**Local Limits Information Development System (LLIDS)**

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**Introduction**

**Local Limit Information and Development System (LLIDS)**

The Local Limits Development System (LLIDS) was developed by Florida Department of Environmental Protection (Department) engineering staff in 1998. LLIDS was revised in 2001 to fix errors and update information. LLIDS was also revised in 2010 to update the water quality standards which became effective April 16, 2003. Revisions were also made to LLIDS in 2015 to include the U.S. EPA’s 2012 Guidelines for Water Reuse (EPA/600/R-12/618), update various references, and to permit the software to function on 64-bit computers running Microsoft Windows 7/10.

This most recent revision has been named LLID2020 to distinguish it from earlier versions. Because of the long history and age of this software, it has been given a perpetual “beta” designation since ongoing *ad hoc* maintenance will be required until the Department can upgrade it to a contemporary software platform. The software is based on MS Access and Visual Basic. The code is not compiled and can be modified by knowledgeable users. However, if approved programs use LLID2020 to assist with local limits re-evaluations, they must use an un-tampered version of LLID2020 obtained from the Department.

For routine installations on an individual computer, the software must be located on the computer’s hard drive in a root directory such as “C:\LLID2020”. The Department can offer assistance, to the extent practicable, for routine installations on individual computers. For advanced users who are adapt with MS Access and Visual Basic and who would like to attempt a customized installation, say in a different subdirectory or on a network, the directory references in the code could be modified. For custom installations, users will proceed at their own risk and effort.

LLIDS was developed to assist in developing local limits, which are a requirement of the federally mandated program Pretreatment Program, regulated under 40 CFR 403. LLIDS is not intended to replace best professional judgment in evaluating local limits and is not a Department rule. The Department will not take an action based solely on the results calculated using LLIDS.

Since the development of LLIDS, there has not been a manual to guide a user through the LLIDS program. This Manual was developed to explain the use of the LLIDS program.

This Manual is divided into four parts.

Part I is the pre-LLIDS activities.

This briefly explains the activities that need to be done prior to using the LLIDS program. This consists of determining the pollutants that should be evaluated for the need of local limits, sampling for those pollutants, and calculating average and removal efficiency data that will be entered into LLIDS.

Part II explains how to enter information into LLIDS.

This explains where all information needs to be inputted and what each button and table mean.

Part III explains the LLIDS reports.

This explains what information is on each report, how LLIDS calculated the information on the reports, and how to determine the local limit from the reports.

Part IV explains the LLIDS utility menus.

This explains the source of the values used to base local limits. This also explains how to add disposal options and pollutants.

Additional information on local limit development can be obtained from the EPA *2004 Local Limits Development Guidance Manual* located at the following website:

[EPA 2004 Local Limits Development Guidance Manual](http://www.epa.gov/npdes/pubs/final_local_limits_guidance.pdf)

The appendices for the above referenced guidance manual are located at the following website:

[EPA 2004 Local Limits Development Guidance Manual Appendices](http://www.epa.gov/npdes/pubs/final_local_limits_appendices.pdf)

**Important Note:**

Effective April 16, 2003, the hardness-based Class III Fresh Water Quality Standards were changed. These water quality standards were updated in version LLIDS2001v2 of LLIDS and remains in the same in LLIDS2020. Due to restrictions in the LLIDS utility menu, the user is unable to change the equations and have the equations work correctly for the LLIDS calculations; however the equations contained in LLIDS2020are consistent with those promulgated April 16, 2003, and provide correct results. Users of the LLIDS program should verify that all water quality standards are the most recent. You can find the revised water quality standard equations at the following website:

<http://www.dep.state.fl.us/legal/Rules/shared/62-302/302-Table.pdf>

The links in this document were active at the time of document publication. The Florida DEP’s computer services periodically reorganizes the Department’s webpage. If you discover that the links are broken and cannot find the document otherwise, please contact the Department’s Industrial Pretreatment Program for assistance.

