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Scientific Notebook # 352
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Felicia Guzmán

Lietai Yang Oct. 27, 1999 — July 21, 2000

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Title: TWRSP Inspection Database Date: 06/14/99 -
Name: Felicia Guzmán 07/23/99

Objectives:

1.) Identify the structures, systems, and components present in BNFL, Inc.'s Hanford site design
2.) Identify the hazards associated with each SSC.
3.) Develop a database structure into which the information will be included

Purpose:

1.) Allow a person to choose a piece of equipment, view its role in the process, and find out what hazards are associated with it.
2.) Choose a specific hazard, and view all pieces of equipment that might lead to that hazard.

Procedure:

1.) Prepare a list of SSCs from BNFL technical reports.
2.) Prepare a list of hazards and process constraints associated with each SSC.
3.) Develop an Access database based on users' needs and input data.

I Development of Database Structure

It has been decided that users will need to be able to access information in three ways:

1.) facility → vessel → components → hazards → hazardous/current conditions → controls → lessons learned

2.) hazards → vessel and components → hazardous/current conditions

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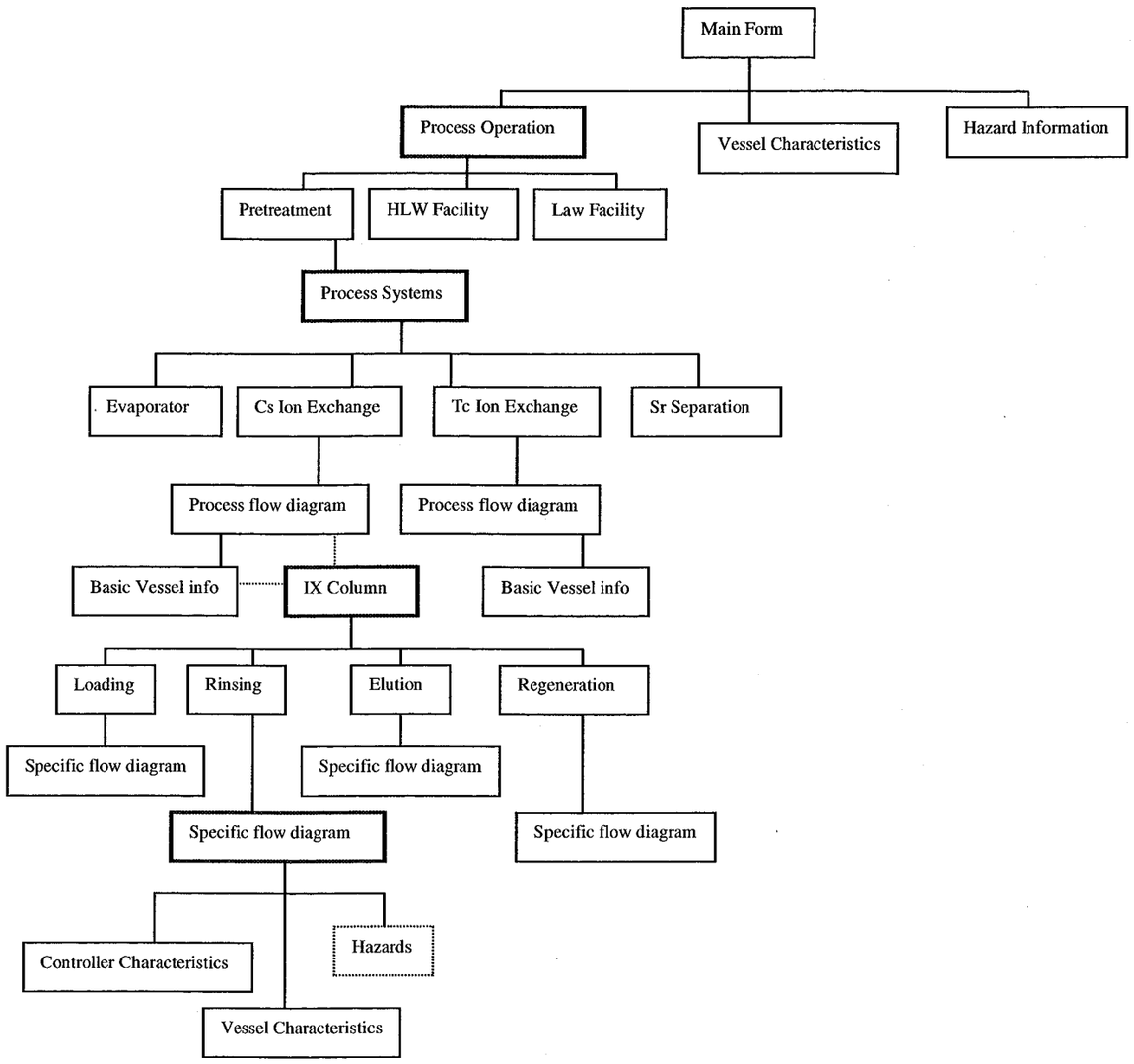
3.) edit data

Therefore, the proposed database structure is described in the following flowsheet (which is specific for the pretreatment facility):

TWRS-P Hazard Information Database – 06/29/99



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II. Database Organization

The input data was gathered from BNFL's preliminary PID diagrams.
This data was organized into the following seven tables:

Table	Description
1) Components: Controls	Indicates location & function of control
2) Components: Pumps	Indicated function & design specs
3) Component: Vessels	Includes pump, column, and tank specs & descriptions
4) Hazards	Indicates hazard type & causes
5) Hazards for plant items*	Indicates hazard, event, & control based on vessel
6) PS vessels	Indicates position of vessel in overall process (operation & stage)
7) Units*	Displays units used in specs, for editing purpose

The asterisk denotes tables that were imported from the database, *ver7moc*.

The following queries and forms were based on the information in the tables:

Query/Form	Description
1) C2601-4 (Q&F)	Indicates overall position of vessel
2) V2201 (Q&F)	Indicates overall position of vessel
3) V2202 (Q&F)	Indicates overall position of vessel
4) V2203 (Q&F)	Indicates overall position of vessel
5) V2205 (Q&F)	Indicates overall position of vessel
6) V2206 (Q&F)	Indicates overall position of vessel
7) V2207 (Q&F)	Indicates overall position of vessel
8) V2601 (Q&F)	Indicates overall position of vessel
9) V2602 (Q&F)	Indicates overall position of vessel
10) V2603A-C (Q&F)	Indicates overall position of vessel
11) V2604 (Q&F)	Indicates overall position of vessel
12) V2605 (Q&F)	Indicates overall position of vessel
13) Components:C2201 (Q&F)	Indicates design specs for vessel
14) Components:C2202 (Q&F)	Indicates design specs for vessel
15) Components:C2203 (Q&F)	Indicates design specs for vessel
16) Components:C2204 (Q&F)	Indicates design specs for vessel
17) Components:P2202 (Q&F)	Indicates design specs for vessel
18) Components:P2203 (Q&F)	Indicates design specs for vessel
19) Components:P2204 (Q&F)	Indicates design specs for vessel
20) Components:P2205 (Q&F)	Indicates design specs for vessel
21) Components:V2201 (Q&F)	Indicates design specs for vessel
22) Components:V2202 (Q&F)	Indicates design specs for vessel
23) Components:V2203 (Q&F)	Indicates design specs for vessel
24) Components:V2204 (Q&F)	Indicates design specs for vessel
25) Components:V2205 (Q&F)	Indicates design specs for vessel
26) Components:V2206 (Q&F)	Indicates design specs for vessel
27) Components:V2207 (Q&F)	Indicates design specs for vessel
28) Components:W2205 (Q&F)	Indicates design specs for vessel
29) PS vessels Query (Q)	Indicates overall position of vessel
30) PS Vessels Query 2 (Q)	Indicates overall position of vessel
31) Components: Controls (F)	Indicates description & position of control
32) Disposal (F)	LAW Facility process flow diagram
33) Edit (F)	Edit vessel records
34) Edit Controller (F)	Edit controller records
35) Edit Hazards (F)	Edit hazard information
36) Elution (F)	Cs Ion Exchange: Column elution flow diagram
37) Hazards (F)	Displays hazard type & cause
38) Hazards Subform1 (F)	Choose by vessel ID
39) Hazards Subform2 (F)	Choose by hazard type
40) Loading (F)	Cs Ion Exchange: Column loading flow diagram

F6

41) Main Form (F)	Selection menu
42) Pretreatment Process Systems (F)	Choose systems
43) Process Flowsheet (F)	Cs process flow diagram
44) Regeneration (F)	Cs Ion Exchange: Column regeneration flow diagram
45) Rinsing (F)	Cs Ion Exchange: Column rinsing flow diagram
46) Search Hazards (F)	Incorporates subform1 &2
47) Tc Process Flowsheet (F)	Tc flow diagram
48) Vessel Characteristics (F)	Choose vessel ID to see characteristics

Additions and Corrections to the list of forms:
PS vessels query & PS vessels query2 are now, C2201-4 and V2204 respectively.

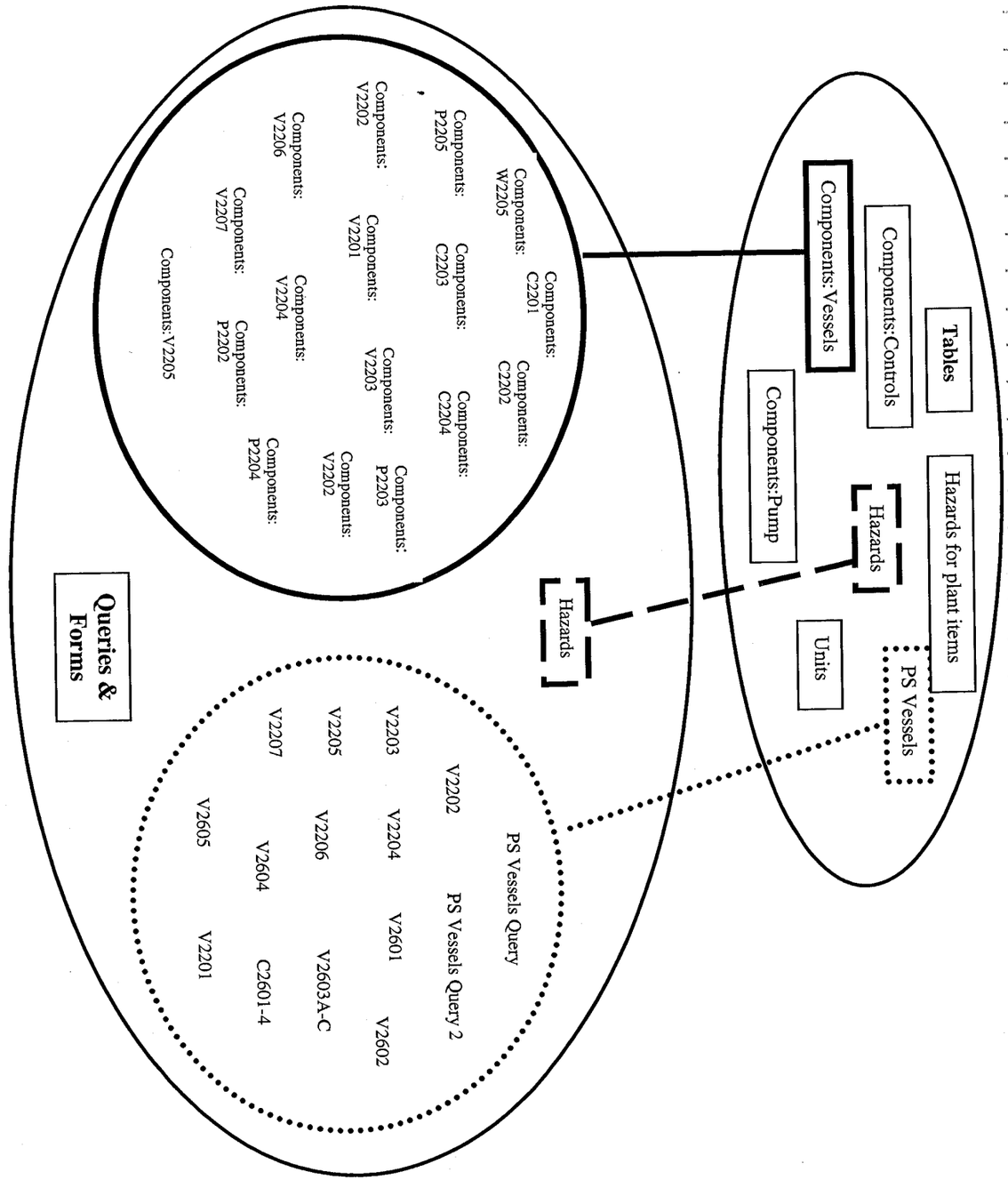
Components:C2601, Components:P2601A/B, Components:V2601, Components:V2602, Components:V2603A, Components:V2604, Components:V2605 were added to provide information on the Tc IX process.

Disposal is now called LAW Facility. HLW Facility was also added.

Edit Hazards2, hazard query form, Select Hazard, select hazard query, Select Hazard2, Selected Hazard Form, Tc Elution, Tc Loading, Tc Regeneration, Tc Rinsing were also added.

E6

The following web diagram illustrates which tables were used to create the queries/forms.



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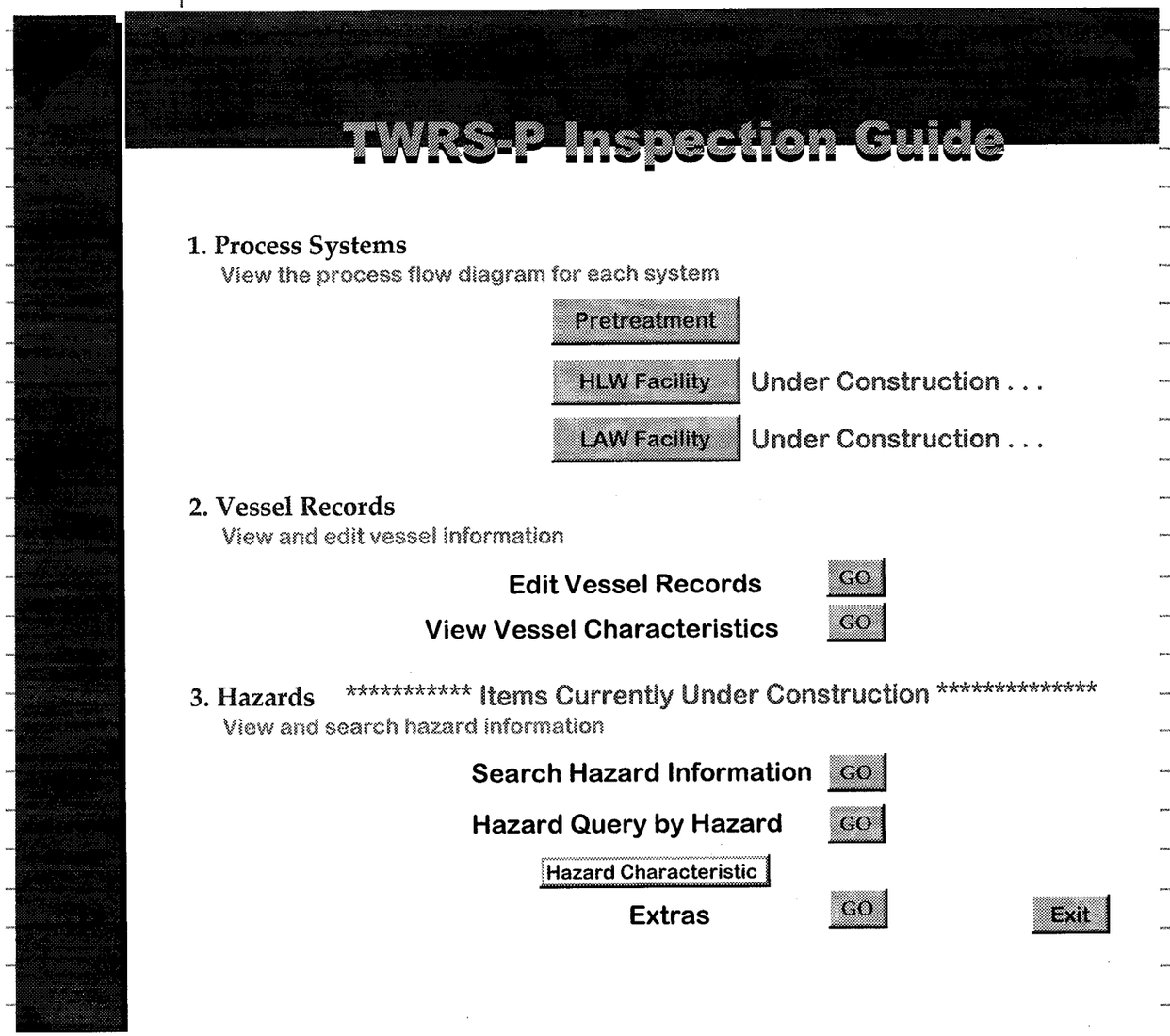
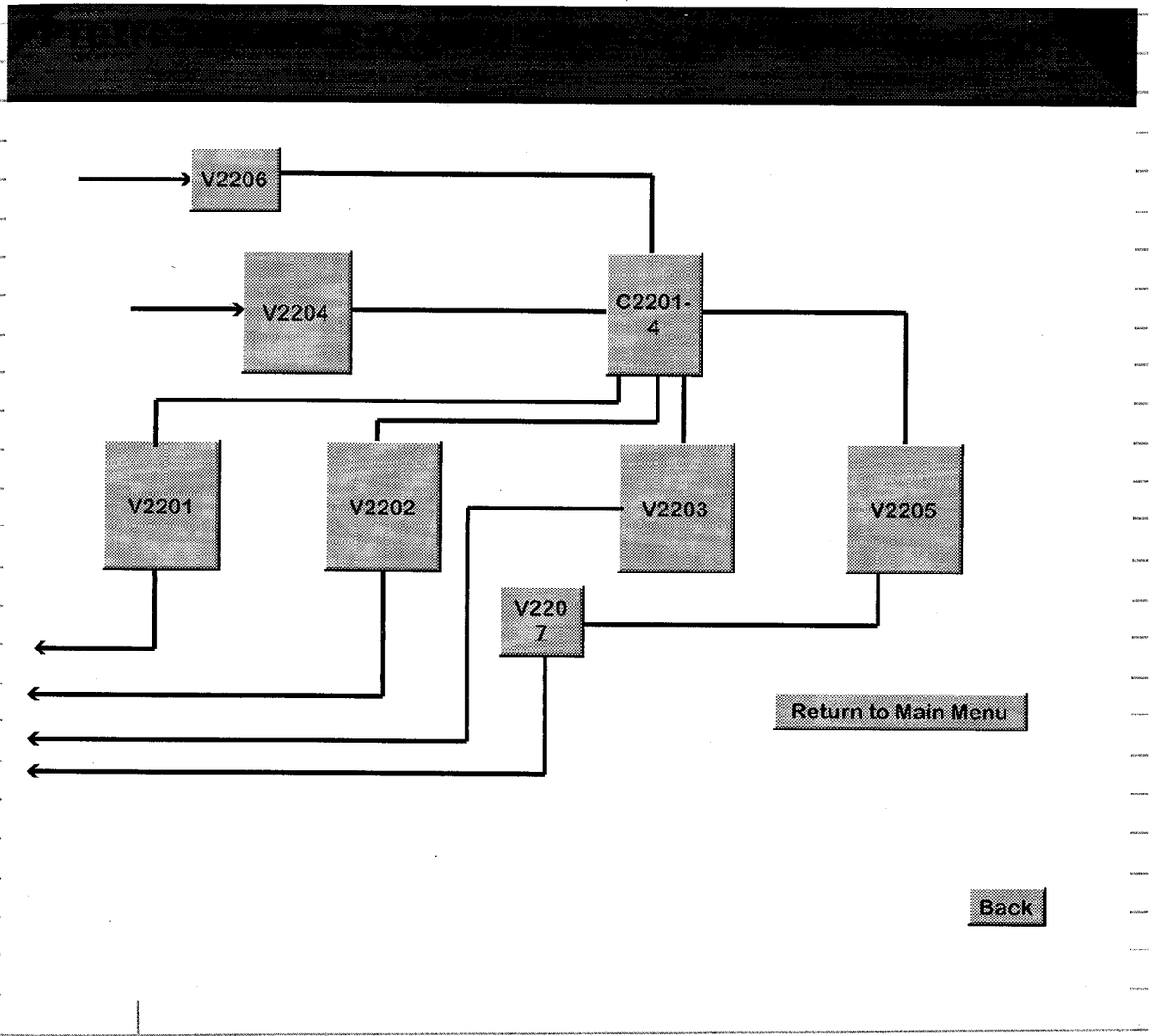
III Database Overview

The current database design allows the user to choose from three categories. Those categories are 1.) Process Systems, 2) Vessel Records, and 3.) Hazards. Choices are displayed as command buttons on the "Main Form".

FG

The process flowsheets are designed to be familiar to the engineers. This was done by creating command buttons which open relevant queries / forms. These button were then arranged in a flowsheet design. "Process Flowsheet" was designed in this fashion.





PG

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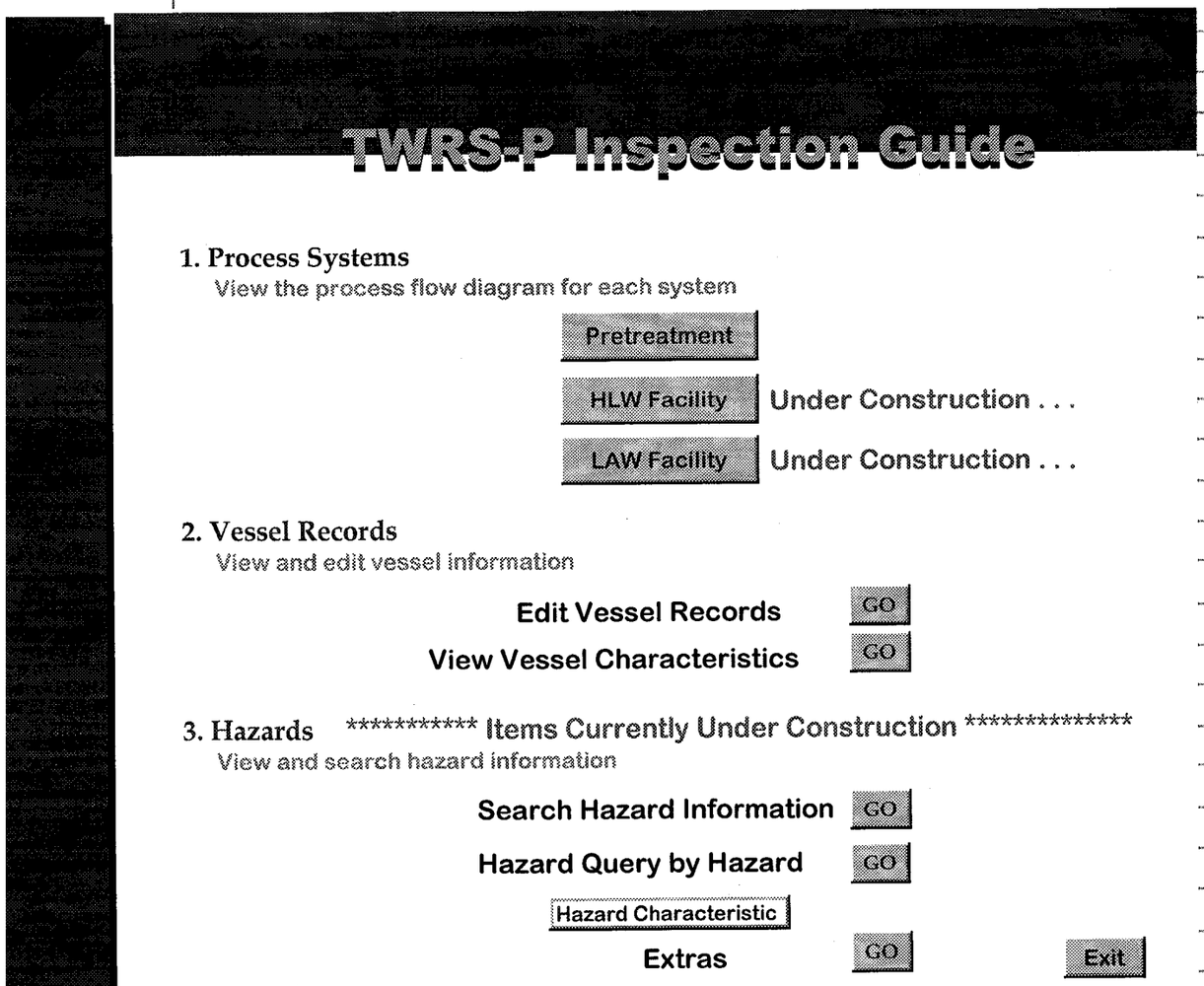
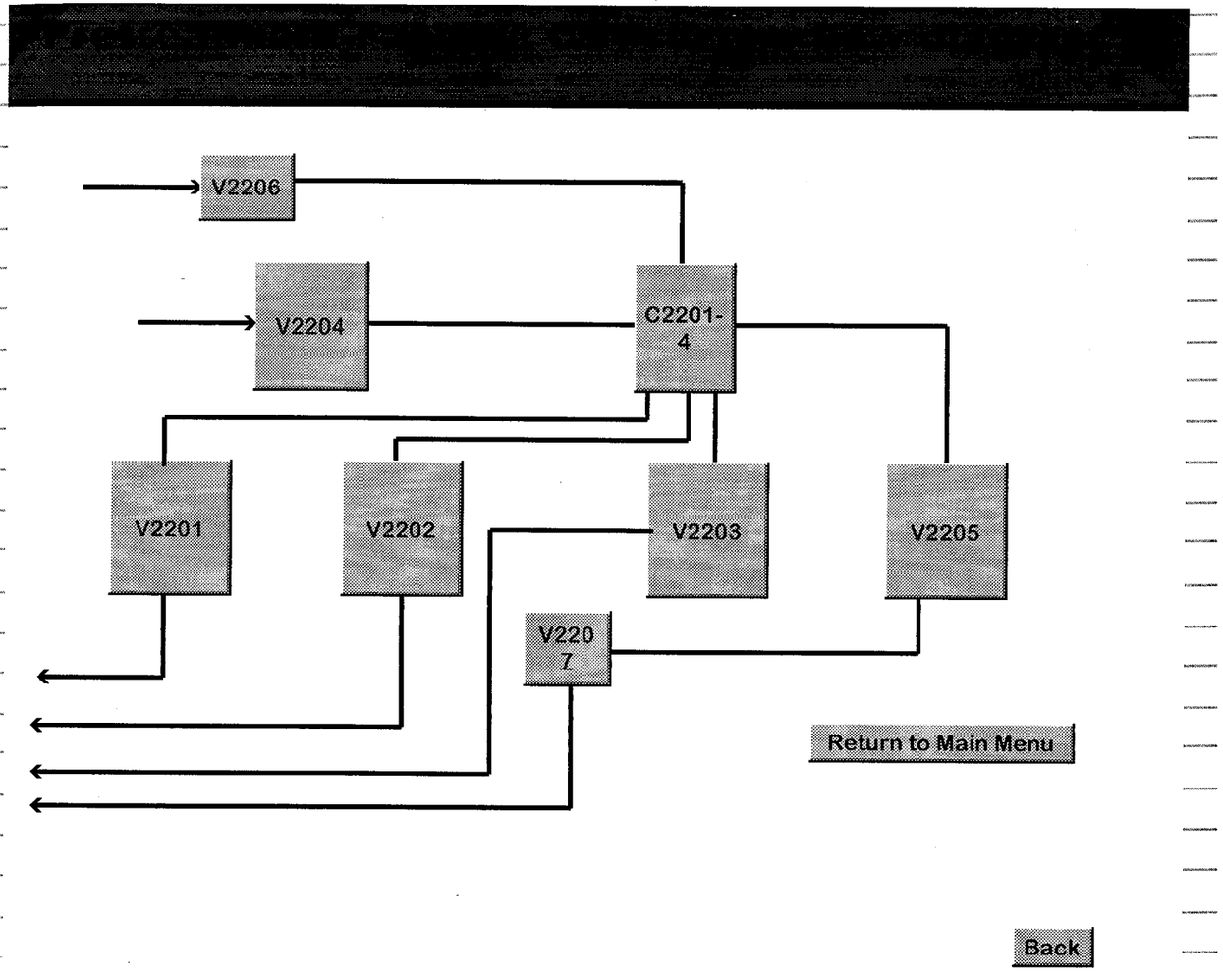
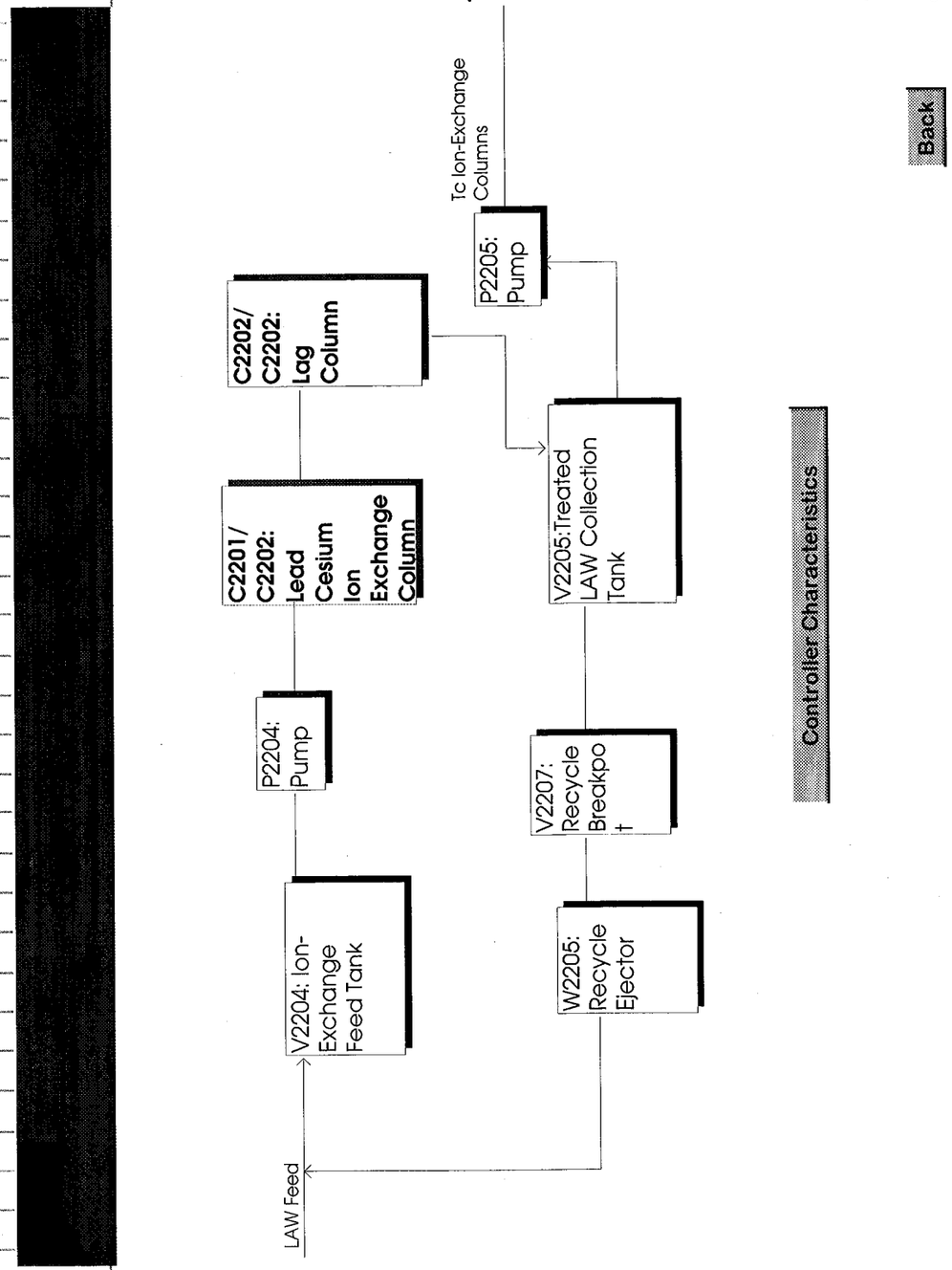




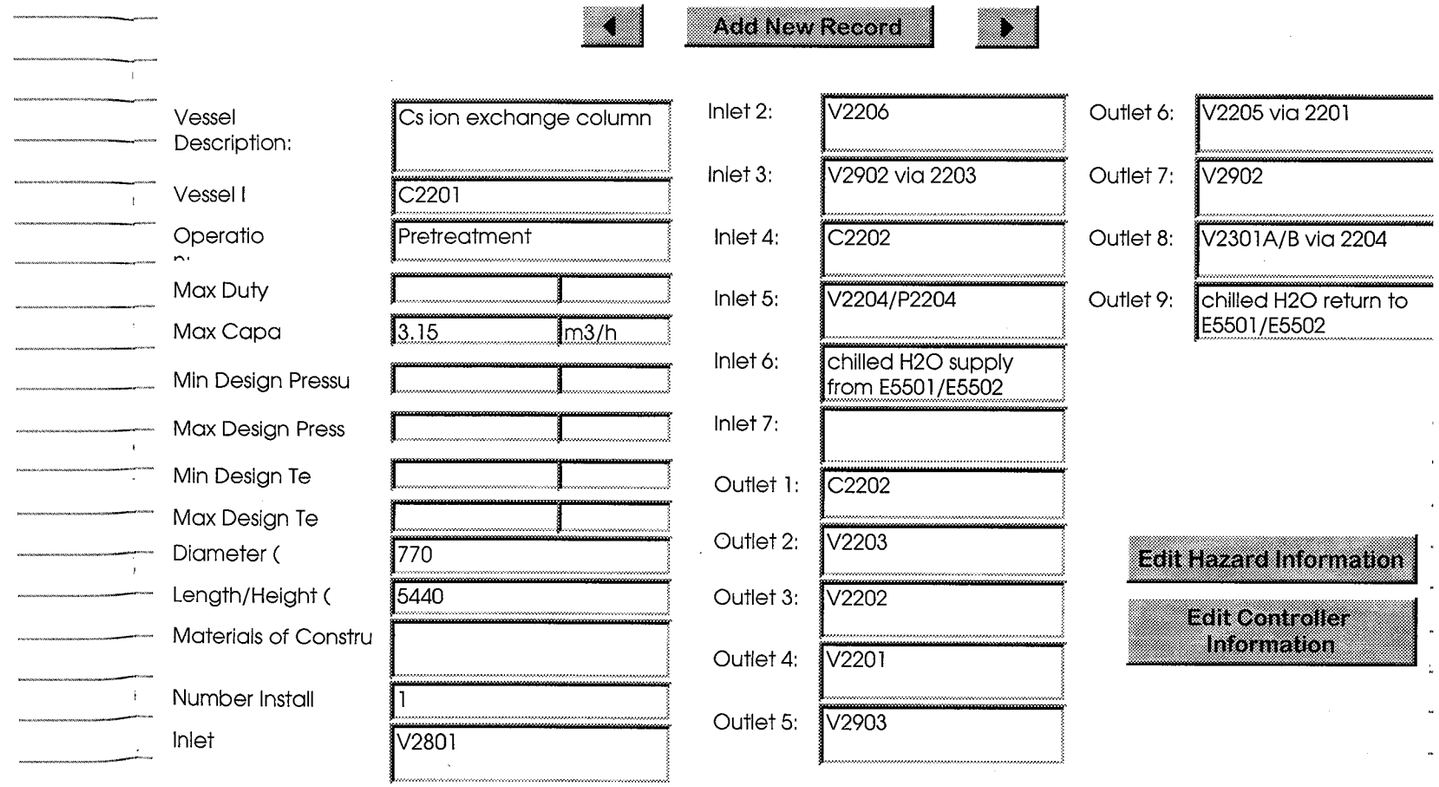
FG

The more specific flow diagrams such as. "Loading" was made by making transparent command buttons placed on top of text boxes. This form displays the Cs IX loading cycle.



FG

Any equipment that must be added to the flow diagram must be added to the appropriate table(s). Subsequently, a query and form will also need to be made. This can be done rather easily by opening an existing query and changing the criteria. The new criteria must be saved under a different name.
In order to add new information to tables, the appropriate edit forms can be used. This information will then appear in any database



FG

IV Tables

The information and fields in the tables were decided on after discussion about the purpose of the database. All of the information is available from BNFL's technical reports and drawings. The following tables were obtained from excel files based on BNFL information:

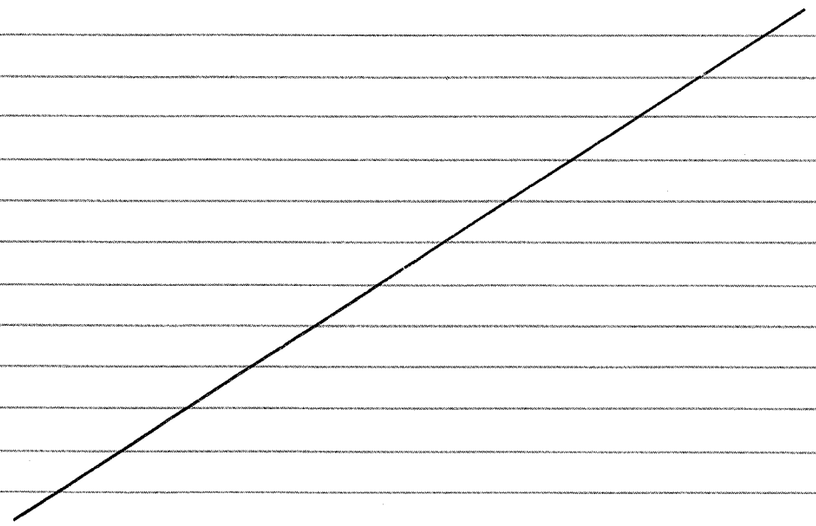
"Components: Controls"
"Components: Vessels"
"Components: Pumps."

The EXCEL files that contain this data are:

"components" → Cs IX
"Tc Components" → Tc IX

To import an excel file into Access:

Click [New] under the Tables tab.
Select Import table and click [OK].
Select the file you want to import.
Answer the Import Wizard's questions.
Click [Finish] when done.



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V Queries

The queries can be made from design view. First, a table is added to the query. From there the fields that will be included in the query can be "dragged" to the appropriate field position. In most cases, it was necessary to include criteria in the query. In order for the command buttons to call up the correct information from the flowsheet, a query was made for each piece of equipment. The criteria used for each was based on the Vessel ID.

Example:

Field	Vessel ID
Table	PS Vessels
Show	✓
Criteria	"C2601-4

query design view

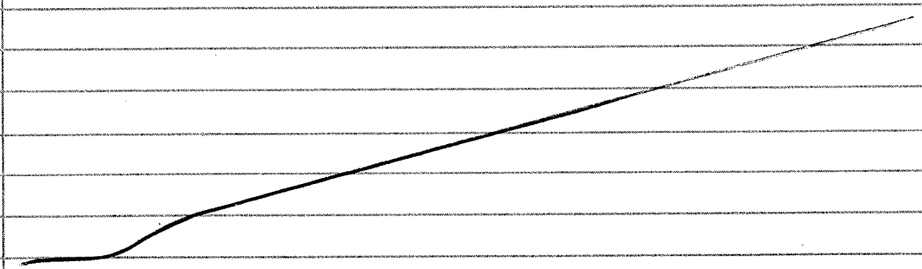
For the hazard queries, the criteria was:

[Forms]![select hazard query]![Hazard]

form name

text box into which the hazard will be input.

This means that there will be a text box on the form "select hazard query" that will determine the criteria with which the query runs.



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VI Forms

The forms were designed to make the database easy to use. The most important aspect of making such a form is knowing what the user already knows and what the user is trying to find out.

The forms that contain a drop down list were based on specific tables/queries. When this is done, the drop down list can be used to navigate through records from the same table on a single form. Otherwise, the form was made in design view. This type of form is used to link forms rather than to provide information.

