

US EPA ARCHIVE DOCUMENT

**E. Go to Tier 1 Evaluation Summary (14) screen**

Clicking on this button will skip over the Tier 1 detailed results and will take you directly to the Tier 1 Evaluation Summary Screen where you can choose to view the Tier 1 report or proceed on to a Tier 2 Evaluation.

**5.4.3 Tier 1 Output (Details) Screen Group: Results - No Liner, Single Clay Liner, and Composite Liner (11, 12, and 13)**

Clicking the | DETAILED RESULTS | button leads you to the detailed results of the Tier 1 Evaluation. This screen group consists of the following three screens, one for each liner scenario: no liner; single clay liner; and composite liner. Each screen presents results based on MCL and HBN reference concentrations for one of the liner scenarios.

The layout of these screens is the same, the only difference is the liner scenario, which is indicated on the tab showing the screen name.

**Results - No Liner (11)**

Results Based on MCL

CAS	Constituent	MCL (mg/L)	Leachate Concentration (mg/L)	DAF	LCTV (mg/L)	Protective?
71-43-2	Benzene	0.005	0.01	2.2	0.011	Yes
75-09-2	Methylene Chloride (Dichloromethane)	0.005	0.02	2.2	0.011	No
7440-36-0	Antimony	0.006	0.03	N/A	0.014	No

Results Based on HBN

CAS	Constituent	HBN (mg/L)	Leachate Concentration (mg/L)	DAF	LCTV (mg/L)	Protective?	Controlling Pathway & Effect
71-43-2	Benzene	0.0016	0.01	2.2	0.0036	No	Inhalation Cancer
75-09-2	Methylene Chloride (Dichloromethane)	0.013	0.02	2.2	0.029	Yes	Ingestion Cancer
7440-36-0	Antimony	0.0098	0.03	N/A	0.023	No	Ingestion Non-cancer

\* Some LCTVs may be capped. Details are given in Tier1 Report. See User's Guide or Help for more information.

Navigation: << Previous | Summary Results | Next >>

**Callouts:**

- A. No-liner LCTV based on MCL
- B. Results of comparison between LCTV and expected leachate concentration
- C. No-liner LCTV based on HBN
- D. Results of comparison between LCTV and expected leachate concentration
- E. HBN pathway and effect
- F. Go back to Summary Results (9) screen

Figure 5.19 Tier 1 Output (Details): Results - No Liner (11).