# PART I

**Pre-LLIDS Activities**

## POC Determination

A pollutant of concern (POC) is any pollutant that might reasonably be expected to be discharged to the wastewater facility (WWF) in sufficient amounts to cause pass through or interference, cause problems in its collection system, or jeopardize its workers. The POCs should include, at a minimum, the 15 POCs identified by EPA. The user should also review the pretreatment program’s wastewater discharge permit(s) to determine any additional POCs. Existing local limits should also be included as POCs. The user should also evaluate their priority pollutant scans to identify any other POCs that are entering the WWF.

Other potential POCs may be identified by reviewing:

* The environmental standards and other statutory and regulatory requirements that must be met;
* Industrial user and other non-domestic discharges to assess which discharges, and which pollutants in those discharges, pose potential problems; and
* The wastewater facility historical data.

Users may need to develop local limits to reduce toxicity. If whole effluent toxicity (WET) testing has shown that the wastewater treatment plant’s effluent is toxic, the pollutants responsible should be identified and designated as POCs.

In general, if any of the following criteria are met, the pollutant should be designated as a POC, unless adequate justification is provided for not doing so.

* The maximum pollutant concentration in a WWF effluent is more than one-half the allowable effluent concentration required to meet water quality criteria or permit discharge limits.
* The maximum pollutant concentration in the sludge is more than one-half the applicable residual disposal standards.
* The maximum pollutant concentration in a WWF influent grab sample is more than one-half the inhibition threshold.
* The maximum pollutant concentration in a WWF influent 24-hour composite sample is more than one-fourth the inhibition threshold.
* The concentration in the plant influent, adjusted through simple dilution analysis, exceeds water quality criteria or permit discharge limits by any amount.

## Sampling Plan for POCs.

The sampling plan should establish, at a minimum, one sample point each for influent, effluent, and residuals wastestream within the WWF and sample points in the collection system. If the individual unit processes (primary, secondary, tertiary) are to be sampled, the sampling plan will include those locations as well. The monitoring plan will establish the analytes to be sampled at each sampling location. In the initial development of local limits, and most re-evaluations, all POCs will be sampled for at each location.

The following information for each POC must be determined:

* the number of samples to be taken;
* the sample type (grab, flow/time-composite);
* the analytical method and method detection level for each POC; and
* the number of sampling events.

Samples of wastewater can be one of three types: flow-proportional composites, time-proportional composites, or grab samples. 24-hour, flow-proportional composite samples are recommended. If a flow-proportional composite sample cannot be taken, the use of time-proportional composite samples is acceptable, but must be justified to the Department. Grab samples are required for pH, cyanide, volatile organic compounds (VOCs), total phenols, oil and grease, total petroleum hydrocarbons, sulfides, and temperature. At least four (4) grab samples must be taken within a 24-hour period.

The number of sampling events for initial local limit development and re-evaluations consists of at least seven consecutive days of sampling from the collection system and the WWF influent and effluent sampling points; and, at least two days of sampling from the residuals sampling point.

There should be at least two background locations included in the sampling plan. The background locations should be representative of the non-industrial contributions to the wastewater treatment plant. The locations of the background sampling should isolate the residential and commercial sources from industrial sources. The background locations should be clearly identified in the sampling plan, and there should be a summary of why these background locations were chosen for the study. The following factors should be considered when determining background sampling locations:

* The size of the service area or collection system (larger service areas may require more sampling locations);
* The variability of pollutant concentrations and loadings from one sector of the collection system to another; (For example, newer areas of a collection system may have higher concentrations of copper, while older areas may have higher concentrations of lead and zinc because of changes in plumbing materials over the years.)
* Types of commercial establishments represented; and
* Whether more than one drinking water system operates within the WWF’ service area. (Different water systems may have different water sources, or may add different chemicals for corrosion control such as polyphosphates.)

Appropriate analytical methods, method detection limits (MDLs) and practical quantification limits (PQLs) should be used. The analyses should be in accordance with Rule 62-4.246, F.A.C. The sampling plan should include an example chain-of-custody for that will be utilized and also identification of the NELAC-certified laboratory that will perform the analysis.