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VII Form Navigation

The following tables show which forms can be accessed from each single form.

hazard query form
(close form)

Select Hazard2
Edit Hazards2
(close form)

Selected Hazards Form

Edit Hazards2
(close form)

Elution
Components: V2206
Components:C2201
Components:Controls
(close form)

Loading
Components:V2204
Components:P2204
Components:C2201
Components:C2202
Components:W2205
Components:V2207
Components:V2205
Components:P2205
Components:Controls
(close form)

Regeneration
Components:V2206
Components:C2201
Components:V2202
Components:P2202A/B
Components:Controls
(close form)

Rinsing
Components:V2206
Components:C2201
Components:V2203
Components:P2203A/B
Components:V2202
Components:P2202A/B
Components:Controls
(close form)

Tc Elution
Components:V2604
Components:C2601
Components:V2603A
Components:Controls
(close form)

Tc Loading
Components:V2601
Components:P2601A/B
Components:C2601
Components:V2603A
Components:Controls
(close form)

Tc Regeneration
Components:V2604
Components:V2601
Components:P2601A/B
Components:C2601
Components:Controls
(close form)

Tc Rinsing
Components:V2604
Components:C2601
Components:V2602
Components:P2601A/B
Components:V2601
Components:Controls
(close form)

24 Components:---------- forms only provide information. They do not link to further forms.

1 form each for the HLW and LAW facilities that are currently under construction.

TOTAL: 66 forms

Main Form
Pretreatment Process Systems
HLW Facility
LAW Facility
Edit
Vessel Characteristics
Search Hazards
select hazard query
Hazards
Select Hazard

Pretreatment Process Systems
Process Flowsheet
Tc Process Flowsheet
Main Menu

Process Flowsheet
V2206
V2204
C2201-4
V2201
V2202
V2203
V2205
V2207
Main Menu
(close form)

V2206
Components:V2206
C2201-4
(close form)

V2204
Components:V2204
C2201-4
(close form)

C2201-4
Components:C2201
V2204
V2206
V2201
V2202
V2203
V2205
Loading
Rinsing
Elution
Regeneration
(close form)

V2201
Components:V2201
C2201-4
(close form)

V2202
Components:V2202
C2201-4
(close form)

V2207
Components:V2207
V2205
(close form)

V2203
Components:V2203
C2201-4
(close form)

V2205
Components:V2205
V2207
C2201-4
(close form)

V2605
Components:V2605
V2603A-C
(close form)

C2601-4
Components:C2601
V2603
V2602
V2604
Tc Loading
Tc Rinsing
Tc Elution
Tc Regeneration
(close form)

V2603A-C
Components:V2603A
C2601-4
V2605
(close form)

Edit
Edit Hazards
Edit Controller
(close form)

Tc Process Flowsheet
V2604
C2601-4
V2601
V2602
V2605
V2603A-C
Main Form
(close form)

V2604
Components:V2604
C2601-4
V2601
(close form)

V2602
Components:V2602
C2601-4
(close form)

V2601
Components:V2601
V2604
(close form)

Edit Hazard
(close form)

Edit Controller
(close form)

Vessel Characteristics
Main Form
(exit access)

Search Hazards
[Hazards Subform1 & 2]
(close form)

select hazard query
hazard query form
(close from)

Hazards
Main Form
(exit access)

Select Hazard
Selected Hazard Form
Select Hazard2

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Notes

1.) The process flowsheets include a footer that contains the source of information for the flowsheets and vessel information. It will be necessary to UPDATE this source info.

2.) It might also be necessary to identify the source of the hazard definitions and characteristics.

3.) There was a question concerning readjusting the size of the form, in order to fit whatever screen resolution the user has. The search for a solution led to a couple of Access support sites:

http://www.athree.com → includes a forum where questions can be posted.

http://www.microsoft.com/support/default.htm → includes technical articles.

No solution was found for the sizing problem. apparently, setting the forms to maximize on open did not work. Scroll bars might aid in helping to view the complete form. Some software was found that allows the forms to readjust spacing and font size in order to best fit the screen. this software can be found at: (sample version)

→ShrinkerStretcher
http://www.petcrssoftware.com/

The software is a demo that you can download. For a working version the cost is approximately $30-40.

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Another support page is:

http://home.att.net/~dashish/index.htm

4.) At the moment two types of hazard information are included in the database. It will be necessary to determine which one will be used and how that information will be linked to the rest of the database objects.

Questions.

These are a few brainstorming question that I came across while developing the database:

1.) what kind of information will the user of this database have?

2.) If the user does not know the ID for the vessel, would they want to look at the process flowsheet and then choose to see the hazards from there?
Would it be better to have hazard info. linked to the process buttons instead of the vessel characteristics?

3.) Would the person want to directly enter the vessel ID and receive hazard info?

4.) Would the user want to enter a type of hazard & get a list of vessels associated with that hazard?

TWRS Inspection database requires no further work at this time per NRC guidance.

This notebook will be used to record Excel Spreadsheet development of the TWRS process.

Data will be recorded by Laetai Yang.

Dr. Vijay Jain
Concurred

10/27/98

10/28/99

Project : Development of a Spreadsheet-based Mass Balance Model for Hanford Tank Waste Pretreatment Processes -Proposed by BNFL, inc.

Project No: 20 1403 106

Objectives

Information potentially subject to copyright protection was redacted from pages 19 through 58. The redacted material is from the reference listed at the top of this page of this scientific notebook.

BNFL Inc. 1998. Tank Waste Remediation System Privatization Project Technical Report. BNFL-5193-TR-01. Revision 0. Richland, WA: BNFL Inc.

Approach:

See Next Page

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Nov. 28/00

Verification of PRETREAT. Feed unit.

Units	in	in	in	out	out-in
	Feed				
Stream Name	LAW Feeds	Recycled Stres	HLW Env. D	Feeds to Evaporator	
Stream No:	2	4	6	8	
Tot Mass (Mt	61.0069	6.6212	0.0000	67.6281	0.0000
Tot Vol (m3/	52.0000	6.0000	0.0000	58.0000	0.0000
Density (Mt/r	1.1732	1.1035	NA	1.1660	
Tot Act. (Bq/	6.983E+14	9.433E+11	0.000E+00	6.992E+14	-0.1250
Temperat. (o	20.0000	25.0000	20.0000	20.0000	
Feed Type:	A		D		
	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	g/L	kg/d
Al	12.0000	0.0000	0.0000	10.7586	0.0000
B	0.0000	0.0000	0.0000	0.0000	0.0000
Ba	0.0000	0.0000	0.0000	0.0000	0.0000
CN	0.0000	0.2000	0.0000	0.0207	0.0000
C as CO3	0.0000	0.1000	0.0000	0.0103	0.0000
Ca	0.0000	0.0000	0.0000	0.0000	0.0000
Cd	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	3.0000	1.9900	1.9951	2.8955	0.0000
Cr	0.1799	0.1500	0.1799	0.1768	0.0000
F	0.0000	0.0000	0.0000	0.0000	0.0000
Fe	0.2953	0.0030	0.0030	0.2650	0.0000
H2O	981.5694	900.0000	981.5694	973.1312	0.0000
Hg	0.0000	0.0000	0.0000	0.0000	0.0000
K	1.8935	1.8935	1.8935	1.8935	0.0000
La	0.0000	0.0000	0.0000	0.0000	0.0000
Li	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0.0000	0.0000	0.0000	0.0000	0.0000
Na	82.0000	68.2120	68.2120	80.5737	0.0000
Ni	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	23.4087	23.4087	23.4087	23.4087	0.0000
NO3	50.9215	50.9215	50.9215	50.9215	0.0000
OH	5.0000	43.6823	43.6823	9.0016	0.0000
Pb	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	0.7389	0.7389	0.7389	0.7389	0.0000
Pu(total)	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0.0000	0.0000	0.0000	0.0000	0.0000
S as SO4	1.7374	1.7200	1.7374	1.7356	0.0000
Sr	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0.0000	0.0000	0.0000	0.0000	0.0000
Mo	0.0000	0.0000	0.0000		
Others	0.0000	0.0000	0.0000		
					0.0000
Precip.	0.1000	0.0000	0.0000	0.0897	0.0000
Solids	18.3926	18.3926	18.3926	18.3926	0.0000
TIC	7.5000	7.5052	7.5052	7.5005	0.0000
TOC	2.9641	3.2000	2.9641	2.9885	0.0000
Gases	g/L	g/L	g/L	g/L	
CH4	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0.0000	0.0000	0.0000	0.0000	0.0000
Fissile	g/L	g/L	g/L	g/L	
Pu239/241	0.0000	0.0000	0.0000	0.0000	0.0000
U-235	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d
Am241	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	1.30E+01	1.34E+08	1.34E+08	1.38E+07	0.0000
Cs137	1.27E+13	1.27E+06	1.27E+13	1.14E+13	0.0000
Eu154/155	4.12E+09	4.12E+09	4.12E+09	4.12E+09	0.0000
Ni63/59	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	1.30E+11	1.30E+11	1.30E+11	1.30E+11	0.0000
Tc99	2.11E+10	2.11E+10	2.11E+10	2.11E+10	0.0000
TRU	1.42E+09	1.42E+09	1.42E+09	1.42E+09	0.0000
Y-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	5.22E+11	5.22E+05	5.22E+11	4.68E+11	0.0000

(a) Not available

(b) Mass Balance:

Total Flow in = 61.0069 + 6.6217 + 0
= 67.6281 mt/d

Total Flow out = 67.6281, O.k.

J.Y. 08/16/00

$Na\ in = 82\ g/L * \frac{10^{-6}}{10^{-3}} * 52.000 * 61.0069$
$+ 68.212\ g/L * \frac{10^{-6}}{10^{-3}} * 6.000 * 6.6212$
$= 5.4542$ (4.6733) mt/d.

$Na\ out = 80.5737 * \frac{10^{-6}}{10^{-3}} * 58.000 * 67.6281$
$= 4.6733$ mt/d

J.Y. 08/16/00

O.k.

(c) Out - in all close to "zero"

Preceding Strm only

Units		in	out	out	out-in
		Evaporation			
Stream Nam	Auxiliar	Feeds to LAW	LAW Concent	Evaporator O·	
Stream No:	10	12	14	16	
Tot Mass (Mt	0	67.6281	38.6546	28.9735	0.0000
Tot Vol (m3/	0	58.0000	29.0265	28.9735	0.0000
Density (Mt/r	0	1.1660	1.3317	1.0000	
Tot Act. (Bq/	0	6.992E+14	6.992E+14	0.000E+00	0.0000
Temperat. (o		20.0000	20.0000	20.0000	
Feed Type:	0.00E+00	A	A	A	
	0	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	g/L	kg/d
Al	0	10.7586	21.4761	0.0215	0.0000
B	0	0.0000	0.0000	0.0000	0.0000
Ba	0	0.0000	0.0000	0.0000	0.0000
CN	0	0.0207	0.0413	0.0000	0.0000
C as CO3	0	0.0103	0.0207	0.0000	0.0000
Ca	0	0.0000	0.0000	0.0000	0.0000
Cd	0	0.0000	0.0000	0.0000	0.0000
Cl	0	2.8955	5.7857	0.0000	0.0000
Cr	0	0.1768	0.3534	0.0000	0.0000
F	0	0.0000	0.0000	0.0000	0.0000
Fe	0	0.2650	0.5296	0.0000	0.0000
H2O	0	973.1312	946.3116	1000.0000	0.0000
Hg	0	0.0000	0.0000	0.0000	0.0000
K	0	1.8935	3.7835	0.0000	0.0000
La	0	0.0000	0.0000	0.0000	0.0000
Li	0	0.0000	0.0000	0.0000	0.0000
Mg	0	0.0000	0.0000	0.0000	0.0000
Mn	0	0.0000	0.0000	0.0000	0.0000
Na	0	80.5737	161.0000	0.0000	0.0000
Ni	0	0.0000	0.0000	0.0000	0.0000
NO2	0	23.4087	46.7746	0.0000	0.0000
NO3	0	50.9215	101.7500	0.0000	0.0000
OH	0	9.0016	17.9868	0.0000	0.0000
Pb	0	0.0000	0.0000	0.0000	0.0000
P as PO4	0	0.7389	1.4765	0.0000	0.0000
Pu(total)	0	0.0000	0.0000	0.0000	0.0000
Si	0	0.0000	0.0000	0.0000	0.0000
S as SO4	0	1.7356	3.4680	0.0000	0.0000
Sr	0	0.0000	0.0000	0.0000	0.0000
U (total)	0	0.0000	0.0000	0.0000	0.0000
Zn	0	0.0000	0.0000	0.0000	0.0000
Zr	0	0.0000	0.0000	0.0000	0.0000
Mo	0	0.0000	0.0000	0.0000	0.0000
Others	0	0.0000	0.0000	0.0000	0.0000
					0.0000
Precip.	0	0.0897	0.1791	0.0000	0.0000
Solids	0	18.3926	36.7515	0.0000	0.0000
	0				
TIC	0	7.5005	14.9874	0.0000	0.0000
TOC	0	2.9885	2.9858	2.9912	0.0000
	0				######
	0				######
	0				
Gases	g/L	g/L	g/L	g/L	
CH4	0	0.0000	0.0000	0.0000	0.0000
H2	0	0.0000	0.0000	0.0000	0.0000
N2	0	0.0000	0.0000	0.0000	0.0000
NH3	0	0.0000	0.0000	0.0000	0.0000
NO	0	0.0000	0.0000	0.0000	0.0000
NO2(g)	0	0.0000	0.0000	0.0000	0.0000
	0				
Fissile	g/L	g/L	g/L	g/L	
Pu239/241	0	0.0000	0.0000	0.0000	0.0000
U-235	0	0.0000	0.0000	0.0000	0.0000
	0				
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d
Am241	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	0	1.38E+07	2.77E+07	0.00E+00	0.0000
Cs137	0	1.14E+13	2.28E+13	0.00E+00	0.0000
Eu154/155	0	4.12E+09	8.23E+09	0.00E+00	0.0000
Ni63/59	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	0	1.30E+11	2.61E+11	0.00E+00	0.0000
Tc99	0	2.11E+10	4.21E+10	0.00E+00	0.0000
TRU	0	1.42E+09	2.84E+09	0.00E+00	0.0000
Y-90	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	0	4.68E+11	9.34E+11	0.00E+00	0.0000

Evaporation Unit

① Auxiliary Stream zero (Stream 8 only)

② Examin Stream 12, it equals to the values in Stream 8 in previous unit. (page 79)

ⓑ Mass Balance in unit

Total Flow in: $67.6281 + 0$ mt/d

Total Flow out: $38.6546 + 28.9735$

$= 67.6281$ mt/d

O.k.

Na in: $80.5737 * \frac{10^{-6}}{10^{-3}} * 58$

$= 4.67327$ mt/d

Na out: $\left(161.000 * \frac{29.026}{100} + 0.0 * 28.9735\right) \times \frac{10^{-6}}{10^{-3}}$

$= 4.67327$ mt/d

O.k.

ⓒ

all out - in = zero

Plants Units		ance in	Strm 10 only out	OUT out	Unit Bala out-in
		Evaporation			
Stream Nam	Auxiliar	Feeds to LAW	LAW Concent	Evaporator O·	
Stream No:	10	12	14	16	
Tot Mass (Mt	76.01603	76.0160	39.1314	36.8847	0.0000
Tot Vol (m3/	64	64.0000	27.1153	36.8847	0.0000
Density (Mt/r	1.187751	1.1878	1.4431	1.0000	
Tot Act. (Bq/	8.59E+14	8.594E+14	8.594E+14	-9.766E-04	-0.0010
Temperat. (o		20.0000	20.0000	20.0000	
Feed Type:	0.00E+00	0.0000	0.0000	0.0000	
	0	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	g/L	kg/d
Al	0.01	0.0100	0.0236	0.0000	0.0000
B	0.1	0.1000	0.2360	0.0000	0.0000
Ba	0.1	0.1000	0.2360	0.0000	0.0000
CN	2.3	2.3000	5.4232	0.0040	0.0000
C as CO3	0.11	0.1100	0.2596	0.0000	0.0000
Ca	0	0.0000	0.0000	0.0000	0.0000
Cd	0	0.0000	0.0000	0.0000	0.0000
Cl	2.5	2.5000	5.9007	0.0000	0.0000
Cr	0.12	0.1200	0.2832	0.0000	0.0000
F	0	0.0000	0.0000	0.0000	0.0000
Fe	0.002953	0.0030	0.0070	0.0000	0.0000
H2O	981.5694	981.5694	956.4986	1000.0000	0.0000
Hg	0	0.0000	0.0000	0.0000	0.0000
K	1.893483	1.8935	4.4692	0.0000	0.0000
La	0.01	0.0100	0.0236	0.0000	0.0000
Li	0	0.0000	0.0000	0.0000	0.0000
Mg	0	0.0000	0.0000	0.0000	0.0000
Mn	0	0.0000	0.0000	0.0000	0.0000
Na	68.21205	68.2120	161.0000	0.0000	0.0000
Ni	0	0.0000	0.0000	0.0000	0.0000
NO2	23.4087	23.4087	55.2513	0.0000	0.0000
NO3	50.92153	50.9215	120.1894	0.0000	0.0000
OH	43.68231	43.6823	103.1028	0.0000	0.0000
Pb	0	0.0000	0.0000	0.0000	0.0000
P as PO4	0.738932	0.7389	1.7441	0.0000	0.0000
Pu(total)	0	0.0000	0.0000	0.0000	0.0000
Si	0	0.0000	0.0000	0.0000	0.0000
S as SO4	1.737412	1.7374	4.1008	0.0000	0.0000
Sr	0	0.0000	0.0000	0.0000	0.0000
U (total)	0	0.0000	0.0000	0.0000	0.0000
Zn	0	0.0000	0.0000	0.0000	0.0000
Zr	0	0.0000	0.0000	0.0000	0.0000
Mo	0	0.0000	0.0000	0.0000	0.0000
Others	0	0.0000	0.0000	0.0000	0.0000
					0.0000
Precip.	0	0.0000	0.0000	0.0000	0.0000
Solids	18.39255	18.3926	43.4117	0.0000	0.0000
	0				
TIC	7.505225	7.5052	17.7145	0.0000	0.0000
TOC	4	4.0000	4.7206	3.4703	0.0000
	0				######
	0				######
	0				
Gases	g/L	g/L	g/L	g/L	
CH4	0	0.0000	0.0000	0.0000	0.0000
H2	0	0.0000	0.0000	0.0000	0.0000
N2	0	0.0000	0.0000	0.0000	0.0000
NH3	0	0.0000	0.0000	0.0000	0.0000
NO	0	0.0000	0.0000	0.0000	0.0000
NO2(g)	0	0.0000	0.0000	0.0000	0.0000
	0				
Fissile	g/L	g/L	g/L	g/L	
Pu239/241	0.1	0.1000	0.2360	0.0000	0.0000
U-235	0	0.0000	0.0000	0.0000	0.0000
	0				
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d
Am241	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	1.34E+08	1.34E+08	3.16E+08	0.00E+00	0.0000
Cs137	1.27E+13	1.27E+13	3.01E+13	0.00E+00	0.0000
Eu154/155	4.12E+09	4.12E+09	9.73E+09	0.00E+00	0.0000
Ni63/59	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	1.3E+11	1.30E+11	3.08E+11	-2.65E-05	0.0000
Tc99	2.11E+10	2.11E+10	4.97E+10	0.00E+00	0.0000
TRU	1.42E+09	1.42E+09	3.36E+09	0.00E+00	0.0000
Y-90	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	5.22E+11	5.22E+11	1.23E+12	0.00E+00	0.0000

Evaporation Unit.

② Stream 10 as input only

ⓐ Examine stream 12.

All parameters equal to that in stream 10.

O.k.

ⓑ Mass Balance on K.

K in: $1.8935 * \frac{10^{-6}}{10^{-3}} * 64$

$= 0.121184$ Mt/da

K out: $4.4692 * \frac{10^{-6}}{10^{-3}} * 27.1153 + 0$

$= 0.121184$ Mt/d.

O.k.

ⓒ all out - in = zero.

Plants Units	IN in	IN in	IN in	out	Unit Balance out-in		Strm 10 +8 Both in	out	OUT out	Unit Bala out-in
	Feed						Evaporation			
Stream Name	LAW Feeds	Recycled Stre	HLW Env. D	Feeds to Evaporator		Auxiliar	Feeds to LAW	LAW Concent	Evaporator O	
Stream No:	2	4	6	8		10	12	14	16	
Tot Mass (Mt	61.0069	6.6212	0.0000	67.6281	0.0000	76.01603	143.6441	77.7860	65.8581	0.0000
Tot Vol (m3/	52.0000	6.0000	0.0000	58.0000	0.0000	64	122.0000	56.1419	65.8581	0.0000
Density (Mt/r	1.1732	1.1035	NA	1.1660		1.187751	1.1774	1.3855	1.0000	
Tot Act. (Bq/	6.983E+14	9.433E+11	0.000E+00	6.992E+14	-0.1250	8.59E+14	1.559E+15	1.559E+15	1.892E-03	0.5019
Temperat. (o	20.0000	25.0000	20.0000	20.0000			40.0000	20.0000	20.0000	
Feed Type:	A		D	A		0.00E+00	0.0000	0.0000	0.0000	
	0.0000	0.0000	0.0000	0.0000		0	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	g/L	kg/d	g/L	g/L	g/L	g/L	kg/d
Al	12.0000	0.0000	0.0000	10.7586	0.0000	0.01	5.1200	11.1150	0.0095	0.0000
B	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.0525	0.1140	0.0000	0.0000
Ba	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.0525	0.1140	0.0000	0.0000
CN	0.0000	0.2000	0.0000	0.0207	0.0000	2.3	1.2164	2.6407	0.0023	0.0000
C as CO3	0.0000	0.1000	0.0000	0.0103	0.0000	0.11	0.0626	0.1361	0.0000	0.0000
Ca	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
Cd	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
Cl	3.0000	1.9900	1.9951	2.8955	0.0000	2.5	2.6880	5.8413	0.0000	0.0000
Cr	0.1799	0.1500	0.1799	0.1768	0.0000	0.12	0.1470	0.3195	0.0000	0.0000
F	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
Fe	0.2953	0.0030	0.0030	0.2650	0.0000	0.002953	0.1275	0.2772	0.0000	0.0000
H2O	981.5694	900.0000	981.5694	973.1312	0.0000	981.5694	977.5578	951.2317	1000.0000	0.0000
Hg	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
K	1.8935	1.8935	1.8935	1.8935	0.0000	1.893483	1.8935	4.1147	0.0000	0.0000
La	0.0000	0.0000	0.0000	0.0000	0.0000	0.01	0.0052	0.0114	0.0000	0.0000
Li	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
Mg	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
Mn	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
Na	82.0000	68.2120	68.2120	80.5737	0.0000	68.21205	74.0889	161.0000	0.0000	0.0000
Ni	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
NO2	23.4087	23.4087	23.4087	23.4087	0.0000	23.4087	23.4087	50.8686	0.0000	0.0000
NO3	50.9215	50.9215	50.9215	50.9215	0.0000	50.92153	50.9215	110.6558	0.0000	0.0000
OH	5.0000	43.6823	43.6823	9.0016	0.0000	43.68231	27.1948	59.0960	0.0000	0.0000
Pb	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
P as PO4	0.7389	0.7389	0.7389	0.7389	0.0000	0.738932	0.7389	1.6057	0.0000	0.0000
Pu(total)	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
Si	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
S as SO4	1.7374	1.7200	1.7374	1.7356	0.0000	1.737412	1.7366	3.7736	0.0000	0.0000
Sr	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
U (total)	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
Zn	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
Zr	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
Mo	0.0000	0.0000	0.0000			0	0.0000	0.0000	0.0000	0.0000
Others	0.0000	0.0000	0.0000			0	0.0000	0.0000	0.0000	0.0000
					0.0000					0.0000
Precip.	0.1000	0.0000	0.0000	0.0897	0.0000	0	0.0426	0.0926	0.0000	0.0000
Solids	18.3926	18.3926	18.3926	18.3926	0.0000	18.39255	18.3926	39.9682	0.0000	0.0000
						0				
TIC	7.5000	7.5052	7.5052	7.5005	0.0000	7.505225	7.5030	16.3045	0.0000	0.0000
TOC	2.9641	3.2000	2.9641	2.9885	0.0000	4	3.5191	3.8236	3.2595	0.0000
						0				######
						0				######
						0				
Gases	g/L	g/L	g/L	g/L		g/L	g/L	g/L	g/L	
CH4	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
H2	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
N2	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
NH3	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
NO	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
NO2(g)	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
						0				
Fissile	g/L	g/L	g/L	g/L		g/L	g/L	g/L	g/L	
Pu239/241	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.0525	0.1140	0.0000	0.0000
U-235	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
						0				
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d
Am241	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	1.30E+01	1.34E+08	1.34E+08	1.38E+07	0.0000	1.34E+08	7.67E+07	1.67E+08	0.00E+00	0.0000
Cs137	1.27E+13	1.27E+06	1.27E+13	1.14E+13	0.0000	1.27E+13	1.21E+13	2.63E+13	0.00E+00	0.0000
Eu154/155	4.12E+09	4.12E+09	4.12E+09	4.12E+09	0.0000	4.12E+09	4.12E+09	8.96E+09	-9.27E-07	0.0000
Ni63/59	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	1.30E+11	1.30E+11	1.30E+11	1.30E+11	0.0000	1.3E+11	1.30E+11	2.84E+11	2.97E-05	0.0000
Tc99	2.11E+10	2.11E+10	2.11E+10	2.11E+10	0.0000	2.11E+10	2.11E+10	4.57E+10	0.00E+00	0.0000
TRU	1.42E+09	1.42E+09	1.42E+09	1.42E+09	0.0000	1.42E+09	1.42E+09	3.09E+09	0.00E+00	0.0000
Y-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	5.22E+11	5.22E+05	5.22E+11	4.68E+11	0.0000	5.22E+11	4.96E+11	1.08E+12	0.00E+00	0.0000

Evaporation Unit

③ Stream 8+10 Both as Input

ⓐ Input stream 12.

Total Flow from #8+#10
$= 67.6281 + 76.01603$
$= 143.6441$. Mt/d

Total Flow in str #12
143.6441. Mt/da
O.k.

K from #8 + #10.

$1.8935 * \frac{10^{-6}}{10^{-3}} * 58 +$
$1.893483 * \frac{10^{-6}}{10^{-3}} * 64$ (J.Y. 04/21/00)
$=$ ~~0.109823~~ 0.231007 Mt/d

K in str #12
$1.8935 * \frac{10^{-6}}{10^{-3}} * 122.00$
$= 0.231007$. Mt/d
o.k.

ⓑ Mass Balance in Unit.
Omitted, should same as in case ① and ②

Note: Preceeding Units all set to " preceeding unit strm only "

Plants Units	Input= in	Preceed Strm only IN in	out	OUT out	Unit Ba out-in
	Filtration				
Stream Name	Auxiliar	Feeds to Filtra	Precip. Agent	LAW Permeat	Sr/TRU & Entrained soli
Stream No:	18	20	22	24	26
Tot Mass (Mt	0	38.6546	9.4114	44.5367	3.5293	0.0000
Tot Vol (m3/	0	29.0265	9.4114	36.0851	2.3529	0.0000
Density (Mt/r	0	1.3317	1.0000	1.2342	1.5000	
Tot Act. (Bq/	0	6.992E+14	0.000E+00	6.433E+14	5.586E+13	0.3516
Temperat. (o		20.0000	20.0000	20.0000	20.0000	
Feed Type:	A	A	A	A	A	
	0	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	g/L	g/L	kg/d
Al	0	21.4761	0.0000	2.7294	223.0846	0.0000
B	0	0.0000	0.0000	0.0000	0.0000	0.0000
Ba	0	0.0000	0.0000	0.0000	0.0000	0.0000
CN	0	0.0413	0.0000	0.0332	0.0000	0.0000
C as CO3	0	0.0207	0.0000	0.0015	0.2326	0.0000
Ca	0	0.0000	0.0000	0.0000	0.0000	0.0000
Cd	0	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	0	5.7857	0.0000	2.8639	27.4541	0.0000
Cr	0	0.3534	0.0000	0.1773	1.6395	0.0000
F	0	0.0000	0.0000	0.0000	0.0000	0.0000
Fe	0	0.5296	0.0000	0.0829	5.2614	0.0000
H2O	0	946.3116	1000.0000	989.4150	500.0000	0.0000
Hg	0	0.0000	0.0000	0.0000	0.0000	0.0000
K	0	3.7835	0.0000	1.6712	21.0457	0.0000
La	0	0.0000	0.0000	0.0000	0.0000	0.0000
Li	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0	0.0000	0.0000	0.0000	0.0000	0.0000
Na	0	161.0000	0.0000	125.3902	63.1372	0.0000
Ni	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	0	46.7746	0.0000	24.1424	206.7798	0.0000
NO3	0	101.7500	0.0000	70.9975	166.3923	0.0000
OH	0	17.9868	0.0000	0.0599	220.9801	0.0000
Pb	0	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	0	1.4765	0.0000	1.1877	0.0000	0.0000
Pu(total)	0	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0	0.0000	0.0000	0.0000	0.0000	0.0000
S as SO4	0	3.4680	0.0000	1.4322	20.8196	0.0000
Sr	0	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mo	0		0.0000	0.0000	0.0000	
Others	0		0.0000	0.0000	0.0000	
						0.0000
Precip.	0	0.1791	0.0000	0.0001	2.2079	0.0000
Solids	0	36.7515	0.0000	0.0100	996.5830	###### (1278.41)
TIC	0	14.9874	0.0000	10.6835	21.0457	0.0000
TOC	0	2.9858	0.0000	1.0226	21.1509	0.0000
	0					#VALUE!
	0					#VALUE!
Gases	g/L	g/L	g/L	g/L	g/L	
CH4	0	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0	0.0000	0.0000	0.0000	0.0000	0.0000
	0					
Fissile	g/L	g/L	g/L	g/L	g/L	
Pu239/241	0	0.0000	0.0000	0.0000	0.0000	0.0000
U-235	0	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d
Am241	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	0	2.77E+07	0.00E+00	2.15E+07	1.08E+07	0.0000
Cs137	0	2.28E+13	0.00E+00	1.78E+13	8.96E+12	0.0391
Eu154/155	0	8.23E+09	0.00E+00	6.41E+09	3.23E+09	0.0000
Ni63/59	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	0	2.61E+11	0.00E+00	2.10E+08	3.21E+12	0.0000
Tc99	0	4.21E+10	0.00E+00	3.28E+10	1.65E+10	0.0000
TRU	0	2.84E+09	0.00E+00	2.29E+06	3.51E+10	0.0000
Y-90	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	0	9.34E+11	0.00E+00	7.52E+08	1.15E+13	0.0000
						1.2780

Filtration Unit (Preceeding Units all Set to preceeding Unit strm only)

Case ① Stream 16 only as input

ⓐ Input Stream 20

Examine the properties in strm 20. All equals to the corresponding values in stream 16 on page 60
o.k.

ⓑ Mass Balance in Unit.

Total flow in $= 38.6546 + 9.4114$
$= 48.066$

Total Flow out $= 44.5367 + 3.5293$
$= 48.066$
o.k.

H_2O in $= [(946.316 * 29.0265 + 1000.00 * 9.4114) * \frac{10^{-6}}{10^{-3}} = 36.8795$

H_2O out $= (989.415 * 36.0851 + 500 * 2.3529) * \frac{10^{-6}}{10^{-3}} = 36.8796$
o.k.

ⓒ out − in = 0, except ⓓ

ⓓ Solid not balanced, increased by 1278.4 kg/day. (Note solid is not balanced, see page 65)
This is due to the fact that the solid assay is so given, so much solid must be generated in unit. (previously dissolved, but precipitated in unit).

Filtration Unit

Mar. 27/00

Case ③

Stream 14 + 18 as input

Input= Preceed Strm only | Unit Balance | Input= Both Preceed and Aux. Strm | Unit Bal

Plants / Units	in	out	OUT out	out-in	in	IN in	out	OUT out	out-in
	Evaporation				Filtration				
Stream Name	Feeds to LAW	LAW Concent	Evaporator O		Auxiliar	Feeds to Filtra	Precip. Agent	LAW Permeat	Sr/TRU & Entrained soli	
Stream No:	12	14	16		18	20	22	24	26	
Tot Mass (Mt	67.6281	38.6546	28.9735	0.0000	76.01604	114.6706	9.4114	120.5528	3.5293	0.0000
Tot Vol (m3/	58.0000	29.0265	28.9735	0.0000	64	93.0265	9.4114	100.0851	2.3529	0.0000
Density (Mt/	1.1660	1.3317	1.0000		1.187751	1.2327	1.0000	1.2045	1.5000	
Tot Act. (Bq/	6.992E+14	6.992E+14	0.000E+00	0.0000	8.59E+14	1.559E+15	0.000E+00	1.458E+15	1.009E+14	0.5781
Temperat. (o	20.0000	20.0000	20.0000			20.0000	20.0000	20.0000	20.0000	
Feed Type:	A	A			A	A	A	A		
	0.0000	0.0000	0.0000		0	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	kg/d	g/L	g/L	g/L	g/L	g/L	kg/d
Al	10.7586	21.4761	0.0215	0.0000	0.01	6.7079	0.0000	0.9905	223.0846	0.0000
B	0.0000	0.0000	0.0000	0.0000	0.1	0.0688	0.0000	0.0639	0.0000	0.0000
Ba	0.0000	0.0000	0.0000	0.0000	0.1	0.0688	0.0000	0.0639	0.0000	0.0000
CN	0.0207	0.0413	0.0000	0.0000	2.3	1.5952	0.0000	1.4827	0.0000	0.0000
C as CO3	0.0103	0.0207	0.0000	0.0000	0.11	0.0821	0.0000	0.0709	0.2326	0.0000
Ca	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Cd	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	2.8955	5.7857	0.0000	0.0000	2.5	3.5252	0.0000	2.6312	27.4541	0.0000
Cr	0.1768	0.3534	0.0000	0.0000	0.12	0.1928	0.0000	0.1407	1.6395	0.0000
F	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Fe	0.2650	0.5296	0.0000	0.0000	0.002953	0.1673	0.0000	0.0318	5.2614	0.0000
H2O	973.1312	946.3116	1000.0000	0.0000	981.5694	970.5681	1000.0000	984.3981	500.0000	0.0000
Hg	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
K	1.8935	3.7835	0.0000	0.0000	1.893483	2.4832	0.0000	1.8133	21.0457	0.0000
La	0.0000	0.0000	0.0000	0.0000	0.01	0.0069	0.0000	0.0064	0.0000	0.0000
Li	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Na	80.5737	161.0000	0.0000	0.0000	68.21205	97.1641	0.0000	88.8273	63.1372	0.0000
Ni	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	23.4087	46.7746	0.0000	0.0000	23.4087	30.6994	0.0000	23.6732	206.7798	0.0000
NO3	50.9215	101.7500	0.0000	0.0000	50.92153	66.7812	0.0000	58.1598	166.3923	0.0000
OH	9.0016	17.9868	0.0000	0.0000	43.68231	35.6647	0.0000	27.9545	220.9801	0.0000
Pb	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	0.7389	1.4765	0.0000	0.0000	0.738932	0.9691	0.0000	0.9007	0.0000	0.0000
Pu(total)	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
S as SO4	1.7356	3.4680	0.0000	0.0000	1.737412	2.2774	0.0000	1.6274	20.8196	0.0000
Sr	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mo	0.0000	0.0000	0.0000	0.0000	0		0.0000	0.0000	0.0000	
Others	0.0000	0.0000	0.0000	0.0000	0		0.0000	0.0000	0.0000	
				0.0000						0.0000
Precip.	0.0897	0.1791	0.0000	0.0000	0	0.0559	0.0000	0.0001	2.2079	0.0000
Solids	18.3926	36.7515	0.0000	0.0000	18.39255	24.1210	0.0000	0.0100	996.5830	########
										100.g
TIC	7.5005	14.9874	0.0000	0.0000	7.5053	9.8399	0.0000	8.6512	21.0457	0.0000
TOC	2.9885	2.9858	2.9912	0.0000	4	3.6835	0.0000	2.9265	21.1509	0.0000
				#######	0					#VALUE!
				#######	0					#VALUE!
Gases	g/L	g/L	g/L		g/L	g/L	g/L	g/L	g/L	
CH4	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
					0					
Fissile	g/L	g/L	g/L		g/L	g/L	g/L	g/L	g/L	
Pu239/241	0.0000	0.0000	0.0000	0.0000	0.1	0.0688	0.0000	0.0629	0.0447	0.0000
U-235	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/d	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d
Am241	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	1.38E+07	2.77E+07	0.00E+00	0.0000	1.34E+08	1.01E+08	0.00E+00	9.20E+07	6.54E+07	0.0000
Cs137	1.14E+13	2.28E+13	0.00E+00	0.0000	1.27E+13	1.59E+13	0.00E+00	1.45E+13	1.03E+13	0.0469
Eu154/155	4.12E+09	8.23E+09	0.00E+00	0.0000	4.12E+09	5.40E+09	0.00E+00	4.94E+09	3.51E+09	0.0000
Ni63/59	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	1.30E+11	2.61E+11	0.00E+00	0.0000	1.3E+11	1.71E+11	0.00E+00	1.59E+08	6.76E+12	0.0000
Tc99	2.11E+10	4.21E+10	0.00E+00	0.0000	2.11E+10	2.76E+10	0.00E+00	2.52E+10	1.79E+10	-0.0002
TRU	1.42E+09	2.84E+09	0.00E+00	0.0000	1.42E+09	1.87E+09	0.00E+00	1.74E+06	7.37E+10	0.0000
Y-90	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	4.68E+11	9.34E+11	0.00E+00	0.0000	5.22E+11	6.50E+11	0.00E+00	6.05E+08	2.57E+13	0.0000
Sum										0.1009
										is solids

Total Flow #14 + #18
= 38.6546 + 76.0160
= 114.6706.

Total Flow in #20
114.6706
o.k.