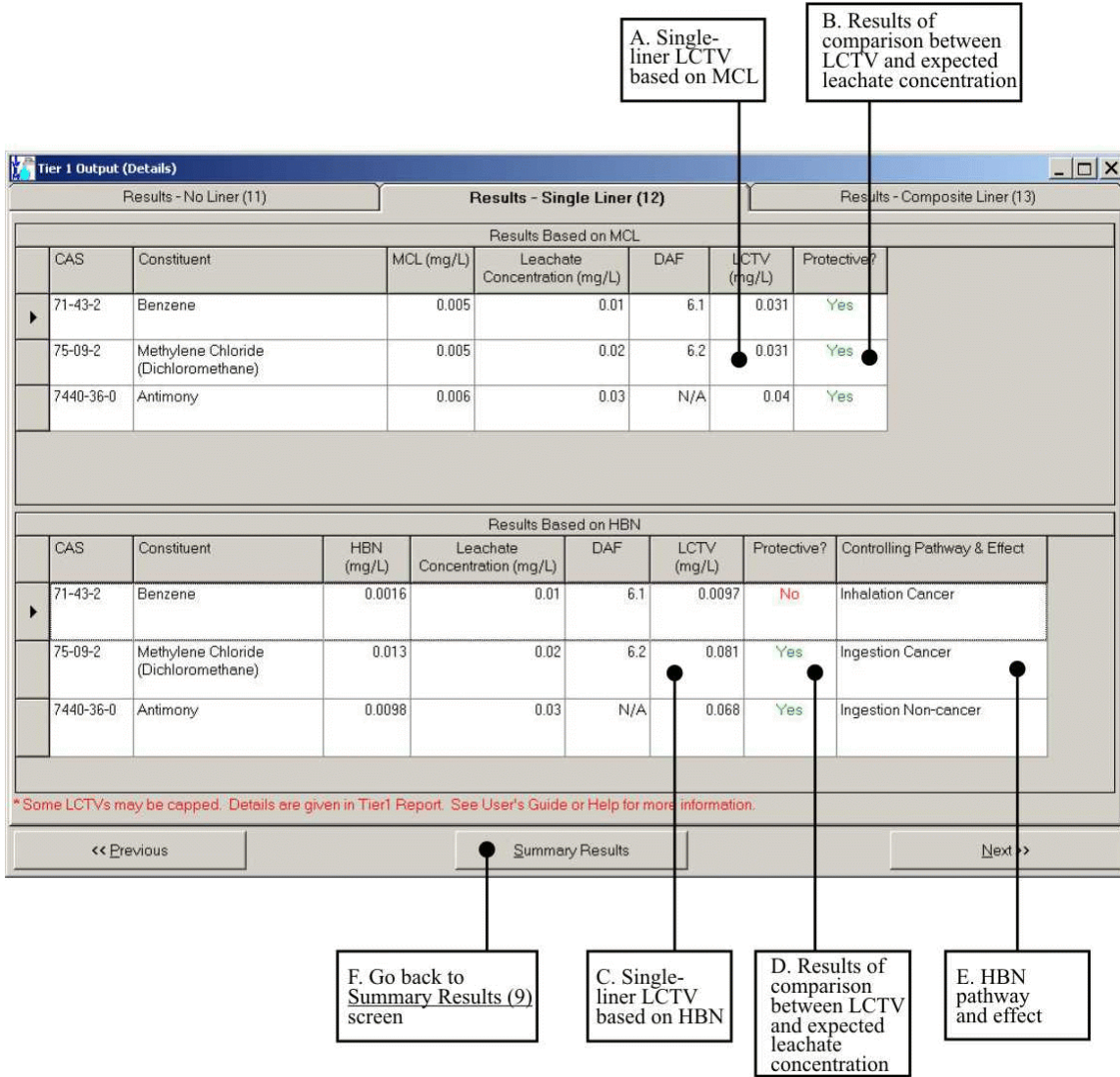


Figure 5.20 Tier 1 Output (Details): Results - Single Clay Liner (12).