## Analytical Data Review

The user should verify that the correct analytical methods were used and the samples were properly analyzed prior to using the data for calculations and the LLIDS program.

The review of the data may show that the samples were improperly collected, they were taken from the wrong location, or if the sample was improperly preserved. Inadequately sampled or analyzed data should not be used in calculating local limits.

## Calculating Averages and Removal Efficiencies

Averages

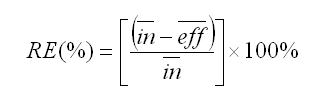
*Non-Detect Data.* Non-detect data is represented by a “U” data qualifier on laboratory data sheets. The most common surrogate value used is ½ the MDL for non-detect data (which is recommended by EPA in the *2004 Local Limits Development Guidance Manual*), but the user may choose another method. It should be noted that the use of surrogate values must be consistent throughout the local limits calculations. If varying surrogate values are used for calculations, the removal efficiencies may not be representative of the WWF’s actual removal capabilities.

Note: Non-detect data may indicate that a local limit may not be needed for a particular pollutant. If the user feels a local limit may not be necessary, the user should explain to the Department in the local limits submittal document that a limit is not necessary.

*How the data will be used.* The user should calculate the averages for the influent, effluent and background data points. The influent average will be used in calculating the removal efficiency and will also be entered into the Select Pollutants screen as Chw. The effluent average will be used in calculating the removal efficiency, but will not be directly entered into the LLIDS program. The background average will be entered into the Select Pollutants screen as Cni. The residuals data is usually not used in the LLIDS calculations; however, it may be used to calculate a removal efficiency, as described below. The residuals data should be used to verify that the WWF is not in violation of any of the limits found in 40 CFR 503.

Removal Efficiencies

*Mean Removal Efficiency.* The most common approach for calculating removal efficiencies is by the mean removal efficiency (MRE) method. The MRE method consists of averaging the influent concentrations of a particular pollutant, and averaging the effluent concentrations for the same pollutant, then determining the average removal using the following equation:



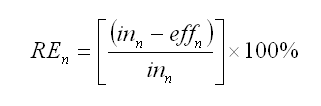
Where:

RE(%)= removal efficiency (%)

In= average of influent concentrations (mg/L)

Eff= average of effluent concentrations (mg/L)

*Average Daily Removal Efficiency.* If there are many data points (usually more than 10), and where the influent samples is paired with a lagged effluent sample, based on the hydraulic detention time through the wastewater treatment plant, may opt to use the average daily removal efficiency (ADRE) method to calculate the removal efficiency of the wastewater treatment plant. This is calculated using the following equations:

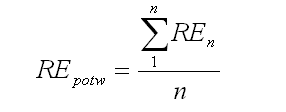


Where:

REn= removal efficiency for day n (%)

Inn= influent concentration for day n (mg/L)

Effn= effluent concentration for day n (mg/L)

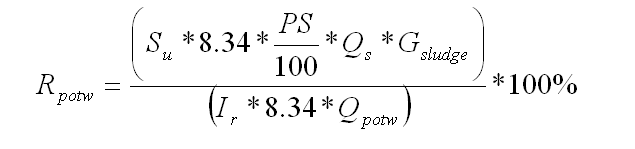


Where:

REpotw = average daily removal efficiency (%)

n= number of days

*Residuals Based Removal Efficiency.* The user can use sludge data to calculate a removal efficiency. This option may be used when the WWF has adequate influent data above detection, but does not have adequate effluent data above detection. This method can also be utilized when the user believes that the sludge data provides a more representative removal efficiency. This is calculated using the following equation:



Where:

Rpotw = removal efficiency (%)

Su = average sludge concentration (mg/kg)

PS = percent solids of sludge to disposal (%)

Qs = sludge flow rate to disposal (MGD)

Gsludge = specific gravity of sludge (kg/L)

Ir = average influent concentration (mg/L)

Qpotw = total WWF flow rate (MGD)

*Negative Removal Efficiencies.* If the programs are unable to calculate a removal efficiency for a particular pollutant at a particular plant, they may opt to use a literature value found in Appendix R of the EPA *2004 Local Limit Development Guidance Manual*. If literature values are used, it should be noted in the local limits submittal.