ⓑ Mass balance in Unit.
Omitted.
No Formula change
Compared with case ①

ⓒ out − in = 0, except ⓓ

ⓓ Solid generated is 100.4 kg this time compared with 1278 kg/d in Case ①.
This is because the assay used in Calculation is different, see sheet "Solid - Assay"

Filtration Unit

Mar 28/00

Case ②, Strm #18 only as input

Input= Aux. Strm only | Unit Balar

Plants / Units	in	IN in	out	OUT out	out-in
	Filtration				
Stream Name	Auxiliar	Feeds to Filtra	Precip. Agent	LAW Permeat	Sr/TRU & Entrained solid	
Stream No:	18	20	22	24	26	
Tot Mass (Mt	76.01604	76.0160	9.3906	81.8852	3.5215	0.0000
Tot Vol (m3/	64	64.0000	9.3906	71.0430	2.3477	0.0000
Density (Mt/	1.187751	1.1878	1.0000	1.1526	1.5000	
Tot Act. (Bq/	8.59E+14	8.594E+14	0.000E+00	7.898E+14	6.960E+13	0.2188
Temperat. (o		20.0000	20.0000	20.0000	20.0000	
Feed Type:	A	A	A	A		
	0	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	g/L	g/L	kg/d
Al	0.01	0.0100	0.0000	-7.3793	223.5783	0.0000
B	0.1	0.1000	0.0000	0.0901	0.0000	0.0000
Ba	0.1	0.1000	0.0000	0.0901	0.0000	0.0000
CN	2.3	2.3000	0.0000	2.0720	0.0000	0.0000
C as CO3	0.11	0.1100	0.0000	0.0914	0.2331	0.0000
Ca	0	0.0000	0.0000	0.0000	0.0000	0.0000
Cd	0	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	2.5	2.5000	0.0000	1.3429	27.5148	0.0000
Cr	0.12	0.1200	0.0000	0.0538	1.6431	0.0000
F	0	0.0000	0.0000	0.0000	0.0000	0.0000
Fe	0.002953	0.0030	0.0000	-0.1716	5.2731	0.0000
H2O	981.5694	981.5694	1000.0000	999.9194	500.0000	0.0000
Hg	0	0.0000	0.0000	0.0000	0.0000	0.0000
K	1.893483	1.8935	0.0000	1.0088	21.0923	0.0000
La	0.01	0.0100	0.0000	0.0090	0.0000	0.0000
Li	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0	0.0000	0.0000	0.0000	0.0000	0.0000
Na	68.21205	68.2120	0.0000	59.3587	63.2769	0.0000
Ni	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	23.4087	23.4087	0.0000	14.2397	207.2374	0.0000
NO3	50.92153	50.9215	0.0000	40.3626	166.7604	0.0000
OH	43.68231	43.6823	0.0000	32.0332	221.4690	0.0000
Pb	0	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	0.738932	0.7389	0.0000	0.6657	0.0000	0.0000
Pu(total)	0	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0	0.0000	0.0000	0.0000	0.0000	0.0000
S as SO4	1.737412	1.7374	0.0000	0.8757	20.8657	0.0000
Sr	0	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mo	0		0.0000	0.0000	0.0000	
Others	0		0.0000	0.0000	0.0000	
						0.0000
Precip.	0	0.0000	0.0000	0.0000	0.0000	0.0000
Solids	18.39255	18.3926	0.0000	0.0100	1001.0010	1173.5971
TIC	7.5053	7.5053	0.0000	6.0642	21.0923	0.0000
TOC	4	4.0000	0.0000	2.9030	21.1977	0.0000
	0					#VALUE!
	0					#VALUE!
Gases	g/L	g/L	g/L	g/L	g/L	
CH4	0	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0	0.0000	0.0000	0.0000	0.0000	0.0000
	0					
Fissile	g/L	g/L	g/L	g/L	g/L	
Pu239/241	0.1	0.1000	0.0000	0.0870	0.0928	0.0000
U-235	0	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d
Am241	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	1.34E+08	1.34E+08	0.00E+00	1.16E+08	1.24E+08	0.0000
Cs137	1.27E+13	1.27E+13	0.00E+00	1.11E+13	1.18E+13	-0.0117
Eu154/155	4.12E+09	4.12E+09	0.00E+00	3.59E+09	3.82E+09	0.0000
Ni63/59	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	1.3E+11	1.30E+11	0.00E+00	1.16E+08	3.55E+12	0.0000
Tc99	2.11E+10	2.11E+10	0.00E+00	1.83E+10	1.95E+10	0.0001
TRU	1.42E+09	1.42E+09	0.00E+00	1.28E+06	3.88E+10	0.0000
Y-90	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	5.22E+11	5.22E+11	0.00E+00	4.70E+08	1.42E+13	0.0000
						1.1728

ⓐ Input Strm #20
All the same as that in Strm. 18. O.k.

ⓑ Mass balance in Unit.
Omitted.
No Formula change. Compared with case ①

ⓒ out − in = 0 except ⓓ

ⓓ Solid of 1173.5-9 kg/d is produced in the Unit.
See Page 63.

Continued From Page 63:

Solids components such as $Fe(OH)_3$, $BaSO_4$, $Al(OH)_3$ as balanced. Solids are not balanced because they changes if pH changes.

3.29.00/16/00

* All previous Units use "Preceeding Strm only*."

Cs - column

ice Input= **Preceed Strm only** * Unit Bal

Plants / Units		in	in	in	out	out	out	out-in
		Cs_Col						
Stream Name	*Aug. F*	Feeds to Cs C	Rinse Soln	Elution Agent	Rinse Recycle	Cs soln	Cs Removed LAW	
Stream No:	*28*	40	41	42	43	44	48	
Tot Mass (Mt	0	44.5367	0.4000	0.2750	0.4001	0.2791	44.4481	-0.0844
Tot Vol (m3/	0	36.0851	0.4000	0.2750	0.4000	0.2750	36.0847	-0.0004
Density (Mt/r	0	1.2342	1.0000	1.0000	1.0002	1.0150	1.2318	
Tot Act. (Bq/	0	6.433E+14	0.000E+00	0.000E+00	0.000E+00	6.413E+14	2.052E+12	-0.0398
Temperat. (o		20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	
Feed Type:	#######	A	0.0000	0.0000	0.0000 A	A		
	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	kg/d
Al	0	2.7294	0.0000	0.0000	0.0001	0.3581	2.7267	0.0985
B	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ba	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CN	0	0.0332	0.0000	0.0000	0.0000	0.0044	0.0332	0.0000
C as CO3	0	0.0015	0.0000	0.0000	0.0000	0.0002	0.0015	0.0000
Ca	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cd	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	0	2.8639	0.0000	0.0000	0.0000	0.3758	2.8611	0.0000
Cr	0	0.1773	0.0000	0.0000	0.0000	0.0233	0.1772	0.0000
F	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fe	0	0.0829	0.0000	0.0000	0.0000	0.0109	0.0828	0.0000
H2O	0	989.4150	0.3960	0.2687	0.3960	977.0909	989.4249	0.0000
Hg	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K	0	1.6712	0.0000	0.0000	0.0000	0.2193	1.6695	0.0000
La	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Li	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Na	0	125.3902	0.0023	0.0000	0.0023	0.0000	125.3915	0.0000
Ni	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	0	24.1424	0.0000	0.0000	0.0000	3.1679	24.1185	0.0000
NO3	0	70.9975	0.0000	0.0062	0.0000	31.8616	70.9272	0.0000
OH	0	0.0599	0.0017	0.0000	0.0017	0.0079	0.0598	0.0000
Pb	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	0	1.1877	0.0000	0.0000	0.0000	0.1558	1.1865	0.0000
Pu(total)	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S as SO4	0	1.4322	0.0000	0.0000	0.0000	0.1879	1.4307	0.0000
Sr	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mo	0		0.0000	0.0000	0.0000	0.0000	0.0000	
Others	0		0.0000	0.0001	0.0000	0.0000	0.0000	
Precip.	0	0.0001	0.0000	0.0000	0.0000	0.0095	0.0001	0.0000
Solids	0	0.0100	0.0000	0.0000	0.0000	0.6561	0.0050	0.0000
TIC	0	10.6835	0.0000	0.0000	0.0000	1.4019	10.6729	0.0000
TOC	0	1.0226	0.0000	0.0000	0.0000	0.1342	1.0216	0.0000
	0							
	0							
Gases	g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	
CH4	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0							#VALUE!
Fissile	g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	#VALUE!
Pu239/241	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
U-235	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/m3	Bq/d	Bq/d	Bq/d	Bq/m3	Bq/m3	Bq/d
Am241	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	0	2.15E+07	0.00E+00	0.00E+00	0.00E+00	2.83E+07	2.13E+07	0.0000
Cs137	0	1.78E+13	0.00E+00	0.00E+00	0.00E+00	2.33E+15	1.78E+10	0.0579
Eu154/155	0	6.41E+09	0.00E+00	0.00E+00	0.00E+00	8.42E+09	6.35E+09	0.0000
Ni63/59	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	0	2.10E+08	0.00E+00	0.00E+00	0.00E+00	2.75E+08	2.08E+08	0.0000
Tc99	0	3.28E+10	0.00E+00	0.00E+00	0.00E+00	4.30E+10	3.24E+10	0.0000
TRU	0	2.29E+06	0.00E+00	0.00E+00	0.00E+00	3.00E+06	2.27E+06	0.0000
Y-90	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	0	7.52E+08	0.00E+00	0.00E+00	0.00E+00	8.88E+10	7.52E+07	0.0000

Case ① "Stream 24 only" as input

ⓐ Input stream 40

All properties in Strm #40 are the same as in Strm # 24 (see page 63)

O.k.

ⓑ Mass Balance in unit

Total Flow in: 44.5367 + 0.400 + 0.2750

= 45.2117 Mt/d

~~Total Flow out: 0.4001 + 0.2791 + 44.4481~~

O.k.? ~~= 45.1273 Mt/d~~

H_2O in: [989.415 * 36.0851 + 0.396 * 0.4 (1000) + 0.2687 * 0.2750 (1000)] * $\frac{10^{-6}}{10^{-3}}$

= 36.36784 Mt/day (J.Y. 04/21/00)

H_2O out: [0.396 * 0.4 (1000) + 977.0909 * 0.275 + 989.4249 * 36.0847] * $\frac{10^{-6}}{10^{-3}}$

= 36.3678 Mt/d

O.k.

ⓒ out − in = 0 (close) for all.

O.k.

Cs - Column Unit Case ③

March 28/00

Input= **Preceed Strm only** — Unit Balance — Input= **Both Preceed and Aux. Strm** — Unit Bal

Plants / Units	in	IN in	out	OUT out	out-in		in	in	in	out	out	out	out-in
	Filtration						Cs_Col						
Stream Name	Feeds to Filtra	Precip. Agent	LAW Permeat	Sr/TRU & Entrained solid		*Aug. F*	Feeds to Cs C	Rinse Soln	Elution Agent	Rinse Recycle	Cs soln	Cs Removed LAW	
Stream No:	20	22	24	26		*28*	40	41	42	43	44	48	
Tot Mass (Mt	38.6546	9.4114	44.5367	3.5293	0.0000	76.016	120.5528	0.4000	0.2750	0.4000	0.2931	94.8206	-25.7140
Tot Vol (m3/	29.0265	9.4114	36.0851	2.3529	0.0000	64	100.0851	0.4000	0.2750	0.4000	0.2750	100.0841	-0.0010
Density (Mt/r	1.3317	1.0000	1.2342	1.5000		1.18775	1.2045	1.0000	1.0000	1.0000	1.0660	0.9474	
Tot Act. (Bq/	6.992E+14	0.000E+00	6.433E+14	5.586E+13	0.3516	8.6E+14	8.594E+14	0.000E+00	0.000E+00	0.000E+00	8.453E+14	1.411E+13	-0.0703
Temperat. (o	20.0000	20.0000	20.0000	20.0000			20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	
Feed Type:	A	A	A	A		#######	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
	0.0000	0.0000	0.0000	0.0000		0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	g/L	kg/d	g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	kg/d
Al	21.4761	0.0000	2.7294	223.0846	0.0000	0.01	0.0064	0.0000	0.0000	0.0000	0.0023	0.0064	0.0006
B	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.0639	0.0000	0.0000	0.0000	0.0233	0.0639	0.0000
Ba	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.0639	0.0000	0.0000	0.0000	0.0233	0.0639	0.0000
CN	0.0413	0.0000	0.0332	0.0000	0.0000	2.3	1.4707	0.0000	0.0000	0.0000	0.5353	1.4693	0.0000
C as CO3	0.0207	0.0000	0.0015	0.2326	0.0000	0.11	0.0703	0.0000	0.0000	0.0000	0.0256	0.0703	0.0000
Ca	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cd	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	5.7857	0.0000	2.8639	27.4541	0.0000	2.5	1.5986	0.0000	0.0000	0.0000	0.5818	1.5971	0.0000
Cr	0.3534	0.0000	0.1773	1.6395	0.0000	0.12	0.0767	0.0000	0.0000	0.0000	0.0279	0.0767	0.0000
F	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fe	0.5296	0.0000	0.0829	5.2614	0.0000	0.00295	0.0019	0.0000	0.0000	0.0000	0.0007	0.0019	0.0000
H2O	946.3116	1000.0000	989.4150	500.0000	0.0000	981.569	721.7045	0.3960	0.2687	0.3960	977.0909	721.7117	0.0000
Hg	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K	3.7835	0.0000	1.6712	21.0457	0.0000	1.89348	1.2108	0.0000	0.0000	0.0000	0.4407	1.2096	0.0000
La	0.0000	0.0000	0.0000	0.0000	0.0000	0.01	0.0064	0.0000	0.0000	0.0000	0.0023	0.0064	0.0000
Li	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Na	161.0000	0.0000	125.3902	63.1372	0.0000	68.212	43.6186	0.0023	0.0000	0.0023	0.0000	43.6190	0.0000
Ni	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	46.7746	0.0000	24.1424	206.7798	0.0000	23.4087	14.9688	0.0000	0.0000	0.0000	5.4478	14.9540	0.0000
NO3	101.7500	0.0000	70.9975	166.3923	0.0000	50.9215	32.5621	0.0000	0.0062	0.0000	34.3963	32.5298	0.0000
OH	17.9868	0.0000	0.0599	220.9801	0.0000	43.6823	27.9329	0.0017	0.0000	0.0017	10.1661	27.9053	0.0000
Pb	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	1.4765	0.0000	1.1877	0.0000	0.0000	0.73893	0.4725	0.0000	0.0000	0.0000	0.1720	0.4720	0.0000
Pu(total)	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S as SO4	3.4680	0.0000	1.4322	20.8196	0.0000	1.73741	1.1110	0.0000	0.0000	0.0000	0.4043	1.1099	0.0000
Sr	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mo		0.0000	0.0000	0.0000		0		0.0000	0.0000	0.0000	0.0000	0.0000	
Others		0.0000	0.0000	0.0000		0		0.0000	0.0001	0.0000	0.0000	0.0000	
					0.0000								
Precip.	0.1791	0.0000	0.0001	2.2079	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Solids	36.7515	0.0000	0.0100	996.5830	1278.4080	18.3926	11.7612	0.0000	0.0000	0.0000	2140.2242	5.8807	0.0000
TIC	14.9874	0.0000	10.6835	21.0457	0.0000	7.50523	4.7993	0.0000	0.0000	0.0000	1.7467	4.7945	0.0000
TOC	2.9858	0.0000	1.0226	21.1509	0.0000	4	2.5578	0.0000	0.0000	0.0000	0.9309	2.5553	0.0000
					#VALUE!	0							
					#VALUE!	0							
Gases	g/L	g/L	g/L	g/L		g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	
CH4	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0.0000	0.0000	0.0000	0.0000	0.0000	0	94.0342	0.0000	0.0000	0.0000	34.2233	93.9411	0.0000
NH3	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
						0							#VALUE!
Fissile	g/L	g/L	g/L	g/L		g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	#VALUE!
Pu239/241	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.0639	0.0000	0.0000	0.0000	0.2327	0.0633	0.0000
U-235	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d	Bq/m3	Bq/m3	Bq/d	Bq/d	Bq/d	Bq/m3	Bq/m3	Bq/d
Am241	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	2.77E+07	0.00E+00	2.15E+07	1.08E+07	0.0000	1.3E+08	8.55E+07	0.00E+00	0.00E+00	0.00E+00	3.11E+08	8.47E+07	0.0000
Cs137	2.28E+13	0.00E+00	1.78E+13	8.96E+12	0.0391	1.3E+13	8.15E+12	0.00E+00	0.00E+00	0.00E+00	2.96E+15	8.15E+09	0.0680
Eu154/155	8.23E+09	0.00E+00	6.41E+09	3.23E+09	0.0000	4.1E+09	2.64E+09	0.00E+00	0.00E+00	0.00E+00	9.59E+09	2.61E+09	0.0000
Ni63/59	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	2.61E+11	0.00E+00	2.10E+08	3.21E+12	0.0000	1.3E+11	8.34E+10	0.00E+00	0.00E+00	0.00E+00	3.04E+11	8.26E+10	0.0000
Tc99	4.21E+10	0.00E+00	3.28E+10	1.65E+10	0.0000	2.1E+10	1.35E+10	0.00E+00	0.00E+00	0.00E+00	4.90E+10	1.33E+10	0.0000
TRU	2.84E+09	0.00E+00	2.29E+06	3.51E+10	0.0000	1.4E+09	9.10E+08	0.00E+00	0.00E+00	0.00E+00	3.31E+09	9.01E+08	0.0000
Y-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	9.40E+01	0.00E+00	0.00E+00	0.00E+00	3.42E+02	9.31E+01	0.0000
Solid	9.34E+11	0.00E+00	7.52E+08	1.15E+13	0.0000	5.2E+11	3.34E+11	0.00E+00	0.00E+00	0.00E+00	1.09E+14	3.34E+10	-0.0005

Stream # 24 + #28 as input

ⓐ Input Strm 40

~~Total from #24 and #28~~

44.5367 + 76.016

= 120.5527 Mt/d

Same as in Strm #40

O.k.

Cl from # 24 and # 28

[2.8639 * 36.0851 + 2.5 * 64] * $\frac{10^{-6}}{10^{-3}}$

= 0.26334 Mt/d

Cl in strm # 40

1.5986 * 100.0851 * $\frac{10^{-6}}{10^{-3}}$ (J.Y. 08/16/00)

= 0.159996

~~Not O.k.~~ Problem

ⓑ Mass balance in unit

Omitted.

ⓒ

Mar. 29/00.

A bug Found in the formula for stream 40 Components.

Fixed. see Page 69

Cs - Column Unit

case ② "Stream #28 only"

ce Input= **Aux. Strm only** Unit Bal

Plants / Units		in	in	in	out	out	out	out-in
		Cs_Col						
Stream Name	*Aug. F*	Feeds to Cs C	Rinse Soln	Elution Agent	Rinse Recycle	Cs soln	Cs Removed LAW	
Stream No:	*28*	40	41	42	43	44	48	
Tot Mass (Mt	76.016	76.0160	0.4000	0.2750	0.4000	0.2837	76.0072	-0.0001
Tot Vol (m3/	64	64.0000	0.4000	0.2750	0.4000	0.2750	63.9994	-0.0006
Density (Mt/	1.18775	1.1878	1.0000	1.0000	1.0000	1.0317	1.1876	
Tot Act. (Bq/	8.6E+14	8.594E+14	0.000E+00	0.000E+00	0.000E+00	8.453E+14	1.411E+13	0.0000
Temperat. (o		20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	
Feed Type:	#######	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	kg/d
Al	0.01	0.0100	0.0000	0.0000	0.0000	0.0023	0.0100	0.0006
B	0.1	0.1000	0.0000	0.0000	0.0000	0.0233	0.0999	0.0000
Ba	0.1	0.1000	0.0000	0.0000	0.0000	0.0233	0.0999	0.0000
CN	2.3	2.3000	0.0000	0.0000	0.0000	0.5353	2.2977	0.0000
C as CO3	0.11	0.1100	0.0000	0.0000	0.0000	0.0256	0.1099	0.0000
Ca	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cd	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	2.5	2.5000	0.0000	0.0000	0.0000	0.5818	2.4975	0.0000
Cr	0.12	0.1200	0.0000	0.0000	0.0000	0.0279	0.1199	0.0000
F	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fe	0.00295	0.0030	0.0000	0.0000	0.0000	0.0007	0.0029	0.0000
H2O	981.569	981.5694	0.3960	0.2687	0.3960	977.0909	981.5793	0.0000
Hg	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K	1.89348	1.8935	0.0000	0.0000	0.0000	0.4407	1.8916	0.0000
La	0.01	0.0100	0.0000	0.0000	0.0000	0.0023	0.0100	0.0000
Li	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Na	68.212	68.2120	0.0023	0.0000	0.0023	0.0000	68.2127	0.0000
Ni	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	23.4087	23.4087	0.0000	0.0000	0.0000	5.4478	23.3855	0.0000
NO3	50.9215	50.9215	0.0000	0.0062	0.0000	34.3963	50.8711	0.0000
OH	43.6823	43.6823	0.0017	0.0000	0.0017	10.1661	43.6391	0.0000
Pb	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	0.73893	0.7389	0.0000	0.0000	0.0000	0.1720	0.7382	0.0000
Pu(total)	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S as SO4	1.73741	1.7374	0.0000	0.0000	0.0000	0.4043	1.7357	0.0000
Sr	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mo	0		0.0000	0.0000	0.0000	0.0000	0.0000	
Others	0		0.0000	0.0001	0.0000	0.0000	0.0000	
Precip.	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Solids	18.3926	18.3926	0.0000	0.0000	0.0000	2140.2242	9.1964	0.0000
TIC	7.50523	7.5052	0.0000	0.0000	0.0000	1.7467	7.4978	0.0000
TOC	4	4.0000	0.0000	0.0000	0.0000	0.9309	3.9960	0.0000
	0							
	0							
Gases	g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	
CH4	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0							#VALUE!
Fissile	g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	#VALUE!
Pu239/241	0.1	0.1000	0.0000	0.0000	0.0000	0.2327	0.0990	0.0000
U-235	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/m3	Bq/d	Bq/d	Bq/d	Bq/m3	Bq/m3	Bq/d
Am241	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	1.3E+08	1.34E+08	0.00E+00	0.00E+00	0.00E+00	3.11E+08	1.32E+08	0.0000
Cs137	1.3E+13	1.27E+13	0.00E+00	0.00E+00	0.00E+00	2.96E+15	1.27E+10	0.0680
Eu154/155	4.1E+09	4.12E+09	0.00E+00	0.00E+00	0.00E+00	9.59E+09	4.08E+09	0.0000
Ni63/59	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	1.3E+11	1.30E+11	0.00E+00	0.00E+00	0.00E+00	3.04E+11	1.29E+11	0.0000
Tc99	2.1E+10	2.11E+10	0.00E+00	0.00E+00	0.00E+00	4.90E+10	2.08E+10	0.0000
TRU	1.4E+09	1.42E+09	0.00E+00	0.00E+00	0.00E+00	3.31E+09	1.41E+09	0.0000
Y-90	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	5.2E+11	5.22E+11	0.00E+00	0.00E+00	0.00E+00	1.09E+14	5.22E+10	-0.0005

ⓐ Input stream 40

Examine properties in #40.

The all agree with that in #28

ⓑ Mass balance in unit

OH in : [43.6823 * 64 + 0.0017 * ~~0.4~~ 1000] * 10^{-6}

= ~~2.795673~~ 2.79736 Mt/d (J.Y. 04/21/00)

OH out : [0.0017 * 0.~~4~~ 1000 + 10.1661 * 0.~~2837~~ 0.275

+ 43.6391 * 63.9994] * $\frac{10^{-6}}{10^{-3}}$

= ~~2.795673~~ 2.79737 Mt/d

o.k. (J.Y. 04/21/00)

ⓒ Out - in ≈ 0

for all

Cs - Column Unit

Case ③ Mar 29/00

" Strm 24 + 28. Both " as Input

Input= **Preceed Strm only** Unit Balance — Input= **Both Preceed and Aux. Strm** Unit Bal

Plants / Units	in	in (IN)	out	out (OUT)	out-in		in	in	in	out	out	out	out-in
	Filtration						**Cs_Col**						
Stream Name	Feeds to Filtra	Precip. Agent	LAW Permeat	Sr/TRU & Entrained solid		*Aug. F*	Feeds to Cs C	Rinse Soln	Elution Agent	Rinse Recycle	Cs soln	Cs Removed LAW	
Stream No:	20	22	24	26		*28*	40	41	42	43	44	48	
Tot Mass (Mt	38.6546	9.4114	44.5367	3.5293	0.0000	76.016	120.5528	0.4000	0.2750	0.4001	0.2880	120.4553	-0.0844
Tot Vol (m3/	29.0265	9.4114	36.0851	2.3529	0.0000	64	100.0851	0.4000	0.2750	0.4000	0.2750	100.0841	-0.0010
Density (Mt/	1.3317	1.0000	1.2342	1.5000		1.18775	1.2045	1.0000	1.0000	1.0002	1.0471	1.2035	
Tot Act. (Bq/	6.992E+14	0.000E+00	6.433E+14	5.586E+13	0.3516	8.6E+14	1.503E+15	0.000E+00	0.000E+00	0.000E+00	1.487E+15	1.617E+13	-0.1660
Temperat. (o	20.0000	20.0000	20.0000	20.0000			20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	
Feed Type:	A	A	A	A		#######	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
	0.0000	0.0000	0.0000	0.0000		0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	g/L	kg/d	g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	kg/d
Al	21.4761	0.0000	2.7294	223.0846	0.0000	0.01	0.9905	0.0000	0.0000	0.0001	0.3605	0.9895	0.0991
B	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.0639	0.0000	0.0000	0.0000	0.0233	0.0639	0.0000
Ba	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.0639	0.0000	0.0000	0.0000	0.0233	0.0639	0.0000
CN	0.0413	0.0000	0.0332	0.0000	0.0000	2.3	1.4827	0.0000	0.0000	0.0000	0.5396	1.4813	0.0000
C as CO3	0.0207	0.0000	0.0015	0.2326	0.0000	0.11	0.0709	0.0000	0.0000	0.0000	0.0258	0.0708	0.0000
Ca	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cd	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	5.7857	0.0000	2.8639	27.4541	0.0000	2.5	2.6312	0.0000	0.0000	0.0000	0.9576	2.6286	0.0000
Cr	0.3534	0.0000	0.1773	1.6395	0.0000	0.12	0.1407	0.0000	0.0000	0.0000	0.0512	0.1405	0.0000
F	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fe	0.5296	0.0000	0.0829	5.2614	0.0000	0.00295	0.0318	0.0000	0.0000	0.0000	0.0116	0.0318	0.0000
H2O	946.3116	1000.0000	989.4150	500.0000	0.0000	981.569	984.3981	0.3960	0.2687	0.3960	977.0909	984.4080	0.0000
Hg	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K	3.7835	0.0000	1.6712	21.0457	0.0000	1.89348	1.8133	0.0000	0.0000	0.0000	0.6600	1.8115	0.0000
La	0.0000	0.0000	0.0000	0.0000	0.0000	0.01	0.0064	0.0000	0.0000	0.0000	0.0023	0.0064	0.0000
Li	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Na	161.0000	0.0000	125.3902	63.1372	0.0000	68.212	88.8273	0.0023	0.0000	0.0023	0.0000	88.8282	0.0000
Ni	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	46.7746	0.0000	24.1424	206.7798	0.0000	23.4087	23.6732	0.0000	0.0000	0.0000	8.6158	23.6498	0.0000
NO3	101.7500	0.0000	70.9975	166.3923	0.0000	50.9215	58.1598	0.0000	0.0062	0.0000	43.7125	58.1022	0.0000
OH	17.9868	0.0000	0.0599	220.9801	0.0000	43.6823	27.9545	0.0017	0.0000	0.0017	10.1739	27.9268	0.0000
Pb	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	1.4765	0.0000	1.1877	0.0000	0.0000	0.73893	0.9007	0.0000	0.0000	0.0000	0.3278	0.8998	0.0000
Pu(total)	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S as SO4	3.4680	0.0000	1.4322	20.8196	0.0000	1.73741	1.6274	0.0000	0.0000	0.0000	0.5923	1.6257	0.0000
Sr	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mo		0.0000	0.0000	0.0000		0		0.0000	0.0000	0.0000	0.0000	0.0000	
Others		0.0000	0.0000	0.0000		0		0.0000	0.0001	0.0000	0.0000	0.0000	
					0.0000								
Precip.	0.1791	0.0000	0.0001	2.2079	0.0000	0	0.0001	0.0000	0.0000	0.0000	0.0095	0.0000	0.0000
Solids	36.7515	0.0000	0.0100	996.5830	1273.4060	18.3926	11.7648	0.0000	0.0000	0.0000	2140.8803	5.8825	0.0000
TIC	14.9874	0.0000	10.6835	21.0457	0.0000	7.50523	8.6511	0.0000	0.0000	0.0000	3.1485	8.6426	0.0000
TOC	2.9858	0.0000	1.0226	21.1509	0.0000	4	2.9265	0.0000	0.0000	0.0000	1.0651	2.9236	0.0000
					#VALUE!	0							
					#VALUE!	0							
Gases	g/L	g/L	g/L	g/L		g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	
CH4	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
						0							
Fissile	g/L	g/L	g/L	g/L		g/L	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	#VALUE!
Pu239/241	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.0639	0.0000	0.0000	0.0000	0.2327	0.0633	0.0000
U-235	0.0000	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d	Bq/m3	Bq/m3	Bq/d	Bq/d	Bq/d	Bq/m3	Bq/m3	Bq/d
Am241	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	2.77E+07	0.00E+00	2.15E+07	1.08E+07	0.0000	1.3E+08	9.33E+07	0.00E+00	0.00E+00	0.00E+00	3.40E+08	9.24E+07	0.0000
Cs137	2.28E+13	0.00E+00	1.78E+13	8.96E+12	0.0391	1.3E+13	1.46E+13	0.00E+00	0.00E+00	0.00E+00	5.30E+15	1.46E+10	0.0010
Eu154/155	8.23E+09	0.00E+00	6.41E+09	3.23E+09	0.0000	4.1E+09	4.95E+09	0.00E+00	0.00E+00	0.00E+00	1.80E+10	4.90E+09	0.0001
Ni63/59	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	2.61E+11	0.00E+00	2.10E+08	3.21E+12	0.0000	1.3E+11	8.35E+10	0.00E+00	0.00E+00	0.00E+00	3.04E+11	8.27E+10	0.0000
Tc99	4.21E+10	0.00E+00	3.28E+10	1.65E+10	0.0000	2.1E+10	2.53E+10	0.00E+00	0.00E+00	0.00E+00	9.20E+10	2.50E+10	0.0000
TRU	2.84E+09	0.00E+00	2.29E+06	3.51E+10	0.0000	1.4E+09	9.11E+08	0.00E+00	0.00E+00	0.00E+00	3.32E+09	9.02E+08	0.0000
Y-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	9.34E+11	0.00E+00	7.52E+08	1.15E+13	0.0000	5.2E+11	3.34E+11	0.00E+00	0.00E+00	0.00E+00	1.09E+14	3.34E+10	-0.0005

ⓐ Input Strm 40

Total from #24 + #28

44.5367 + 76.016

= 76.016

Same as in #40

o.k.

Cl from #24 + #28

[2.8639 * 36.0851

+ 2.5 * 64] * $\frac{10^{-6}}{10^{-3}}$

= 263.3441 * 10^{-3} Mt/d

Cl in #40

2.6312 * 100.0851

= 0.263353 Mt/d

o.k.

ⓑ Mass bal in unit

Omitted

ⓒ Out - in = 0

or very close to zero.

o.k.

Tc - Column Unit.

ance						Unit Bala
Plants Units	in	in	in	out	out	out	out-in

Tc_Col							
Stream Name	Cs Removed L	Rinse Soln	Elution Agent	Rinse Recycle	Tc soln	Cs+Tc Remov	
Stream No:	48	51	52	53	54	58	
Tot Mass (Mt	44.4481	0.2000	2.2000	0.2001	2.2032	44.4438	-0.0009
Tot Vol (m3/	36.0847	0.2000	2.2000	0.2000	2.2000	36.0844	-0.0004
Density (Mt/n	1.2318	1.0000	1.0000	1.0005	1.0015	1.2317	
Tot Act. (Bq/	2.052E+12	0.000E+00	0.000E+00	0.000E+00	1.123E+12	9.294E+11	-0.0004
Temperat. (o	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	
Feed Type:	A	0.0000	0.0000	0.0000	A	A	
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	
Al	2.7267	0.0000	0.0000	0.0001	0.0447	2.7240	0.0984
B	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ba	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CN	0.0332	0.0000	0.0000	0.0000	0.0005	0.0332	0.0000
C as CO3	0.0015	0.0000	0.0000	0.0000	0.0000	0.0015	0.0000
Ca	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cd	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	2.8611	0.0000	0.0000	0.0000	0.0469	2.8582	0.0000
Cr	0.1772	0.0000	0.0000	0.0000	0.0029	0.1770	0.0000
F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fe	0.0828	0.0000	0.0000	0.0000	0.0014	0.0828	0.0000
H2O	989.4249	0.1960	2.1370	0.1960	971.3636	989.4348	0.0000
Hg	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K	1.6695	0.0000	0.0000	0.0000	0.0274	1.6679	0.0000
La	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Li	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Na	125.3915	0.0023	0.0000	0.0023	0.0000	125.3928	0.0000
Ni	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	24.1185	0.0000	0.0000	0.0000	0.3956	24.0946	0.0000
NO3	70.9272	0.0000	0.0620	0.0000	29.3452	70.8570	0.0000
OH	0.0598	0.0017	0.0000	0.0017	0.0010	0.0597	0.0000
Pb	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	1.1865	0.0000	0.0000	0.0000	0.0195	1.1853	0.0000
Pu(total)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S as SO4	1.4307	0.0000	0.0000	0.0000	0.0235	1.4293	0.0000
Sr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mo		0.0000	0.0000	0.0000	0.0000	0.0000	#VALUE!
Others		0.0000	0.0010	0.0000	0.0000	0.0000	#VALUE!
							0.0000
Precip.	0.0001	0.0000	0.0000	0.0000	0.0006	0.0000	0.0000
Solids	0.0050	0.0000	0.0000	0.0000	0.0410	0.0025	0.0000
							#VALUE!
TIC	10.6729	0.0000	0.0000	0.0000	0.1751	10.6623	0.0000
TOC	1.0216	0.0000	0.0000	0.0000	0.0168	1.0206	0.0000
							#VALUE!
							#VALUE!
							#VALUE!
Gases	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	#VALUE!
CH4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fissile	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	#VALUE!
Pu239/241	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
U-235	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/d	Bq/d	Bq/d	Bq/m3	Bq/m3	Bq/d
Am241	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Ba137m	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Co60	2.13E+07	0.00E+00	0.00E+00	0.00E+00	3.50E+06	2.11E+07	0
Cs137	1.78E+10	0.00E+00	0.00E+00	0.00E+00	2.92E+09	1.76E+10	0
Eu154/155	6.35E+09	0.00E+00	0.00E+00	0.00E+00	1.04E+09	6.29E+09	0
Ni63/59	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Sm151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Sr90	2.08E+08	0.00E+00	0.00E+00	0.00E+00	3.41E+07	2.06E+08	0
Tc99	3.24E+10	0.00E+00	0.00E+00	0.00E+00	5.05E+11	1.62E+09	-6.1E-05
TRU	2.27E+06	0.00E+00	0.00E+00	0.00E+00	3.72E+05	2.24E+06	0
Y-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Solid	7.52E+07	0.00E+00	0.00E+00	0.00E+00	1.11E+09	7.52E+06	2.98E-07

There is only one case for this unit, no Auxiliary stream was set up for this ~~unit~~ unit.

(a): Input stream # 48

examine values in #48 this page and the values in #48 on page 66

There is no difference.

O.k.

(b) mass balance in unit

Total in: $44.4481 + 0.20 + 2.20$

$= 46.8481$ Mt/d

Total out: $0.2001 + 2.2032 + 44.4438$

$= 46.847$ Mt/d

O.k. (J.Y. 04/21/00)

H_2O in: $(989.4249 * 36.0847 + 0.196 * \sout{0.2}\ 10^3 + 2.1370 * \sout{2.2}\ 10^3) * \frac{10^{-6}}{10^{-3}}$ J.Y. 04

$=$ ~~35.08 Mt/d~~ 38.036 Mt/d

H_2O out: $(0.196 * 10^3\ \sout{0.2} + 971.3636 * 2.2 + 989.4348 * 36.0844) * \frac{10^{-6}}{10^{-3}}$

$=$ 3~~7~~840 Mt/d. (J.Y. 04/21/00)

$= 38.036$ Mt/d

(c) out - in = 0.

---

* Note: All preceeding units set Auxil. strm to zero.

ance	Input=	Preceed Strm only		Unit Bal
Plants Units		in	out	out	out-in

M. Evaporator					
Stream Name	Aug. Fe	Feeds to LAW	LAW Concent	Evaporator Overhead	
Stream No:	70	72	74	76	
Tot Mass (Mt	0	44.4438	29.0490	15.3948	0.0000
Tot Vol (m3/	0	36.0844	20.7081	15.3763	0.0000
Density (Mt/	0	1.2317	1.4028	1.0012	
Tot Act. (Bq/	0	9.294E+11	9.294E+11	9.294E+05	0.0000
Temperat. (o		20.0000	20.0000	20.0000	
Feed Type:	#######	A	A	A	
	0	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	g/L	
Al	0	2.7240	4.7419	0.0064	0.0000
B	0	0.0000	0.0000	0.0000	0.0000
Ba	0	0.0000	0.0000	0.0000	0.0000
CN	0	0.0332	0.0577	0.0001	0.0000
C as CO3	0	0.0015	0.0025	0.0000	0.0000
Ca	0	0.0000	0.0000	0.0000	0.0000
Cd	0	0.0000	0.0000	0.0000	0.0000
Cl	0	2.8582	4.9806	0.0000	0.0000
Cr	0	0.1770	0.3084	0.0000	0.0000
F	0	0.0000	0.0000	0.0000	0.0000
Fe	0	0.0828	0.1442	0.0000	0.0000
H2O	0	989.4348	981.5898	1000.0000	0.0000
Hg	0	0.0000	0.0000	0.0000	0.0000
K	0	1.6679	2.9063	0.0000	0.0000
La	0	0.0000	0.0000	0.0000	0.0000
Li	0	0.0000	0.0000	0.0000	0.0000
Mg	0	0.0000	0.0000	0.0000	0.0000
Mn	0	0.0000	0.0000	0.0000	0.0000
Na	0	125.3928	218.5000	0.0000	0.0000
Ni	0	0.0000	0.0000	0.0000	0.0000
NO2	0	24.0946	41.9855	0.0000	0.0000
NO3	0	70.8570	123.4701	0.0000	0.0000
OH	0	0.0597	0.1041	0.0000	0.0000
Pb	0	0.0000	0.0000	0.0000	0.0000
P as PO4	0	1.1853	2.0655	0.0000	0.0000
Pu(total)	0	0.0000	0.0000	0.0000	0.0000
Si	0	0.0000	0.0000	0.0000	0.0000
S as SO4	0	1.4293	2.4906	0.0000	0.0000
Sr	0	0.0000	0.0000	0.0000	0.0000
U (total)	0	0.0000	0.0000	0.0000	0.0000
Zn	0	0.0000	0.0000	0.0000	0.0000
Zr	0	0.0000	0.0000	0.0000	0.0000
Mo	0		0.0000	0.0000	######
Others	0	0.0000	0.0000	0.0000	0.0000
					0.0000
Precip.	0	0.0000	0.0001	0.0000	0.0000
Solids	0	0.0025	0.0044	0.0000	0.0000
	0				######
TIC	0	10.6623	18.5794	0.0000	0.0000
TOC	0	1.0206	0.8892	1.1975	0.0000
	0				######
	0				######
					######
Gases	g/L	g/L	g/L	g/L	######
CH4	0	0.0000	0.0000	0.0000	0.0000
H2	0	0.0000	0.0000	0.0000	0.0000
N2	0	0.0000	0.0000	0.0000	0.0000
NH3	0	0.0000	0.0000	0.0000	0.0000
NO	0	0.0000	0.0000	0.0000	0.0000
NO2(g)	0	0.0000	0.0000	0.0000	0.0000
	0				######
Fissile	g/L	g/L	g/L	g/L	######
Pu239/241	0	0.0000	0.0000	0.0000	0.0000
U-235	0	0.0000	0.0000	0.0000	0.0000
					######
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d
Am241	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	0	2.11E+07	3.68E+07	4.95E+01	0.0000
Cs137	0	1.76E+10	3.07E+10	4.13E+04	0.0000
Eu154/155	0	6.29E+09	1.10E+10	1.48E+04	0.0000
Ni63/59	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	0	2.06E+08	3.58E+08	4.82E+02	0.0000
Tc99	0	1.62E+09	2.83E+09	3.81E+03	0.0000
TRU	0	2.24E+06	3.91E+06	5.26E+00	0.0000
Y-90	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	0	7.52E+06	1.31E+07	1.76E+01	0.0000

Melter Evaporator Unit

Mar. 29/00

Case ①, Strm # 58 as input only

(a) Input strm # 72

Examine the values in # 72, All are the same as that in # 58, page 70

good

(b) Mass Balance in unit

Total Flow in: 44.4438 Mt/d

Total Flow out: $29.049 + 15.3948$

$= 44.4438$ Mt/d

O.k.

TOC in: $1.0206 * 36.0844 * \frac{10^{-6}}{10^{-3}}$

$= 36.82774$ Mt/d

TOC out: $(0.8892 * 20.7081 + 1.1975 * 15.3763) * \frac{10^{-6}}{10^{-3}} = 36.82676$ Mt/d

O.k.

(c) out - in = 0

for all component.