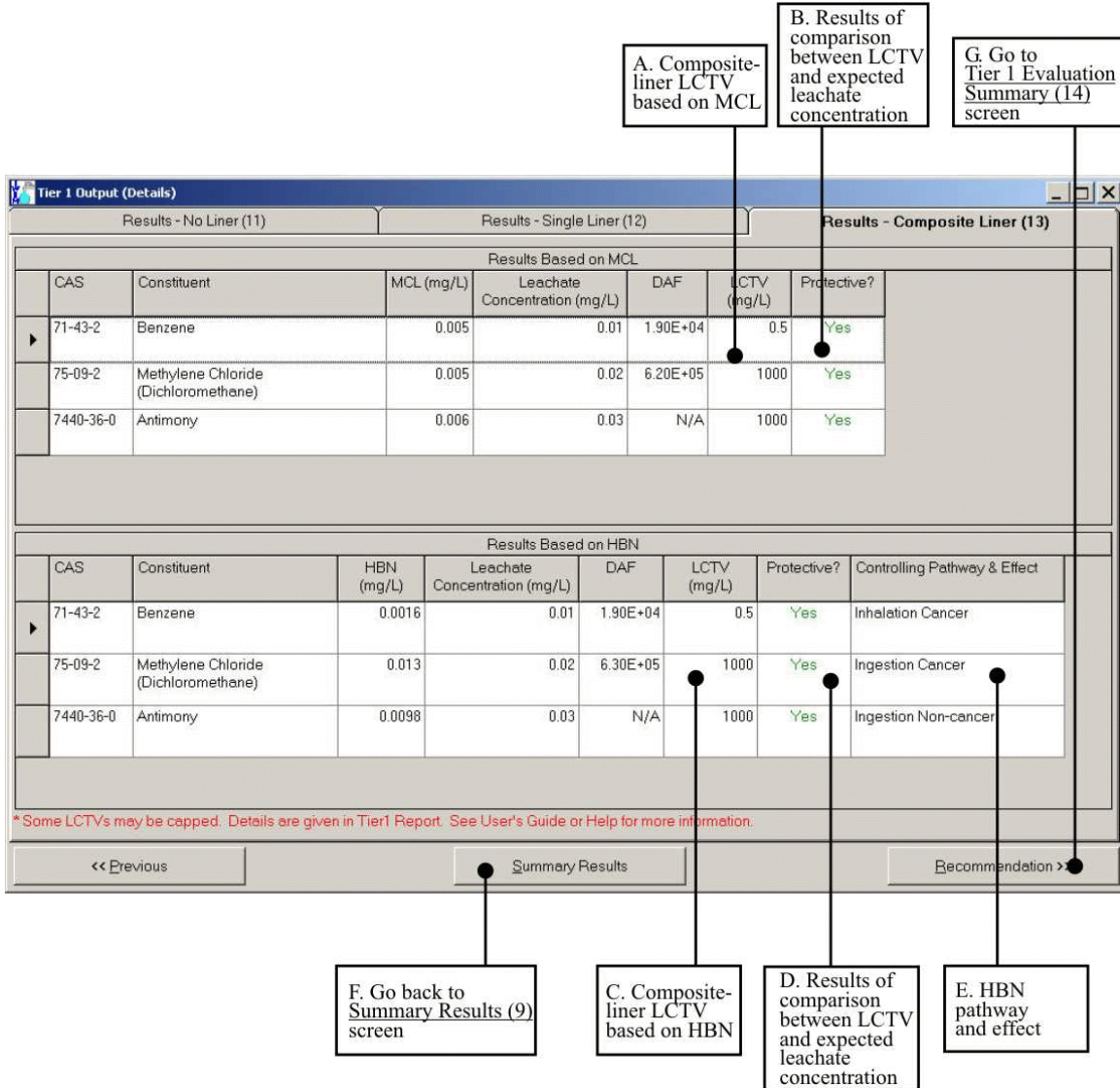


Figure 5.21 Tier 1 Output (Details): Results - Composite Liner (13).

The features identified in Figures 5.19 through 5.21 are explained in more detail in the following paragraphs.

#### ***A. Liner-Specific LCTV based on MCL***

The Tier 1 constituent- and liner-specific LCTV is displayed on this screen. An LCTV is the maximum concentration of a constituent in the waste leachate that is protective of ground water. That is, if the concentration in the leachate does not exceed the LCTV, then the modeled concentration in ground water (at the modeled well) will not exceed the MCL for that constituent.

#### ***B. Results of Comparison between LCTV and Expected Leachate Concentration***

The data displayed in the top window of the screen present the result on which the liner recommendation is based for each selected constituent. The last column in the table (with the header | PROTECTIVE? |) tells you whether or not the specified liner is protective of ground water for that constituent. This determination is made by comparing the entered leachate concentration with the LCTV calculated from the MCL. If the expected leachate concentration is greater than the LCTV, the liner is not recommended as being protective (“No”), whereas, if the expected leachate concentration is less than the LCTV, the liner is recommended as being protective (“Yes”). If the LCTV is not calculated for that constituent because the MCL is not available, “NA” (not applicable) is displayed in this cell.

To properly interpret the results of the Tier 1 Evaluation, you should consult with the appropriate state regulatory agency to determine which RGC should be used for each constituent of concern. For wastes with multiple constituents of concern, you may need to construct your own final list of liner recommendations, some from LCTVs based on MCLs and some from LCTVs based on HBNs.

For waste streams with multiple constituents, the most protective liner specified for any one constituent is the overall recommended liner type.

#### ***C. Liner-Specific LCTV based on HBN***

The Tier 1 constituent- and liner-specific LCTV is displayed on this screen. An LCTV is the maximum concentration of a constituent in the waste leachate from a modeled WMU that is protective of ground water. That is, if the concentration in the leachate does not exceed the LCTV, then the modeled concentration in ground water (at the modeled well) will not exceed the HBN for that constituent.

#### ***D. Results of Comparison between LCTV and Expected Leachate Concentration***

The data displayed in the bottom window of the screen present the liner recommendation for each selected constituent. The column with the header |PROTECTIVE?| tells you whether or not the specified liner is protective of ground water for that constituent. This determination is made by comparing the entered leachate concentration with the LCTV based on the most protective HBN. If the expected leachate concentration is greater than the LCTV, the liner is not recommended as being protective (“No”), whereas, if the expected leachate concentration is less than the LCTV, the liner is recommended as being protective (“Yes”).

To properly interpret the results of the Tier 1 evaluation, you should consult with the appropriate state regulatory agency to determine which RGC should be used for each constituent of concern. For wastes with multiple constituents of concern, you may need to construct your own final list of liner recommendations, some from LCTVs based on MCLs and some from LCTVs based on HBNs.