# PART II

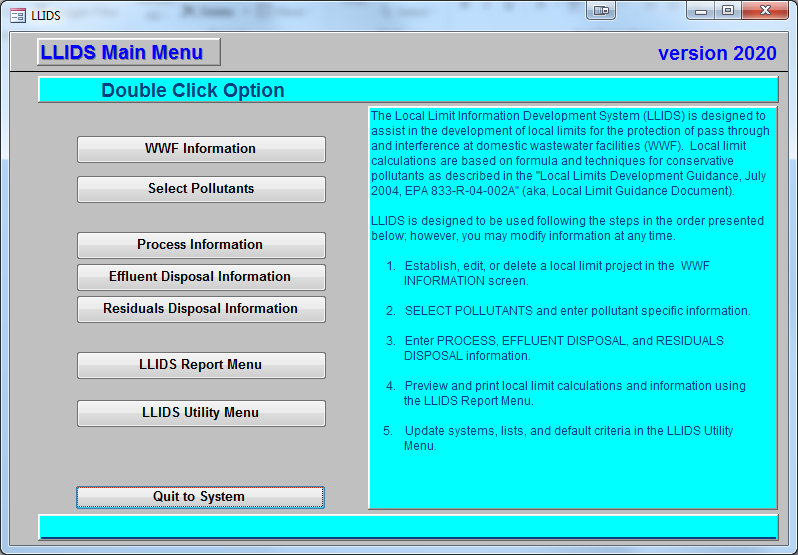
**LLIDS Data Entry**

## Create a New Project

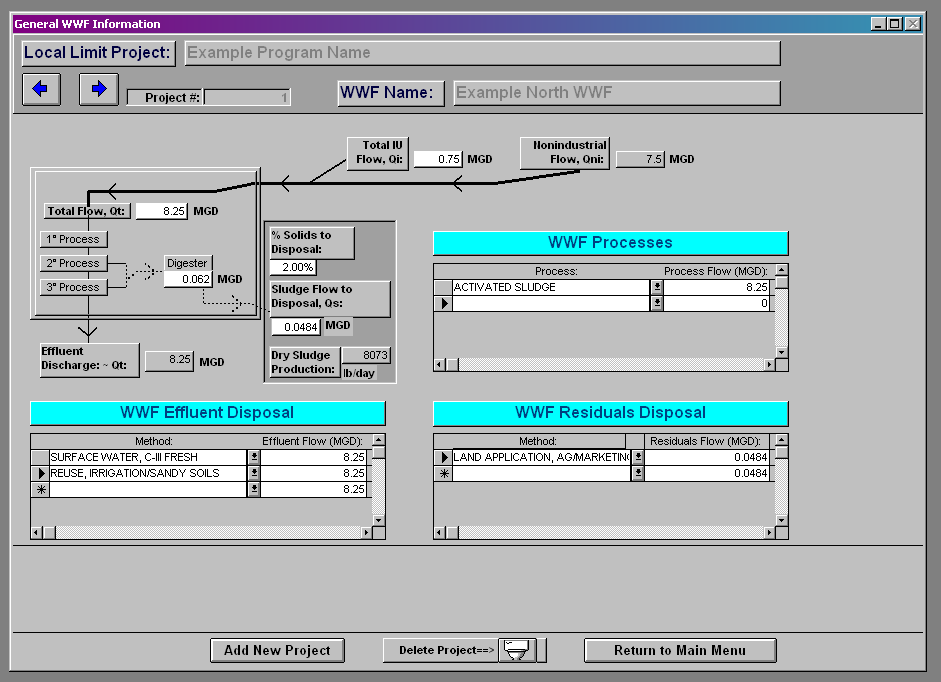
Open the LLIDS program by double clicking on the user agreement button.

