/ODCs (TAC Code 1 – 23 and TAC Code 32). This form is automatically generated based on data reported on Form TAC. If you click on the reference (shown in yellow)…

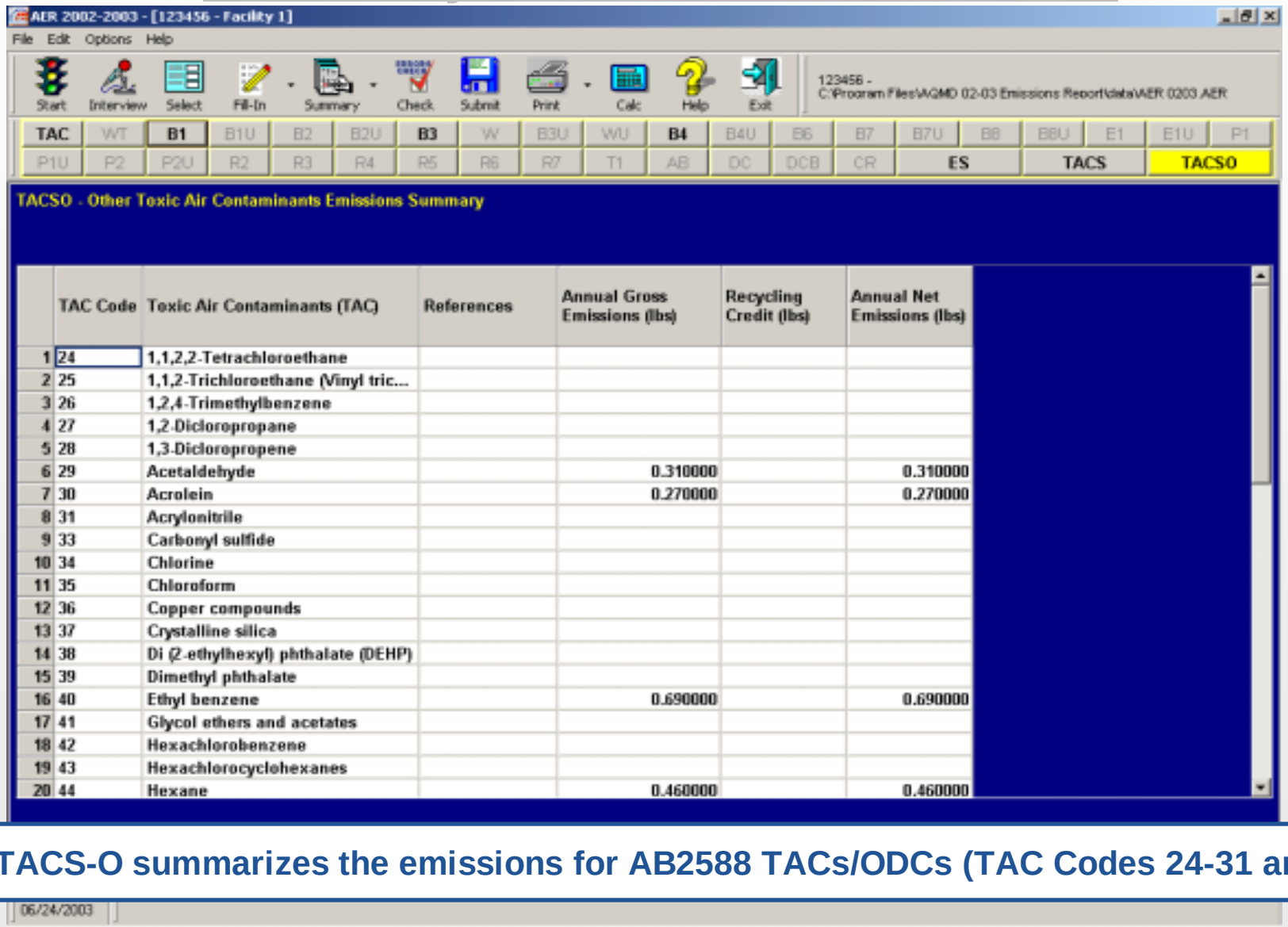
Summary Forms – Form TACS - TAC References