For waste streams with multiple constituents, the most protective liner specified for any one constituent is the overall recommended liner type. For constituents that have more than one HBN, IWEM calculates the LCTV for each HBN and uses the HBN that produces the lowest LCTV to determine the Tier 1 liner recommendation.

#### ***E. HBN Pathway and Effect***

The exposure pathway and health effect for the HBN that is used to calculate the LCTV, that is, the controlling HBN, is displayed in the column labeled |CONTROLLING PATHWAY & EFFECT|. IWEM accounts for direct ingestion and inhalation pathways, and carcinogenic and non-carcinogenic health effects. The |HBN| column in the table shows the value, in mg/L, of the controlling HBN.

#### ***F. Go Back to the Summary Results (9) screen***

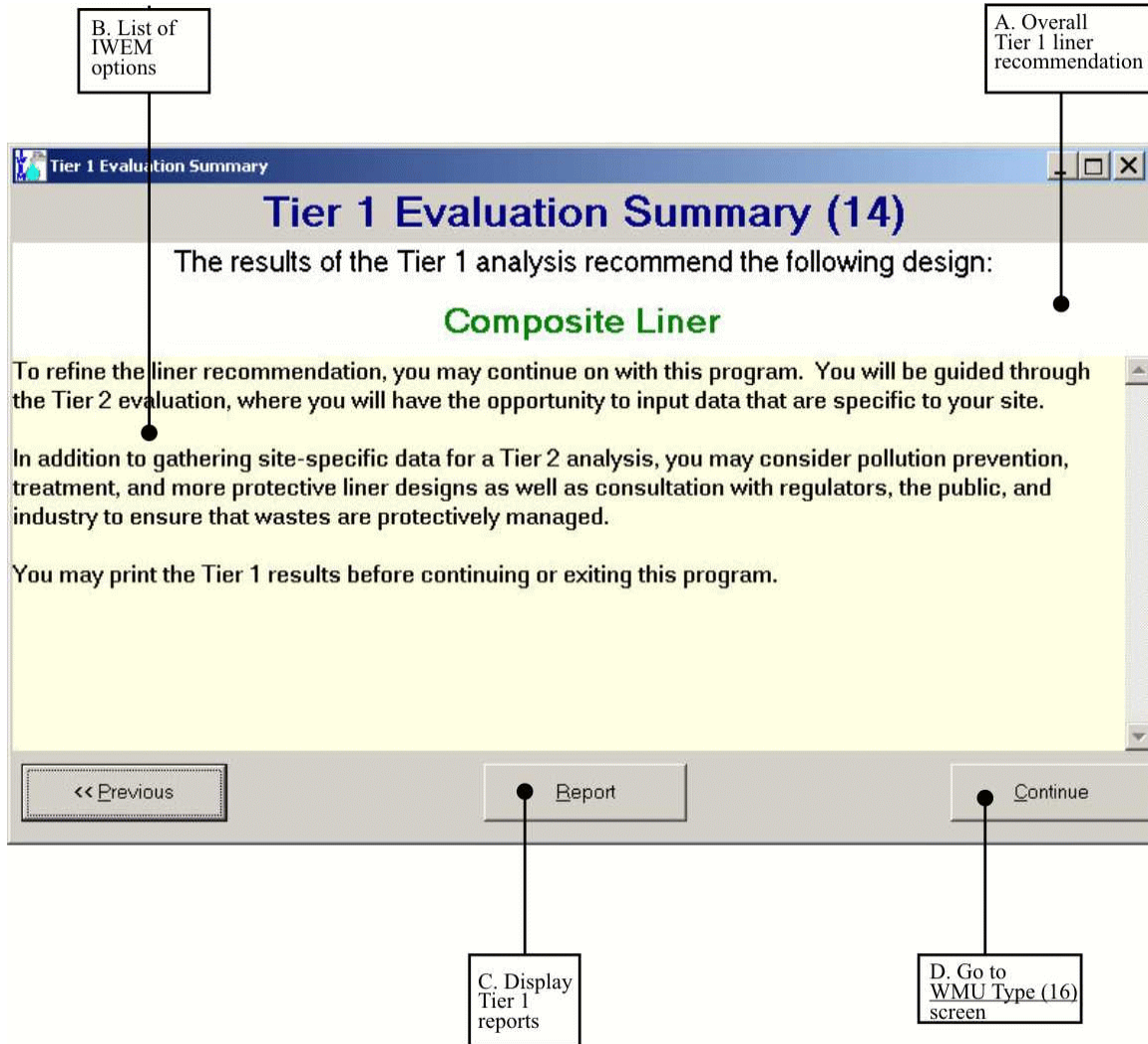
Clicking on this button will take you back to the Tier 1 MCL Summary Results (9) screen.