## WWF Information Button

To create or edit a project, double click on the WWF Information button.



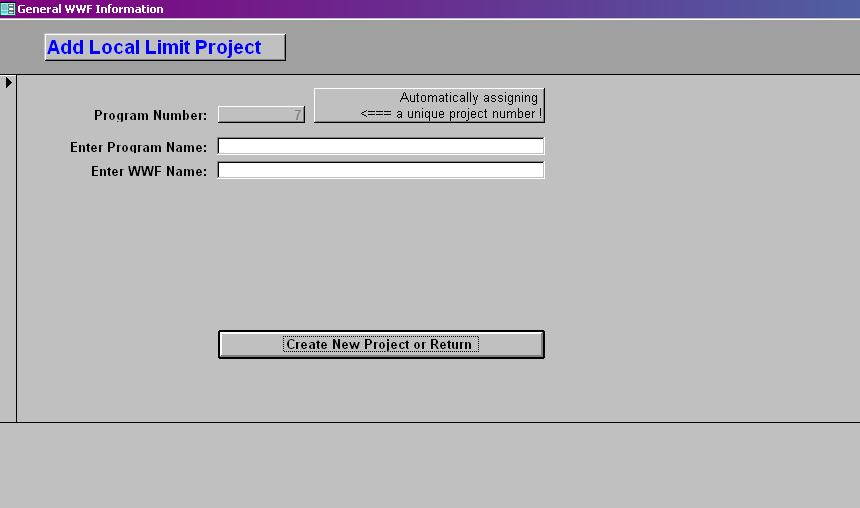
## Add New Project Button



Once clicked, a unique project number is assigned. This is how the LLIDS program identifies each project.

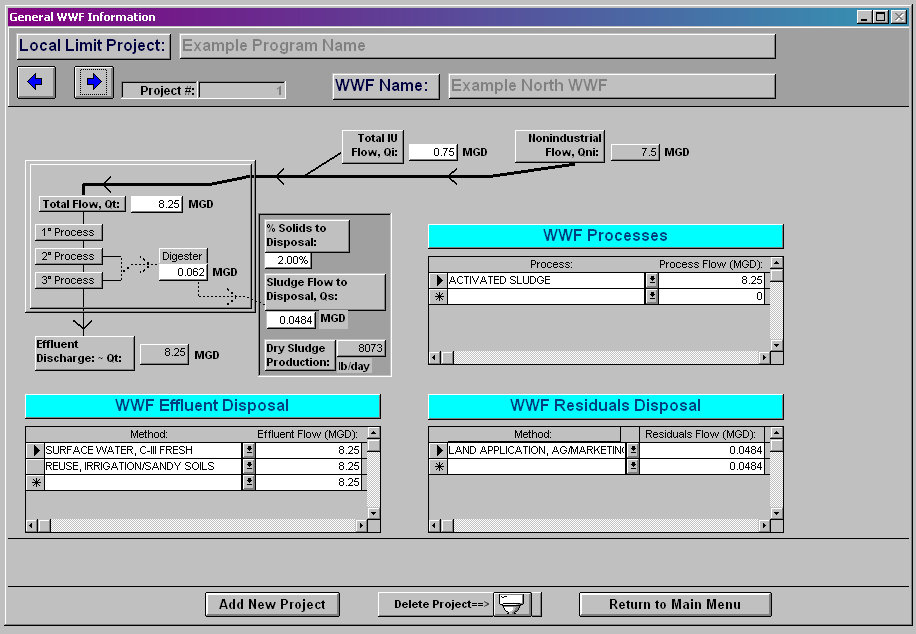
Enter name of program and name of WWF into the text boxes. This information will help the user identify the particular project.

“Create New Project or Return” button will take you back to the WWF Information Screen and you can begin the project.