	TAC Code	Toxic Air Contaminants (TAC)/Ozone Depleters (ODC)	References	Annual Gross Emissions (lbs)	Recycling Credit (lbs)	Annual Net Emissions (lbs)	Fee ($/lb)	Fee Due
1	32	Ammonia		320.000000		320	$0.01	$3.20
2	01	Asbestos					$3.73	
3	02	Benzene		12.380000		12	$1.24	$14.88
4	03	Beryllium					$3.73	
5	04	1,3-Butadiene					$3.73	
6	05	Cadmium					$3.73	
7	06	Carbon Tetrachloride					$1.24	
8	07	Chlorinated Dioxins & Dibenzof...					$6.20	
9	08	1,4-Dioxane					$0.26	
10	09	Ethylene Dibromide					$1.24	
11	10	Ethylene Dichloride					$1.24	
12	11	Ethylene Oxide					$1.24	
13	12	Formaldehyde				1	$0.00	$0.00
14	13	Hexavalent Chromium					$4.96	
15	14	Inorganic Arsenic					$3.73	
16	15	Lead					$1.24	
17	16	Methylene Chloride					$0.06	
18	17	Nickel					$2.47	
19	18	Perchloroethylene					$0.26	
20	19	Polynuclear Aromatic Hydrocar...				0	$0.00	$0.00

... a pop up window will display emissions for specific TAC Code by emission source.