#### ***G. Go to Tier 1 Evaluation Summary (14) screen***

Clicking on the |RECOMMENDATION| button on screen 13 will take you to the next screen, the Tier 1 Evaluation Summary screen, where you can choose to view the printable Tier 1 report, or proceed on to a Tier 2 evaluation.

### 5.4.4 Tier 1 Evaluation Summary Screen (14)

This screen (Figure 5.22) contains an overall summary of the Tier 1 evaluation results along with options for further (Tier 2) evaluation. You can also view or print a report of the Tier 1 evaluation by clicking on the **REPORT** button at the bottom of the screen.



**Figure 5.22 Tier 1 Evaluation Summary (14).**

The features identified in Figure 5.22 are explained in more detail in the following paragraphs.

### A. Overall Tier 1 Liner Recommendation

The Tier 1 liner recommendation, based on consideration of all available RGC values for each waste constituent, is displayed at the top of this screen. For landfills, surface impoundments, and waste piles the available recommendations are: “no liner,” “single clay liner,” “composite liner,” or “not protective.” For LAUs, the available recommendations are: “no liner” or “not protective.” If your Tier 1 evaluation results in a recommendation of “not protective,” this indicates that either the chosen WMU is not appropriate for managing your waste or you may need to continue to a Tier 2 or Tier 3 analysis to further evaluate your site.

### B. List of IWEM Options

After reviewing your Tier 1 results on-screen, you can choose to continue by,

- Going back to the previous screens of the Tier 1 results by clicking on the |PREVIOUS| button,
- Viewing the Tier 1 report by clicking the |REPORT| button, or
- Beginning a Tier 2 Evaluation by clicking the |CONTINUE| button.

Or, you can choose to save your results and exit IWEM as described in Section 5.2.4 of this *User's Guide*.

### C. Display Tier 1 Reports

Clicking on the |REPORT| button first displays a dialog box with the following question:

|DO YOU WANT TO SHOW THE DETAILS?|

Choosing |No| will display a summary version of the IWEM Tier 1 Report. This short version of the report includes the following information and data:

- Facility data entered on Screen 6
- List of selected constituents and their corresponding leachate concentrations
- Tier 1 summary results for each selected constituent, based on both MCLs and HBNS
- Tier 1 detailed results for each selected constituent, based on both MCLs and HBNS, and including an explanation of any caps or warnings that apply to the presented LCTVs

Choosing **|YES|** will display a complete version of the IWEM Tier 1 Report. This detailed version of the report includes the following additional information and data:

- Constituent properties and RGCs for each selected constituent, including full references for the data sources.

After making your choice, the selected report will be displayed on-screen. The following toolbar buttons to print, save, and scroll through the pages of the report are provided along the top of the screen:



Print the report; the **|PRINT|** dialog box allows you to adjust printer settings or print all or selected pages.



Export the report in order to save it to a file; after specifying the file type, destination type, and the pages to be included, the **|CHOOSE EXPORT FILE|** dialog box then appears; you can specify the file type, and then select the file name and directory. The file types in this list are dependent upon what software you have installed on your personal computer. Most users will find that the option for PDF format will produce a document-ready report.



View the next page of the report.



View the last page of the report.



View the previous page of the report.



View the first page of the report.



Change the display size of the report.

#### **A Tier 1 Report Includes:**

- 1) List of selected waste constituent(s) and constituent data
- 2) Minimum liner requirement based on MCLs
- 3) Minimum liner requirement based on HBNs
- 4) Data used to calculate the LCTV for each liner

An example Tier 1 report is included in this *User's Guide* in Appendix B.

#### ***D. Go to WMU Type (16) screen***

Clicking here will take you to the Tier 2 Input screen. WMU Type, facility description information, and your list of selected Tier 1 constituents are automatically transferred to the Tier 2 analysis.

#### **5.4.5 Exiting the IWEM software**

You can exit the IWEM software by clicking on the |FILE| menu, and choosing |EXIT|. If you forget to save before trying to exit the IWEM software, a dialog box will ask if you want to save your data before exiting the software.