Melter Evaporator Unit

ance	Input=	Aux. Strm only		Unit Bal:
Plants Units		in	out	out	out-in

M. Evaporator					
Stream Name	Aug. Fe	Feeds to LAW	LAW Concent	Evaporator Overhead	
Stream No:	70	72	74	76	
Tot Mass (Mt	76.01603	76.0160	31.8677	44.1484	0.0000
Tot Vol (m3/	64	64.0000	19.9797	44.0203	0.0000
Density (Mt/r	1.187751	1.1878	1.5950	1.0029	
Tot Act. (Bq/	8.59E+14	8.594E+14	8.594E+14	8.594E+08	0.1426
Temperat. (o		20.0000	20.0000	20.0000	
Feed Type:	#######	0.0000	0.0000	0.0000	
	0	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	g/L	
Al	0.01	0.0100	0.0320	0.0000	0.0000
B	0.1	0.1000	0.3203	0.0000	0.0000
Ba	0.1	0.1000	0.3203	0.0000	0.0000
CN	2.3	2.3000	7.3601	0.0033	0.0000
C as CO3	0.11	0.1100	0.3524	0.0000	0.0000
Ca	0	0.0000	0.0000	0.0000	0.0000
Cd	0	0.0000	0.0000	0.0000	0.0000
Cl	2.5	2.5000	8.0081	0.0000	0.0000
Cr	0.12	0.1200	0.3844	0.0000	0.0000
F	0	0.0000	0.0000	0.0000	0.0000
Fe	0.002953	0.0030	0.0095	0.0000	0.0000
H2O	981.5694	981.5694	940.9624	1000.0000	0.0000
Hg	0	0.0000	0.0000	0.0000	0.0000
K	1.893483	1.8935	6.0653	0.0000	0.0000
La	0.01	0.0100	0.0320	0.0000	0.0000
Li	0	0.0000	0.0000	0.0000	0.0000
Mg	0	0.0000	0.0000	0.0000	0.0000
Mn	0	0.0000	0.0000	0.0000	0.0000
Na	68.21205	68.2120	218.5000	0.0000	0.0000
Ni	0	0.0000	0.0000	0.0000	0.0000
NO2	23.4087	23.4087	74.9838	0.0000	0.0000
NO3	50.92153	50.9215	163.1142	0.0000	0.0000
OH	43.68231	43.6823	139.9252	0.0000	0.0000
Pb	0	0.0000	0.0000	0.0000	0.0000
P as PO4	0.738932	0.7389	2.3670	0.0000	0.0000
Pu(total)	0	0.0000	0.0000	0.0000	0.0000
Si	0	0.0000	0.0000	0.0000	0.0000
S as SO4	1.737412	1.7374	5.5654	0.0000	0.0000
Sr	0	0.0000	0.0000	0.0000	0.0000
U (total)	0	0.0000	0.0000	0.0000	0.0000
Zn	0	0.0000	0.0000	0.0000	0.0000
Zr	0	0.0000	0.0000	0.0000	0.0000
Mo	0		0.0000	0.0000	######
Others	0	0.0000	0.0000	0.0000	0.0000
					0.0000
Precip.	0	0.0000	0.0000	0.0000	0.0000
Solids	18.39255	18.3926	58.9159	0.0000	0.0000
	0				######
TIC	7.505225	7.5052	24.0411	0.0000	0.0000
TOC	4	4.0000	6.4065	2.9078	0.0000
	0				######
	0				######
					######
Gases	g/L	g/L	g/L	g/L	######
CH4	0	0.0000	0.0000	0.0000	0.0000
H2	0	0.0000	0.0000	0.0000	0.0000
N2	0	0.0000	0.0000	0.0000	0.0000
NH3	0	0.0000	0.0000	0.0000	0.0000
NO	0	0.0000	0.0000	0.0000	0.0000
NO2(g)	0	0.0000	0.0000	0.0000	0.0000
	0				######
Fissile	g/L	g/L	g/L	g/L	######
Pu239/241	0.1	0.1000	0.3203	0.0000	0.0000
U-235	0	0.0000	0.0000	0.0000	0.0000
					######
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d
Am241	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	1.34E+08	1.34E+08	4.28E+08	1.94E+02	0.0000
Cs137	1.27E+13	1.27E+13	4.08E+13	1.85E+07	0.0000
Eu154/155	4.12E+09	4.12E+09	1.32E+10	5.99E+03	0.0000
Ni63/59	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	1.3E+11	1.30E+11	4.18E+11	1.90E+05	0.0000
Tc99	2.11E+10	2.11E+10	6.74E+10	3.06E+04	0.0000
TRU	1.42E+09	1.42E+09	4.56E+09	2.07E+03	0.0000
Y-90	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	5.22E+11	5.22E+11	1.67E+12	7.58E+05	0.0000

Case ② Strm #70 as input only

ⓐ Input Strm #72

Examine values in #72. They all are the same as that in #70.

o.k.

ⓑ Mass balance in Unit.

omitted, as no formula change from Case ①

ⓒ Out − in ≐ 0 for all

Difference in Total Activity = 0.1426 which is extremely small compared with 8.594×10^{14}.

Melter Evaporator Unit

April 4/~

ance						Unit Balance
Plants Units	in	in	in	out	out	out	out-in

Tc_Col							
Stream Name	Cs Removed L	Rinse Soln	Elution Agent	Rinse Recycle	Tc soln	Cs+Tc Remov	
Stream No:	48	51	52	53	54	58	
Tot Mass (Mt	44.4481	0.2000	2.2000	0.2001	2.2032	44.4438	-0.0009
Tot Vol (m3/	36.0847	0.2000	2.2000	0.2000	2.2000	36.0844	-0.0004
Density (Mt/n	1.2318	1.0000	1.0000	1.0005	1.0015	1.2317	
Tot Act. (Bq/	2.052E+12	0.000E+00	0.000E+00	0.000E+00	1.123E+12	9.294E+11	-0.0004
Temperat. (o	20.0000	20.0000	20.0000	20.0000	20.0000	20.0000	
Feed Type:	A	0.0000	0.0000	0.0000	A	A	
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
Ionic Comp	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	
Al	2.7267	0.0000	0.0000	0.0001	0.0447	2.7240	0.0984
B	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ba	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CN	0.0332	0.0000	0.0000	0.0000	0.0005	0.0332	0.0000
C as CO3	0.0015	0.0000	0.0000	0.0000	0.0000	0.0015	0.0000
Ca	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cd	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	2.8611	0.0000	0.0000	0.0000	0.0469	2.8582	0.0000
Cr	0.1772	0.0000	0.0000	0.0000	0.0029	0.1770	0.0000
F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fe	0.0828	0.0000	0.0000	0.0000	0.0014	0.0828	0.0000
H2O	989.4249	0.1960	2.1370	0.1960	971.3636	989.4348	0.0000
Hg	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K	1.6695	0.0000	0.0000	0.0000	0.0274	1.6679	0.0000
La	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Li	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Na	125.3915	0.0023	0.0000	0.0023	0.0000	125.3928	0.0000
Ni	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	24.1185	0.0000	0.0000	0.0000	0.3956	24.0946	0.0000
NO3	70.9272	0.0000	0.0620	0.0000	29.3452	70.8570	0.0000
OH	0.0598	0.0017	0.0000	0.0017	0.0010	0.0597	0.0000
Pb	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	1.1865	0.0000	0.0000	0.0000	0.0195	1.1853	0.0000
Pu(total)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S as SO4	1.4307	0.0000	0.0000	0.0000	0.0235	1.4293	0.0000
Sr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mo		0.0000	0.0000	0.0000	0.0000	0.0000	#VALUE!
Others		0.0000	0.0010	0.0000	0.0000	0.0000	#VALUE!
							0.0000
Precip.	0.0001	0.0000	0.0000	0.0000	0.0006	0.0000	0.0000
Solids	0.0050	0.0000	0.0000	0.0000	0.0410	0.0025	0.0000
							#VALUE!
TIC	10.6729	0.0000	0.0000	0.0000	0.1751	10.6623	0.0000
TOC	1.0216	0.0000	0.0000	0.0000	0.0168	1.0206	0.0000
							#VALUE!
							#VALUE!
							#VALUE!
Gases	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	#VALUE!
CH4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fissile	g/L	Mt/d	Mt/d	Mt/d	g/L	g/L	#VALUE!
Pu239/241	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
U-235	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/d	Bq/d	Bq/d	Bq/m3	Bq/m3	Bq/d
Am241	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Ba137m	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Co60	2.13E+07	0.00E+00	0.00E+00	0.00E+00	3.50E+06	2.11E+07	0
Cs137	1.78E+10	0.00E+00	0.00E+00	0.00E+00	2.92E+09	1.76E+10	0
Eu154/155	6.35E+09	0.00E+00	0.00E+00	0.00E+00	1.04E+09	6.29E+09	0
Ni63/59	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Sm151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Sr90	2.08E+08	0.00E+00	0.00E+00	0.00E+00	3.41E+07	2.06E+08	0
Tc99	3.24E+10	0.00E+00	0.00E+00	0.00E+00	5.05E+11	1.62E+09	-6.1E-05
TRU	2.27E+06	0.00E+00	0.00E+00	0.00E+00	3.72E+05	2.24E+06	0
Y-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Solid	7.52E+07	0.00E+00	0.00E+00	0.00E+00	1.11E+09	7.52E+06	2.98E-07

Input=	Both Proceed and Aux. St	Unit Balar			
		in	out	out	out-in

M. Evaporator					
Stream Name	Aug. Fe	Feeds to LAW	LAW Concent	Evaporator Overhead	
Stream No:	70	72	74	76	
Tot Mass (Mt	76.01603	120.4599	60.9167	59.5431	0.0000
Tot Vol (m3/	64	100.0844	40.6878	59.3965	0.0000
Density (Mt/n	1.187751	1.2036	1.4972	1.0025	
Tot Act. (Bq/	8.59E+14	8.603E+14	8.603E+14	8.603E+08	0.0769
Temperat. (o		40.0000	20.0000	20.0000	
Feed Type:	#######	0.0000	0.0000	0.0000	
	0	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L	g/L	
Al	0.01	0.9885	2.4291	0.0017	0.0000
B	0.1	0.0639	0.1573	0.0000	0.0000
Ba	0.1	0.0639	0.1573	0.0000	0.0000
CN	2.3	1.4827	3.6435	0.0025	0.0000
C as CO3	0.11	0.0709	0.1743	0.0000	0.0000
Ca	0	0.0000	0.0000	0.0000	0.0000
Cd	0	0.0000	0.0000	0.0000	0.0000
Cl	2.5	2.6292	6.4672	0.0000	0.0000
Cr	0.12	0.1405	0.3457	0.0000	0.0000
F	.0	0.0000	0.0000	0.0000	0.0000
Fe	0.002953	0.0317	0.0780	0.0000	0.0000
H2O	981.5694	984.4052	961.6398	1000.0000	0.0000
Hg	0	0.0000	0.0000	0.0000	0.0000
K	1.893483	1.8121	4.4575	0.0000	0.0000
La	0.01	0.0064	0.0157	0.0000	0.0000
Li	0	0.0000	0.0000	0.0000	0.0000
Mg	0	0.0000	0.0000	0.0000	0.0000
Mn	0	0.0000	0.0000	0.0000	0.0000
Na	68.21205	88.8280	218.5000	0.0000	0.0000
Ni	0	0.0000	0.0000	0.0000	0.0000
NO2	23.4087	23.6560	58.1893	0.0000	0.0000
NO3	50.92153	58.1091	142.9373	0.0000	0.0000
OH	43.68231	27.9546	68.7632	0.0000	0.0000
Pb	0	0.0000	0.0000	0.0000	0.0000
P as PO4	0.738932	0.8999	2.2135	0.0000	0.0000
Pu(total)	0	0.0000	0.0000	0.0000	0.0000
Si	0	0.0000	0.0000	0.0000	0.0000
S as SO4	1.737412	1.6263	4.0005	0.0000	0.0000
Sr	0	0.0000	0.0000	0.0000	0.0000
U (total)	0	0.0000	0.0000	0.0000	0.0000
Zn	0	0.0000	0.0000	0.0000	0.0000
Zr	0	0.0000	0.0000	0.0000	0.0000
Mo	0		0.0000	0.0000	#VALUE!
Others	0	0.0000	0.0000	0.0000	0.0000
					0.0000
Precip.	0	0.0000	0.0000	0.0000	0.0000
Solids	18.39255	11.7622	28.9328	0.0000	0.0000
	0				#VALUE!
TIC	7.505225	8.6435	21.2613	0.0000	0.0000
TOC	4	2.9258	3.5985	2.4650	0.0000
	0				#VALUE!
	0				#VALUE!
					#VALUE!
Gases	g/L	g/L	g/L	g/L	#VALUE!
CH4	0	0.0000	0.0000	0.0000	0.0000
H2	.0	0.0000	0.0000	0.0000	0.0000
N2	0	0.0000	0.0000	0.0000	0.0000
NH3	0	0.0000	0.0000	0.0000	0.0000
NO	0	0.0000	0.0000	0.0000	0.0000
NO2(g)	0	0.0000	0.0000	0.0000	0.0000
	0				#VALUE!
Fissile	g/L	g/L	g/L	g/L	#VALUE!
Pu239/241	0.1	0.0639	0.1573	0.0000	0.0000
U-235	0	0.0000	0.0000	0.0000	0.0000
					#VALUE!
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/m3	Bq/d
Am241	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	1.34E+08	9.31E+07	2.29E+08	1.57E+02	0.0000
Cs137	1.27E+13	8.16E+12	2.01E+13	1.37E+07	0.0000
Eu154/155	4.12E+09	4.90E+09	1.21E+10	8.26E+03	0.0000
Ni63/59	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	1.3E+11	8.35E+10	2.05E+11	1.41E+05	0.0000
Tc99	2.11E+10	1.40E+10	3.46E+10	2.37E+04	0.0000
TRU	1.42E+09	9.11E+08	2.24E+09	1.54E+03	0.0000
Y-90	0	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	5.22E+11	3.34E+11	8.20E+11	5.62E+05	0.0000

Case 3

Strm #58 and #70 Both as input

ⓐ Input stream #72.

Total:

from Stream #58 + #70

44.4438 + 76.01603

= 120.46 mt/d

which is the same as in Strm #72.

o.k.

J.Y. 08/16/00

CN:

from stream #58 + #70

$(0.0332 * 36.0844 + 2.3 * 64) \times 10^{-6} / 10^{-3}$

= 0.1484 mt/d

in Stm #72

$1.4827 * 100.0844 * 10^{-6} / 10^{-3}$

= 0.1484 mt/d

o.k.

ⓑ Mass Bal in Unit

omitted

ⓒ Out − in = 0

for all.

o.k.

Note All preceeding Unit Set Aux. Strm = 0

Plants Units	Input= in	Proceed Strm only in	out	out	Unit Bal out-in
	Melter				
Stream Name	Feeds to Melte	Glass Formers	LAW Glass	Melter Off Gas	
Stream No:	82	84	86	88	
Tot Mass (Mt	29.0490	11.3491	29.5284	24.3814	13.5116
Tot Vol (m3/	20.7081	4.5397	9.8428 ?		
Density (Mt/r	1.4028	2.5000	3.0000 ?		
Tot Act. (Bq/	9.294E+11	0.000E+00	9.0147E+11	2.7881E+10	0.0000
Temperat. (o	20.0000	20.0000	20.0000	20.0000	
Feed Type:	A	A	A	A	
	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	Mt/d	Mt/d	Mt/d	
Al	4.7419	1.7838	1.8791	0.0029	0.0000
B	0.0000	0.4590	0.4590	0.0000	0.0000
Ba	0.0000	0.0000	0.0000	0.0000	0.0000
CN	0.0577	0.0000	0.0000	0.0012	0.0000
C as CO3	0.0025	0.0000	0.0000	0.0001	0.0000
Ca	0.0000	0.8451	0.8451	0.0000	0.0000
Cd	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	4.9806	0.0829	0.1035	0.0825	0.0000
Cr	0.3084	0.0019	0.0081	0.0002	0.0000
F	0.0000	0.0858	0.0858	0.0000	0.0000
Fe	0.1442	-0.0023	0.0008	0.0001	0.0000
H2O	981.5898	0.0000	0.0000	20.3269	0.0000
Hg	0.0000	0.0000	0.0000	0.0000	0.0000
K	2.9063	0.3001	0.3585	0.0018	0.0000
La	0.0000	0.0000	0.0000	0.0000	0.0000
Li	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0.0000	0.0005	0.0005	0.0000	0.0000
Na	218.5000	0.0000	4.3890	0.1357	0.0000
Ni	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	41.9855	0.0000	0.0000	0.8694	0.0000
NO3	123.4701	0.0000	0.0000	2.5568	0.0000
OH	0.1041	0.0000	0.0000	0.0022	0.0000
Pb	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	2.0655	-0.0170	0.0245	0.0013	0.0000
Pu(total)	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0.0000	7.7319	7.7319	0.0000	0.0000
S as SO4	2.4906	-0.0465	0.0035 5	0.0015 5	0.0000
Sr	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0.0000	0.0000	0.0000	0.0000	0.0000
Mo	0.0000	0.0296	0.0296	0.0000	0.0000
Others		0.0943	0.0943	0.0000	#VALUE!
					0.0000
Precip.	0.0001	0.0000	0.0000	0.0000	0.0000
Solids	0.0044	0.0000	0.0001	0.0000	0.0000
					#VALUE!
TIC	18.5794	0.0000	0.0038	0.3809	0.0000
TOC	0.8892	0.0000	0.0000	0.0184	0.0000
Gases	g/L	Mt/d	Mt/d	Mt/d	
CH4	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0.0000	0.0000	0.0000	0.0000	0.0000
					#VALUE!
Fissile	g/L	Mt/d	Mt/d	Mt/d	#VALUE!
Pu239/241	0.0000	0.0000	0.0000	0.0000	0.0000
U-235	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/d	Bq/d	Bq/d	Bq/d
Am241	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	3.68E+07	0.00E+00	7.39E+08	2.28E+07	0.0000
Cs137	3.07E+10	0.00E+00	6.16E+11	1.91E+10	0.0000
Eu154/155	1.10E+10	0.00E+00	2.20E+11	6.80E+09	0.0000
Ni63/59	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	3.58E+08	0.00E+00	7.19E+09	2.23E+08	0.0000
Tc99	2.83E+09	0.00E+00	5.68E+10	1.76E+09	0.0000
TRU	3.91E+06	0.00E+00	7.85E+07	2.43E+06	0.0000
Y-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	1.31E+07	0.00E+00	2.63E+08	8.14E+06	0.0000
					13.5116
Sum	1402.8202	11.3491	16.0169	24.3820	Is O fro

Melter Unit

Case ① Strm # 74 as input only.

ⓐ Stream # 82

~~Examine the values in # 82.~~

They are all the same as in # 74

(See page 71)

O.k.

ⓑ Mass balance in Unit.

Total Flow in

29.0490 + 11.3491

= 40.3981 Mt

Total Flow out

29.5284 + 24.3814 = 53.9098 Mt/d

$(out - in)_{total}$ = 13.5117 Mt/d

This is the additional O from the air due to oxide glass formation. The additional O is not shown in the balance sheet.

J.Y. 04/21/00

$SO_4^{=}$ in : [2.4906 $* 20.7081 * \frac{10^{-6}}{10^{-3}}$ − 0.0465 ~~[illegible]~~

= 0.05076 Mt/d

S out : 0.00355 + 0.00155 = ~~[illegible]~~ 0.0051

O.k.

Note: minus −0.0465 mean SO_4 has to be taken out to meet the Glass Assay requirement (specified in Assumption page by user)

ⓒ out − in = 0 except for total flow and O (not shown)

Melter Unit

April 21/00

Plants Units	Input= in	Aux. Strm only in	in	out	out	Unit Bal out-in
		Melter				
Stream Name	Aug. Fe	Feeds to Melte	Glass Formers	LAW Glass.	Melter Off Gas	
Stream No:	80	82	84	86	88	
Tot Mass (Mt	76.01603	76.0160	9.7135	27.3139	71.4521	13.0364
Tot Vol (m3/	64	64.0000	3.8854	9.1046 ?		
Density (Mt/r	1.187751	1.1878	2.5000	3.0000 ?		
Tot Act. (Bq/	8.59E+14	8.594E+14	0.000E+00	8.3362E+14	2.5782E+13	0.0000
Temperat. (o		20.0000	20.0000	20.0000	20.0000	
Feed Type:	#######	0.0000	0.0000	0.0000	0.0000	
	0	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	Mt/d	Mt/d	Mt/d	
Al	0.01	0.0100	1.8124	1.8130	0.0000	0.0000
B	0.1	0.1000	0.4366	0.4428	0.0002	0.0000
Ba	0.1	0.1000	-0.0062	0.0000	0.0002	0.0000
CN	2.3	2.3000	0.0000	0.0000	0.1472	0.0000
C as CO3	0.11	0.1100	0.0000	0.0000	0.0070	0.0000
Ca	0	0.0000	0.8154	0.8154	0.0000	0.0000
Cd	0	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	2.5	2.5000	0.0679	0.0999	0.1280	0.0000
Cr	0.12	0.1200	0.0004	0.0078	0.0002	0.0000
F	0	0.0000	0.0828	0.0828	0.0000	0.0000
Fe	0.002953	0.0030	0.0004	0.0006	0.0000	0.0000
H2O	981.5694	981.5694	0.0000	0.0000	62.8204	0.0000
Hg	0	0.0000	0.0000	0.0000	0.0000	0.0000
K	1.893483	1.8935	0.2283	0.3459	0.0036	0.0000
La	0.01	0.0100	-0.0006	0.0000	0.0000	0.0000
Li	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0	0.0000	0.0004	0.0004	0.0000	0.0000
Na	68.21205	68.2120	0.0000	4.2346	0.1310	0.0000
Ni	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	23.4087	23.4087	0.0000	0.0000	1.4982	0.0000
NO3	50.92153	50.9215	0.0000	0.0000	3.2590	0.0000
OH	43.68231	43.6823	0.0000	0.0000	2.7957	0.0000
Pb	0	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	0.738932	0.7389	-0.0222	0.0237	0.0014	0.0000
Pu(total)	0	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0	0.0000	7.4600	7.4600	0.0000	0.0000
S as SO4	1.737412	1.7374	-0.1044	0.0034	0.0033	0.0000
Sr	0	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mo	0	0.0000	0.0285	0.0285	0.0000	0.0000
Others	0		-1.0860	-1.0860	0.0000	#VALUE!
						0.0000
Precip.	0	0.0000	0.0000	0.0000	0.0000	0.0000
Solids	18.39255	18.3926	0.0000	1.1771	0.0000	0.0000
	0					#VALUE!
TIC	7.505225	7.5052	0.0000	0.0048	0.4755	0.0000
TOC	4	4.0000	0.0000	0.0000	0.2560	0.0000
	0					
	0					
	0					
Gases	g/L	g/L	Mt/d	Mt/d	Mt/d	
CH4	0	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0	0.0000	0.0000	0.0000	0.0000	0.0000
	0					#VALUE!
Fissile	g/L	g/L	Mt/d	Mt/d	Mt/d	#VALUE!
Pu239/241	0	0.1000	0.0000	0.0062	0.0002	0.0000
U-235	0	0.0000	0.0000	0.0000	0.0000	0.0000
Activity	Bq/m3	Bq/m3	Bq/d	Bq/d	Bq/d	Bq/d
Am241	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	1.34E+08	1.34E+08	0.00E+00	8.30E+09	2.57E+08	0.0000
Cs137	1.27E+13	1.27E+13	0.00E+00	7.91E+14	2.45E+13	0.0000
Eu154/155	4.12E+09	4.12E+09	0.00E+00	2.56E+11	7.91E+09	0.0000
Ni63/59	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	1.3E+11	1.30E+11	0.00E+00	8.10E+12	2.51E+11	0.0000
Tc99	2.11E+10	2.11E+10	0.00E+00	1.31E+12	4.04E+10	0.0000
TRU	1.42E+09	1.42E+09	0.00E+00	8.84E+10	2.73E+09	0.0000
Y-90	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	5.22E+11	5.22E+11	0.00E+00	3.24E+13	1.00E+12	0.0000
						13.0364
Sum		1207.4146	9.7135	15.4608	71.5272	Is O fro

Case ② Strm 80 As input only.

ⓐ Input # 82

Examine data in # 82, they are all the same as # 80

O.k.

ⓑ Mass Balance in Unit.

Total Flow in :

76.0160 + 9.7135 = 85.7295 Mt/d

Total Flow out

27.3139 + 71.4521 = 98.766 Mt/d

Difference : 98.766 − 85.7295 = 13.0365 Mt/d

due to O from Air which is not shown in the balance sheet.

K in : $1.8935 * 64 * \frac{10^{-6}}{10^{-3}} + 0.2283$

= 0.3495 Mt/d

K out : 0.3459 + 0.0036 = 0.3495 Mt/d.

O.k.

ⓒ. out − in = 0.

except for oxygen and ~~total flow.~~

Plants	Input=	Preceed Strm only		Unit Balance		Input=	Both Preceed and Aux. Strm			Unit Bal
Units	in	out	out	out-in		in	in	out	out	out-in
	M. Evaporator					Melter				
Stream Name	Feeds to LAW	LAW Concent	Evaporator Overhead		Aug. Fe	Feeds to Melte	Glass Formers	LAW Glass	Melter Off Gas	
Stream No:	72	74	76		80	82	84	86	88	
Tot Mass (Mt	44.4438	29.0490	15.3948	0.0000	76.01603	105.0651	21.0627	56.8423	95.8334	26.5479
Tot Vol (m3/	36.0844	20.7081	15.3763	0.0000	64	84.7081	8.4251	18.9474 ?		
Density (Mt/r	1.2317	1.4028	1.0012		1.187751	1.2403	2.5000	3.0000 ?		
Tot Act. (Bq/	9.294E+11	9.294E+11	9.294E+05	0.0000	8.59E+14	8.603E+14	0.000E+00	8.3452E+14	2.581E+13	0.0000
Temperat. (c	20.0000	20.0000	20.0000			20.0000	20.0000	20.0000	20.0000	
Feed Type:	A	A	A		#######	0.0000	0.0000	0.0000	0.0000	
	0.0000	0.0000	0.0000		0	0.0000	0.0000	0.0000	0.0000	
Ionic Comp	g/L	g/L	g/L		g/L	g/L	Mt/d	Mt/d	Mt/d	
Al	2.7240	4.7419	0.0064	0.0000	0.01	1.1668	3.5962	3.6920	0.0030	0.0000
B	0.0000	0.0000	0.0000	0.0000	0.1	0.0756	0.8958	0.9018	0.0002	0.0000
Ba	0.0000	0.0000	0.0000	0.0000	0.1	0.0756	-0.0062	0.0000	0.0002	0.0000
CN	0.0332	0.0577	0.0001	0.0000	2.3	1.7518	0.0000	0.0000	0.1484	0.0000
C as CO3	0.0015	0.0025	0.0000	0.0000	0.11	0.0837	0.0000	0.0000	0.0071	0.0000
Ca	0.0000	0.0000	0.0000	0.0000	0	0.0000	1.6604	1.6604	0.0000	0.0000
Cd	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Cl	2.8582	4.9806	0.0000	0.0000	2.5	3.1064	0.1508	0.2034	0.2105	0.0000
Cr	0.1770	0.3084	0.0000	0.0000	0.12	0.1661	0.0023	0.0159	0.0004	0.0000
F	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.1685	0.1685	0.0000	0.0000
Fe	0.0828	0.1442	0.0000	0.0000	0.002953	0.0375	-0.0019	0.0012	0.0001	0.0000
H2O	989.4348	981.5898	1000.0000	0.0000	981.5694	981.5744	0.0000	0.0000	83.1473	0.0000
Hg	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
K	1.6679	2.9063	0.0000	0.0000	1.893483	2.1411	0.5284	0.7044	0.0054	0.0000
La	0.0000	0.0000	0.0000	0.0000	0.01	0.0076	-0.0006	0.0000	0.0000	0.0000
LI	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mg	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mn	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0009	0.0009	0.0000	0.0000
Na	125.3928	218.5000	0.0000	0.0000	68.21205	104.9521	0.0000	8.6236	0.2667	0.0000
NI	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO2	24.0946	41.9855	0.0000	0.0000	23.4087	27.9501	0.0000	0.0000	2.3676	0.0000
NO3	70.8570	123.4701	0.0000	0.0000	50.92153	68.6570	0.0000	0.0000	5.8158	0.0000
OH	0.0597	0.1041	0.0000	0.0000	43.68231	33.0290	0.0000	0.0000	2.7978	0.0000
Pb	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
P as PO4	1.1853	2.0655	0.0000	0.0000	0.738932	1.0632	-0.0392	0.0482	0.0027	0.0000
Pu(total)	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Si	0.0000	0.0000	0.0000	0.0000	0	0.0000	15.1919	15.1919	0.0000	0.0000
S as SO4	1.4293	2.4906	0.0000	0.0000	1.737412	1.9216	-0.1509	0.0070	0.0049	0.0000
Sr	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
U (total)	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Zn	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Zr	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Mo		0.0000	0.0000	######	0	0.0000	0.0581	0.0581	0.0000	0.0000
Others	0.0000	0.0000	0.0000	0.0000	0		-0.9917	-0.9917	0.0000	#VALUE!
				0.0000						0.0000
Precip.	0.0000	0.0001	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
Solids	0.0025	0.0044	0.0000	0.0000	18.39255	13.8973	0.0000	1.1772	0.0000	0.0000
				######	0					#VALUE!
TIC	10.6823	18.5794	0.0000	0.0000	7.505225	10.2125	0.0000	0.0087	0.8564	0.0000
TOC	1.0206	0.8892	1.1975	0.0000	4	3.2395	0.0000	0.0000	0.2744	0.0000
				######	0					
				######	0					
				######	0					
Gases	g/L	g/L	g/L	######	g/L	g/L	Mt/d	Mt/d	Mt/d	
CH4	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
H2	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
N2	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
NH3	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
NO2(g)	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
				######	0					#VALUE!
Fissile	g/L	g/L	g/L	######	g/L	g/L	Mt/d	Mt/d	Mt/d	#VALUE!
Pu239/241	0.0000	0.0000	0.0000	0.0000	0	0.0756	0.0000	0.0062	0.0002	0.0000
U-235	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000	0.0000
				######						
Activity	Bq/m3	Bq/m3	Bq/m3	Bq/d	Bq/m3	Bq/m3	Bq/d	Bq/d	Bq/d	Bq/d
Am241	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Ba137m	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Co60	2.11E+07	3.68E+07	4.95E+01	0.0000	1.34E+08	1.10E+08	0.00E+00	9.04E+09	2.80E+08	0.0000
Cs137	1.76E+10	3.07E+10	4.13E+04	0.0000	1.27E+13	9.64E+12	0.00E+00	7.92E+14	2.45E+13	0.0000
Eu154/155	8.29E+09	1.10E+10	1.48E+04	0.0000	4.12E+09	5.79E+09	0.00E+00	4.76E+11	1.47E+10	0.0000
Ni63/59	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Pu	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sm151	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Sr90	2.06E+08	3.58E+08	4.82E+02	0.0000	1.3E+11	9.87E+10	0.00E+00	8.11E+12	2.51E+11	0.0000
Tc99	1.62E+09	2.83E+09	3.81E+03	0.0000	2.11E+10	1.66E+10	0.00E+00	1.36E+12	4.22E+10	0.0000
TRU	2.24E+08	3.91E+08	5.26E+00	0.0000	1.42E+09	1.08E+09	0.00E+00	8.84E+10	2.74E+09	0.0000
Y-90	0.00E+00	0.00E+00	0.00E+00	0.0000	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0000
Solid	7.52E+06	1.31E+07	1.76E+01	0.0000	5.22E+11	3.94E+11	0.00E+00	3.24E+13	1.00E+12	0.0000
										26.5479
Sum	1231.6835	1402.8202	1001.2040			1255.1843	21.0627	31.4777	95.9092	is O fro

melter Unit

Case ③ Strm #74 and #80 Both as input

(a) Input strm #82

Total:

from #74 + #80

= 29.049 + 76.0163

= 105.065

o.k.

Na:

from #74 + #80

$(213.500 \times 20.7081 + 68.21205 \times 64) \times \frac{10^{-6}}{10^{-3}}$

= 8.89029 mt/d

in #82

$104.9521 \times 84.7081 \times \frac{10^{-6}}{10^{-3}}$

= 8.89029 Mt/d

o.k.

(b) Mass balance in Unit

Total:

105.0651 + 21.0627

= 126.1278

56.8423 + 95.8334

= 152.6757

Difference = 26.5479

which is due to oxygen from the air.

o.k.

(c) Out - in = 0

except for oxygen and total

April 21/00

Reconsider the component Table:

chemical Element to be considered: (Sources).

① Table 2-1, Envelope A B C Composition.
BNFL Report (5193-TR-01)

include all in the spread sheet model.

② Table-2-2, Envelope D composition
BNFL Report (5193-TR-01)

in this Table, 68 components were listed.
Only those whose concentration is higher than 0.15 g/L will be listed in the model except

(A) dangerous materials (chemical, fissionable, explosive)
(B) & significant radio nuclide contributor.
& has only NO_2/NO_3 total number.

③ Table 4-9, BNFL Report 5193-TR-01
Estimated composition of Dangerous Liquid Effluents in LAW-only Treatment
has NO_2/NO_3 as separate numbers, but amount is low.
has solids.
has E154, 155.
we have included all.

④ Table 4-10 same report.
Extra: H3, C14
We have all except C14 extremely low.

Table: 4-12 — Effluent limits.

extra: CO, NO_x, SO_2, O_3, H_2S

We do not have these except NO_2

Table 4-103

4-14, Same report.

We do not have CO_2, P_2O_5, SO_3

Hanford Tank Waste

Familiarization Report. CAWRA-97-001

Page A-3. Hanford site inventories:

This table gives the significance of Radionuclides in Tanks (also in total).

I should include:

DBP, Butanol

Ru-106 and Cd^{-113m}, Sb^{-121}, their total ☒ ≥ 5000 $\sum C_i$

Page A-4.

I should include:

Cs^{-134},

& Th-229, 232. both low!

U-238, 233, 234, all small

Page A-6

We need to add individual organics.

April 27/00

☒ New configuration for tables.

Feed Code 1:	1
Feed Code 2:	1
Feed from Preceding Unit Only	
Stream No	
Stream Name	
Stream Temp	
Feed A (%)	
Feed B (%)	
Feed C (%)	
Feed D (%)	
Mass Flow, g/d	
Volume Flow, L/d	
Density, g/L	
Activity Flow, Bq/d	

Component*	Property code**
INORGANICS	
Ag	XXXDXX
Al	XXXXXX
Am/Am241,242	RXXXXX
As	XXXDXX
B	XXXXXX
Ba/Ba137	RXXDXX
Be	XXXXXX
Bi	XXXXXX
C (as CO3)	XXXXXX
Ca	XXXXXX
Cd	XXXDXX
Ce	XXXXXX
Cl	XXXXXX
CN	XXXDXX
Co/Co60	RXXXXX
Cr	XXXDXX
Cs/Cs137,134	RXXXXX
Cu	XXXXXX
Eu/Eu 154,155	RXXXXX
F	XXXXXX
Fe	XXXXXX
H2(Molecule)	XXXGXX
H2O/H3	RXXXXX
Hg	XXXDXX
I/I129	RXXXXX
K	XXXXXX
La	XXXXXX
Li	XXXXXX
Mg	XXXXXX
Mn	XXXXXX
Mo	XXXXXX
N2(Molecule)	XXXXGX
Na	XXXXXX
Nd	XXXXXX
NH3(Molecule)	XXXXGX
NiNi63,59	RXXXXX
NO2(molecule)	XXXXGX
NO2	XXXXXX
NO3	XXXXXX
O2(Molecule)	XXXXGX
OH	XXXXXX
P (as PO4)	XXXXXX
Pb	XXXDXX
Pu/Pu236-241	RXFXXX
S (as SO4)	XXXXXX
Sb	XXXXXX
Se	XXXDXX
Si	XXXXXX
Sm/Sm151	RXXXXX
Sr/Sr90	RXXXXX
Tc/Tc99	RXXXXX
Th/Th232,229	RXXXXX
Ti	XXXXXX
U/U233-238	RXFXXX
Y/Y90	RXXXXX
Zn	XXXXXX
Zr	XXXXXX
Others Inorg.	XXXXXX
ORGANICS	
Acetate	XXXXXO
Butanol	XXXXXO
Citric Acid	XXXXXO
Formic Acid	XXXXXO
DBP	XXXXXO
EDDA	XXXXXO
EDTA	XXXXXO
Glycolate	XXXXXO
HEDTA	XXXXXO
NPH	XXXXXO
NIDA	XXXXXO
NTA	XXXXXO
Oxalate	XXXXXO
TBP	XXXXXO
Other Organics	XXXXXO
SUM	
Total TRU	
TIC	
TOC	
Total solids	
Pu239/241 in solids	
U235 in solids	

12 Feeds to LAW Evaporator	
20	
0	
0	
89	
11	
73442886	
64000	
1.1475E+03	
7.465E+14	
Mass, g/L	Activity, Bq/L
0	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0094	0
0.0000	0
0.0000	0
2.6111	0
0.0188	0
0.0000	2.513E+04
0.1771	0
0.0000	1.151E+10
0.0000	0
0.0000	4.120E+06
0.0000	0
0.2408	0
0.0000	0
973.9223	0
0.0000	0
0.0000	0
1.8935	0
0.0000	0
0.0000	0
78.4148	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
23.4087	0
69.9218	0
0.0000	0
12.5529	0
0.7389	0
0.0000	0
0.0000	0
1.7358	0
0.0000	0
0.0000	0
0.0000	0
0.0000	1.300E+08
0.0000	2.110E+07
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0	0
1147.5453	1.166E+10
0	1.420E+06
7.9009	0
2.9837	0
18.3926	4.731E+08
0.0000	0.000E+00
0.0000	0.000E+00
0	0

14 LAW Concentrate	
20	
0	
0	
89	
11	
4.8536E+07	
32566	
1.2697E+03	
7.458E+14	
Mass, g/L	Activity, Bq/L
0	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0184	0
0.0000	0
0.0000	0
0.0159	0
0.0368	0
0.0000	4.928E+04
0.3474	0
0.0000	2.258E+10
0.0000	0
0.0000	8.081E+06
0.0000	0
0.4717	0
0.0000	0
948.7977	0
0.0000	0
0.0000	0
3.7141	0
0.0000	0
0.0000	0
155.7712	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
45.9169	0
99.5820	0
0.0000	0
24.0540	0
1.4494	0
0.0000	0
0.0000	0
0.0000	0
3.4047	0
0.0000	0
0.0000	0
0.0000	0
0.0000	2.550E+08
0.0000	4.139E+07
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0	0
1289.3572	2.268E+10
0	2.788E+06
14.7139	0
5.8133	0
36.1129	9.288E+08
0.0000	0.000E+00
0.0000	0.000E+00
0	0

16 Evaporator Overhead	
20	
0	
0	
89	
11	
3.1404E+07	
31494	
1.0000E+03	
7.465E+11	
Mass, g/L	Activity, Bq/L
0	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	5.120E+01
0.0004	0
0.0000	2.344E+07
0.0000	0
0.0000	8.596E+03
0.0000	0
0.0008	0
0.0000	0
1000.0000	0
0.0000	0
0.0000	0
0.0039	0
0.0000	0
0.0000	0
0.0000	0
0.0477	0
0.1038	0
0.0000	0
0.0250	0
0.0015	0
0.0000	0
0.0000	0
0.0000	0
0.0038	0
0.0000	0
0.0000	0
0.0000	0
0.0000	2.640E+05
0.0000	4.300E+04
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0.0000	0
0	0
1002.3538	2.377E+07
0	2.894E+03
0.0183	0
0.0000	0
0.0000	0.000E+00
0.0000	0.000E+00
0.0000	0.000E+00
0	0

* If not otherwise specified, components are in ionic form in solution

** 1st character R=Radionuclide Hazard, X=Non-radionuclide Hazard
2nd character E=Explosion Hazard, X=Non-explosion Hazard
3rd character F=Flammable, X=Non-Flammable
4th character D=Dangerous constuent under WAC 173-303, X=Non-dangerous

April 27/00

Minor error noticed for

① Filtration_Calc. sheet, cell T62

should not Assay amount * filtration efficiency.

should: just Assay amount.

because it has nothing to do with efficiency.
(this may cause unbalance).