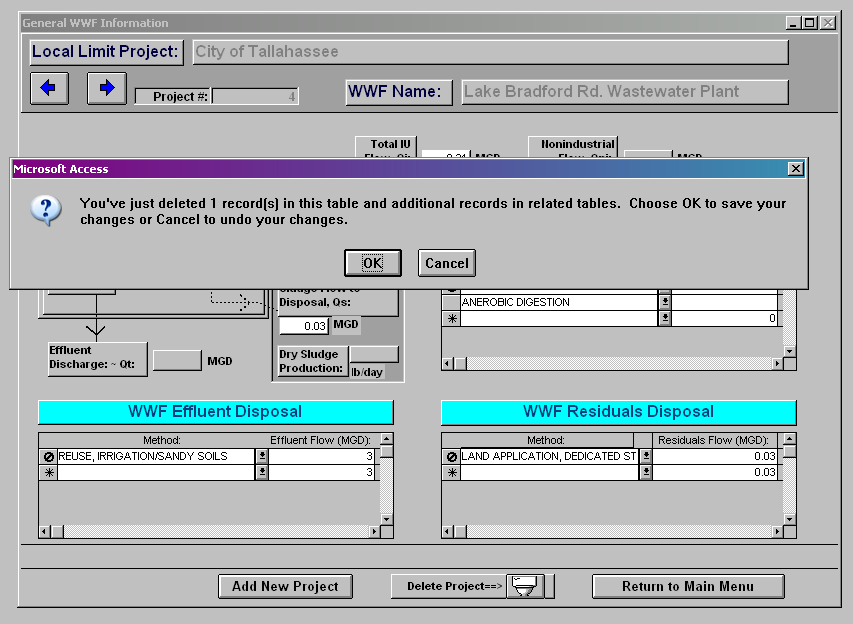


## Delete Project Button

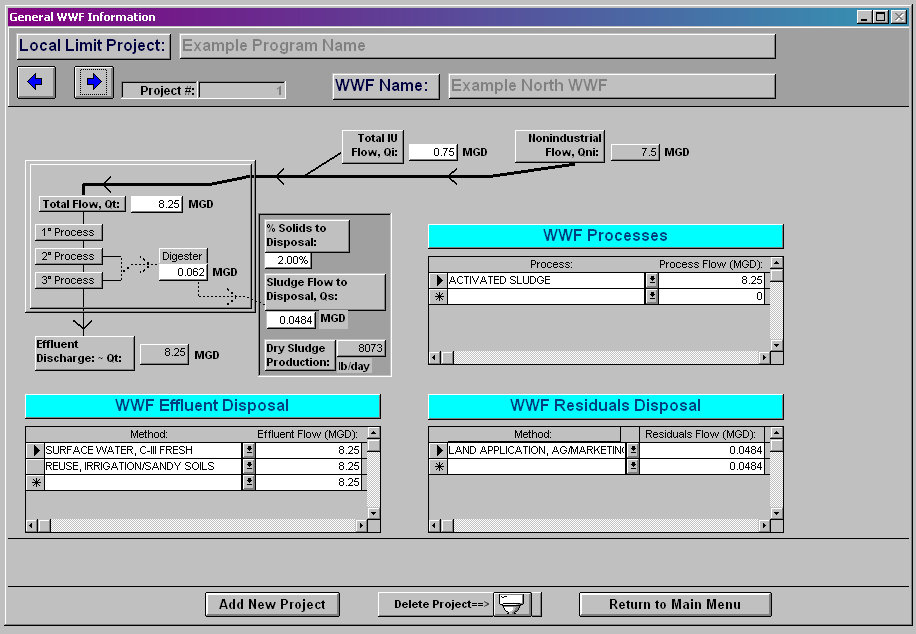
This button will delete the project being currently worked on.



LLIDS asks you to confirm the project deletion before it occurs.



“Return to Main Menu” button will take you back to the main LLIDS menu.



## General WWF Information Screen

The user will enter the information listed below into the General WWF Information screen.

*Total Flow* (Identified as Qt on LLIDS screen). The total flow should be the average annual daily flow for the wastewater treatment plant.