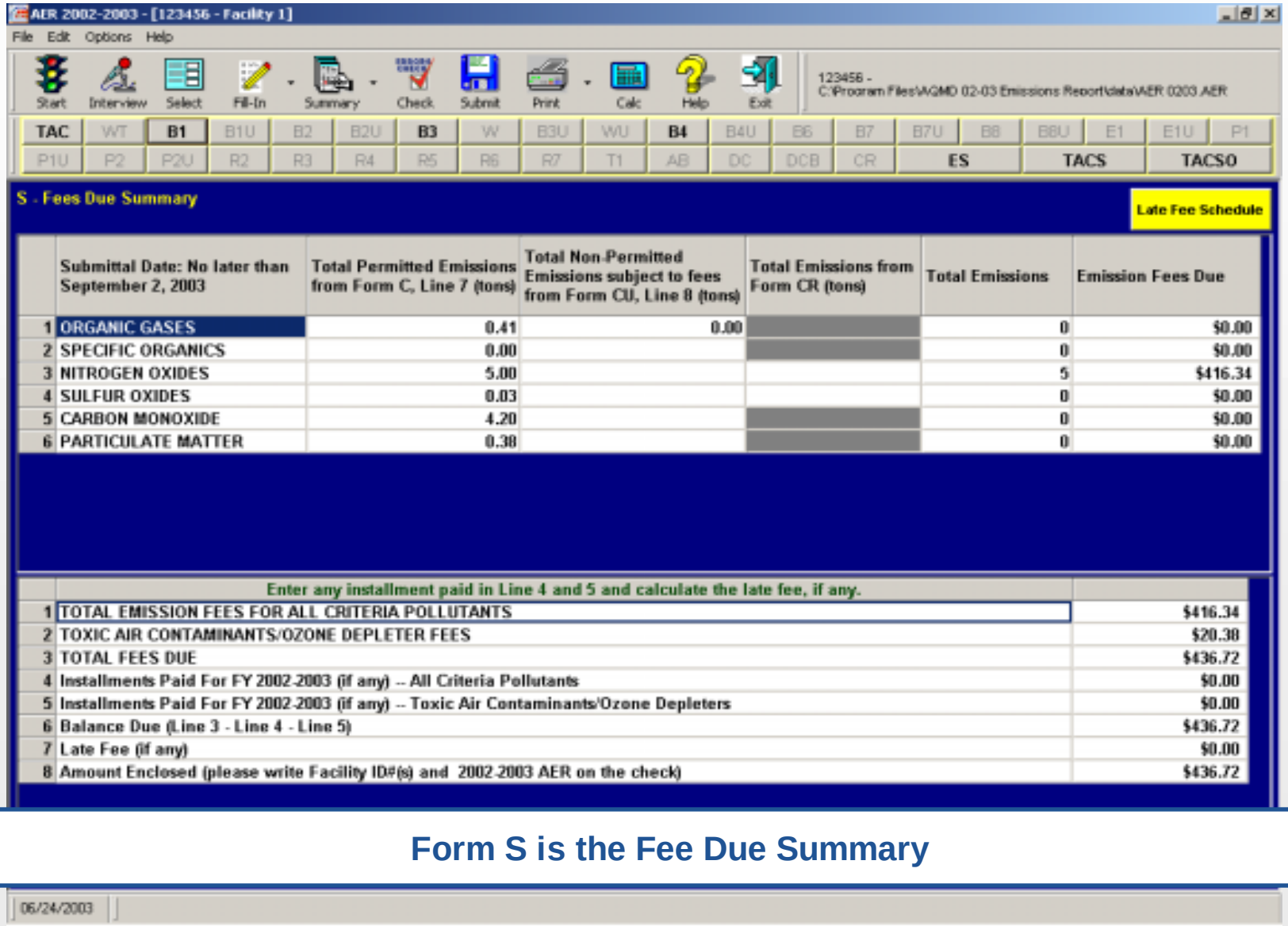
Summary Forms – Form TACS-O



	TAC Code	Toxic Air Contaminants (TAC)	References	Annual Gross Emissions (lbs)	Recycling Credit (lbs)	Annual Net Emissions (lbs)
1	24	1,1,2,2-Tetrachloroethane				
2	25	1,1,2-Trichloroethane (Vinyl tric...				
3	26	1,2,4-Trimethylbenzene				
4	27	1,2-Dichloropropane				
5	28	1,3-Dichloropropene				
6	29	Acetaldehyde		0.310000		0.310000
7	30	Acrolein		0.270000		0.270000
8	31	Acrylonitrile				
9	33	Carbonyl sulfide				
10	34	Chlorine				
11	35	Chloroform				
12	36	Copper compounds				
13	37	Crystalline silica				
14	38	Di (2-ethylhexyl) phthalate (DEHP)				
15	39	Dimethyl phthalate				
16	40	Ethyl benzene		0.690000		0.690000
17	41	Glycol ethers and acetates				
18	42	Hexachlorobenzene				
19	43	Hexachlorocyclohexanes				
20	44	Hexane		0.460000		0.460000

Form TACS-O summarizes the emissions for AB2588 TACs/ODCs (TAC Codes 24-31 and 33-73).