② Filtration-calc. sheet, cell T69.

Equal amount of water, should be total slurry volume. should be using T67+T68

not T65+T68

(This should not cause unbalance.)

③ J. Yang / 08/16/00

changes.

① Not to use 60 g Na / dry solid

to calculate Na distribution, (Comp. factor).

use Assay to do the comp. factor.

•

in solid Assay: 0.10 (J.Y. 04/27/00)

If feed contain C% > 0.10, Then consider the feed "C" envelope, use precipitation. This number is arbitrary.

sheet: Filtration

$\Sigma C_i * F_i / F$ produces some error.

if $\Sigma (F_i/F) * C_i$ should be better.

Density = 1.3088 E3 v.s. 1.3085 E3

1.2041 E3 v.s. 1.203.97 E3

= 1.2040 E3

June 22.

PRETREAT

Spreadsheet part is in good shape.

J. Yang / 08/16/00

July 5/00

Started to Work on the interface so that it is applicable to the new sheet modifications.

① Add a form – frmAssay for Solid Assay sheet

② Separated Component factor form from "STREAMS" So less conflict would be experienced.

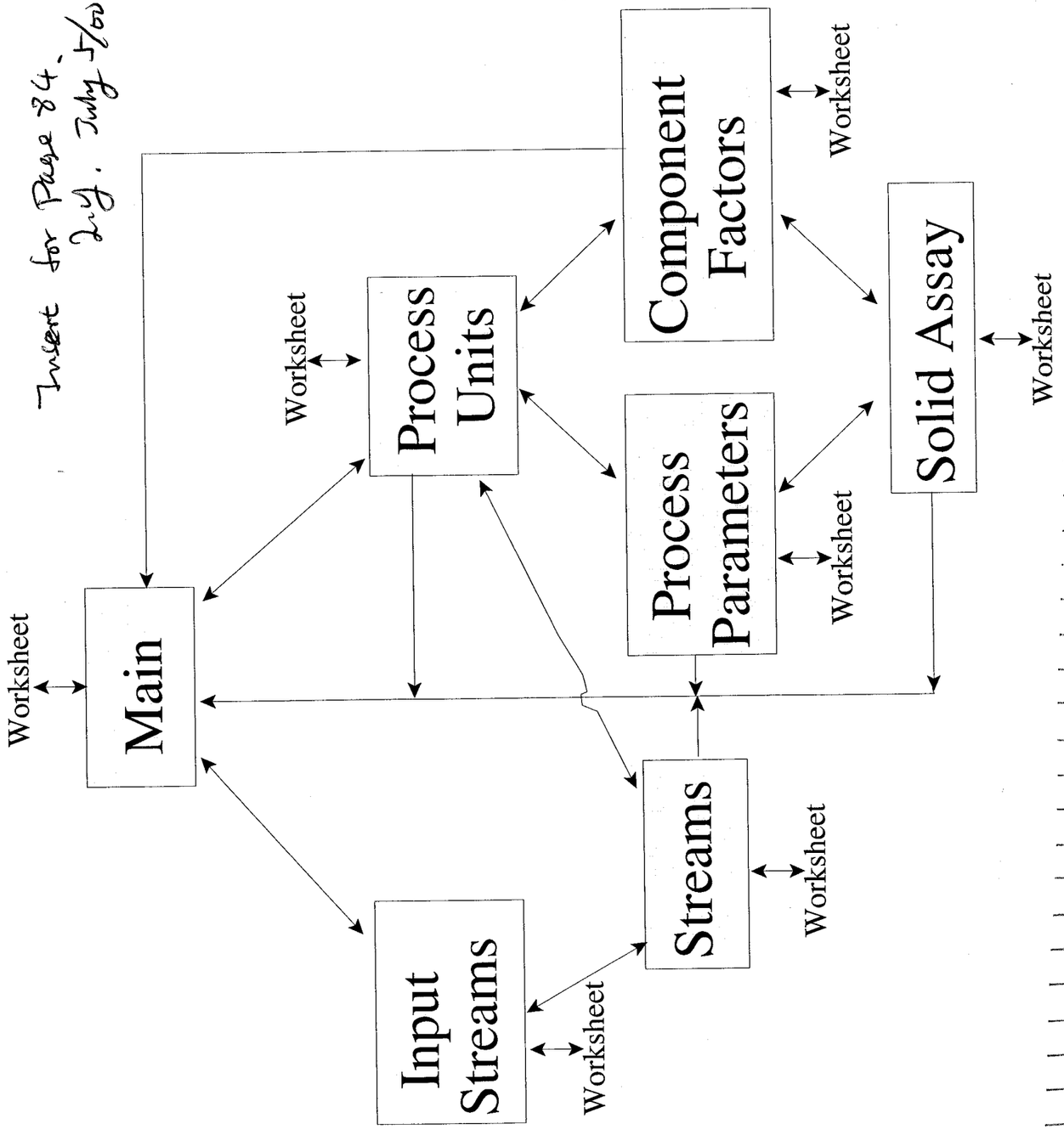
Call it frmCompFactor

③ Change "frmAssumption" To "frmProParameters" just rename the form and make the changes wherever ~~retreenced~~ referenced "frmAssumption".

To This stage, there are 6 independent forms as shown in Page ~~83~~ 84. (J.Y.) July 5/00

The ~~tranverse~~ directions are also shown in Page ~~83~~ 84 (or Navegation direction). (J.Y.) July 5/00

Insert for Page 84. July. July 5/00



July 06/00

Rules:

"BACK" Button in every form should always go back to the Parent Form the user last worked on. For example, in Streams Form, the Back button should go to Eigher "Input Streams" or "Process Units", from which ever "STREAMS" were initiated.

We need a variable in such forms to track which is the latest parant.

Create a Variable

public Parent_Form as String for such forms

also: Public Parent_sheet " " for sheet tracking

"Back to User Form" Button on Spreadsheet should alway go to the form where "GoTo" Button was pressed. To keep track, use frmV.prev-form.Text. which always indicate the previous-form the user has worked on, it may be a parent, may be a daughter form.

also: Prev-sheet is for sheet tracking.

For QA purpose, Pages up to Page 85 were copied and given to QA for records.

J. Yang July 13/00

July 13/00

Interface was finished.

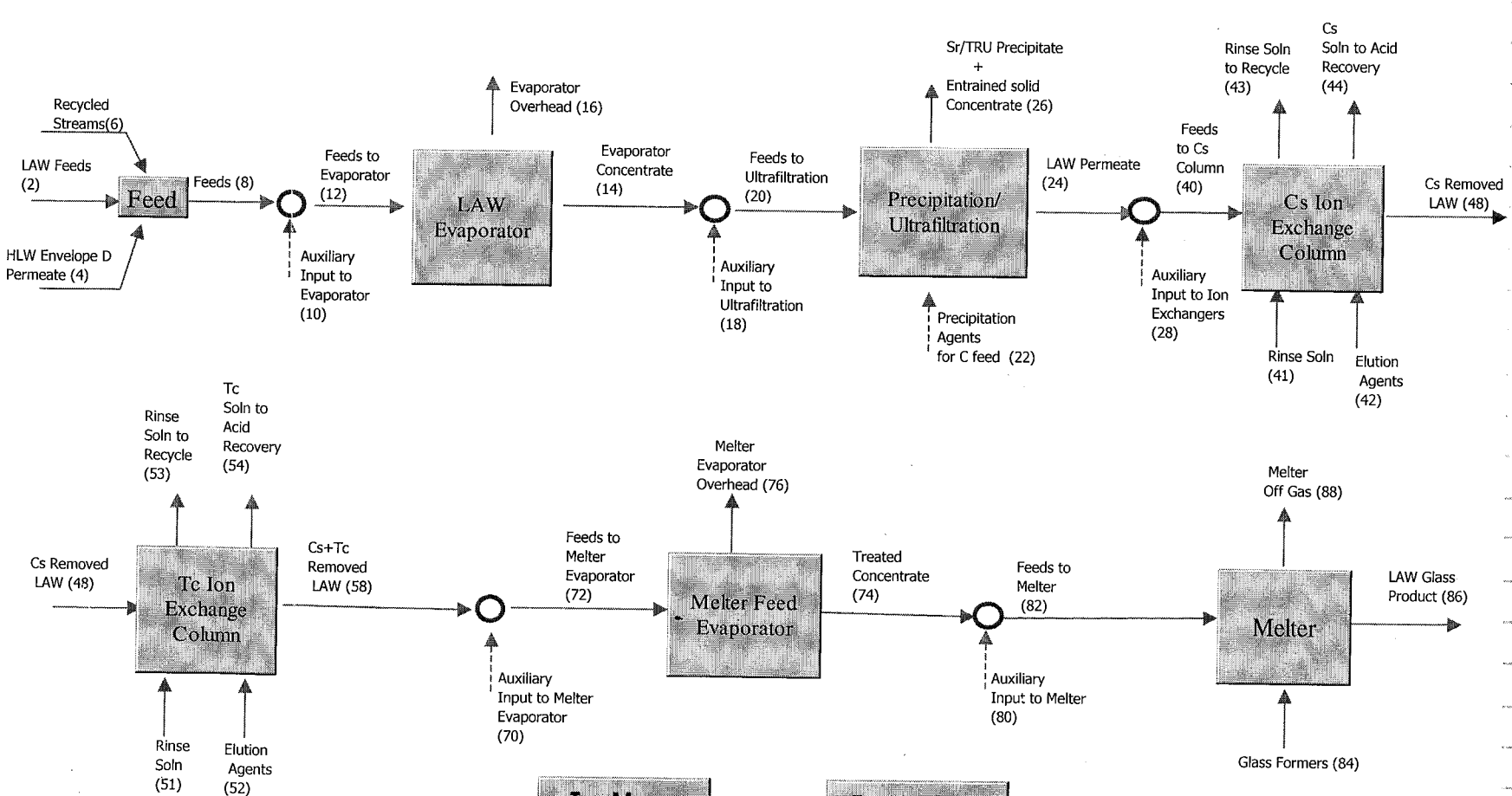
Should have a Save Dialog Button on Main Form. However, VBA does not support this. "Not Licensed" when tried to use it.

J. Yang 08/16/00

07/13/00

Validation of the Spreadsheet Calculation for the modified version of PRETREAT

Flow sheet with Stream numbers. July 13/00



Feed Unit

Unit Mass Summaries and Mass Balances

Mass Summaries				Mass Balances: Unit Out - In	Mass Balances: Unit In	Mass Balances: Unit Out
Stream No	2	4	6	8	Out - In	2+4+6	8
Stream Name							
Stream Temp	20	20	20	20			
Feed A (%)	0	0	0	0	0.0000	0.0000E+00	0.0000E+00
Feed B (%)	95	100	0	95	0.0000	1.7008E+10	1.7008E+10
Feed C (%)	5	0	0	5	0.0000	8.9517E+08	8.9517E+08
Feed D (%)	0	0	100	0	0.0000	0.0000E+00	0.0000E+00
Mass Flow, g/d	1.7903E+08	0.0000E+00	0.0000E+00	1.7903E+08	0.0000E+00	1.7903E+08	1.7903E+08
Volume Flow, L/d	1.5000E+05	0.0000E+00	0.0000E+00	1.5000E+05	0.0000E+00	1.5000E+05	1.5000E+05
Density, g/L*	1.1936E+03	NA	NA	1.1936E+03			
Activity Flow, Bq/d	1.2816E+16	0.0000E+00	0.0000E+00	1.2816E+16	0.0000E+00	1.9223E+21	1.9223E+21
Component*	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d
INORGANICS	0	0	0	0		0.0000E+00	0.0000E+00
Ag	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	7.7760E+00	0.0000E+00	0.0000E+00	7.7760E+00	0.0000E+00	1.1664E+06	1.1664E+06
Am/Am241,242	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
As	0.0000E+00	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	5.5195E-05	0.0000E+00	0.0000E+00	5.5195E-05	0.0000E+00	8.2792E+00	8.2792E+00
Be	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	1.0000E-05	1.0000E-01	0.0000E+00	1.0000E-05	0.0000E+00	1.5000E+00	1.5000E+00
Ca	1.9960E-03	0.0000E+00	0.0000E+00	1.9960E-03	0.0000E+00	2.9940E+02	2.9940E+02
Cd	2.3997E-03	0.0000E+00	0.0000E+00	2.3997E-03	0.0000E+00	3.5996E+02	3.5996E+02
Ce	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
Cl	1.4857E-01	1.9900E+00	1.9951E+00	1.4857E-01	0.0000E+00	2.2285E+04	2.2285E+04
CN	0	2.0000E-01	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0	1.0000E-10	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	1.1752E+00	1.5000E-01	1.7994E-01	1.1752E+00	0.0000E+00	1.7628E+05	1.7628E+05
Cs/Cs137,134	0.0000E+00	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
F	1.9855E+00	0.0000E+00	0.0000E+00	1.9855E+00	0.0000E+00	2.9783E+05	2.9783E+05
Fe	1.2834E-04	2.9527E-03	2.9527E-03	1.2834E-04	0.0000E+00	1.9251E+01	1.9251E+01
H2(Molecule)	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	8.9000E+02	9.0000E+02	9.8157E+02	8.9000E+02	0.0000E+00	1.3350E+08	1.3350E+08
Hg	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
K	3.3431E+00	1.8935E+00	1.8935E+00	3.3431E+00	0.0000E+00	5.0146E+05	5.0146E+05
La	5.8894E-04	0.0000E+00	0.0000E+00	5.8894E-04	0.0000E+00	8.8340E+01	8.8340E+01
Li	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
Na	1.1510E+02	6.8212E+01	6.8212E+01	1.1510E+02	0.0000E+00	1.7265E+07	1.7265E+07
Np /Np-237	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule)	0.0000E+00	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	6.0157E-04	0.0000E+00	0.0000E+00	6.0157E-04	0.0000E+00	9.0236E+01	9.0236E+01
NO2(molecule)	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
NO2	6.5550E+01	2.3409E+01	2.3409E+01	6.5550E+01	0.0000E+00	9.8325E+06	9.8325E+06
NO3	7.1300E+01	5.0922E+01	5.0922E+01	7.1300E+01	0.0000E+00	1.0695E+07	1.0695E+07
O(in others, Note 9)	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
OH	1.0710E+01	4.0000E+00	1.4000E+01	1.0710E+01	0.0000E+00	1.6065E+06	1.6065E+06
P (as PO4)	1.0925E+00	7.3893E-01	7.3893E-01	1.0925E+00	0.0000E+00	1.6388E+05	1.6388E+05
Pb	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Pu/Pu238--241	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	2.4336E+01	1.7200E+00	1.7374E+00	2.4336E+01	0.0000E+00	3.6504E+06	3.6504E+06
Sb	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
Se	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
Si	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	3.3157E-05	0.0000E+00	0.0000E+00	3.3157E-05	0.0000E+00	4.9735E+00	4.9735E+00
Tc/Tc99	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ti	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233--238	1.0424E+00	0.0000E+00	0.0000E+00	1.0424E+00	0.0000E+00	1.5637E+05	1.5637E+05
Y/Y90	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS	0	0	0	0		0.0000E+00	0.0000E+00
Acetate	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organics	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
SUM	1.1936E+03	1.0533E+03	1.1447E+03	1.1936E+03	0.0000E+00	1.7903E+08	1.7903E+08
Total TRU	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00
TIC	8.7000E+00	7.5000E+00	7.5100E+00	8.7000E+00	0.0000E+00	1.3050E+06	1.3050E+06
TOC	1.9560E+00	2.9641E+00	2.9600E+00	1.9560E+00	0.0000E+00	2.9340E+05	2.9340E+05
Total solids	0	1.8393E+01	1.8393E+01	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Pu239/241 in solids	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	1.0424E+00	0.0000E+00	0.0000E+00	1.0424E+00	0.0000E+00	1.5637E+05	1.5637E+05
END	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00

Note 9: In Oxygen containing speci

Sample calculation for Na:

input = #2 + #4 + #6

= 1.1510E2 * 1.5E5 + 6.8212E1 * 0 + 6.8212E1 * 0

= 1.7265E7 g/day

output = #8

= 1.1510E2 * 1.500E5

= 1.7265E7 g/day.

output = input.

O.k.

July 13/00

Evaporation Case 1

Feed from Preceding Unit Only

Unit Mass Summaries and Mass Balances

	Mass Summaries					Mass Balances					
						Unit			Feed		
						Out - In	In	Out	Out - In	In	Out
	8	10	12	14	16		12	14+16		8+10	12
	20	20	20	20	20						
	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	95	0	95	95	95	0.0000	1.7008E+10	1.7008E+10	0.0000E+00	1.7008E+10	1.7008E+10
	5	0	5	5	5	0.0000	8.9517E+08	8.9517E+08	0.0000E+00	8.9517E+08	8.9517E+08
	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.7903E+08	0.0000E+00	1.7903E+08	1.3624E+08	4.2792E+07	0.0000E+00	1.7903E+08	1.7903E+08	0.0000E+00	1.7903E+08	1.7903E+08
Flow L/d	1.5000E+05	0.0000E+00	1.5000E+05	1.0724E+05	4.2764E+04	0.0000E+00	1.5000E+05	1.5000E+05	0.0000E+00	1.5000E+05	1.5000E+05
	1.1936E+03	0.0000E+00	1.1936E+03	1.2705E+03	1.0007E+03						
	1.2816E+16	0.0000E+00	1.2816E+16	1.2803E+16	1.2816E+13	0.0000E+00	1.2816E+16	1.2816E+16	0.0000E+00	1.2816E+16	1.2816E+16
	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al g/L	7.7760E+00	0.0000E+00	7.7760E+00	1.0866E+01	2.7275E-02	0.0000E+00	1.1664E+06	1.1664E+06	0.0000E+00	1.1664E+06	1.1664E+06
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	5.5195E-05	0.0000E+00	5.5195E-05	7.7128E-05	1.9360E-07	0.0000E+00	8.2792E+00	8.2792E+00	0.0000E+00	8.2792E+00	8.2792E+00
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.0000E-05	0.0000E+00	1.0000E-05	1.3974E-05	3.5076E-08	0.0000E+00	1.5000E+00	1.5000E+00	0.0000E+00	1.5000E+00	1.5000E+00
	1.9960E-03	0.0000E+00	1.9960E-03	2.7892E-03	7.0012E-06	0.0000E+00	2.9940E+02	2.9940E+02	0.0000E+00	2.9940E+02	2.9940E+02
	2.3997E-03	0.0000E+00	2.3997E-03	3.3534E-03	8.4174E-06	0.0000E+00	3.5996E+02	3.5996E+02	0.0000E+00	3.5996E+02	3.5996E+02
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.4857E-01	0.0000E+00	1.4857E-01	2.0761E-01	5.2112E-04	0.0000E+00	2.2285E+04	2.2285E+04	0.0000E+00	2.2285E+04	2.2285E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.1752E+00	0.0000E+00	1.1752E+00	1.6422E+00	4.1222E-03	0.0000E+00	1.7628E+05	1.7628E+05	0.0000E+00	1.7628E+05	1.7628E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.9855E+00	0.0000E+00	1.9855E+00	2.7745E+00	6.9644E-03	0.0000E+00	2.9783E+05	2.9783E+05	0.0000E+00	2.9783E+05	2.9783E+05
	1.2834E-04	0.0000E+00	1.2834E-04	1.7934E-04	4.5017E-07	0.0000E+00	1.9251E+01	1.9251E+01	0.0000E+00	1.9251E+01	1.9251E+01
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	8.9000E+02	0.0000E+00	8.9000E+02	8.4613E+02	1.0000E+03	0.0000E+00	1.3350E+08	1.3350E+08	0.0000E+00	1.3350E+08	1.3350E+08
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	3.3431E+00	0.0000E+00	3.3431E+00	4.6715E+00	1.1726E-02	0.0000E+00	5.0146E+05	5.0146E+05	0.0000E+00	5.0146E+05	5.0146E+05
	5.8894E-04	0.0000E+00	5.8894E-04	8.2297E-04	2.0658E-06	0.0000E+00	8.8340E+01	8.8340E+01	0.0000E+00	8.8340E+01	8.8340E+01
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.1510E+02	0.0000E+00	1.1510E+02	1.6100E+02	8.7113E-14	0.0000E+00	1.7265E+07	1.7265E+07	0.0000E+00	1.7265E+07	1.7265E+07
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	6.0157E-04	0.0000E+00	6.0157E-04	8.4063E-04	2.1101E-06	0.0000E+00	9.0236E+01	9.0236E+01	0.0000E+00	9.0236E+01	9.0236E+01
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	6.5550E+01	0.0000E+00	6.5550E+01	9.1599E+01	2.2992E-01	0.0000E+00	9.8325E+06	9.8325E+06	0.0000E+00	9.8325E+06	9.8325E+06
	7.1300E+01	0.0000E+00	7.1300E+01	9.9634E+01	2.5009E-01	0.0000E+00	1.0695E+07	1.0695E+07	0.0000E+00	1.0695E+07	1.0695E+07
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.0710E+01	0.0000E+00	1.0710E+01	1.4966E+01	3.7567E-02	0.0000E+00	1.6065E+06	1.6065E+06	0.0000E+00	1.6065E+06	1.6065E+06
	1.0925E+00	0.0000E+00	1.0925E+00	1.5266E+00	3.8321E-03	0.0000E+00	1.6388E+05	1.6388E+05	0.0000E+00	1.6388E+05	1.6388E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	2.4336E+01	0.0000E+00	2.4336E+01	3.4007E+01	8.5362E-02	0.0000E+00	3.6504E+06	3.6504E+06	0.0000E+00	3.6504E+06	3.6504E+06
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	3.3157E-05	0.0000E+00	3.3157E-05	4.6333E-05	1.1630E-07	0.0000E+00	4.9735E+00	4.9735E+00	0.0000E+00	4.9735E+00	4.9735E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.0424E+00	0.0000E+00	1.0424E+00	1.4567E+00	3.6565E-03	0.0000E+00	1.5637E+05	1.5637E+05	0.0000E+00	1.5637E+05	1.5637E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.1936E+03	0.0000E+00	1.1936E+03	1.2705E+03	1.0007E+03	0.0000E+00	1.7903E+08	1.7903E+08	0.0000E+00	1.7903E+08	1.7903E+08
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	8.7000E+00	0.0000E+00	8.7000E+00	1.2157E+01	3.0516E-02	0.0000E+00	1.3050E+06	1.3050E+06	0.0000E+00	1.3050E+06	1.3050E+06
	1.9560E+00	0.0000E+00	1.9560E+00	2.7333E+00	6.8609E-03	0.0000E+00	2.9340E+05	2.9340E+05	0.0000E+00	2.9340E+05	2.9340E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.0424E+00	0.0000E+00	1.0424E+00	1.4581E+00	0.0000E+00	0.0000E+00	1.5637E+05	1.5637E+05	0.0000E+00	1.5637E+05	1.5637E+05

Evaporation Unit.

Case 1:

Stream 8 as Feed alone.

Sample calc. for Al

① Unit: (d.y. 07/13)

Input = #12

= 7.776*1.50E5

= 1.1664E6

output = #14 + #16

= 1.0866E1 * 1.0724E5

+ 2.7275E-2 * 4.2764E4

= 1.1652698E6

+ 0.11664E4

= 1.16644E6

So Input = Output.

② Feed.

Input = #8 + #10

= 7.776 * 1.5E5

+ 0

= 1.16644E6

output = #12

= 7.776 * 1.5E5

= 1.16644E6

So:

Input = output

O.K.

Evaporation Unit

Case 2

Aux. Stream Only

Unit Mass Summaries and Mass Balances

	Mass Summaries					Mass Balances					
						Unit			Feed		
						Out - In	In	Out	Out - In	In	Out
	8	10	12	14	16		12	14+16		8+10	12
	20	20	20	20	20						
	0	100	100	100	100	0.0000	7.3648E+09	7.3648E+09	0.0000E+00	7.3648E+09	7.3648E+09
	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	7.3648E+07	7.3648E+07	4.2239E+07	3.1409E+07	0.0000E+00	7.3648E+07	7.3648E+07	0.0000E+00	7.3648E+07	7.3648E+07
Flow L/d	0.0000E+00	6.4000E+04	6.4000E+04	3.2596E+04	3.1404E+04	0.0000E+00	6.4000E+04	6.4000E+04	0.0000E+00	6.4000E+04	6.4000E+04
	0.0000E+00	1.1508E+03	1.1508E+03	1.2958E+03	1.0002E+03						
	0.0000E+00	8.2273E+14	8.2273E+14	8.2191E+14	8.2273E+11	0.0000E+00	8.2273E+14	8.2273E+14	0.0000E+00	8.2273E+14	8.2273E+14
	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al g/L	0.0000E+00	1.0000E-02	1.0000E-02	1.9615E-02	2.0380E-05	0.0000E+00	6.4000E+02	6.4000E+02	0.0000E+00	6.4000E+02	6.4000E+02
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	3.0000E+00	3.0000E+00	5.8844E+00	6.1139E-03	0.0000E+00	1.9200E+05	1.9200E+05	0.0000E+00	1.9200E+05	1.9200E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1.7994E-01	1.7994E-01	3.5293E-01	3.6670E-04	0.0000E+00	1.1516E+04	1.1516E+04	0.0000E+00	1.1516E+04	1.1516E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	2.9527E-01	2.9527E-01	5.7916E-01	6.0175E-04	0.0000E+00	1.8897E+04	1.8897E+04	0.0000E+00	1.8897E+04	1.8897E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	9.8157E+02	9.8157E+02	9.6381E+02	1.0000E+03	0.0000E+00	6.2820E+07	6.2820E+07	0.0000E+00	6.2820E+07	6.2820E+07
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1.8935E+00	1.8935E+00	3.7140E+00	3.8589E-03	0.0000E+00	1.2118E+05	1.2118E+05	0.0000E+00	1.2118E+05	1.2118E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	8.2000E+01	8.2000E+01	1.6100E+02	0.0000E+00	0.0000E+00	5.2480E+06	5.2480E+06	0.0000E+00	5.2480E+06	5.2480E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	2.3409E+01	2.3409E+01	4.5915E+01	4.7706E-02	0.0000E+00	1.4982E+06	1.4982E+06	0.0000E+00	1.4982E+06	1.4982E+06
	0.0000E+00	5.0922E+01	5.0922E+01	9.9880E+01	1.0378E-01	0.0000E+00	3.2590E+06	3.2590E+06	0.0000E+00	3.2590E+06	3.2590E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	5.0000E+00	5.0000E+00	9.8073E+00	1.0190E-02	0.0000E+00	3.2000E+05	3.2000E+05	0.0000E+00	3.2000E+05	3.2000E+05
	0.0000E+00	7.3893E-01	7.3893E-01	1.4494E+00	1.5059E-03	0.0000E+00	4.7292E+04	4.7292E+04	0.0000E+00	4.7292E+04	4.7292E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1.7374E+00	1.7374E+00	3.4078E+00	3.5408E-03	0.0000E+00	1.1119E+05	1.1119E+05	0.0000E+00	1.1119E+05	1.1119E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1.1508E+03	1.1508E+03	1.2958E+03	1.0002E+03	0.0000E+00	7.3648E+07	7.3648E+07	0.0000E+00	7.3648E+07	7.3648E+07
	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	7.5000E+00	7.5000E+00	1.4711E+01	1.5285E-02	0.0000E+00	4.8000E+05	4.8000E+05	0.0000E+00	4.8000E+05	4.8000E+05
	0.0000E+00	2.9641E+00	2.9641E+00	5.8139E+00	6.0407E-03	0.0000E+00	1.8970E+05	1.8970E+05	0.0000E+00	1.8970E+05	1.8970E+05
	0.0000E+00	1.8393E+01	1.8393E+01	3.6112E+01	0.0000E+00	0.0000E+00	1.1771E+06	1.1771E+06	0.0000E+00	1.1771E+06	1.1771E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

In this case, stream #10 only. Stream #8 set to zero

① Unit balance

Input = #12

= 1.000E-2 * 6.4E4

= 6.4 E 2

output = #14 + #16

= 1.9615E-2 * 3.2596E4 + 2.038E-5 * 3.1404E4

= 6.40E2

Input = output

② Feed entrance

#8 = 0.

input = #10

Output = #12

Visual examination this is true.

O.k.

July 13/00

Evaporation

From both Preceding and Aux. Strm — Case 3

Unit Mass Summaries and Mass Balances

	Mass Summaries					Mass Balances: Unit			Mass Balances: Feed		
						Out - In	In	Out	Out - In	In	Out
	8	10	12	14	16		12	14+16		8+10	12
	20	20	20	20	20						
	0	100	29	29	29	0.0000	7.3648E+09	7.3648E+09	0.0000E+00	7.3648E+09	7.3648E+09
	95	0	67	67	67	0.0000	1.7008E+10	1.7008E+10	1.9073E-06	1.7008E+10	1.7008E+10
	5	0	4	4	4	0.0000	8.9517E+08	8.9517E+08	0.0000E+00	8.9517E+08	8.9517E+08
	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Flow, l/d	1.7903E+08	7.3648E+07	2.5268E+08	1.7848E+08	7.4202E+07	0.0000E+00	2.5268E+08	2.5268E+08	0.0000E+00	2.5268E+08	2.5268E+08
	1.5000E+05	6.4000E+04	2.1400E+05	1.3983E+05	7.4168E+04	0.0000E+00	2.1400E+05	2.1400E+05	0.0000E+00	2.1400E+05	2.1400E+05
	1.1936E+03	1.1508E+03	1.1808E+03	1.2764E+03	1.0005E+03						
	1.2816E+16	8.2273E+14	1.3638E+16	1.3625E+16	1.3638E+13	0.0000E+00	1.3638E+16	1.3638E+16	0.0000E+00	1.3638E+16	1.3638E+16
	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	7.7760E+00	1.0000E-02	5.4535E+00	8.3377E+00	1.5735E-02	0.0000E+00	1.1670E+06	1.1670E+06	0.0000E+00	1.1670E+06	1.1670E+06
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	5.5195E-05	0.0000E+00	3.8688E-05	5.9149E-05	1.1163E-07	0.0000E+00	8.2792E+00	8.2792E+00	0.0000E+00	8.2792E+00	8.2792E+00
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.0000E-05	0.0000E+00	7.0093E-06	1.0716E-05	2.0224E-08	0.0000E+00	1.5000E+00	1.5000E+00	0.0000E+00	1.5000E+00	1.5000E+00
	1.9960E-03	0.0000E+00	1.3991E-03	2.1390E-03	4.0368E-06	0.0000E+00	2.9940E+02	2.9940E+02	0.0000E+00	2.9940E+02	2.9940E+02
	2.3997E-03	0.0000E+00	1.6821E-03	2.5717E-03	4.8533E-06	0.0000E+00	3.5996E+02	3.5996E+02	0.0000E+00	3.5996E+02	3.5996E+02
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.4857E-01	3.0000E+00	1.0013E+00	1.5309E+00	2.8892E-03	0.0000E+00	2.1429E+05	2.1429E+05	0.0000E+00	2.1429E+05	2.1429E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.1752E+00	1.7994E-01	8.7755E-01	1.3417E+00	2.5320E-03	0.0000E+00	1.8780E+05	1.8780E+05	0.0000E+00	1.8780E+05	1.8780E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.9855E+00	0.0000E+00	1.3917E+00	2.1277E+00	4.0156E-03	0.0000E+00	2.9783E+05	2.9783E+05	0.0000E+00	2.9783E+05	2.9783E+05
	1.2834E-04	2.9527E-01	8.8395E-02	1.3514E-01	2.5505E-04	0.0000E+00	1.8916E+04	1.8916E+04	0.0000E+00	1.8916E+04	1.8916E+04
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	8.9000E+02	9.8157E+02	9.1739E+02	8.7357E+02	1.0000E+03	0.0000E+00	1.9632E+08	1.9632E+08	0.0000E+00	1.9632E+08	1.9632E+08
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	3.3431E+00	1.8935E+00	2.9095E+00	4.4483E+00	8.3950E-03	0.0000E+00	6.2264E+05	6.2264E+05	0.0000E+00	6.2264E+05	6.2264E+05
	5.8894E-04	0.0000E+00	4.1281E-04	6.3113E-04	1.1911E-06	0.0000E+00	8.8340E+01	8.8340E+01	0.0000E+00	8.8340E+01	8.8340E+01
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.1510E+02	8.2000E+01	1.0520E+02	1.6100E+02	0.0000E+00	0.0000E+00	2.2513E+07	2.2513E+07	0.0000E+00	2.2513E+07	2.2513E+07
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	6.0157E-04	0.0000E+00	4.2166E-04	6.4467E-04	1.2166E-06	0.0000E+00	9.0236E+01	9.0236E+01	0.0000E+00	9.0236E+01	9.0236E+01
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	6.5550E+01	2.3409E+01	5.2947E+01	8.0949E+01	1.5277E-01	0.0000E+00	1.1331E+07	1.1331E+07	0.0000E+00	1.1331E+07	1.1331E+07
	7.1300E+01	5.0922E+01	6.5206E+01	9.9691E+01	1.8814E-01	0.0000E+00	1.3954E+07	1.3954E+07	0.0000E+00	1.3954E+07	1.3954E+07
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.0710E+01	5.0000E+00	9.0023E+00	1.3763E+01	2.5975E-02	0.0000E+00	1.9265E+06	1.9265E+06	2.3283E-10	1.9265E+06	1.9265E+06
	1.0925E+00	7.3893E-01	9.8676E-01	1.5086E+00	2.8472E-03	0.0000E+00	2.1117E+05	2.1117E+05	0.0000E+00	2.1117E+05	2.1117E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	2.4336E-01	1.7374E+00	1.7578E-01	2.6874E-01	5.0717E-02	0.0000E+00	3.7616E+06	3.7616E+06	0.0000E+00	3.7616E+06	3.7616E+06
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	3.3157E-05	0.0000E+00	2.3241E-05	3.5532E-05	6.7057E-08	0.0000E+00	4.9735E+00	4.9735E+00	0.0000E+00	4.9735E+00	4.9735E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.0424E+00	0.0000E+00	7.3068E-01	1.1171E+00	2.1083E-03	0.0000E+00	1.5637E+05	1.5637E+05	0.0000E+00	1.5637E+05	1.5637E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.1936E+03	1.1508E+03	1.1808E+03	1.2764E+03	1.0005E+03	0.0000E+00	2.5268E+08	2.5268E+08	0.0000E+00	2.5268E+08	2.5268E+08
	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	8.7000E+00	7.5000E+00	8.3411E+00	1.2753E+01	2.4067E-02	0.0000E+00	1.7850E+06	1.7850E+06	0.0000E+00	1.7850E+06	1.7850E+06
	1.9560E+00	2.9641E+00	2.2575E+00	3.4514E+00	6.5136E-03	0.0000E+00	4.8310E+05	4.8310E+05	0.0000E+00	4.8310E+05	4.8310E+05
	0.0000E+00	1.8393E+01	5.5006E+00	8.4181E+00	0.0000E+00	0.0000E+00	1.1771E+06	1.1771E+06	0.0000E+00	1.1771E+06	1.1771E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.0424E+00	0.0000E+00	7.3068E-01	1.1182E+00	0.0000E+00	0.0000E+00	1.5637E+05	1.5637E+05	0.0000E+00	1.5637E+05	1.5637E+05

In this case

#8 + #10 = #12

① Unit balance.

Input, and output has been varified in case 1 and case 2

② Feed Entrance

For Al:

Input = #8 + #10

= 7.7760E0 * 1.50E5 + 1.00E-2 * 6.4E4

= 1.1664*E6 + 640

= 1.16704E6

output = #12

= 5.4535E0 * 2.14E5

= 1.16704E6

So: Input = Output

o.k.

③

July 13/00

Filtration Unit

Feed from Preceding Unit Only — Feed contng: Non-C — Case 1

Unit Mass Summaries and Mass Balances

	Mass Summaries						Mass Balances: Unit			Mass Balances: Feed		
							Out - In	In	Out	Out - In	In	Out
	14	18	20	22	24	26		20+22	24+26		14+18	20
	20	20	20	20	20	20						
	100	0	100	0	100	100	Note 4	4.2239E+09	5.2190E+09	0.0000E+00	4.2239E+09	4.2239E+09
	0	0	0	0	0	0		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C	0	0	0	0	0	0		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0	0	0	0	0		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	4.2239E+07	0.0000E+00	4.2239E+07	9.9505E+06	4.8458E+07	3.7315E+06	0.0000E+00	5.2190E+07	5.2190E+07	0.0000E+00	4.2239E+07	4.2239E+07
Flow	3.2596E+04	0.0000E+00	3.2596E+04	9.9505E+03	4.0059E+04	2.4876E+03	0.0000E+00	4.2547E+04	4.2547E+04	0.0000E+00	3.2596E+04	3.2596E+04
	1.2958E+03	0.0000E+00	1.2958E+03	1.0000E+03	1.2097E+03	1.5000E+03						
	8.2191E+14	0.0000E+00	8.2191E+14	0.0000E+00	8.2191E+12	8.1369E+1[illegible]	0.0000E+00	8.2191E+14	8.2191E+14	0.0000E+00	8.2191E+14	8.2191E+14
	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	g/d	g/d	g/d	g/d	g/d	g/d
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.9615E-02	0.0000E+00	1.9615E-02	0	-1.4070E+01	5.6426E+05	-1.3983E-11	6.3936E+02	6.3936E+02	0.0000E+00	6.3936E+02	6.3936E+02
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	5.8844E+00	0.0000E+00	5.8844E+00	0	3.0378E+00	7.0118E+04	0.0000E+00	1.9181E+05	1.9181E+05	0.0000E+00	1.9181E+05	1.9181E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	3.5293E-01	0.0000E+00	3.5293E-01	0	1.8652E-01	4.0327E+03	0.0000E+00	1.1504E+04	1.1504E+04	0.0000E+00	1.1504E+04	1.1504E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	5.7916E-01	0.0000E+00	5.7916E-01	0.0000E+00	4.7126E-03	1.8690E+04	0.0000E+00	1.8878E+04	1.8878E+04	0.0000E+00	1.8878E+04	1.8878E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H_2O	9.6381E+02	0.0000E+00	9.6381E+02	1.0000E+03	1.0016E+03	1.2438E+06	0.0000E+00	4.1367E+07	4.1367E+07	0.0000E+00	3.1417E+07	3.1417E+07
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	3.7140E+00	0.0000E+00	3.7140E+00	0	8.3173E-01	8.7744E+04	0.0000E+00	1.2106E+05	1.2106E+05	0.0000E+00	1.2106E+05	1.2106E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.6100E+02	0.0000E+00	1.6100E+02	0.0000E+00	1.2727E+02	1.4964E+05	0.0000E+00	5.2480E+06	5.2480E+06	0.0000E+00	5.2480E+06	5.2480E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	4.5915E+01	0.0000E+00	4.5915E+01	0	2.4664E+01	5.0862E+05	0.0000E+00	1.4967E+06	1.4967E+06	0.0000E+00	1.4967E+06	1.4967E+06
	9.9880E+01	0.0000E+00	9.9880E+01	0.0000E+00	6.9053E+01	4.8952E+05	0.0000E+00	3.2557E+06	3.2557E+06	0.0000E+00	3.2557E+06	3.2557E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	9.8073E+00	0.0000E+00	9.8073E+00	0.0000E+00	-5.5884E+00	5.4355E+05	0.0000E+00	3.1968E+05	3.1968E+05	0.0000E+00	3.1968E+05	3.1968E+05
	1.4494E+00	0.0000E+00	1.4494E+00	0	1.1794E+00	0.0000E+00	0.0000E+00	4.7244E+04	4.7244E+04	0.0000E+00	4.7244E+04	4.7244E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	3.4078E+00	0.0000E+00	3.4078E+00	0	1.4881E+00	5.1469E+04	0.0000E+00	1.1108E+05	1.1108E+05	0.0000E+00	1.1108E+05	1.1108E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.2958E+03	0.0000E+00	1.2958E+03	1.0000E+03	1.2097E+03	3.7314E+06	0.0000E+00	5.2190E+07	5.2190E+07	0.0000E+00	4.2239E+07	4.2239E+07
	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.4711E+01	0.0000E+00	1.4711E+01	0	1.1970E-02	4.7904E+05	0.0000E+00	4.7952E+05	4.7952E+05	0.0000E+00	4.7952E+05	4.7952E+05
	5.8139E+00	0.0000E+00	5.8139E+00	0	4.7308E-03	1.8932E+05	0.0000E+00	1.8951E+05	1.8951E+05	0.0000E+00	1.8951E+05	1.8951E+05
	3.6112E+01	0.0000E+00	3.6112E+01	0	6.2161E-02	2.4876E+06	1.3130E+06	1.1771E+06	2.4901E+06	0.0000E+00	1.1771E+06	1.1771E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
						Sum=	1.3130E+06			0.0000E+00		

1.3130E+06 -This is the total solids generated in the unit which is the sum of * and ** (see t

* 0.0000E+00 -Total solids produced from added agent (agen was added as solution, no soli

** 1.3130E+06 -Total solid produced from feed in the unit (due to chemistry change, excluding

In this case

Stream #18 = 0

None c̄ Feed.