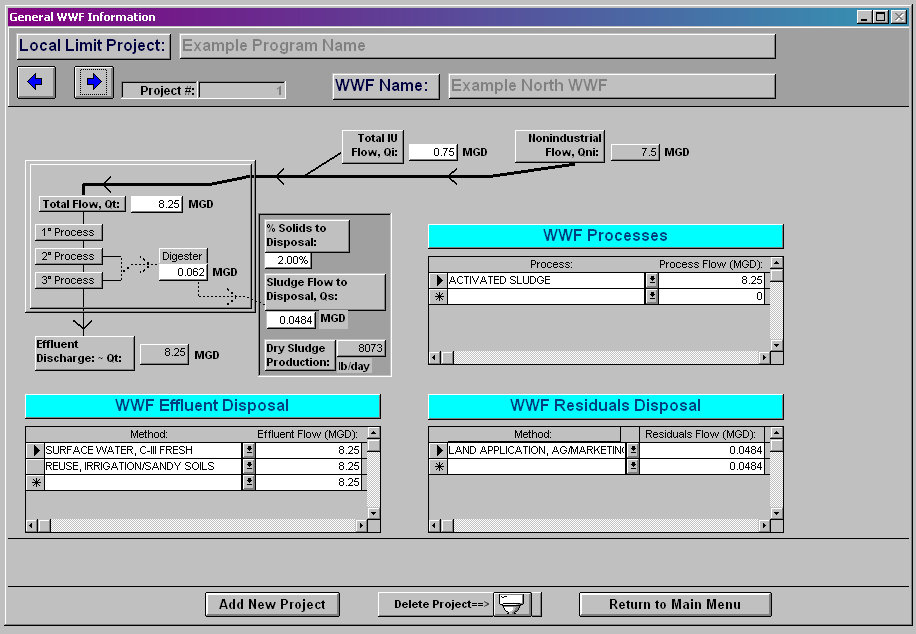
*Total IU Flow* (Identified as Qi on LLIDS screen). This should also be the annual average flow from the industrial users that are regulated by the pretreatment program.

*Flow to Digester.* This can usually be determined from wastewater treatment plant operators, or other individuals who track WWF flows.

*% Solids in Disposal.* This is a normal item that WWF’s monitor for so it should be fairly easy to obtain this information.

*Sludge Flow to Disposal* (Identified as Qs on LLIDS screen). This can usually be determined from wastewater treatment plant operators, or other individuals who track WWF flows.

Note: Non-industrial flow (Qni), effluent discharge (Qt), and dry sludge production values are calculated automatically by LLIDS.



### WWF Processes Table

The user will select the processes that are used at the WWF being evaluated.

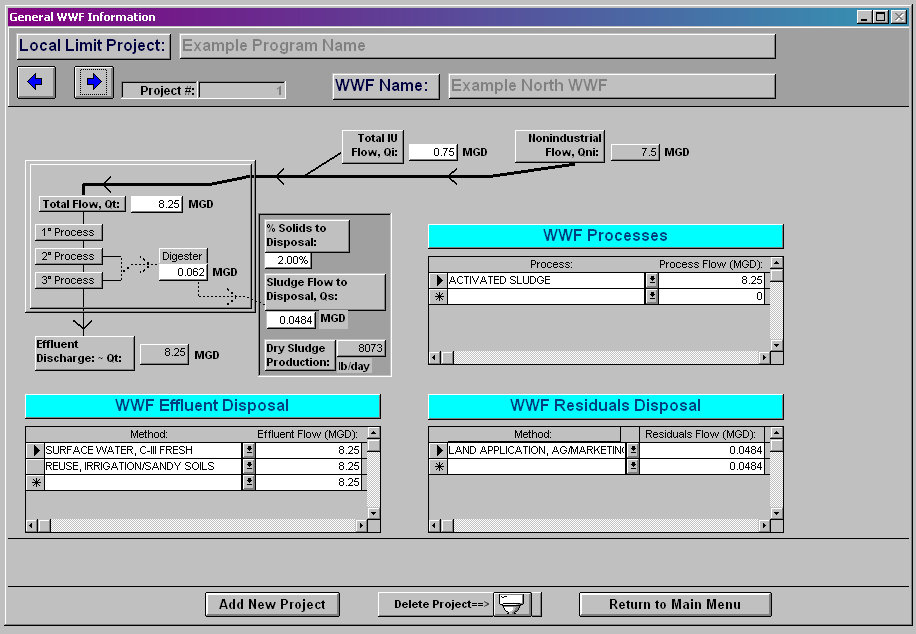
The program defaults to enter the total WWF flow (Qt) under process flow (MGD) to be used in the calculations, which is preferred, but the user can change the flow to a different value.