Summary Forms – Form S



Form S is the Fee Due Summary

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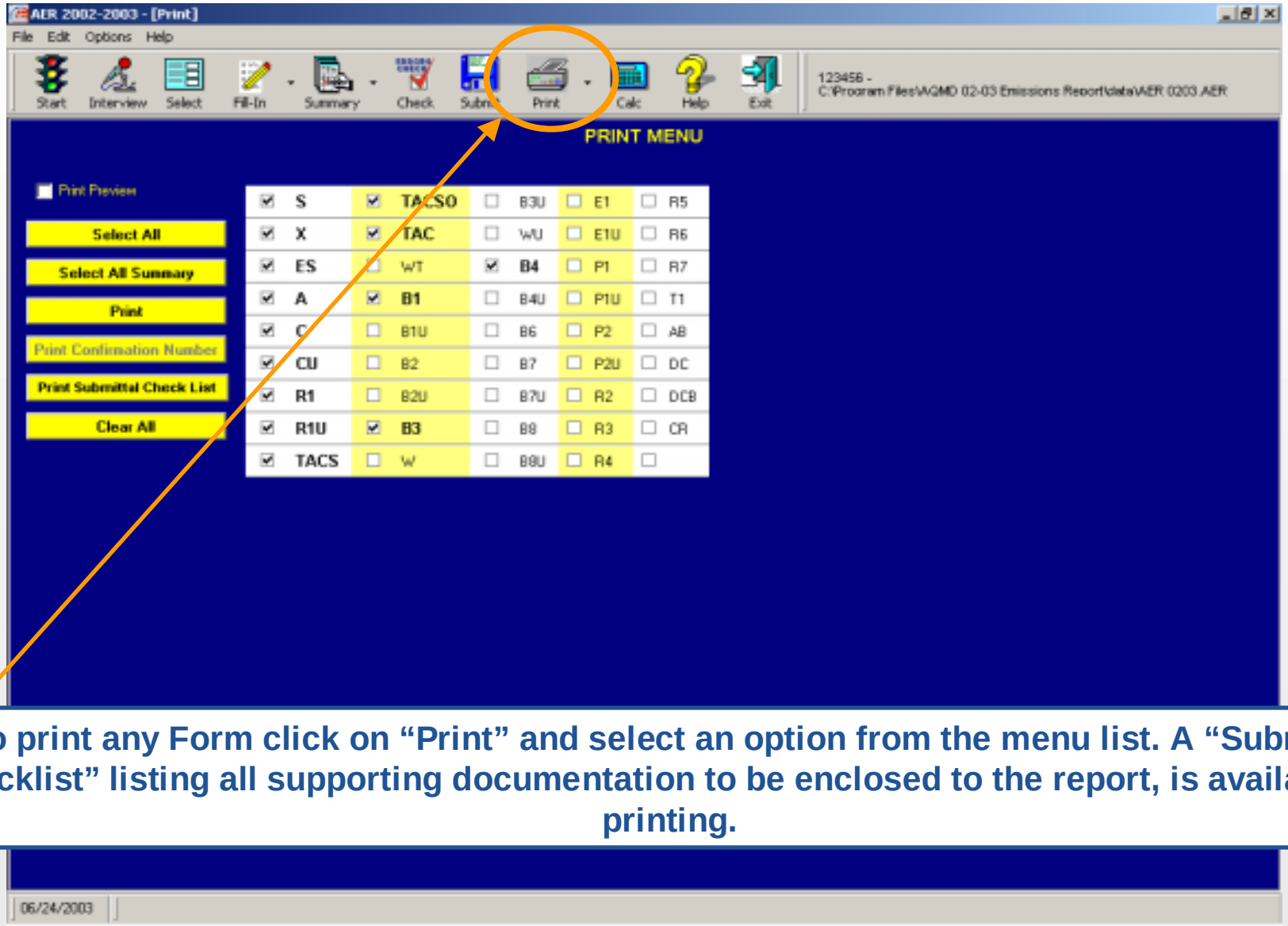
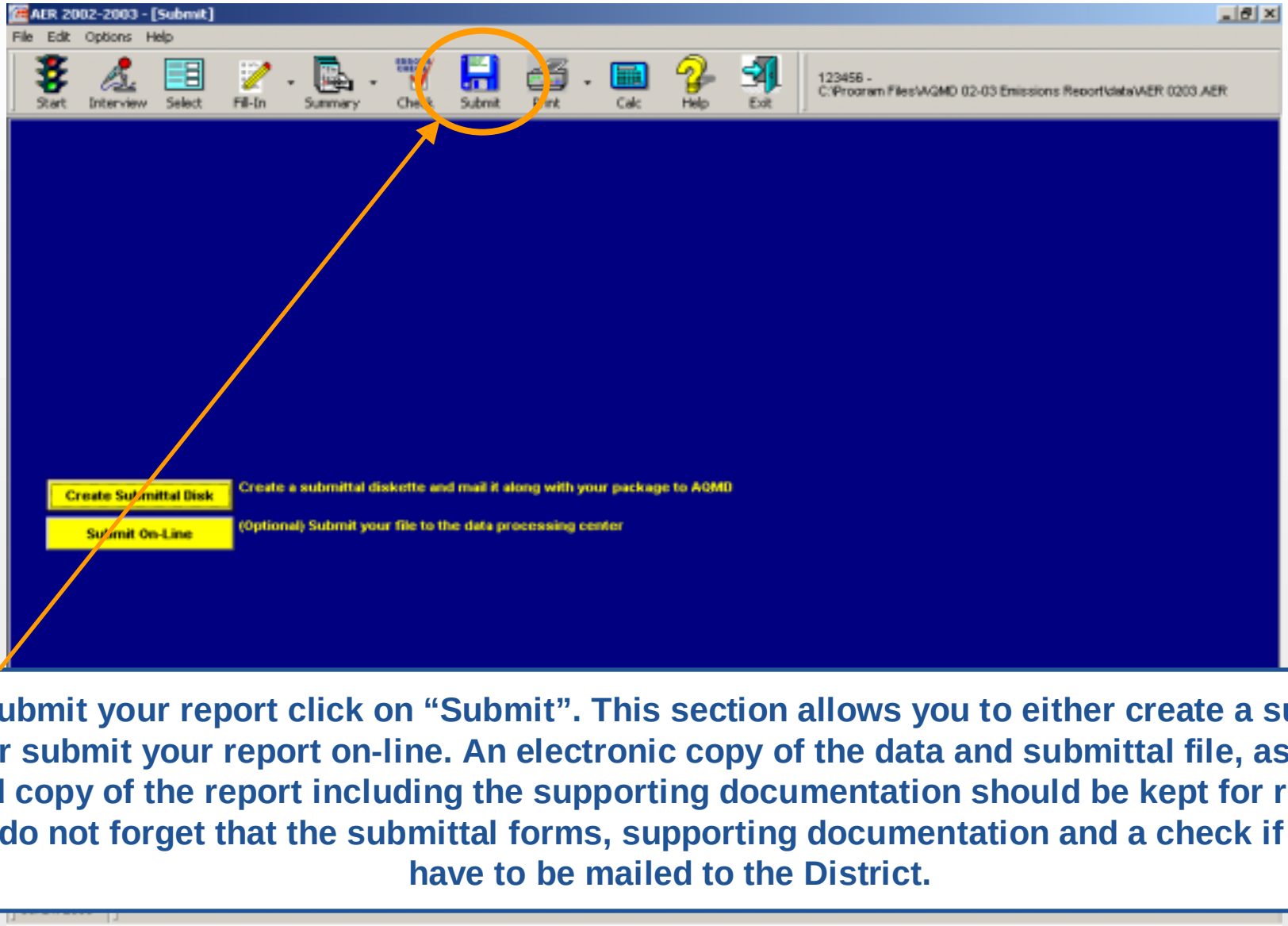
Print Forms



To print any Form click on “Print” and select an option from the menu list. A “Submittal Checklist” listing all supporting documentation to be enclosed to the report, is available for printing.

Submit report



To submit your report click on "Submit". This section allows you to either create a submittal disk or submit your report on-line. An electronic copy of the data and submittal file, as well as a hard copy of the report including the supporting documentation should be kept for records. Please do not forget that the submittal forms, supporting documentation and a check if applicable have to be mailed to the District.

Contact Information

For Consolidated AER Program :

Annual Emission Report

Ali Ghasemi
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(909) 396-2451
aghasemi@aqmd.gov

Or

AB2588

Tom Chico
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