① Unit Balance.

For Cl:

Input = #20 + #22

= 5.8844 * 3.2596E4 + 0

= 1.9181E5

output = #24 + #26

= 3.0378 * 4.0059E4 + 7.0118E4

= 1.9181E5

Input = output

o.k.

② Feed Entrance

use Cl:

Input = #14

= 5.8844 * 3.2596E4

output = #20

= 5.8844 * 3.2596E4

Input = output.

o.k.

③ Stream 22 has only water since the feed does not have "C" envelope

Filtration Unit

Case 2

Aux. Stream Only — Feed contng: Non-C

Unit Mass Summaries and Mass Balances

	Mass Summaries						Mass Balances: Unit Out - In	Unit In	Unit Out	Feed Out - In	Feed * In	Feed Out
	14	18	20	22	24	26		20+22	24+26		14+18	20
	20	20	20	20	20	20						
	0	100	100	0	100	100	Note 4	7.3648E+09	8.3598E+09	0.0000E+00	7.3648E+09	7.3648E+09
C	0	0	0	0	0	0		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0	0	0	0	0		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0	0	0	0	0		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	7.3648E+07	7.3648E+07	9.9505E+06	7.9867E+07	3.7315E+06	0.0000E+00	8.3598E+07	8.3598E+07	0.0000E+00	7.3648E+07	7.3648E+07
	0.0000E+00	6.4000E+04	6.4000E+04	9.9505E+03	7.1463E+04	2.4876E+03	0.0000E+00	7.3951E+04	7.3951E+04	0.0000E+00	6.4000E+04	6.4000E+04
	0.0000E+00	1.1507E+03	1.1507E+03	1.0000E+03	1.1176E+03	1.5000E+03						
	0.0000E+00	8.2273E+14	8.2273E+14	0.0000E+00	8.2274E+12	8.1451E+14	0.0000E+00	8.2273E+14	8.2273E+14	0.0000E+00	8.2273E+14	8.2273E+14
	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	g/d	g/d	g/d	g/d	g/d	g/d
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	0.0000E+00	3.0000E+00	3.0000E+00	0	1.7055E+00	7.0117E+04	0.0000E+00	1.9200E+05	1.9200E+05	0.0000E+00	1.9200E+05	1.9200E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1.7994E-01	1.7994E-01	0	1.0472E-01	4.0326E+03	0.0000E+00	1.1516E+04	1.1516E+04	0.0000E+00	1.1516E+04	1.1516E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	2.9527E-01	2.9527E-01	0.0000E+00	2.6443E-03	1.8708E+04	0.0000E+00	1.8897E+04	1.8897E+04	0.0000E+00	1.8897E+04	1.8897E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H_2O	0.0000E+00	9.8157E+02	9.8157E+02	1.0000E+03	1.0009E+03	1.2438E+06	0.0000E+00	7.2771E+07	7.2771E+07	0.0000E+00	6.2820E+07	6.2820E+07
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1.8935E+00	1.8935E+00	0	4.6794E-01	8.7744E+04	0.0000E+00	1.2118E+05	1.2118E+05	0.0000E+00	1.2118E+05	1.2118E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	8.2000E+01	8.2000E+01	0.0000E+00	7.1343E+01	1.4964E+05	0.0000E+00	5.2480E+06	5.2480E+06	0.0000E+00	5.2480E+06	5.2480E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	2.3409E+01	2.3409E+01	0	1.3847E+01	5.0862E+05	0.0000E+00	1.4982E+06	1.4982E+06	0.0000E+00	1.4982E+06	1.4982E+06
	0.0000E+00	5.0922E+01	5.0922E+01	0.0000E+00	3.8754E+01	4.8951E+05	0.0000E+00	3.2590E+06	3.2590E+06	0.0000E+00	3.2590E+06	3.2590E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	5.0000E+00	5.0000E+00	0.0000E+00	-3.1281E+00	5.4354E+05	0.0000E+00	3.2000E+05	3.2000E+05	0.0000E+00	3.2000E+05	3.2000E+05
	0.0000E+00	7.3893E-01	7.3893E-01	0	6.6177E-01	0.0000E+00	0.0000E+00	4.7292E+04	4.7292E+04	0.0000E+00	4.7292E+04	4.7292E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1.7374E+00	1.7374E+00	0	8.3576E-01	5.1469E+04	0.0000E+00	1.1119E+05	1.1119E+05	0.0000E+00	1.1119E+05	1.1119E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1.1507E+03	1.1507E+03	1.0000E+03	1.1255E+03	3.1672E+06	0.0000E+00	8.3598E+07	8.3598E+07	0.0000E+00	7.3648E+07	7.3648E+07
	0.0000E+00	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	7.5000E+00	7.5000E+00	0	6.7168E-03	4.7952E+05	0.0000E+00	4.8000E+05	4.8000E+05	0.0000E+00	4.8000E+05	4.8000E+05
	0.0000E+00	2.9641E+00	2.9641E+00	0	2.6545E-03	1.8951E+05	0.0000E+00	1.8970E+05	1.8970E+05	0.0000E+00	1.8970E+05	1.8970E+05
	0.0000E+00	1.8393E+01	1.8393E+01	0	3.4845E-02	2.4876E+06	1.3130E+06	1.1771E+06	2.4901E+06	0.0000E+00	1.1771E+06	1.1771E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
						Sum=	1.3130E+06			0.0000E+00		

1.3130E+06 -This is the total solids generated in the unit which is the sum of * and ** (see t

* 0.0000E+00 -Total solids produced from added agent (agen was added as solution, no soli

** 1.3130E+06 -Total solid produced from feed in the unit (due to chemistry change, excluding

July 13/00

In this case

Stream #14 = 0.
None C Feed

① Unit Balance
For Cl.

Input = #20 + #22

Output = #24 + #26.

Calculation is the
Same as in case 1.

omitted.

② Feed Entrance

Input = #18
= 3.0 * 6.4E4

Output = # 20
= 3.000 * 6.4E4
= 1.92 E5

Input = output.
O.K.

③ None C Feed,
only water in
Stream 22.

Filtration Unit

Case 3

From both Preceding and Aux. Strm — Feed contng: Non-C

Unit Mass Summaries and Mass Balances

	Mass Summaries						Mass Balances: Unit Out - In	Unit In	Unit Out	Feed Out - In	Feed In	Feed Out
	14	18	20	22	24	26		20+22	24+26		14+18	20
	20	20	20	20	20	20						
	100	100	100	0	100	100	Note 4	1.1589E+10	1.2584E+10	0.0000E+00	1.1589E+10	1.1589E+10
	0	0	0	0	0	0		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0	0	0	0	0		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0	0	0	0	0		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	4.2239E+07	7.3648E+07	1.1589E+08	9.9537E+06	1.2211E+08	3.7326E+06	0.0000E+00	1.2584E+08	1.2584E+08	0.0000E+00	1.1589E+08	1.1589E+08
Flow	3.2596E+04	6.4000E+04	9.6596E+04	9.9537E+03	1.0406E+05	2.4884E+03	0.0000E+00	1.0655E+05	1.0655E+05	0.0000E+00	9.6596E+04	9.6596E+04
	1.2958E+03	1.1507E+03	1.1997E+03	1.0000E+03	1.1734E+03	1.5000E+03						
	8.2191E+14	8.2273E+14	1.6446E+15	0.0000E+00	1.6447E+13	1.6282E+15	0.0000E+00	1.6446E+15	1.6446E+15	0.0000E+00	1.6446E+15	1.6446E+15
	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	g/d	g/d	g/d	g/d	g/d	g/d
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.9615E-02	0.0000E+00	6.6189E-03	0	-5.3743E+00	5.5990E+05	-1.3983E-11	6.3936E+02	6.3936E+02	0.0000E+00	6.3936E+02	6.3936E+02
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	5.8844E+00	3.0000E+00	3.9733E+00	0	3.0197E+00	6.9576E+04	0.0000E+00	3.8381E+05	3.8381E+05	0.0000E+00	3.8381E+05	3.8381E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	3.5293E-01	1.7994E-01	2.3831E-01	0	1.8276E-01	4.0015E+03	0.0000E+00	2.3020E+04	2.3020E+04	0.0000E+00	2.3020E+04	2.3020E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	5.7916E-01	2.9527E-01	3.9107E-01	0.0000E+00	3.6301E-03	3.7398E+04	0.0000E+00	3.7776E+04	3.7776E+04	0.0000E+00	3.7776E+04	3.7776E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	9.6381E+02	9.8157E+02	9.7558E+02	1.0000E+03	9.8929E+02	1.2442E+06	0.0000E+00	1.0419E+08	1.0419E+08	0.0000E+00	9.4237E+07	9.4237E+07
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	3.7140E+00	1.8935E+00	2.5078E+00	0	1.4912E+00	8.7066E+04	0.0000E+00	2.4225E+05	2.4225E+05	0.0000E+00	2.4225E+05	2.4225E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.6100E+02	8.2000E+01	1.0866E+02	0.0000E+00	9.9425E+01	1.4964E+05	0.0000E+00	1.0496E+07	1.0496E+07	0.0000E+00	1.0496E+07	1.0496E+07
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	4.5915E+01	2.3409E+01	3.1003E+01	0	2.3929E+01	5.0469E+05	0.0000E+00	2.9948E+06	2.9948E+06	0.0000E+00	2.9948E+06	2.9948E+06
	9.9880E+01	5.0922E+01	6.7443E+01	0.0000E+00	5.7936E+01	4.8573E+05	0.0000E+00	6.5147E+06	6.5147E+06	0.0000E+00	6.5147E+06	6.5147E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	9.8073E+00	5.0000E+00	6.6222E+00	0.0000E+00	9.6414E-01	5.3935E+05	0.0000E+00	6.3968E+05	6.3968E+05	0.0000E+00	6.3968E+05	6.3968E+05
	1.4494E+00	7.3893E-01	9.7867E-01	0	9.0846E-01	0.0000E+00	0.0000E+00	9.4536E+04	9.4536E+04	0.0000E+00	9.4536E+04	9.4536E+04
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	3.4078E+00	1.7374E+00	2.3011E+00	0	1.6452E+00	5.1072E+04	0.0000E+00	2.2228E+05	2.2228E+05	0.0000E+00	2.2228E+05	2.2228E+05
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.2958E+03	1.1507E+03	1.1997E+03	1.0000E+03	1.1734E+03	3.7326E+06	0.0000E+00	1.2584E+08	1.2584E+08	0.0000E+00	1.1589E+08	1.1589E+08
	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1.4711E+01	7.5000E+00	9.9333E+00	0	9.2207E-03	9.5856E+05	0.0000E+00	9.5952E+05	9.5952E+05	0.0000E+00	9.5952E+05	9.5952E+05
	5.8139E+00	2.9641E+00	3.9258E+00	0	3.6441E-03	3.7883E+05	0.0000E+00	3.7921E+05	3.7921E+05	0.0000E+00	3.7921E+05	3.7921E+05
	3.6112E+01	1.8393E+01	2.4372E+01	0	2.3937E-02	2.4884E+06	1.3667E+05	2.3542E+06	2.4909E+06	0.0000E+00	2.3542E+06	2.3542E+06
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
						Sum=	1.3667E+05			0.0000E+00		

1.3667E+05 -This is the total solids generated in the unit which is the sum of * and ** (see t

* 0.0000E+00 -Total solids produced from added agent (agen was added as solution, no soli

** 1.3667E+05 -Total solid produced from feed in the unit (due to chemistry change, excluding

July 16/00

In this case:

Stream 14 ≠ 0
Stream 18 ≠ 0
None C Feed

① Unit Balance

Calculation same as
in cases 1 and 2.
omitted

② Feed Entrance:

Input = #14 + #18
= 5.8844 * 3.2596E4
+ 3.0 * 6.4E4
= 3.8381 E5

output = # 20
= 3.9733 * 9.6596E4
= 3.8381 E5

Input = Output
O.K.

③ Same as in
Cases 1 and 2.

Filtration Unit

Case 4

July 16/00

Feed from Preceding Unit Only Feed contng: C

Unit Mass Summaries and Mass Balances

Feed from Preceding Unit	Mass Summaries						Mass Balances: Unit Out - In	Unit In	Unit Out	Feed Out - In	Feed In	Feed Out
Stream No	14	18	20	22	24	26		20+22	24+26		14+18	20
Stream Name												
Stream Temp	20	20	20	20	20	20						
Feed A (%)	0	0	0	0	0	0	Note 4	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Feed B (%)	95	0	95	0	95	95		1.2943E+10	1.5388E+10	0.0000E+00	1.2943E+10	1.2943E+10
Feed C (%)	5	0	5	0	5	5		6.8121E+08	8.0989E+08	0.0000E+00	6.8121E+08	6.8121E+08
Feed D (%)	0	0	0	0	0	0		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mass Flow, g/d	1.3624E+08	0.0000E+00	1.3624E+08	2.5735E+07	1.5953E+08	2.4438E+06	0.0000E+00	1.6198E+08	1.6198E+08	0.0000E+00	1.3624E+08	1.3624E+08
Volume Flow, L/d	1.0724E+05	0.0000E+00	1.0724E+05	2.0533E+04	1.2641E+05	1.3619E+03	0.0000E+00	1.2777E+05	1.2777E+05	0.0000E+00	1.0724E+05	1.0724E+05
Density, g/L*	1.2705E+03	0.0000E+00	1.2705E+03	1.2534E+03	1.2621E+03	1.7944E+03						
Activity Flow, Bq/d	1.2803E+16	0.0000E+00	1.2803E+16	0.0000E+00	4.2482E+15	8.5545E+15	0.0000E+00	1.2803E+16	1.2803E+16	0.0000E+00	1.2803E+16	1.2803E+16
Component*	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	g/d	g/d	g/d	g/d	g/d	g/d
INORGANICS	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ag	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	1.0866E+01	0.0000E+00	1.0866E+01	0	9.2181E+00	0.0000E+00	0.0000E+00	1.1652E+06	1.1652E+06	0.0000E+00	1.1652E+06	1.1652E+06
Am/Am241,242	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
As	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	7.7128E-05	0.0000E+00	7.7128E-05	0	6.5431E-06	7.4438E+00	0.0000E+00	8.2709E+00	8.2709E+00	0.0000E+00	8.2709E+00	8.2709E+00
Be	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	1.3974E-05	0.0000E+00	1.3974E-05	0	1.1855E-05	0.0000E+00	0.0000E+00	1.4985E+00	1.4985E+00	0.0000E+00	1.4985E+00	1.4985E+00
Ca	2.7892E-03	0.0000E+00	2.7892E-03	0	2.3662E-03	0.0000E+00	0.0000E+00	2.9910E+02	2.9910E+02	0.0000E+00	2.9910E+02	2.9910E+02
Cd	3.3534E-03	0.0000E+00	3.3534E-03	0	2.8448E-03	0.0000E+00	0.0000E+00	3.5960E+02	3.5960E+02	0.0000E+00	3.5960E+02	3.5960E+02
Ce	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	2.0761E-01	0.0000E+00	2.0761E-01	0	-8.8537E-02	3.3455E+04	0.0000E+00	2.2263E+04	2.2263E+04	0.0000E+00	2.2263E+04	2.2263E+04
CN	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	1.6422E+00	0.0000E+00	1.6422E+00	0	1.3434E+00	6.2892E+03	0.0000E+00	1.7610E+05	1.7610E+05	0.0000E+00	1.7610E+05	1.7610E+05
Cs/Cs137,134	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
F	2.7745E+00	0.0000E+00	2.7745E+00	0	2.3537E+00	0.0000E+00	0.0000E+00	2.9753E+05	2.9753E+05	0.0000E+00	2.9753E+05	2.9753E+05
Fe	1.7934E-04	0.0000E+00	1.7934E-04	2.1876E+01	3.6386E-03	4.4873E+05	0.0000E+00	4.4919E+05	4.4919E+05	0.0000E+00	1.9232E+01	1.9232E+01
H2(Molecule)	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	8.4613E+02	0.0000E+00	8.4613E+02	9.0005E+02	8.5862E+02	3.8097E+05	0.0000E+00	1.0922E+08	1.0922E+08	0.0000E+00	9.0736E+07	9.0736E+07
Hg	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
K	4.6715E+00	0.0000E+00	4.6715E+00	0	3.7794E+00	2.3220E+04	0.0000E+00	5.0096E+05	5.0096E+05	0.0000E+00	5.0096E+05	5.0096E+05
La	8.2297E-04	0.0000E+00	8.2297E-04	0	6.9816E-04	0.0000E+00	0.0000E+00	8.8252E+01	8.8252E+01	0.0000E+00	8.8252E+01	8.8252E+01
Li	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Na	1.6100E+02	0.0000E+00	1.6100E+02	1.0104E+02	1.5219E+02	1.0156E+05	0.0000E+00	1.5340E+07	1.9340E+07	0.0000E+00	1.7265E+07	1.7265E+07
Np /Np-237	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule)	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	8.4063E-04	0.0000E+00	3.4063E-04	0	7.1314E-06	8.9244E+01	0.0000E+00	9.0146E+01	9.0146E+01	0.0000E+00	9.0146E+01	9.0146E+01
NO2(molecule)	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2	9.1599E+01	0.0000E+00	9.1599E+01	0	7.5803E+01	2.4060E+05	0.0000E+00	9.8227E+06	9.8227E+06	0.0000E+00	9.8227E+06	9.8227E+06
NO3	9.9634E+01	0.0000E+00	9.9634E+01	1.2140E+02	1.0372E+02	6.5763E+04	0.0000E+00	1.3177E+07	1.3177E+07	0.0000E+00	1.0684E+07	1.0684E+07
O(in others, Note 9)	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
OH	1.4966E+01	0.0000E+00	1.4966E+01	7.4714E+01	2.4579E+01	3.2079E+04	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
P (as PO4)	1.5266E+00	0.0000E+00	1.5266E+00	0	1.2951E+00	0.0000E+00	0.0000E+00	3.1390E+06	3.1390E+06	0.0000E+00	1.6049E+06	1.6049E+06
Pb	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	1.6371E+05	1.6371E+05	0.0000E+00	1.6371E+05	1.6371E+05
Pu/Pu238--241	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	3.4007E+01	0.0000E+00	3.4007E+01	0	2.8666E+01	2.3220E+04	0.0000E+00	3.6467E+06	3.6467E+06	0.0000E+00	3.6467E+06	3.6467E+06
Sb	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Se	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Si	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	4.6333E-05	0.0000E+00	4.6333E-05	3.4300E+01	5.6216E-01	6.3321E+05	0.0000E+00	7.0427E+05	7.0427E+05	0.0000E+00	4.9685E+00	4.9685E+00
Tc/Tc99	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Tl	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233--238	1.4567E+00	0.0000E+00	1.4567E+00	0	1.2358E-02	1.5465E+05	0.0000E+00	1.5621E+05	1.5621E+05	0.0000E+00	1.5621E+05	1.5621E+05
Y/Y90	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS												
Acetate	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organics	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
SUM	1.2705E+03	0.0000E+00	1.2705E+03	1.2534E+03	1.2621E+03	2.4438E+06	0.0000E+00	1.6198E+08	1.6198E+08	0.0000E+00	1.3624E+08	1.3624E+08
Total TRU	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TIC	1.2157E+01	0.0000E+00	1.2157E+01	0	1.0313E-02	1.3024E+06	0.0000E+00	1.3037E+06	1.3037E+06	0.0000E+00	1.3037E+06	1.3037E+06
TOC	2.7333E+00	0.0000E+00	2.7333E+00	0	2.3188E-03	2.9281E+05	0.0000E+00	2.9311E+05	2.9311E+05	0.0000E+00	2.9311E+05	2.9311E+05
Total solids	0.0000E+00	0.0000E+00	0.0000E+00	0	1.3960E-02	1.7629E+06	1.7646E+06	0.0000E+00	1.7646E+06	0.0000E+00	0.0000E+00	0.0000E+00
Pu239/241 in solids	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	1.4581E+00	0.0000E+00	1.4581E+00	0	1.2370E-03	1.5621E+05	0.0000E+00	1.5637E+05	1.5637E+05	0.0000E+00	1.5637E+05	1.5637E+05
END	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
						Sum=	1.7646E+06			0.0000E+00		

Note 9: In Oxygen containing

Notes 1, 2, 3, 4 are notes for r

1.7646E+06 -This is the total solids generated in the unit which is the sum of * and ** (see below)

* 1.7391E+06 -Total solids produced from added agent (agen was added as solution, no solid initially)

** 2.5499E+04 -Total solid produced from feed in the unit (due to chemistry change, excluding those from added agent)

In this case:

Stream 14 ≠ 0

Stream 18 = 0

stream contain C envelope. (Precipitation will be carried out)

① Unit Balance

Fe:

Input = #20 + #22

= 1.7934(E-4) * 1.0724E5 + 2.1876 E1 * 2.0533E4

= 4.491991E4

output = #24 + #26

= 3.6386E-3 * 1.2641E+5 + 4.4873E5

= 459.95 + 4.4873E5

= 4.491899 E5

Out ≐ input.

O.k.

07/24/00

② Feed entrance.

omitted.

③ ④ C Feed, requires precipitation agents

Solids not in ④ Balance due to

Cs - Column Unit

Case 1

Feed from Preceding Unit Only

Unit Mass Summaries and Mass Balances

Component*	Mass Summaries								Mass Balances: Unit Out - In	Unit In	Unit Out	Feed Out - In	Feed In	Feed Out
Stream No	24	28	40	41	42	43	44	48		40+41+42	43+44+48		24+28	40
Stream Name														
Stream Temp	20	20	20	20	20	20	20	20						
Feed A (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Feed B (%)	95.0	0.0	95.0	0.0	0.0	0.0	0.0	95.0	0.0000			0.0000E+00	1.5156E+10	1.5156E+10
Feed C (%)	5.0	0.0	5.0	0.0	0.0	0.0	0.0	5.0	0.0000			0.0000E+00	7.9767E+08	7.9767E+08
Feed D (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Mass Flow, g/d	1.5953E+08	0.0000E+00	1.5953E+08	4.0000E+05	2.7500E+05	4.0000E+05	3.2600E+05	1.5948E+08	0.0000E+00	1.6021E+08	1.6021E+08	0.0000E+00	1.5953E+08	1.5953E+08
Volume Flow, L/d	1.2641E+05	0.0000E+00	1.2641E+05	4.0000E+02	2.7500E+02	4.0000E+02	2.7626E+02	1.2641E+05	0.0000E+00	1.2708E+05	1.2708E+05	0.0000E+00	1.2641E+05	1.2641E+05
Density, g/L*	1.2621E+03	0.0000E+00	1.2621E+03	1.0000E+03	1.0000E+03	1.0000E+03	1.1800E+03	1.2617E+03						
Activity Flow, Bq/d	4.2482E+15	0.0000E+00	4.2482E+15	0.0000E+00	0.0000E+00	0.0000E+00	3.6275E+15	6.2074E+14	0.0000E+00	4.2482E+15	4.2482E+15	0.0000E+00	4.2482E+15	4.2482E+15
Component*	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/L	Mass, g/L	g/d	g/d	g/d	g/d	g/d	g/d
INORGANICS														
Ag	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	9.2181E+00	0.0000E+00	9.2181E+00	0	0	0	4.2178E+00	9.2090E+00	0.0000E+00	1.1652E+06	1.1652E+06	0.0000E+00	1.1652E+06	1.1652E+06
Am/Am241,242	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
As	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	6.5431E-06	0.0000E+00	6.5431E-06	0	0	0	2.9938E-06	6.5366E-06	0.0000E+00	8.2709E-01	8.2709E-01	0.0000E+00	8.2709E-01	8.2709E-01
Be	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	1.1855E-05	0.0000E+00	1.1855E-05	0	0	0	5.4242E-06	1.1843E-05	0.0000E+00	1.4985E+00	1.4985E+00	0.0000E+00	1.4985E+00	1.4985E+00
Ca	2.3662E-03	0.0000E+00	2.3662E-03	0	0	0	1.0827E-03	2.3638E-03	0.0000E+00	2.9910E+02	2.9910E+02	0.0000E+00	2.9910E+02	2.9910E+02
Cd	2.8448E-03	0.0000E+00	2.8448E-03	0	0	0	1.3017E-03	2.8420E-03	0.0000E+00	3.5960E+02	3.5960E+02	0.0000E+00	3.5960E+02	3.5960E+02
Ce	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	-8.8537E-02	0.0000E+00	-8.8537E-02	0	0	0	-4.0511E-02	-8.8449E-02	0.0000E+00	-1.1192E+04	-1.1192E+04	0.0000E+00	-1.1192E+04	-1.1192E+04
CN	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	1.3434E+00	0.0000E+00	1.3434E+00	0	0	0	6.1468E-01	1.3421E+00	0.0000E+00	1.6981E+05	1.6981E+05	0.0000E+00	1.6981E+05	1.6981E+05
Cs/Cs137,134	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
F	2.3537E+00	0.0000E+00	2.3537E+00	0	0	0	1.0770E+00	2.3514E+00	0.0000E+00	2.9753E+05	2.9753E+05	0.0000E+00	2.9753E+05	2.9753E+05
Fe	3.6386E-03	0.0000E+00	3.6386E-03	0	0	0	1.6649E-03	3.6350E-03	0.0000E+00	4.5995E+02	4.5995E+02	0.0000E+00	4.5995E+02	4.5995E+02
H2(Molecule)	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	8.5862E+02	0.0000E+00	8.5862E+02	3.9600E+05	2.6870E+05	3.9600E+05	9.7262E+02	8.5863E+02	0.0000E+00	1.0920E+08	1.0920E+08	0.0000E+00	1.0854E+08	1.0854E+08
Hg	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
K	3.7794E+00	0.0000E+00	3.7794E+00	0	0	0	1.7293E+00	3.7756E+00	0.0000E+00	4.7774E+05	4.7774E+05	0.0000E+00	4.7774E+05	4.7774E+05
La	6.9816E-04	0.0000E+00	6.9816E-04	0	0	0	3.1945E-04	6.9747E-04	0.0000E+00	8.8252E+01	8.8252E+01	0.0000E+00	8.8252E+01	8.8252E+01
Li	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Na	1.5219E+02	0.0000E+00	1.5219E+02	2.3000E+03	0	2.3000E+03	6.9636E+01	1.5204E+02	0.0000E+00	1.9240E+07	1.9240E+07	0.0000E+00	1.9238E+07	1.9238E+07
Np /Np-237	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule)	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	7.1314E-06	0.0000E+00	7.1314E-06	0	0	0	3.2630E-06	7.1243E-06	0.0000E+00	9.0146E-01	9.0146E-01	0.0000E+00	9.0146E-01	9.0146E-01
NO2(molecule)	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2	7.5803E+01	0.0000E+00	7.5803E+01	0	0	0	3.4684E+01	7.5728E+01	0.0000E+00	9.5821E+06	9.5821E+06	0.0000E+00	9.5821E+06	9.5821E+06
NO3	1.0372E+02	0.0000E+00	1.0372E+02	0	6.2000E+03	0	6.9901E+01	1.0362E+02	0.0000E+00	1.3117E+07	1.3117E+07	0.0000E+00	1.3111E+07	1.3111E+07
O(in others, No	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
OH	2.4579E+01	0.0000E+00	2.4579E+01	1.7000E+03	0	1.7000E+03	1.1246E+01	2.4554E+01	0.0000E+00	3.1086E+06	3.1086E+06	0.0000E+00	3.1069E+06	3.1069E+06
P (as PO4)	1.2951E+00	0.0000E+00	1.2951E+00	0	0	0	5.9259E-01	1.2938E+00	0.0000E+00	1.6371E+05	1.6371E+05	0.0000E+00	1.6371E+05	1.6371E+05
Pb	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Pu/Pu238--241	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	2.8666E+01	0.0000E+00	2.8666E+01	0	0	0	1.3116E+01	2.8637E+01	0.0000E+00	3.6235E+06	3.6235E+06	0.0000E+00	3.6235E+06	3.6235E+06
Sb	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Se	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Si	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	5.6216E-01	0.0000E+00	5.6216E-01	0	0	0	2.5722E-01	5.6160E-01	0.0000E+00	7.1061E+04	7.1061E+04	0.0000E+00	7.1061E+04	7.1061E+04
Tc/Tc99	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Tl	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233--238	1.2358E-02	0.0000E+00	1.2358E-02	0	0	0	5.6544E-03	1.2345E-02	0.0000E+00	1.5621E+03	1.5621E+03	0.0000E+00	1.5621E+03	1.5621E+03
Y/Y90	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS														
Acetate	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organics	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H+	0	0.0000E+00	0.0000E+00	0	1.0000E+02	0	3.6197E-01	0.0000E+00	0.0000E+00	1.0000E+02	1.0000E+02	0.0000E+00	0.0000E+00	0.0000E+00
SUM	1.2621E+03	0.0000E+00	1.2621E+03	4.0000E+05	2.7500E+05	4.0000E+05	1.1800E+03	1.2617E+03	0.0000E+00	1.6021E+08	1.6021E+08	0.0000E+00	1.5953E+08	1.5953E+08
Total TRU	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TIC	1.0313E-02	0.0000E+00	1.0313E-02	0	0	0	4.7190E-03	1.0303E-02	0.0000E+00	1.3037E+03	1.3037E+03	0.0000E+00	1.3037E+03	1.3037E+03
TOC	2.3188E-03	0.0000E+00	2.3188E-03	0	0	0	1.0610E-03	2.3165E-03	0.0000E+00	2.9311E+02	2.9311E+02	0.0000E+00	2.9311E+02	2.9311E+02
Total solids	1.3960E-02	0.0000E+00	1.3960E-02	0	0	0	5.7488E+00	1.3960E-03	0.0000E+00	1.7646E+03	1.7646E+03	0.0000E+00	1.7646E+03	1.7646E+03
Pu239/241 in so	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	1.2370E-03	0.0000E+00	1.2370E-03	0	0	0	2.8300E-01	6.1851E-04	0.0000E+00	1.5637E+02	1.5637E+02	0.0000E+00	1.5637E+02	1.5637E+02
	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

July 16/00

This case:

Stream 24 ≠ 0

Stream 28 = 0

① Unit Balance

Na:

Input: #40 + #41 + #42

= 1.5219E2 * 1.2641E5 + 2.30E3

= 1.9238E7 + 2300

= 1.92406E7 g/d

output = #43 + #44 + #48

= 2.30E3 + 69.636 * 276.26 + 1.5204E2 * 1.2641E5

= 2300 + 19237.64 + 1.921937 E7

= 1.92407E7 g/d

② Feed Entrance

Input = #24

output = #40

The table shows the two streams are the same.

O.k.

Cs-Column Unit. Case 2

Aux. Stream Only

Unit Mass Summaries and Mass Balances

	Mass Summaries								Mass Balances: Unit			Mass Balances: Feed		
									Out - In	In	Out	Out - In	In	Out
Stream No	24	28	40	41	42	43	44	48		40+41+42	43+44+48		24+28	40
Stream Name														
Stream Temp	20	20	20	20	20	20	20	20						
Feed A (%)	0.0	100.0	100.0	0.0	0.0	0.0	0.0	100.0	0.0000			0.0000E+00	7.3648E+09	7.3648E+09
Feed B (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Feed C (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Feed D (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Mass Flow, g/d	0.0000E+00	7.3648E+07	7.3648E+07	4.0000E+05	2.7500E+05	4.0000E+05	2.8583E+05	7.3637E+07	0.0000E+00	7.4323E+07	7.4323E+07	0.0000E+00	7.3648E+07	7.3648E+07
Volume Flow, L	0.0000E+00	6.4000E+04	6.4000E+04	4.0000E+02	2.7500E+02	4.0000E+02	2.7564E+02	6.3999E+04	0.0000E+00	6.4675E+04	6.4675E+04	0.0000E+00	6.4000E+04	6.4000E+04
Density, g/L*	0.0000E+00	1.1507E+03	1.1507E+03	1.0000E+03	1.0000E+03	1.0000E+03	1.0370E+03	1.1506E+03						
Activity Flow, Bq	0.0000E+00	8.2273E+14	8.2273E+14	0.0000E+00	0.0000E+00	0.0000E+00	8.1200E+14	1.0737E+13	0.0000E+00	8.2273E+14	8.2273E+14	0.0000E+00	8.2273E+14	8.2273E+14
Component*	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/L	Mass, g/L	g/d	g/d	g/d	g/d	g/d	g/d
INORGANICS														
Ag	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Am/Am241,242	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
As	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Be	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ca	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cd	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ce	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	0.0000E+00	3.0000E+00	3.0000E+00	0	0	0	6.9656E-01	2.9970E+00	0.0000E+00	1.9200E+05	1.9200E+05	0.0000E+00	1.9200E+05	1.9200E+05
CN	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	0.0000E+00	1.7994E-01	1.7994E-01	0	0	0	4.1779E-02	1.7976E-01	0.0000E+00	1.1516E+04	1.1516E+04	0.0000E+00	1.1516E+04	1.1516E+04
Cs/Cs137,134	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
F	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Fe	0.0000E+00	2.9527E-01	2.9527E-01	0	0	0	6.8558E-02	2.9498E-01	0.0000E+00	1.8897E+04	1.8897E+04	0.0000E+00	1.8897E+04	1.8897E+04
H2(Molecule)	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	0.0000E+00	9.8157E+02	9.8157E+02	3.9600E+05	2.6870E+05	3.9600E+05	9.7482E+02	9.8158E+02	0.0000E+00	6.3485E+07	6.3485E+07	0.0000E+00	6.2820E+07	6.2820E+07
Hg	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
K	0.0000E+00	1.8935E+00	1.8935E+00	0	0	0	4.3965E-01	1.8916E+00	0.0000E+00	1.2118E+05	1.2118E+05	0.0000E+00	1.2118E+05	1.2118E+05
La	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Li	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Na	0.0000E+00	8.2000E+01	8.2000E+01	2.3000E+03	0	2.3000E+03	1.9039E+01	8.1919E+01	0.0000E+00	5.2503E+06	5.2503E+06	0.0000E+00	5.2480E+06	5.2480E+06
Np /Np-237	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule)	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2(molecule)	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2	0.0000E+00	2.3409E+01	2.3409E+01	0	0	0	5.4352E+00	2.3386E+01	0.0000E+00	1.4982E+06	1.4982E+06	0.0000E+00	1.4982E+06	1.4982E+06
NO3	0.0000E+00	5.0922E+01	5.0922E+01	0	6.2000E+03	0	3.4316E+01	5.0871E+01	0.0000E+00	3.2652E+06	3.2652E+06	0.0000E+00	3.2590E+06	3.2590E+06
O(in others, Not	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
OH	0.0000E+00	5.0000E+00	5.0000E+00	1.7000E+03	0	1.7000E+03	1.1609E+00	4.9950E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
P (as PO4)	0.0000E+00	7.3893E-01	7.3893E-01	0	0	0	1.7157E-01	7.3820E-01	0.0000E+00	3.2170E+05	3.2170E+05	0.0000E+00	3.2000E+05	3.2000E+05
Pb	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	4.7292E+04	4.7292E+04	0.0000E+00	4.7292E+04	4.7292E+04
Pu/Pu238-241	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	0.0000E+00	1.7374E+00	1.7374E+00	0	0	0	4.0340E-01	1.7357E+00	0.0000E+00	1.1119E+05	1.1119E+05	0.0000E+00	1.1119E+05	1.1119E+05
Sb	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Se	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Si	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Tc/Tc99	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ti	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233--238	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Y/Y90	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS														
Acetate	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organics	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H+	0.0000E+00	0.0000E+00	0.0000E+00	0	1.0000E+02	0	3.6279E-01	0.0000E+00	0.0000E+00	1.0000E+02	1.0000E+02	0.0000E+00	0.0000E+00	0.0000E+00
SUM	0.0000E+00	1.1507E+03	1.1507E+03	4.0000E+05	2.7500E+05	4.0000E+05	1.0370E+03	1.1506E+03	0.0000E+00	7.4323E+07	7.4323E+07	0.0000E+00	7.3648E+07	7.3648E+07
Total TRU	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TIC	0.0000E+00	7.5000E+00	7.5000E+00	0	0	0	1.7414E+00	7.4926E+00	0.0000E+00	4.8000E+05	4.8000E+05	0.0000E+00	4.8000E+05	4.8000E+05
TOC	0.0000E+00	2.9641E+00	2.9641E+00	0	0	0	6.8822E-01	2.9612E+00	0.0000E+00	1.8970E+05	1.8970E+05	0.0000E+00	1.8970E+05	1.8970E+05
Total solids	0.0000E+00	1.8393E+01	1.8393E+01	0	0	0	3.8435E+03	1.8393E+00	0.0000E+00	1.1771E+06	1.1771E+06	0.0000E+00	1.1771E+06	1.1771E+06
Pu239/241 in so	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	0.0000E+00	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

July 16/00

This Case:

Stream 24 ~~0~~ = 0

Stream 28 ≠ 0

① Unit Balance should be the same as in Case 1, although the values are different. (The formula are the same).

Omitted.

② Feed Entrance.

Input = #28

output = #40.

Table shows this is true.

O.k.

Case3. Cs-Column Unit July 16/00

From both Preceding and Aux. Strm

Unit Mass Summaries and Mass Balances

	Mass Summaries								Mass Balances: Unit			Mass Balances: Feed		
									Out - In	In	Out	Out - In	In	Out
Stream No	24	28	40	41	42	43	44	48		40+41+42	43+44+48		24+28	40
Stream Name														
Stream Temp	20	20	20	20	20	20	20	20						
Feed A (%)	0.0	100.0	31.6	0.0	0.0	0.0	0.0	31.6	0.0000			0.0000E+00	7.3648E+09	7.3648E+09
Feed B (%)	95.0	0.0	65.0	0.0	0.0	0.0	0.0	65.0	0.0000			0.0000E+00	1.5156E+10	1.5156E+10
Feed C (%)	5.0	0.0	3.4	0.0	0.0	0.0	0.0	3.4	0.0000			0.0000E+00	7.9767E+08	7.9767E+08
Feed D (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Mass Flow, g/d	1.5953E+08	7.3648E+07	2.3318E+08	4.0000E+05	2.7500E+05	4.0000E+05	3.3683E+05	2.3312E+08	0.0000E+00	2.3386E+08	2.3386E+08	0.0000E+00	2.3318E+08	2.3318E+08
Volume Flow, L	1.2641E+05	6.4000E+04	1.9041E+05	4.0000E+02	2.7500E+02	4.0000E+02	2.7690E+02	1.9041E+05	0.0000E+00	1.9108E+05	1.9108E+05	0.0000E+00	1.9041E+05	1.9041E+05
Density, g/L*	1.2621E+03	1.1507E+03	1.2246E+03	1.0000E+03	1.0000E+03	1.0000E+03	1.2164E+03	1.2243E+03						
Activity Flow, Bq	4.2482E+15	8.2273E+14	5.0710E+15	0.0000E+00	0.0000E+00	0.0000E+00	4.4395E+15	6.3148E+14	0.0000E+00	5.0710E+15	5.0710E+15	0.0000E+00	5.0710E+15	5.0710E+15
Component*	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/L	Mass, g/L	g/d	g/d	g/d	g/d	g/d	g/d
INORGANICS														
Ag	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	9.2181E+00	0.0000E+00	6.1197E+00	0	0	0	4.2081E+00	6.1136E+00	0.0000E+00	1.1652E+06	1.1652E+06	0.0000E+00	1.1652E+06	1.1652E+06
Am/Am241,242	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
As	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	6.5431E-06	0.0000E+00	4.3438E-06	0	0	0	2.9869E-06	4.3395E-06	0.0000E+00	8.2709E-01	8.2709E-01	0.0000E+00	8.2709E-01	8.2709E-01
Be	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	1.1855E-05	0.0000E+00	7.8700E-06	0	0	0	5.4116E-06	7.8622E-06	0.0000E+00	1.4985E+00	1.4985E+00	0.0000E+00	1.4985E+00	1.4985E+00
Ca	2.3662E-03	0.0000E+00	1.5708E-03	0	0	0	1.0802E-03	1.5693E-03	0.0000E+00	2.9910E+02	2.9910E+02	0.0000E+00	2.9910E+02	2.9910E+02
Cd	2.8448E-03	0.0000E+00	1.8886E-03	0	0	0	1.2986E-03	1.8867E-03	0.0000E+00	3.5960E+02	3.5960E+02	0.0000E+00	3.5960E+02	3.5960E+02
Ce	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	-8.8537E-02	3.0000E+00	9.4959E-01	0	0	0	6.5296E-01	9.4865E-01	0.0000E+00	1.8081E+05	1.8081E+05	0.0000E+00	1.8081E+05	1.8081E+05
CN	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	1.3434E+00	1.7994E-01	9.5233E-01	0	0	0	6.5485E-01	9.5139E-01	0.0000E+00	1.8133E+05	1.8133E+05	0.0000E+00	1.8133E+05	1.8133E+05
Cs/Cs137,134	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
F	2.3537E+00	0.0000E+00	1.5626E+00	0	0	0	1.0745E+00	1.5610E+00	0.0000E+00	2.9753E+05	2.9753E+05	0.0000E+00	2.9753E+05	2.9753E+05
Fe	3.6386E-03	2.9527E-01	1.0166E-01	0	0	0	6.9906E-02	1.0156E-01	0.0000E+00	1.9357E+04	1.9357E+04	0.0000E+00	1.9357E+04	1.9357E+04
H2(Molecule)	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	8.5862E+02	9.8157E+02	8.9995E+02	3.9600E+05	2.6870E+05	3.9600E+05	9.7037E+02	8.9996E+02	0.0000E+00	1.7202E+08	1.7202E+08	0.0000E+00	1.7136E+08	1.7136E+08
Hg	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
K	3.7794E+00	1.8935E+00	3.1455E+00	0	0	0	2.1629E+00	3.1424E+00	0.0000E+00	5.9892E+05	5.9892E+05	0.0000E+00	5.9892E+05	5.9892E+05
La	6.9816E-04	0.0000E+00	4.6349E-04	0	0	0	3.1871E-04	4.6303E-04	0.0000E+00	8.8252E+01	8.8252E+01	0.0000E+00	8.8252E+01	8.8252E+01
Li	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Na	1.5219E+02	8.2000E+01	1.2860E+02	2.3000E+03	0	2.3000E+03	8.8428E+01	1.2847E+02	0.0000E+00	2.4488E+07	2.4488E+07	0.0000E+00	2.4486E+07	2.4486E+07
Np /Np-237	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule)	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	7.1314E-06	0.0000E+00	4.7344E-06	0	0	0	3.2555E-06	4.7297E-06	0.0000E+00	9.0146E-01	9.0146E-01	0.0000E+00	9.0146E-01	9.0146E-01
NO2(molecule)	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2	7.5803E+01	2.3409E+01	5.8192E+01	0	0	0	4.0015E+01	5.8135E+01	0.0000E+00	1.1080E+07	1.1080E+07	0.0000E+00	1.1080E+07	1.1080E+07
NO3	1.0372E+02	5.0922E+01	8.5974E+01	0	6.2000E+03	0	8.1509E+01	8.5889E+01	0.0000E+00	1.6376E+07	1.6376E+07	0.0000E+00	1.6370E+07	1.6370E+07
O(in others, Not	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
OH	2.4579E+01	5.0000E+00	1.7998E+01	1.7000E+03	0	1.7000E+03	1.2376E+01	1.7980E+01	0.0000E+00	3.4286E+06	3.4286E+06	0.0000E+00	3.4269E+06	3.4269E+06
P (as PO4)	1.2951E+00	7.3893E-01	1.1082E+00	0	0	0	7.6201E-01	1.1071E+00	0.0000E+00	2.1100E+05	2.1100E+05	0.0000E+00	2.1100E+05	2.1100E+05
Pb	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Pu/Pu238-241	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	2.8666E+01	1.7374E+00	1.9614E+01	0	0	0	1.3487E+01	1.9595E+01	0.0000E+00	3.7347E+06	3.7347E+06	0.0000E+00	3.7347E+06	3.7347E+06
Sb	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Se	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Si	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	5.6216E-01	0.0000E+00	3.7320E-01	0	0	0	2.5663E-01	3.7283E-01	0.0000E+00	7.1061E+04	7.1061E+04	0.0000E+00	7.1061E+04	7.1061E+04
Tc/Tc99	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ti	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233--238	1.2358E-02	0.0000E+00	8.2040E-03	0	0	0	5.6413E-03	8.1959E-03	0.0000E+00	1.5621E+03	1.5621E+03	0.0000E+00	1.5621E+03	1.5621E+03
Y/Y90	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS														
Acetate	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organics	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H+	0	0.0000E+00	0.0000E+00	0	1.0000E+02	0	3.6114E-01	0.0000E+00	0.0000E+00	1.0000E+02	1.0000E+02	0.0000E+00	0.0000E+00	0.0000E+00
SUM	1.2621E+03	1.1507E+03	1.2246E+03	4.0000E+05	2.7500E+05	4.0000E+05	1.2164E+03	1.2243E+03	0.0000E+00	2.3386E+08	2.3386E+08	0.0000E+00	2.3318E+08	2.3318E+08
Total TRU	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TIC	1.0313E-02	7.5000E+00	2.5278E+00	0	0	0	1.7382E+00	2.5253E+00	0.0000E+00	4.8130E+05	4.8130E+05	0.0000E+00	4.8130E+05	4.8130E+05
TOC	2.3188E-03	2.9641E+00	9.9784E-01	0	0	0	6.8614E-01	9.9685E-01	0.0000E+00	1.8999E+05	1.8999E+05	0.0000E+00	1.8999E+05	1.8999E+05
Total solids	1.3960E-02	1.8393E+01	6.1914E+00	0	0	0	3.8316E+03	6.1915E-01	0.0000E+00	1.1789E+06	1.1789E+06	0.0000E+00	1.1789E+06	1.1789E+06
Pu239/241 in so	0	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	1.2370E-03	0.0000E+00	8.2122E-04	0	0	0	2.8235E-01	4.1061E-04	0.0000E+00	1.5637E+02	1.5637E+02	0.0000E+00	1.5637E+02	1.5637E+02
	0	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

This case:

Stream 24 ≠ 0

Stream 28 ≠ 0

① Unit Balance: skipped.

② Feed Entrance Blance:

Input = #24 + #28

= 1.5219E2 × 1.2641E5 + 8.2E1 × 6.4E4

= ~~1.97586E7~~ (Jwy. 07/16/00)

= 244.87E5

Out put = #40

1.2860E2 × 1.9041E5

= 2.487E7

o.k.

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07/17/00

Tc~ Column Case 1 (There is No Case 2 or 3)

Feed from Preceding Unit Only

Unit Mass Summaries and Mass Balances

Mass Summaries									Mass Balances					
									Unit			Feed		
									Out - In	In	Out	Out - In	In	Out
Stream No	(Pre+Aux)	Feed (Fd)	48	51	52	53	54	58		48+51+52	53+54+58			
Stream Name														
Stream Temp			20	20	20	20	20	20						
Feed A (%)			0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00		
Feed B (%)			95.0	0.0	0.0	0.0	0.0	95.0	0.0000			0.0000E+00		
Feed C (%)			5.0	0.0	0.0	0.0	0.0	5.0	0.0000			0.0000E+00		
Feed D (%)			0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00		
Mass Flow, g/d	0.0000E+00	0.0000E+00	1.5948E+08	3.0000E+05	2.2000E+06	3.0000E+05	2.2509E+06	1.5943E+08	0.0000E+00	*1.6198E+08*	*1.6198E+08*	0.0000E+00	0.0000E+00	0.0000E+00
Volume Flow, L	0.0000E+00	0.0000E+00	1.2641E+05	3.0000E+02	2.2000E+03	3.0000E+02	2.2126E+03	1.2639E+05	0.0000E+00	*1.2891E+05*	*1.2891E+05*	0.0000E+00	0.0000E+00	0.0000E+00
Density, g/L*	0.0000E+00	0.0000E+00	1.2617E+03	1.0000E+03	1.0000E+03	1.0000E+03	1.0173E+03	1.2614E+03					0.0000E+00	0.0000E+00
Activity Flow, Bq	0.0000E+00	0.0000E+00	6.2074E+14	0.0000E+00	0.0000E+00	0.0000E+00	6.4191E+11	6.2010E+14	0.0000E+00	*6.2074E+14*	*6.2074E+14*	0.0000E+00	0.0000E+00	0.0000E+00
Component*			Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/L	Mass, g/L	g/d	g/d	g/d	g/d		
INORGANICS	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00					0.0000E+00	0.0000E+00
Ag	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	0.0000E+00	0.0000E+00	9.2090E+00	0	0	0	5.2610E-01	9.2007E+00	0.0000E+00	1.1641E+06	1.1641E+06	0.0000E+00	0.0000E+00	0.0000E+00
Am/Am241,242	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
As	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	0.0000E+00	0.0000E+00	6.5366E-06	0	0	0	3.7343E-07	6.5307E-06	0.0000E+00	8.2626E-01	8.2626E-01	0.0000E+00	0.0000E+00	0.0000E+00
Be	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	0.0000E+00	0.0000E+00	1.1843E-05	0	0	0	6.7657E-07	1.1832E-05	0.0000E+00	1.4970E+00	1.4970E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ca	0.0000E+00	0.0000E+00	2.3638E-03	0	0	0	1.3504E-04	2.3617E-03	0.0000E+00	2.9880E+02	2.9880E+02	0.0000E+00	0.0000E+00	0.0000E+00
Cd	0.0000E+00	0.0000E+00	2.8420E-03	0	0	0	1.6236E-04	2.8394E-03	0.0000E+00	3.5924E+02	3.5924E+02	0.0000E+00	0.0000E+00	0.0000E+00
Ce	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	0.0000E+00	0.0000E+00	-8.8449E-02	0	0	0	-5.0530E-03	-8.8370E-02	0.0000E+00	-1.1180E+04	-1.1180E+04	0.0000E+00	0.0000E+00	0.0000E+00
CN	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	0.0000E+00	0.0000E+00	1.3421E+00	0	0	0	7.6671E-02	1.3409E+00	0.0000E+00	1.6964E+05	1.6964E+05	0.0000E+00	0.0000E+00	0.0000E+00
Cs/Cs137,134	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
F	0.0000E+00	0.0000E+00	2.3514E+00	0	0	0	1.3433E-01	2.3493E+00	0.0000E+00	2.9723E+05	2.9723E+05	0.0000E+00	0.0000E+00	0.0000E+00
Fe	0.0000E+00	0.0000E+00	3.6350E-03	0	0	0	2.0768E-04	3.6317E-03	0.0000E+00	4.5949E+02	4.5949E+02	0.0000E+00	0.0000E+00	0.0000E+00
H2(Molecule)	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	0.0000E+00	0.0000E+00	8.5863E+02	2.9600E+05	2.1370E+06	2.9600E+05	9.6581E+02	8.5872E+02	0.0000E+00	1.1097E+08	1.1097E+08	0.0000E+00	0.0000E+00	0.0000E+00
Hg	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
K	0.0000E+00	0.0000E+00	3.7756E+00	0	0	0	2.1570E-01	3.7722E+00	0.0000E+00	4.7726E+05	4.7726E+05	0.0000E+00	0.0000E+00	0.0000E+00
La	0.0000E+00	0.0000E+00	8.9747E-04	0	0	0	3.9846E-05	6.9684E-04	0.0000E+00	8.8164E+01	8.8164E+01	0.0000E+00	0.0000E+00	0.0000E+00
Li	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Na	0.0000E+00	0.0000E+00	1.5204E+02	2.3000E+03	0	2.3000E+03	8.6859E+00	1.5190E+02	0.0000E+00	1.9221E+07	1.9221E+07	0.0000E+00	0.0000E+00	0.0000E+00
Np/Np-237	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule)	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	0.0000E+00	0.0000E+00	7.1243E-06	0	0	0	4.0700E-07	7.1179E-06	0.0000E+00	9.0055E-01	9.0055E-01	0.0000E+00	0.0000E+00	0.0000E+00
NO2(molecule)	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2	0.0000E+00	0.0000E+00	7.5728E+01	0	0	0	4.3263E+00	7.5660E+01	0.0000E+00	9.5725E+06	9.5725E+06	0.0000E+00	0.0000E+00	0.0000E+00
NO3	0.0000E+00	0.0000E+00	1.0362E+02	0	6.2000E+04	0	3.3940E+01	1.0353E+02	0.0000E+00	1.3160E+07	1.3160E+07	0.0000E+00	0.0000E+00	0.0000E+00
O(in others, Nc	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
OH	0.0000E+00	0.0000E+00	2.4554E+01	1.7000E+03	0	1.7000E+03	1.4028E+00	2.4532E+01	0.0000E+00	3.1055E+06	3.1055E+06	0.0000E+00	0.0000E+00	0.0000E+00
P (as PO4)	0.0000E+00	0.0000E+00	1.2938E+00	0	0	0	7.3915E-02	1.2927E+00	0.0000E+00	1.6355E+05	1.6355E+05	0.0000E+00	0.0000E+00	0.0000E+00
Pb	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Pu/Pu238-241	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	0.0000E+00	0.0000E+00	2.8637E+01	0	0	0	1.6360E+00	2.8611E+01	0.0000E+00	3.6199E+06	3.6199E+06	0.0000E+00	0.0000E+00	0.0000E+00
Sb	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Se	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Si	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	0.0000E+00	0.0000E+00	5.6160E-01	0	0	0	3.2084E-02	5.6109E-01	0.0000E+00	7.0989E+04	7.0989E+04	0.0000E+00	0.0000E+00	0.0000E+00
Tc/Tc99	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ti	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233-238	0.0000E+00	0.0000E+00	1.2345E-02	0	0	0	7.0528E-04	1.2334E-02	0.0000E+00	1.5605E+03	1.5605E+03	0.0000E+00	0.0000E+00	0.0000E+00
Y/Y90	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS														
Acetate	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organics	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H+	0.0000E+00	0.0000E+00	0.0000E+00	0	1.0000E+03	0	4.5195E-01	0.0000E+00	0.0000E+00	1.0000E+03	1.0000E+03	0.0000E+00	0.0000E+00	0.0000E+00
SUM	0.0000E+00	0.0000E+00	1.2617E+03	3.0000E+05	2.2000E+06	3.0000E+05	1.0173E+03	1.2614E+03	0.0000E+00	1.6198E+08	1.6198E+08	0.0000E+00	0.0000E+00	0.0000E+00
Total TRU	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TIC	0.0000E+00	0.0000E+00	1.0303E-02	0	0	0	5.8861E-04	1.0294E-02	0.0000E+00	1.3024E+03	1.3024E+03	0.0000E+00	0.0000E+00	0.0000E+00
TOC	0.0000E+00	0.0000E+00	2.3165E-03	0	0	0	1.3234E-04	2.3144E-03	0.0000E+00	2.9281E+02	2.9281E+02	0.0000E+00	0.0000E+00	0.0000E+00
Total solids	0.0000E+00	0.0000E+00	1.3960E-03	0	0	0	7.1777E-02	1.3962E-04	0.0000E+00	1.7646E+02	1.7646E+02	0.0000E+00	0.0000E+00	0.0000E+00
Pu239/241 in s	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	0.0000E+00	0.0000E+00	8.1851E-04	0	0	0	1.7667E-02	3.0929E-04	0.0000E+00	7.8183E+01	7.8183E+01	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0	0	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Sample Calculation For OH:

① Unit Balance:

Input = #48+#51+#52

= 24.554*1.2641E5 + 1.7E3 + 0

= 31.0557 E5

output = #53+#54+#58

= 1.7E3 + 1.4028E0* 2.2126E3 + 2.4582E1* 1.2639E5

= 1.7E3 + 3.1038E3 + 3100.594E3

= 3105.5E3

= 3.1055E6

O.K.

② Feed Entrance Balance.

Not applicable.

There is no auxil. stream.

Melter Feed Evaporator Case 1

July 17/00

Feed from Preceding Unit Only

Unit Mass Summaries and Mass Balances

	Mass Summaries					Mass Balances: Unit			Mass Balances: Feed		
						Out - In	In	Out	Out - In	In	Out
Stream No	58	70	72	74	76	Output-Input	72	74+76	Fd-(Pre&Aux	58+70	72
Stream Name											
Stream Temp	20	20	20	20	20						
Feed A (%)	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Feed B (%)	95	0	95	95	95	0.0000	1.5146E+10	1.5146E+10	0.0000E+00	1.5146E+10	1.5146E+10
Feed C (%)	5	0	5	5	5	0.0000	7.9716E+08	7.9716E+08	0.0000E+00	7.9716E+08	7.9716E+08
Feed D (%)	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mass Flow, g/	1.5943E+08	0.0000E+00	1.5943E+08	1.1987E+08	3.9560E+07	0.0000E+00	1.5943E+08	1.5943E+08	0.0000E+00	1.5943E+08	1.5943E+08
Volume Flow,	1.2639E+05	0.0000E+00	1.2639E+05	8.6864E+04	3.9529E+04	0.0000E+00	1.2639E+05	1.2639E+05	0.0000E+00	1.2639E+05	1.2639E+05
Density, g/L*	1.2614E+03	0.0000E+00	1.2614E+03	1.3800E+03	1.0008E+03						
Activity Flow,	6.2010E+14	0.0000E+00	6.2010E+14	6.1948E+14	6.2010E+11	0.0000E+00	6.2010E+14	6.2010E+14	0.0000E+00	6.2010E+14	6.2010E+14
Component*	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d
INORGANICS											
Ag	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	9.2007E+00	0.0000E+00	9.2007E+00	1.3374E+01	2.9419E-02	0.0000E+00	1.1629E+06	1.1629E+06	0.0000E+00	1.1629E+06	1.1629E+06
Am/Am241,24	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
As	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	6.5307E-06	0.0000E+00	6.5307E-06	9.4931E-06	2.0882E-08	0.0000E+00	8.2544E-01	8.2544E-01	0.0000E+00	8.2544E-01	8.2544E-01
Be	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	1.1832E-05	0.0000E+00	1.1832E-05	1.7199E-05	3.7833E-08	0.0000E+00	1.4955E+00	1.4955E+00	0.0000E+00	1.4955E+00	1.4955E+00
Ca	2.3617E-03	0.0000E+00	2.3617E-03	3.4330E-03	7.5515E-06	0.0000E+00	2.9850E+02	2.9850E+02	0.0000E+00	2.9850E+02	2.9850E+02
Cd	2.8394E-03	0.0000E+00	2.8394E-03	4.1274E-03	9.0790E-06	0.0000E+00	3.5888E+02	3.5888E+02	0.0000E+00	3.5888E+02	3.5888E+02
Ce	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	-8.8370E-02	0.0000E+00	-8.8370E-02	-1.2845E-01	-2.8256E-04	0.0000E+00	-1.1169E+04	-1.1169E+04	0.0000E+00	-1.1169E+04	-1.1169E+04
CN	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	1.3409E+00	0.0000E+00	1.3409E+00	1.9491E+00	4.2874E-03	0.0000E+00	1.6948E+05	1.6948E+05	0.0000E+00	1.6948E+05	1.6948E+05
Cs/Cs137,134	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
F	2.3493E+00	0.0000E+00	2.3493E+00	3.4149E+00	7.5118E-03	0.0000E+00	2.9693E+05	2.9693E+05	0.0000E+00	2.9693E+05	2.9693E+05
Fe	3.6317E-03	0.0000E+00	3.6317E-03	5.2791E-03	1.1612E-05	0.0000E+00	4.5903E+02	4.5903E+02	0.0000E+00	4.5903E+02	4.5903E+02
H2(Molecule)	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	8.5872E+02	0.0000E+00	8.5872E+02	7.9442E+02	1.0000E+03	0.0000E+00	1.0854E+08	1.0854E+08	0.0000E+00	1.0854E+08	1.0854E+08
Hg	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
K	3.7722E+00	0.0000E+00	3.7722E+00	5.4833E+00	1.2062E-02	0.0000E+00	4.7678E+05	4.7678E+05	0.0000E+00	4.7678E+05	4.7678E+05
La	6.9684E-04	0.0000E+00	6.9684E-04	1.0129E-03	2.2281E-06	0.0000E+00	8.8076E+01	8.8076E+01	0.0000E+00	8.8076E+01	8.8076E+01
Li	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Na	1.5190E+02	0.0000E+00	1.5190E+02	2.2103E+02	0.0000E+00	0.0000E+00	1.9200E+07	1.9200E+07	0.0000E+00	1.9200E+07	1.9200E+07
Np /Np-237	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	7.1179E-06	0.0000E+00	7.1179E-06	1.0347E-05	2.2759E-08	0.0000E+00	8.9965E-01	8.9965E-01	0.0000E+00	8.9965E-01	8.9965E-01
NO2(molecule	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2	7.5660E+01	0.0000E+00	7.5660E+01	1.0998E+02	2.4192E-01	0.0000E+00	9.5629E+06	9.5629E+06	0.0000E+00	9.5629E+06	9.5629E+06
NO3	1.0353E+02	0.0000E+00	1.0353E+02	1.5049E+02	3.3102E-01	0.0000E+00	1.3085E+07	1.3085E+07	0.0000E+00	1.3085E+07	1.3085E+07
O(in others, N	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
OH	2.4532E+01	0.0000E+00	2.4532E+01	3.5660E+01	7.8441E-02	0.0000E+00	3.1007E+06	3.1007E+06	0.0000E+00	3.1007E+06	3.1007E+06
P (as PO4)	1.2927E+00	0.0000E+00	1.2927E+00	1.8790E+00	4.1333E-03	0.0000E+00	1.6338E+05	1.6338E+05	0.0000E+00	1.6338E+05	1.6338E+05
Pb	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Pu/Pu238--241	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	2.8611E+01	0.0000E+00	2.8611E+01	4.1590E+01	9.1485E-02	0.0000E+00	3.6163E+06	3.6163E+06	0.0000E+00	3.6163E+06	3.6163E+06
Sb	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Se	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Si	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	5.6109E-01	0.0000E+00	5.6109E-01	8.1561E-01	1.7941E-03	0.0000E+00	7.0918E+04	7.0918E+04	0.0000E+00	7.0918E+04	7.0918E+04
Tc/Tc99	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ti	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233--238	1.2334E-02	0.0000E+00	1.2334E-02	1.7929E-02	3.9439E-05	0.0000E+00	1.5590E+03	1.5590E+03	0.0000E+00	1.5590E+03	1.5590E+03
Y/Y90	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS											
Acetate	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organic	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
SUM	1.2614E+03	0.0000E+00	1.2614E+03	1.3800E+03	1.0008E+03	0.0000E+00	1.5943E+08	1.5943E+08	0.0000E+00	1.5943E+08	1.5943E+08
Total TRU	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TIC	1.0294E-02	0.0000E+00	1.0294E-02	1.4963E-02	3.2915E-05	0.0000E+00	1.3011E+03	1.3011E+03	0.0000E+00	1.3011E+03	1.3011E+03
TOC	2.3144E-03	0.0000E+00	2.3144E-03	3.3642E-03	7.4002E-06	0.0000E+00	2.9252E+02	2.9252E+02	0.0000E+00	2.9252E+02	2.9252E+02
Total solids	1.3962E-04	0.0000E+00	1.3962E-04	2.0315E-04	0.0000E+00	0.0000E+00	1.7646E+01	1.7646E+01	0.0000E+00	1.7646E+01	1.7646E+01
Pu239/241 in s	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	3.0929E-04	0.0000E+00	3.0929E-04	4.5003E-04	0.0000E+00	0.0000E+00	3.9092E+01	3.9092E+01	0.0000E+00	3.9092E+01	3.9092E+01

This Case:

Stream 58 ≠ 0

Stream 70 = 0

Stream 58 = Stream 72.

Sample calculation for $SO_4^=$

① Unit Balance

Input = #72

= 28.611 * 1.2639E5

= 36.16 E5

Output = #74 + #76

= 41.59 * 8.6864E4 + 0.091485 * 3.9529E4

= 36.1267E5 + 0.3616E4

= 36.162E5

O.k.

(J.J. 08/16/00)

② Feed Entrance Balance

Table shows that

stream 58 = Stream 72

2.8611E1 * 1.2639E5 = 2.8611E1 * 1.2639E5

O.k.

Melter Feed Evaporator Case 2

July 17/00

Aux. Stream Only

Unit Mass Summaries and Mass Balances

	Mass Summaries					Mass Balances: Unit			Mass Balances: Feed		
						Out - In	In	Out	Out - In	In	Out
Stream No	58	70	72	74	76	Output-Input	72	74+76	Fd-(Pre&Aux	58+70	72
Stream Name											
Stream Temp	20	20	20	20	20						
Feed A (%)	0	100	100	100	100	0.0000	7.1346E+06	7.1346E+06	0.0000E+00	7.1346E+06	7.1346E+06
Feed B (%)	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Feed C (%)	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Feed D (%)	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mass Flow, g/	0.0000E+00	7.1346E+04	7.1346E+04	3.2342E+04	3.9004E+04	0.0000E+00	7.1346E+04	7.1346E+04	0.0000E+00	7.1346E+04	7.1346E+04
Volume Flow,	0.0000E+00	6.2000E+01	6.2000E+01	2.3001E+01	3.8999E+01	0.0000E+00	6.2000E+01	6.2000E+01	0.0000E+00	6.2000E+01	6.2000E+01
Density, g/L*	0.0000E+00	1.1507E+03	1.1507E+03	1.4061E+03	1.0001E+03						
Activity Flow,	0.0000E+00	7.9702E+11	7.9702E+11	7.9623E+11	7.9702E+08	0.0000E+00	7.9702E+11	7.9702E+11	0.0000E+00	7.9702E+11	7.9702E+11
Component*	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d
INORGANICS											
Ag	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Am/Am241,24	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
As	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Be	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ca	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cd	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ce	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	0.0000E+00	3.0000E+00	3.0000E+00	8.0784E+00	4.7694E-03	0.0000E+00	1.8600E+02	1.8600E+02	0.0000E+00	1.8600E+02	1.8600E+02
CN	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	0.0000E+00	1.7994E-01	1.7994E-01	4.8453E-01	2.8606E-04	0.0000E+00	1.1156E+01	1.1156E+01	0.0000E+00	1.1156E+01	1.1156E+01
Cs/Cs137,134	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
F	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Fe	0.0000E+00	2.9527E-01	2.9527E-01	7.9510E-01	4.6942E-04	0.0000E+00	1.8307E+01	1.8307E+01	0.0000E+00	1.8307E+01	1.8307E+01
H2(Molecule)	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	0.0000E+00	9.8157E+02	9.8157E+02	9.5032E+02	1.0000E+03	0.0000E+00	6.0857E+04	6.0857E+04	0.0000E+00	6.0857E+04	6.0857E+04
Hg	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
K	0.0000E+00	1.8935E+00	1.8935E+00	5.0988E+00	3.0103E-03	0.0000E+00	1.1740E+02	1.1740E+02	0.0000E+00	1.1740E+02	1.1740E+02
La	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Li	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Na	0.0000E+00	8.2000E+01	8.2000E+01	2.2103E+02	0.0000E+00	0.0000E+00	5.0840E+03	5.0840E+03	0.0000E+00	5.0840E+03	5.0840E+03
Np /Np-237	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2(molecule	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2	0.0000E+00	2.3409E+01	2.3409E+01	6.3035E+01	3.7215E-02	0.0000E+00	1.4513E+03	1.4513E+03	0.0000E+00	1.4513E+03	1.4513E+03
NO3	0.0000E+00	5.0922E+01	5.0922E+01	1.3712E+02	8.0955E-02	0.0000E+00	3.1571E+03	3.1571E+03	0.0000E+00	3.1571E+03	3.1571E+03
O(in others, N	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
OH	0.0000E+00	5.0000E+00	5.0000E+00	1.3464E+01	7.9490E-03	0.0000E+00	3.1000E+02	3.1000E+02	0.0000E+00	3.1000E+02	3.1000E+02
P (as PO4)	0.0000E+00	7.3893E-01	7.3893E-01	1.9898E+00	1.1748E-03	0.0000E+00	4.5814E+01	4.5814E+01	0.0000E+00	4.5814E+01	4.5814E+01
Pb	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Pu/Pu238--241	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	0.0000E+00	1.7374E+00	1.7374E+00	4.6785E+00	2.7621E-03	0.0000E+00	1.0772E+02	1.0772E+02	0.0000E+00	1.0772E+02	1.0772E+02
Sb	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Se	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Si	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Tc/Tc99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ti	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233--238	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Y/Y90	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS											
Acetate	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organic	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
SUM	0.0000E+00	1.1507E+03	1.1507E+03	1.4061E+03	1.0001E+03	0.0000E+00	7.1346E+04	7.1346E+04	0.0000E+00	7.1346E+04	7.1346E+04
Total TRU	0.0000E+00	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TIC	0.0000E+00	7.5000E+00	7.5000E+00	2.0196E+01	1.1924E-02	0.0000E+00	4.6500E+02	4.6500E+02	0.0000E+00	4.6500E+02	4.6500E+02
TOC	0.0000E+00	2.9641E+00	2.9641E+00	7.9817E+00	4.7123E-03	0.0000E+00	1.8377E+02	1.8377E+02	0.0000E+00	1.8377E+02	1.8377E+02
Total solids	0.0000E+00	1.8393E+01	1.8393E+01	4.9577E+01	0.0000E+00	0.0000E+00	1.1403E+03	1.1403E+03	0.0000E+00	1.1403E+03	1.1403E+03
Pu239/241 in s	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

This case

Stream 58 = 0

Stream 70 = Stream 72

① Unit Balance.

Formula are the same as in Case 1.

Skipped.

② Feed Entrance Balance.

Table shows that

Stream 70 = Stream 72

5*62 = 5*62

o.k.

Melter Feed Evaporator Case 3

From both Preceding and Aux. Strm

Unit Mass Summaries and Mass Balances

	Mass Summaries					Mass Balances: Unit			Mass Balances: Feed		
						Out - In	In	Out	Out - In	In	Out
Stream No	58	70	72	74	76	Output-Inpu	72	74+76	d-(Pre&Aux	58+70	72
Stream Name											
Stream Temp	20	20	20	20	20						
Feed A (%)	0	100	0	0	0	0.0000	7.1346E+06	7.1346E+06	0.0000E+00	7.1346E+06	7.1346E+06
Feed B (%)	95	0	95	95	95	0.0000	1.5146E+10	1.5146E+10	0.0000E+00	1.5146E+10	1.5146E+10
Feed C (%)	5	0	5	5	5	0.0000	7.9716E+08	7.9716E+08	0.0000E+00	7.9716E+08	7.9716E+08
Feed D (%)	0	0	0	0	0	0.0000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mass Flow, g/	1.5943E+08	7.1346E+04	1.5950E+08	1.1990E+08	3.9599E+07	0.0000E+00	1.5950E+08	1.5950E+08	0.0000E+00	1.5950E+08	1.5950E+08
Volume Flow,	1.2639E+05	6.2000E+01	1.2646E+05	8.6887E+04	3.9568E+04	0.0000E+00	1.2646E+05	1.2646E+05	0.0000E+00	1.2646E+05	1.2646E+05
Density, g/L*	1.2614E+03	1.1507E+03	1.2613E+03	1.3800E+03	1.0008E+03						
Activity Flow,	6.2010E+14	7.9702E+11	6.2090E+14	6.2028E+14	6.2090E+11	0.0000E+00	6.2090E+14	6.2090E+14	0.0000E+00	6.2090E+14	6.2090E+14
Component*	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d	Mass, g/d
INORGANICS											
Ag	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	9.2007E+00	0.0000E+00	9.1962E+00	1.3371E+01	2.9390E-02	0.0000E+00	1.1629E+06	1.1629E+06	0.0000E+00	1.1629E+06	1.1629E+06
Am/Am241,24	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
As	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	6.5307E-06	0.0000E+00	6.5275E-06	9.4906E-06	2.0861E-08	0.0000E+00	8.2544E-01	8.2544E-01	0.0000E+00	8.2544E-01	8.2544E-01
Be	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	1.1832E-05	0.0000E+00	1.1826E-05	1.7195E-05	3.7796E-08	0.0000E+00	1.4955E+00	1.4955E+00	0.0000E+00	1.4955E+00	1.4955E+00
Ca	2.3617E-03	0.0000E+00	2.3605E-03	3.4321E-03	7.5441E-06	0.0000E+00	2.9850E+02	2.9850E+02	0.0000E+00	2.9850E+02	2.9850E+02
Cd	2.8394E-03	0.0000E+00	2.8380E-03	4.1263E-03	9.0701E-06	0.0000E+00	3.5888E+02	3.5888E+02	0.0000E+00	3.5888E+02	3.5888E+02
Ce	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	-8.8370E-02	3.0000E+00	-8.6856E-02	-1.2628E-01	-2.7758E-04	0.0000E+00	-1.0983E+04	-1.0983E+04	0.0000E+00	-1.0983E+04	-1.0983E+04
CN	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	1.3409E+00	1.7994E-01	1.3403E+00	1.9487E+00	4.2834E-03	0.0000E+00	1.6949E+05	1.6949E+05	0.0000E+00	1.6949E+05	1.6949E+05
Cs/Cs137,134	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
F	2.3493E+00	0.0000E+00	2.3481E+00	3.4140E+00	7.5044E-03	0.0000E+00	2.9693E+05	2.9693E+05	0.0000E+00	2.9693E+05	2.9693E+05
Fe	3.6317E-03	2.9527E-01	3.7747E-03	5.4882E-03	1.2064E-05	0.0000E+00	4.7733E+02	4.7733E+02	0.0000E+00	4.7733E+02	4.7733E+02
H2(Molecule)	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	8.5872E+02	9.8157E+02	8.5878E+02	7.9446E+02	1.0000E+03	0.0000E+00	1.0860E+08	1.0860E+08	0.0000E+00	1.0860E+08	1.0860E+08
Hg	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
K	3.7722E+00	1.8935E+00	3.7713E+00	5.4832E+00	1.2053E-02	0.0000E+00	4.7690E+05	4.7690E+05	0.0000E+00	4.7690E+05	4.7690E+05
La	6.9684E-04	0.0000E+00	6.9650E-04	1.0127E-03	2.2259E-06	0.0000E+00	8.8076E+01	8.8076E+01	0.0000E+00	8.8076E+01	8.8076E+01
Li	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Na	1.5190E+02	8.2000E+01	1.5187E+02	2.2103E+02	0.0000E+00	0.0000E+00	1.9205E+07	1.9205E+07	0.0000E+00	1.9205E+07	1.9205E+07
Np /Np-237	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	7.1179E-06	0.0000E+00	7.1144E-06	1.0344E-05	2.2737E-08	0.0000E+00	8.9965E-01	8.9965E-01	0.0000E+00	8.9965E-01	8.9965E-01
NO2(molecule	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2	7.5660E+01	2.3409E+01	7.5635E+01	1.0997E+02	2.4172E-01	0.0000E+00	9.5644E+06	9.5644E+06	0.0000E+00	9.5644E+06	9.5644E+06
NO3	1.0353E+02	5.0922E+01	1.0350E+02	1.5048E+02	3.3078E-01	0.0000E+00	1.3088E+07	1.3088E+07	0.0000E+00	1.3088E+07	1.3088E+07
O(in others, N	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
OH	2.4532E+01	5.0000E+00	2.4523E+01	3.5654E+01	7.8372E-02	0.0000E+00	3.1010E+06	3.1010E+06	0.0000E+00	3.1010E+06	3.1010E+06
P (as PO4)	1.2927E+00	7.3893E-01	1.2924E+00	1.8791E+00	4.1304E-03	0.0000E+00	1.6343E+05	1.6343E+05	0.0000E+00	1.6343E+05	1.6343E+05
Pb	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Pu/Pu238--241	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	2.8611E+01	1.7374E+00	2.8598E+01	4.1580E+01	9.1397E-02	0.0000E+00	3.6164E+06	3.6164E+06	0.0000E+00	3.6164E+06	3.6164E+06
Sb	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Se	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Si	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	5.6109E-01	0.0000E+00	5.6082E-01	8.1540E-01	1.7923E-03	0.0000E+00	7.0918E+04	7.0918E+04	0.0000E+00	7.0918E+04	7.0918E+04
Tc/Tc99	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ti	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233--238	1.2334E-02	0.0000E+00	1.2328E-02	1.7925E-02	3.9400E-05	0.0000E+00	1.5590E+03	1.5590E+03	0.0000E+00	1.5590E+03	1.5590E+03
Y/Y90	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS											
Acetate	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organic	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
SUM	1.2614E+03	1.1507E+03	1.2613E+03	1.3800E+03	1.0008E+03	0.0000E+00	1.5950E+08	1.5950E+08	0.0000E+00	1.5950E+08	1.5950E+08
Total TRU	0	0.0000E+00	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TIC	1.0294E-02	7.5000E+00	1.3966E-02	2.0306E-02	4.4635E-05	0.0000E+00	1.7661E+03	1.7661E+03	0.0000E+00	1.7661E+03	1.7661E+03
TOC	2.3144E-03	2.9641E+00	3.7665E-03	5.4763E-03	1.2037E-05	0.0000E+00	4.7629E+02	4.7629E+02	0.0000E+00	4.7629E+02	4.7629E+02
Total solids	1.3962E-04	1.8393E+01	9.1573E-03	1.3327E-02	0.0000E+00	0.0000E+00	1.1580E+03	1.1580E+03	0.0000E+00	1.1580E+03	1.1580E+03
Pu239/241 in s	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	3.0929E-04	0.0000E+00	3.0913E-04	4.4991E-04	0.0000E+00	0.0000E+00	3.9092E+01	3.9092E+01	0.0000E+00	3.9092E+01	3.9092E+01

This case:

Stream 58 ≠ 0

Stream 70 ≠ 0

Sample Calculation for ~~[illegible]~~ $SO_4^{=}$ (J.Y. 08/16/00)

① Unit Balance;

Input = #72

Output = #74 + #76.

Same as cases 1 & 2.

Skipped.

② Feed Entrance Balance.

Input = #58 + #70

= 2.8611E1 * 1.2639E5 + 1.7374 * 6.2E1

= 36,1625E4

output = #72

= 2.8598E1 * 1.2646E5

= 3.6165E5

o.k.

Melter Unit Case 1

July 17/00

Feed from Preceding Unit Only

Unit Mass Summaries and Mass Balances

	Mass Summaries						Mass Balances: Unit			Mass Balances: Feed		
							Out - In	In	Out	Out - In	In	Out
Stream No	74	80	82	84	88	86	Output-Inpu	82+84	88+86	d-(Pre&Aux	74+80	82
Stream Name												
Stream Temp	20	20	20	20	20	20						
Feed A (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Feed B (%)	95.0	0.0	95.0	0.0	0.0	95.0	0.0000			0.0000E+00	1.1388E+10	1.1388E+10
Feed C (%)	5.0	0.0	5.0	0.0	0.0	5.0	0.0000			0.0000E+00	5.9936E+08	5.9936E+08
Feed D (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Mass Flow, g/	1.1987E+08	0.0000E+00	1.1987E+08	9.6662E+07	9.7271E+07	1.2903E+08	9.7652E+06	2.1653E+08	2.2630E+08	0.0000E+00	1.1987E+08	1.1987E+08
Volume Flow,	8.6864E+04	0.0000E+00	8.6864E+04	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00			0.0000E+00	8.6864E+04	8.6864E+04
Density, g/L*	1.3800E+03	0.0000E+00	1.3800E+03	0.0000E+00	0.0000E+00	0.0000E+00						
Activity Flow,	6.1948E+14	0.0000E+00	6.1948E+14	0.0000E+00	6.1948E+11	6.1886E+14	0.0000E+00	6.1948E+14	6.1948E+14	0.0000E+00	6.1948E+14	6.1948E+14
Component*	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	g/d	g/d	g/d	g/d	g/d	g/d
INORGANICS												
Ag	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	1.3374E+01	0.0000E+00	1.3374E+01	7.0512E+06	1.1617E+03	8.2118E+06	0.0000E+00	8.2129E+06	8.2129E+06	0.0000E+00	1.1617E+06	1.1617E+06
Am/Am241,242	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
As	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0	0.0000E+00	0	2.0057E+06	0	2.0057E+06	0.0000E+00	2.0057E+06	2.0057E+06	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	9.4931E-06	0.0000E+00	9.4931E-06	-8.2379E-01	8.2461E-04	0.0000E+00	0.0000E+00	8.2461E-04	8.2461E-04	0.0000E+00	8.2461E-01	8.2461E-01
Be	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	1.7199E-05	0.0000E+00	1.7199E-05	0	1.4940E+00	0.0000E+00	0.0000E+00	1.4940E+00	1.4940E+00	0.0000E+00	1.4940E+00	1.4940E+00
Ca	3.4330E-03	0.0000E+00	3.4330E-03	3.6928E+06	2.9820E-01	3.6931E+06	0.0000E+00	3.6931E+06	3.6931E+06	0.0000E+00	2.9820E+02	2.9820E+02
Cd	4.1274E-03	0.0000E+00	4.1274E-03	-3.5816E+02	3.5852E-01	0.0000E+00	0.0000E+00	3.5852E-01	3.5852E-01	0.0000E+00	3.5852E+02	3.5852E+02
Ce	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	-1.2845E-01	0.0000E+00	-1.2845E-01	4.6355E+05	-1.1158E+01	4.5241E+05	0.0000E+00	4.5240E+05	4.5240E+05	0.0000E+00	-1.1158E+04	-1.1158E+04
CN	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	1.9491E+00	0.0000E+00	1.9491E+00	-1.3376E+05	1.6931E+02	3.5376E+04	0.0000E+00	3.5546E+04	3.5546E+04	0.0000E+00	1.6931E+05	1.6931E+05
Cs/Cs137,134	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
F	3.4149E+00	0.0000E+00	3.4149E+00	7.8513E+04	2.9664E+02	3.7485E+05	0.0000E+00	3.7515E+05	3.7515E+05	0.0000E+00	2.9664E+05	2.9664E+05
Fe	5.2791E-03	0.0000E+00	5.2791E-03	2.2534E+03	4.5857E-01	2.7115E+03	0.0000E+00	2.7120E+03	2.7120E+03	0.0000E+00	4.5857E+02	4.5857E+02
H2(Molecule)	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	7.9442E+02	0.0000E+00	7.9442E+02	0	6.9007E+07	0.0000E+00	0.0000E+00	6.9007E+07	6.9007E+07	0.0000E+00	6.9007E+07	6.9007E+07
Hg	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
K	5.4833E+00	0.0000E+00	5.4833E+00	1.0908E+06	4.7630E+02	1.5666E+06	0.0000E+00	1.5671E+06	1.5671E+06	0.0000E+00	4.7630E+05	4.7630E+05
La	1.0129E-03	0.0000E+00	1.0129E-03	-8.7900E+01	8.7988E-02	0.0000E+00	0.0000E+00	8.7988E-02	8.7988E-02	0.0000E+00	8.7988E+01	8.7988E+01
Li	0	0.0000E+00	0	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0	0.0000E+00	0	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0	0.0000E+00	0	2.0021E+03	0	2.0021E+03	0.0000E+00	2.0021E+03	2.0021E+03	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0	0.0000E+00	0	1.2923E+05	0	1.2923E+05	0.0000E+00	1.2923E+05	1.2923E+05	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Na	2.2103E+02	0.0000E+00	2.2103E+02	0.0000E+00	1.9200E+04	1.9180E+07	0.0000E+00	1.9200E+07	1.9200E+07	0.0000E+00	1.9200E+07	1.9200E+07
Np /Np-237	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule)	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	1.0347E-05	0.0000E+00	1.0347E-05	-8.9786E-01	8.9875E-04	0.0000E+00	0.0000E+00	8.9875E-04	8.9875E-04	0.0000E+00	8.9875E-01	8.9875E-01
NO2(molecule)	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2	1.0998E+02	0.0000E+00	1.0998E+02	0	9.5534E+06	0.0000E+00	0.0000E+00	9.5534E+06	9.5534E+06	0.0000E+00	9.5534E+06	9.5534E+06
NO3	1.5049E+02	0.0000E+00	1.5049E+02	0	1.3072E+07	0.0000E+00	0.0000E+00	1.3072E+07	1.3072E+07	0.0000E+00	1.3072E+07	1.3072E+07
O(in others, N	0	0.0000E+00	0	4.9281E+07	0.0000E+00	5.9046E+07	9.7652E+06	4.9281E+07	5.9046E+07	0.0000E+00	0.0000E+00	0.0000E+00
OH	3.5660E+01	0.0000E+00	3.5660E+01	0	3.0976E+06	0.0000E+00	0.0000E+00	3.0976E+06	3.0976E+06	0.0000E+00	3.0976E+06	3.0976E+06
P (as PO4)	1.8790E+00	0.0000E+00	1.8790E+00	5.4022E+04	1.1001E+05	1.0723E+05	0.0000E+00	2.1724E+05	2.1724E+05	0.0000E+00	1.6322E+05	1.6322E+05
Pb	0	0.0000E+00	0	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Pu/Pu238--241	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	4.1590E+01	0.0000E+00	4.1590E+01	-1.1875E+06	2.4097E+06	1.5511E+04	0.0000E+00	2.4252E+06	2.4252E+06	0.0000E+00	3.6127E+06	3.6127E+06
Sb	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Se	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Si	0	0.0000E+00	0	3.3790E+07	0	3.3790E+07	0.0000E+00	3.3790E+07	3.3790E+07	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	8.1561E-01	0.0000E+00	8.1561E-01	-7.0777E+04	7.0848E+01	0.0000E+00	0.0000E+00	7.0848E+01	7.0848E+01	0.0000E+00	7.0848E+04	7.0848E+04
Tc/Tc99	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ti	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233--238	1.7929E-02	0.0000E+00	1.7929E-02	-1.5559E+03	1.5574E+00	0.0000E+00	0.0000E+00	1.5574E+00	1.5574E+00	0.0000E+00	1.5574E+03	1.5574E+03
Y/Y90	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0	0.0000E+00	0	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0	0.0000E+00	0	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0	0.0000E+00	0	4.1493E+05	0	4.1493E+05	0.0000E+00	4.1493E+05	4.1493E+05	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS												
Acetate	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organic	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H+	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
SUM	1.3800E+03	0.0000E+00	1.3800E+03	9.6662E+07	9.7271E+07	1.2903E+08	9.7652E+06	2.1653E+08	2.2630E+08	0.0000E+00	1.1987E+08	1.1987E+08
Total TRU	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TIC	1.4963E-02	0.0000E+00	1.4963E-02	0	1.2998E+02	1.1698E+03	0.0000E+00	1.2998E+03	1.2998E+03	0.0000E+00	1.2998E+03	1.2998E+03
TOC	3.3642E-03	0.0000E+00	3.3642E-03	0	2.3378E+02	5.8446E+01	0.0000E+00	2.9223E+02	2.9223E+02	0.0000E+00	2.9223E+02	2.9223E+02
Total solids	2.0315E-04	0.0000E+00	2.0315E-04	0	1.7646E-01	1.7470E+01	0.0000E+00	1.7646E+01	1.7646E+01	0.0000E+00	1.7646E+01	1.7646E+01
Pu239/241 in s	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	4.5003E-04	0.0000E+00	4.5003E-04	0	4.6910E+00	3.4401E+01	0.0000E+00	3.9092E+01	3.9092E+01	0.0000E+00	3.9092E+01	3.9092E+01
END	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

the off gass

9.7652E+06
is the O from the air but not accounted for in feed

This case:

stream 80 = 0

Stream 74 = Stream 82

Sample calculation for F

① Unit Balance:

Input = #82 + #84

= 3.4149E0 * 8.6864E4 ~~[illegible]~~

~~output = #86 + #88~~ (J.Y. 07/13/00)

+ 7.8513E4

= 37.51449E4

Output: #86 + #88

= 3.7485E5 + 2.9664E2

= 37.51466E4

So Input = output.

o.k.

② Table shows that #74 = #82

3.4149 * 8.6864E4 = 3.4149 * 8.6864E4

o.k.

③ Oxygen gained 9.7652E6 g/d due to → (see calc. worksheet.)

Melter Unit Case 2

Aux. Stream Only

Unit Mass Summaries and Mass Balances

	Mass Summaries						Mass Balances: Unit			Mass Balances: Feed		
							Out - In	In	Out	Out - In	In	Out
Stream No	74	80	82	84	88	86	Output-Inpu	82+84	88+86	d-(Pre&Au	74+80	82
Stream Name												
Stream Temp	20	20	20	20	20	20						
Feed A (%)	0.0	100.0	100.0	0.0	0.0	100.0	0.0000			0.0000E+00	6.3291E+09	6.3291E+09
Feed B (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Feed C (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Feed D (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Mass Flow, g/	0.0000E+00	6.3291E+07	6.3291E+07	2.3798E+07	5.8445E+07	3.0309E+07	1.6648E+06	8.7089E+07	8.8754E+07	0.0000E+00	6.3291E+07	6.3291E+07
Volume Flow,	0.0000E+00	5.5000E+04	5.5000E+04	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00			0.0000E+00	5.5000E+04	5.5000E+04
Density, g/L*	0.0000E+00	1.1507E+03	1.1507E+03	0.0000E+00	0.0000E+00	0.0000E+00						
Activity Flow,	0.0000E+00	7.0704E+14	7.0704E+14	0.0000E+00	7.0704E+11	7.0633E+14	0.0000E+00	7.0704E+14	7.0704E+14	0.0000E+00	7.0704E+14	7.0704E+14
Component*	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	g/d	g/d	g/d	g/d	g/d	g/d
INORGANICS												
Ag	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	0.0000E+00	0.0000E+00	0.0000E+00	1.9289E+06	0.0000E+00	1.9289E+06	0.0000E+00	1.9289E+06	1.9289E+06	0.0000E+00	0.0000E+00	0.0000E+00
Am/Am241,242	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
As	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0.0000E+00	0.0000E+00	0.0000E+00	4.7115E+05	0.0000E+00	4.7115E+05	0.0000E+00	4.7115E+05	4.7115E+05	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Be	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ca	0.0000E+00	0.0000E+00	0.0000E+00	8.6752E+05	0.0000E+00	8.6752E+05	0.0000E+00	8.6752E+05	8.6752E+05	0.0000E+00	0.0000E+00	0.0000E+00
Cd	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ce	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	0.0000E+00	3.0000E+00	3.0000E+00	-5.8564E+04	1.6500E+02	1.0627E+05	0.0000E+00	1.0644E+05	1.0644E+05	0.0000E+00	1.6500E+05	1.6500E+05
CN	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	0.0000E+00	1.7994E-01	1.7994E-01	-1.5767E+03	9.8964E+00	8.3099E+03	0.0000E+00	8.3198E+03	8.3198E+03	0.0000E+00	9.8964E+03	9.8964E+03
Cs/Cs137,134	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
F	0.0000E+00	0.0000E+00	0.0000E+00	8.8053E+04	0.0000E+00	8.8053E+04	0.0000E+00	8.8053E+04	8.8053E+04	0.0000E+00	0.0000E+00	0.0000E+00
Fe	0.0000E+00	2.9527E-01	2.9527E-01	-1.5587E+04	1.6240E+01	6.3694E+02	0.0000E+00	6.5318E+02	6.5318E+02	0.0000E+00	1.6240E+04	1.6240E+04
H2(Molecule)	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	0.0000E+00	9.8157E+02	9.8157E+02	0	5.3986E+07	0.0000E+00	0.0000E+00	5.3986E+07	5.3986E+07	0.0000E+00	5.3986E+07	5.3986E+07
Hg	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
K	0.0000E+00	1.8935E+00	1.8935E+00	2.6397E+05	1.0414E+02	3.6801E+05	0.0000E+00	3.6811E+05	3.6811E+05	0.0000E+00	1.0414E+05	1.0414E+05
La	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Li	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0.0000E+00	0.0000E+00	0.0000E+00	4.7030E+02	0.0000E+00	4.7030E+02	0.0000E+00	4.7030E+02	4.7030E+02	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0.0000E+00	0.0000E+00	0.0000E+00	3.0357E+04	0.0000E+00	3.0357E+04	0.0000E+00	3.0357E+04	3.0357E+04	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Na	0.0000E+00	8.2000E+01	8.2000E+01	0.0000E+00	4.5100E+03	4.5055E+06	0.0000E+00	4.5100E+06	4.5100E+06	0.0000E+00	4.5100E+06	4.5100E+06
Np /Np-237	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule)	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2(molecule)	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2	0.0000E+00	2.3409E+01	2.3409E+01	0	1.2875E+06	0.0000E+00	0.0000E+00	1.2875E+06	1.2875E+06	0.0000E+00	1.2875E+06	1.2875E+06
NO3	0.0000E+00	5.0922E+01	5.0922E+01	0	2.8007E+06	0.0000E+00	0.0000E+00	2.8007E+06	2.8007E+06	0.0000E+00	2.8007E+06	2.8007E+06
O(in others, No	0.0000E+00	0.0000E+00	0.0000E+00	1.2205E+07	0.0000E+00	1.3870E+07	1.6648E+06	1.2205E+07	1.3870E+07	0.0000E+00	0.0000E+00	0.0000E+00
OH	0.0000E+00	5.0000E+00	5.0000E+00	0	2.7500E+05	0.0000E+00	0.0000E+00	2.7500E+05	2.7500E+05	0.0000E+00	2.7500E+05	2.7500E+05
P (as PO4)	0.0000E+00	7.3893E-01	7.3893E-01	1.1940E+04	2.7393E+04	2.5189E+04	0.0000E+00	5.2581E+04	5.2581E+04	0.0000E+00	4.0641E+04	4.0641E+04
Pb	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Pu/Pu238--241	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	0.0000E+00	1.7374E+00	1.7374E+00	-2.8177E+04	6.3737E+04	3.6436E+03	0.0000E+00	6.7381E+04	6.7381E+04	0.0000E+00	9.5558E+04	9.5558E+04
Sb	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Se	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Si	0.0000E+00	0.0000E+00	0.0000E+00	7.9372E+06	0.0000E+00	7.9372E+06	0.0000E+00	7.9372E+06	7.9372E+06	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Tc/Tc99	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ti	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233--238	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Y/Y90	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0.0000E+00	0.0000E+00	0.0000E+00	9.7467E+04	0.0000E+00	9.7467E+04	0.0000E+00	9.7467E+04	9.7467E+04	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS												
Acetate	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organic	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H+	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
SUM	0.0000E+00	1.1507E+03	1.1507E+03	2.3798E+07	5.8445E+07	3.0309E+07	1.6648E+06	8.7089E+07	8.8754E+07	0.0000E+00	6.3291E+07	6.3291E+07
Total TRU	0.0000E+00	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TIC	0.0000E+00	7.5000E+00	7.5000E+00	0	4.1250E+04	3.7125E+05	0.0000E+00	4.1250E+05	4.1250E+05	0.0000E+00	4.1250E+05	4.1250E+05
TOC	0.0000E+00	2.9641E+00	2.9641E+00	0	1.3042E+05	3.2605E+04	0.0000E+00	1.6302E+05	1.6302E+05	0.0000E+00	1.6302E+05	1.6302E+05
Total solids	0.0000E+00	1.8393E+01	1.8393E+01	0	1.0116E+04	1.0015E+06	0.0000E+00	1.0116E+06	1.0116E+06	0.0000E+00	1.0116E+06	1.0116E+06
Pu239/241 in s	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
END	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

the off gass

1.6648E+06
is the O from the air but not accounted for in feed

This case

Stream 74 = 0

Stream 80 = Stream 82

Sample Calculation for (i.e.) NO_3^- (08/15/00)

① Unit Balance.

Skipped.

Formula same as in Case 1

② Entrance Balance (i.e.) (08/16/00)

Input = #80

= 5.0922E1 * 5.5E4

Output = #82

= 5.0922E1 * 5.5E4

Input = Output

③ Oxygen gained 1.6648 E6 g/d due to

July 17/00

Melter Unit Case 3

From both Preceding and Aux. Strm

Unit Mass Summaries and Mass Balances

	Mass Summaries						Mass Balances: Unit			Mass Balances: Feed		
							Out - In	In	Out	Out - In	In	Out
Stream No	74	80	82	84	88	86	Output-Inpu	82+84	88+86	d-(Pre&Au	74+80	82
Stream Name												
Stream Temp	20	20	20	20	20	20						
Feed A (%)	0.0	100.0	34.6	0.0	0.0	34.6	0.0000			0.0000E+00	6.3291E+09	6.3291E+09
Feed B (%)	95.0	0.0	62.2	0.0	0.0	62.2	0.0000			0.0000E+00	1.1388E+10	1.1388E+10
Feed C (%)	5.0	0.0	3.3	0.0	0.0	3.3	0.0000			0.0000E+00	5.9936E+08	5.9936E+08
Feed D (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0000			0.0000E+00	0.0000E+00	0.0000E+00
Mass Flow, g/	1.1987E+08	6.3291E+07	1.8316E+08	1.2046E+08	1.5572E+08	1.5934E+08	1.1430E+07	3.0362E+08	3.1505E+08	0.0000E+00	1.8316E+08	1.8316E+08
Volume Flow,	8.6864E+04	5.5000E+04	1.4186E+05	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00			0.0000E+00	1.4186E+05	1.4186E+05
Density, g/L*	1.3800E+03	1.1507E+03	1.2911E+03	0.0000E+00	0.0000E+00	0.0000E+00						
Activity Flow,	6.1948E+14	7.0704E+14	1.3265E+15	0.0000E+00	1.3265E+12	1.3252E+15	0.0000E+00	1.3265E+15	1.3265E+15	0.0000E+00	1.3265E+15	1.3265E+15
Component*	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/d	Mass, g/d	Mass, g/d	g/d	g/d	g/d	g/d	g/d	g/d
INORGANICS												
Ag	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Al	1.3374E+01	0.0000E+00	8.1891E+00	8.9801E+06	1.1617E+03	1.0141E+07	0.0000E+00	1.0142E+07	1.0142E+07	0.0000E+00	1.1617E+06	1.1617E+06
Am/Am241,242	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
As	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
B	0	0.0000E+00	0.0000E+00	2.4769E+06	0.0000E+00	2.4769E+06	0.0000E+00	2.4769E+06	2.4769E+06	0.0000E+00	0.0000E+00	0.0000E+00
Ba/Ba137	9.4931E-06	0.0000E+00	5.8127E-06	-8.2379E-01	8.2461E-04	0.0000E+00	0.0000E+00	8.2461E-04	8.2461E-04	0.0000E+00	8.2461E-01	8.2461E-01
Be	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Bi	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C (as CO3)	1.7199E-05	0.0000E+00	1.0531E-05	0	1.4940E+00	0.0000E+00	0.0000E+00	1.4940E+00	1.4940E+00	0.0000E+00	1.4940E+00	1.4940E+00
Ca	3.4330E-03	0.0000E+00	2.1020E-03	4.5603E+06	2.9820E-01	4.5606E+06	0.0000E+00	4.5606E+06	4.5606E+06	0.0000E+00	2.9820E+02	2.9820E+02
Cd	4.1274E-03	0.0000E+00	2.5272E-03	-3.5816E+02	3.5852E-01	0.0000E+00	0.0000E+00	3.5852E-01	3.5852E-01	0.0000E+00	3.5852E+02	3.5852E+02
Ce	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cl	-1.2845E-01	3.0000E+00	1.0844E+00	4.0499E+05	1.5384E+02	5.5868E+05	0.0000E+00	5.5883E+05	5.5883E+05	0.0000E+00	1.5384E+05	1.5384E+05
CN	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Co/Co60	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cr	1.9491E+00	1.7994E-01	1.2632E+00	-1.3534E+05	1.7920E+02	4.3686E+04	0.0000E+00	4.3865E+04	4.3865E+04	0.0000E+00	1.7920E+05	1.7920E+05
Cs/Cs137,134	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cu	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Eu/Eu154,155	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
F	3.4149E+00	0.0000E+00	2.0910E+00	1.6657E+05	2.9664E+02	4.6290E+05	0.0000E+00	4.6320E+05	4.6320E+05	0.0000E+00	2.9664E+05	2.9664E+05
Fe	5.2791E-03	2.9527E-01	1.1771E-01	-1.3333E+04	1.6698E+01	3.3485E+03	0.0000E+00	3.3652E+03	3.3652E+03	0.0000E+00	1.6698E+04	1.6698E+04
H2(Molecule)	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H2O/H3	7.9442E+02	9.8157E+02	8.6698E+02	0	1.2299E+08	0.0000E+00	0.0000E+00	1.2299E+08	1.2299E+08	0.0000E+00	1.2299E+08	1.2299E+08
Hg	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I/I129	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
K	5.4833E+00	1.8935E+00	4.0916E+00	1.3548E+06	5.8045E+02	1.9346E+06	0.0000E+00	1.9352E+06	1.9352E+06	0.0000E+00	5.8045E+05	5.8045E+05
La	1.0129E-03	0.0000E+00	6.2022E-04	-8.7900E+01	8.7988E-02	0.0000E+00	0.0000E+00	8.7988E-02	8.7988E-02	0.0000E+00	8.7988E+01	8.7988E+01
Li	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mg	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Mn	0	0.0000E+00	0.0000E+00	2.4724E+03	0.0000E+00	2.4724E+03	0.0000E+00	2.4724E+03	2.4724E+03	0.0000E+00	0.0000E+00	0.0000E+00
Mo	0	0.0000E+00	0.0000E+00	1.5959E+05	0.0000E+00	1.5959E+05	0.0000E+00	1.5959E+05	1.5959E+05	0.0000E+00	0.0000E+00	0.0000E+00
N2(Molecule)	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Na	2.2103E+02	8.2000E+01	1.6713E+02	0.0000E+00	2.3710E+04	2.3686E+07	0.0000E+00	2.3710E+07	2.3710E+07	0.0000E+00	2.3710E+07	2.3710E+07
Np /Np-237	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NH3(Molecule)	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ni/Ni63,59	1.0347E-05	0.0000E+00	6.3353E-06	-8.9786E-01	8.9875E-04	0.0000E+00	0.0000E+00	8.9875E-04	8.9875E-04	0.0000E+00	8.9875E-01	8.9875E-01
NO2(molecule)	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NO2	1.0998E+02	2.3409E+01	7.6417E+01	0	1.0841E+07	0.0000E+00	0.0000E+00	1.0841E+07	1.0841E+07	0.0000E+00	1.0841E+07	1.0841E+07
NO3	1.5049E+02	5.0922E+01	1.1189E+02	0	1.5873E+07	0.0000E+00	0.0000E+00	1.5873E+07	1.5873E+07	0.0000E+00	1.5873E+07	1.5873E+07
O(in others, No	0	0.0000E+00	0.0000E+00	6.1486E+07	0.0000E+00	7.2916E+07	1.1430E+07	6.1486E+07	7.2916E+07	0.0000E+00	0.0000E+00	0.0000E+00
OH	3.5660E+01	5.0000E+00	2.3773E+01	0	3.3726E+06	0.0000E+00	0.0000E+00	3.3726E+06	3.3726E+06	0.0000E+00	3.3726E+06	3.3726E+06
P (as PO4)	1.8790E+00	7.3893E-01	1.4370E+00	6.5962E+04	1.3740E+05	1.3242E+05	0.0000E+00	2.6982E+05	2.6982E+05	0.0000E+00	2.0386E+05	2.0386E+05
Pb	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Pu/Pu238--241	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
S (as SO4)	4.1590E+01	1.7374E+00	2.6139E+01	-1.2157E+06	2.4734E+06	1.9155E+04	0.0000E+00	2.4925E+06	2.4925E+06	0.0000E+00	3.7082E+06	3.7082E+06
Sb	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Se	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Si	0	0.0000E+00	0.0000E+00	4.1727E+07	0.0000E+00	4.1727E+07	0.0000E+00	4.1727E+07	4.1727E+07	0.0000E+00	0.0000E+00	0.0000E+00
Sm/Sm151	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Sr/Sr90	8.1561E-01	0.0000E+00	4.9940E-01	-7.0777E+04	7.0848E+01	0.0000E+00	0.0000E+00	7.0848E+01	7.0848E+01	0.0000E+00	7.0848E+04	7.0848E+04
Tc/Tc99	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Th/Th232,229	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ti	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U/U233--238	1.7929E-02	0.0000E+00	1.0978E-02	-1.5559E+03	1.5574E+00	0.0000E+00	0.0000E+00	1.5574E+00	1.5574E+00	0.0000E+00	1.5574E+03	1.5574E+03
Y/Y90	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zn	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Zr	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Others Inorg.	0	0.0000E+00	0.0000E+00	5.1240E+05	0.0000E+00	5.1240E+05	0.0000E+00	5.1240E+05	5.1240E+05	0.0000E+00	0.0000E+00	0.0000E+00
ORGANICS												
Acetate	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Butanol	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Citric Acid	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Formic Acid	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DBP	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
ED3A	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EDTA	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Glycolate	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
HEDTA	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NPH	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NIDA	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NTA	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Oxalate	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TBP	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Other Organic	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
H+	0.0000E+00	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
SUM	1.3800E+03	1.1507E+03	1.2911E+03	1.2046E+08	1.5572E+08	1.5934E+08	1.1430E+07	3.0362E+08	3.1505E+08	0.0000E+00	1.8316E+08	1.8316E+08
Total TRU	0	0.0000E+00	0	0	0	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TIC	1.4963E-02	7.5000E+00	2.9169E+00	0	4.1380E+04	3.7242E+05	0.0000E+00	4.1380E+05	4.1380E+05	0.0000E+00	4.1380E+05	4.1380E+05
TOC	3.3642E-03	2.9641E+00	1.1512E+00	0	1.3065E+05	3.2663E+04	0.0000E+00	1.6332E+05	1.6332E+05	0.0000E+00	1.6332E+05	1.6332E+05
Total solids	2.0315E-04	1.8393E+01	7.1308E+00	0	1.0116E+04	1.0015E+06	0.0000E+00	1.0116E+06	1.0116E+06	0.0000E+00	1.0116E+06	1.0116E+06
Pu239/241 in s	0	0.0000E+00	0.0000E+00	0	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U235 in solids	4.5003E-04	0.0000E+00	2.7556E-04	0	4.6910E+00	3.4401E+01	0.0000E+00	3.9092E+01	3.9092E+01	0.0000E+00	3.9092E+01	3.9092E+01
END	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

the off gass

1.1430E+07
is the O from the air but not accounted for in feed

This case

Stream 74 ≠ 0

Stream 80 ≠ 0

Sample Calc. for NO_3^-

① Unit Balance

Formula same as in Case 1.

Skipped.

② Entrance Balance

Input = #74 + #80

= 1.5049E2 * 8.6864E4 + 50.922E0 * 5.5E4

= 1.58729E7

Output: #82

= 1.1189E2 * 1.4186E5

= 1.58727E7

Input = Output

O.K.

③ Oxygen gained 1.1430E7 g/d due to

July 17/00.

To this point, the mass balances in all units and the entrence points of all units have been varified again (in addition to the March verification).

The interface also works fine. No apparent error was found in last week's use.

Note: The interface should never be launched from the VB Editor. If from the Editor, every time the "GoTo" Button is pressed, all the variables in the program are reset, and the user cannot go back to the previous worksheet, and user form. The program lost tracking ability.

J.Y. 7/17/00

File saved as PRETREAT_July13.

Read Only. in D:\work\working\

and in Zip Disk.

J.Y. 07/15/00

July 21/00

To address NRC comments, Linking Stream input properties to Envelope A, B, C, or D Waste Streams.

Added the following Worksheet to the model:

Envelope-A-Comp
Envelope-B-Comp
Envelope-C-Comp
Envelope-D-Comp

for the compositions of these streams. and

Stream-2B for specifying Stream-2 without Linking to A, B, C, or D (the second option)

Stream-2, the input stream to the feed is linked to Stream-2B if the user elect not to Link, or is linked to the for Envelopes' sheet if the user elect to link.

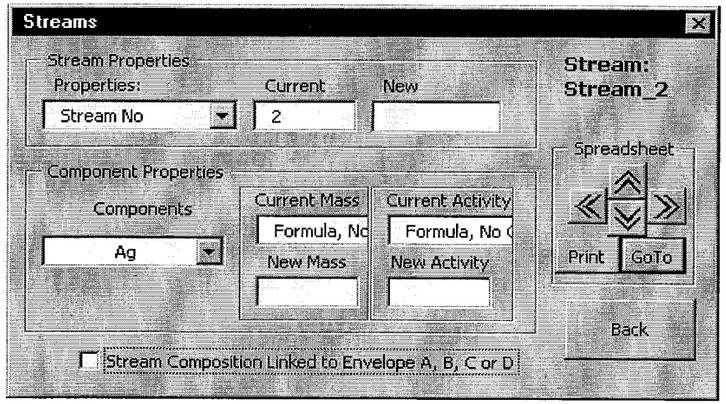
The Streams Form was modified (see next page) Fig.1

a check box was added. if the check box is checked. the Streams Form would look like Fig 2 in the next page.

Validation of the linking calculation see Page 111

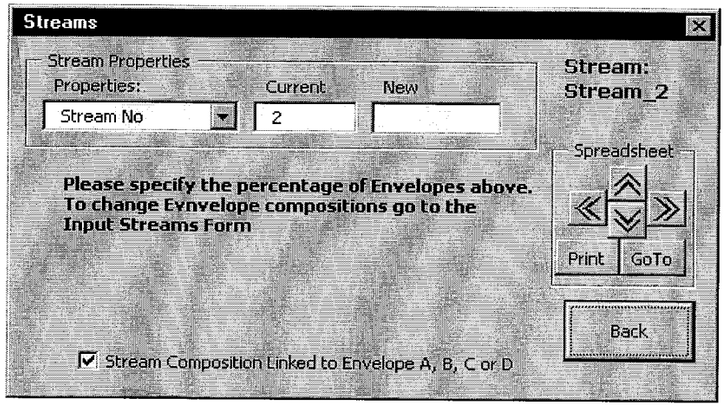
July 21/00

Fig 1



Streams Form after modification.
a Check Box added.

Fig. 2



look of Streams Form if the Check Box is True.

Stream No	
Stream Name	
Stream Temp	
Envelope A (%)	
Envelope B (%)	
Envelope C (%)	
Envelope D (%)	
Mass Flow, g/d	
Volume Flow, L/d	
Density, g/L*	
Activity Flow, Bq/d	
Component*	
INORGANICS	
Ag	
Al	
Am/Am241,242	
As	
B	
Ba/Ba137	
Be	
Bl	
C (as CO3)	
Ca	
Cd	
Ce	
Cl	
CN	
Co/Co60	
Cr	
Cs/Cs137,134	
Cu	
Eu/Eu154,155	
F	
Fe	
H2(Molecule)	
H2O/H3	
Hg	
I/I129	
K	
La	
Li	
Mg	
Mn	
Mo	
N2(Molecule)	
Na	
Np /Np-237	
NH3(Molecule)	
Ni/Ni63,59	
NO2(molecule)	
NO2	
NO3	
O(in others, Note 9)	
OH	
P (as PO4)	
Pb	
Pu/Pu238--241	
S (as SO4)	
Sb	
Se	
Si	
Sm/Sm151	
Sr/Sr90	
Tc/Tc99	
Th/Th232,229	
Ti	
U/U233--238	
Y/Y90	
Zn	
Zr	
Others inorg.	
ORGANICS	
Acetate	
Butanol	
Citric Acid	
Formic Acid	
DBP	
ED3A	
EDTA	
Glycolate	
HEDTA	
NPH	
NIDA	
NTA	
Oxalate	
TBP	
Other Organics	
SUM	
Total TRU	
TIC	
TOC	
Total solids	
Pu239/241 in solids	
U235 in solids	
END	

Validation For Linking Calculation.

Mass Summaries					Mass Balances		
					Out - In	Weighed Conc In	Conc Out
A	B	C	D	2		A+B+C+D	2
Envelope A	Envelope B	Envelope C	Envelope D	LAW Feeds			
				20.0			
0.0				0.0			
	96.0			96.0			
		4.0		4.0			
			0.0	0.0			
Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L	Mass, g/L
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
9.3312E+00	7.7760E+00	1.0886E+01	1.0886E+01	7.9004E+00	0.0000E+00	7.9004E+00	7.9004E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
6.6234E-05	5.5195E-05	7.7272E-05	7.7272E-05	5.6078E-05	0.0000E+00	5.6078E-05	5.6078E-05
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
2.3952E-03	1.9960E-03	2.7944E-03	2.7944E-03	2.0279E-03	0.0000E+00	2.0279E-03	2.0279E-03
2.8797E-03	2.3997E-03	3.3596E-03	3.3596E-03	2.4381E-03	0.0000E+00	2.4381E-03	2.4381E-03
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
1.7828E-01	1.4857E-01	2.0799E-01	2.0799E-01	1.5094E-01	0.0000E+00	1.5094E-01	1.5094E-01
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.4102E+00	1.1752E+00	1.6453E+00	1.6453E+00	1.1940E+00	0.0000E+00	1.1940E+00	1.1940E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
2.3826E+00	1.9855E+00	2.7797E+00	2.7797E+00	2.0173E+00	0.0000E+00	2.0173E+00	2.0173E+00
1.5401E-04	1.2834E-04	1.7968E-04	1.7968E-04	1.3039E-04	0.0000E+00	1.3039E-04	1.3039E-04
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
8.9000E+02	8.9000E+02	9.8000E+02	9.8000E+02	8.9360E+02	0.0000E+00	8.9360E+02	8.9360E+02
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
4.0117E+00	3.3431E+00	4.6803E+00	4.6803E+00	3.3965E+00	0.0000E+00	3.3965E+00	3.3965E+00
7.0672E-04	5.8894E-04	8.2451E-04	8.2451E-04	5.9836E-04	0.0000E+00	5.9836E-04	5.9836E-04
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
1.3812E+02	1.1500E+02	1.6114E+02	1.6114E+02	1.1685E+02	0.0000E+00	1.1685E+02	1.1685E+02
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
7.2189E-04	6.0157E-04	8.4220E-04	8.4220E-04	6.1120E-04	0.0000E+00	6.1120E-04	6.1120E-04
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
7.8660E+01	6.5550E+01	9.1770E+01	9.1770E+01	6.6599E+01	0.0000E+00	6.6599E+01	6.6599E+01
8.5560E+01	7.1300E+01	9.9820E+01	9.9820E+01	7.2441E+01	0.0000E+00	7.2441E+01	7.2441E+01
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.2852E+01	1.0710E+01	1.4994E+01	1.4994E+01	1.0881E+01	0.0000E+00	1.0881E+01	1.0881E+01
1.3110E+00	1.0925E+00	1.5295E+00	1.5295E+00	1.1100E+00	0.0000E+00	1.1100E+00	1.1100E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
2.9203E+01	2.4336E+01	3.4070E+01	3.4070E+01	2.4725E+01	0.0000E+00	2.4725E+01	2.4725E+01
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	3.3157E-05	0.0000E+00	0.0000E+00	3.1830E-05	0.0000E+00	3.1830E-05	3.1830E-05
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
1.2509E+00	1.0424E+00	1.4594E+00	1.4594E+00	1.0591E+00	0.0000E+00	1.0591E+00	1.0591E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
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0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
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0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
1254.278033	1.1935E+03	1.4050E+03	1.4050E+03	1.2019E+03	0.0000E+00	1.2019E+03	1.2019E+03
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00
1.0440E+01	8.7000E+00	1.2180E+01	1.2180E+01	8.8392E+00	0.0000E+00	8.8392E+00	8.8392E+00
2.3472E+00	1.9560E+00	2.7384E+00	2.7384E+00	1.9873E+00	0.0000E+00	1.9873E+00	1.9873E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.2759E+00	0.0000E+00	1.4594E+00	1.4594E+00	5.8377E-02	0.0000E+00	5.8377E-02	5.8377E-02
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00		0.0000E+00	0.0000E+00	0.0000E+00

July 21/00

Stream_2 linked to 96% B, 4% C.

Stream_2 Composition should be the weighed composition.

e.g. k:

Weighed comp

$= (4.0117*0 + 3.3431*96 + 4.6803*4 + 4.6803*0)/100$

$= 3.396$

= Stream_2 concen.

O.k.

From: http://twins.pnl.gov:8001/tcd/main.html
Assumed 1060 M^3 volue

	Concen, kg/L	Ci/L	
Tank: 241-AN-102_Envelope C			
Ac		4.62264E-09	
Al	0.059339623		
Am		0.000767011	0.000767
Ba		1.330188679	
Bi	0		
C		3.07547E-06	
Ca	0.002528302		
Cd		0.000533019	
Cl	0.014433962		
Cm		2.00028E-05	2.13E-06
Co		0.000716981	
Cr	0.001707547		
Cs		1.405718774	5.84E-05
Eu		0.00315783	2.58E-05
F	0.007009434		
Fe	0.000981132		
H-3		4.30189E-06	
Hg	0		
I		2.99057E-06	
K	0.014528302		
La	0		
Mn	0.000366981		
Na	0.962264151		
Nb		6.96226E-05	
Ni	0.001556604	0.001086321	
NO2	0.311320755		
NO3	0.85		
Np		5.39623E-06	
OH (total)	0.246226415		
Pa		2.21698E-08	
Pb	0.000773585		
PO4	0.018490566		
Pu		0.00016434	1.16E-05
Ra		1.62339E-06	7.51E-10
Ru		4.57547E-08	
Sb		0.001188679	
Se		3.06604E-06	
Si	0.000719811		
Sm		0.069245283	
Sn		2.9717E-05	
SO4	0.061226415		
Sr	1.61321E-05		
Sr		0.347169811	
Tc		0.000536792	
Th		2.10283E-07	3.76E-08
TIC as CO:	0.263207547		
TOC	0.100943396		
U (total)	0.000831132	2.54057E-06	

continue on back

July 21/00

Envelope Compositions:

Typical Envelope C compositin was obtained from website: http://twins.pnl.gov:8001/tcd/main.html

See pasted page on left page.

J. Yang / 08/15/00

Latest spreadsheet was saved as

PRETREAT_Revision_Aug16.XLS

after the fixing of an initialization error found by Vijay.

J. Yang / 08/16/00

All BNFL appearences in the spreadsheet were removed for "proprietary" Reason. After the removal, the lastest file was saved as:

~~PRETEAT00~~ J. Yang / 08/21/00

PRETREAT_V00.XLS, sent to Bobby P.

J. Yang / 08/21/00

The project is closed and this book is submitted to QA for records. The final version of the program, PRETREAT_V00.XLS is attached in the CD at the back of this book.

L-Yang. 10/04/00

I have reviewed this scientific notebook and find it in compliance with QAP-001. There is sufficient information regarding procedures used for conducting tests, acquiring and analyzing data so that another qualified individual could repeat the activity.

for N.S.

V. JAIN

N. SRIDHAR

10-4-00

ADDITIONAL INFORMATION FOR SCIENTIFIC NOTEBOOK #: 352

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