*Activated Sludge.* EPA has several metals, inorganics, as well as several organic chemicals with values or ranges of values for interference. These threshold levels were based on studies involving treatment plants throughout the country.

*Nitrification.* This is often used in addition to activated sludge. The user can choose multiple treatment processes to be evaluated by the LLIDS program.

*Anaerobic Digestion.* There are literature values and ranges for several of these pollutants

*Aerobic Digestion.* EPA does not have any literature values for this type of treatment process, so if this is chosen, there will be no calculations associated with it, unless the pretreatment program has its own data to use, (which is rare).



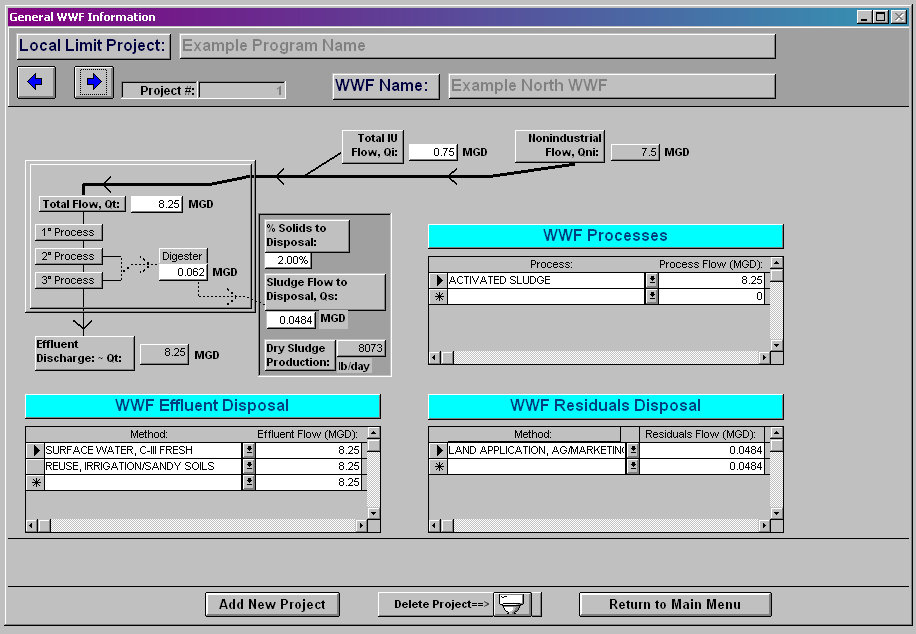
The threshold values used in LLIDS are listed in Appendix G of the EPA *2004 Local Limit Development Guidance Manual*. WWF Effluent Disposal

The Department recommends that the total flow be used for all effluent disposal options, even if the facility does not usually send all of their effluent to one disposal option. This is to ensure that all of the flow (Qt) is able to meet the applicable water quality standards. The user should verify that all effluent limits are the most recent.

The user will choose the effluent disposal options the treatment plant uses. The default effluent options available in LLIDS are listed below.

* Reuse Irrigation for sandy soils.
* Surface Water Class III Fresh.
* Surface Water Class III Marine.
* UICs meeting GW standards (primary and secondary).

If another effluent disposal is used by the WWF other than those listed above, the user will have to create the disposal option in the Utility Menu of LLIDS. See Part IV for an explanation of how this is accomplished.

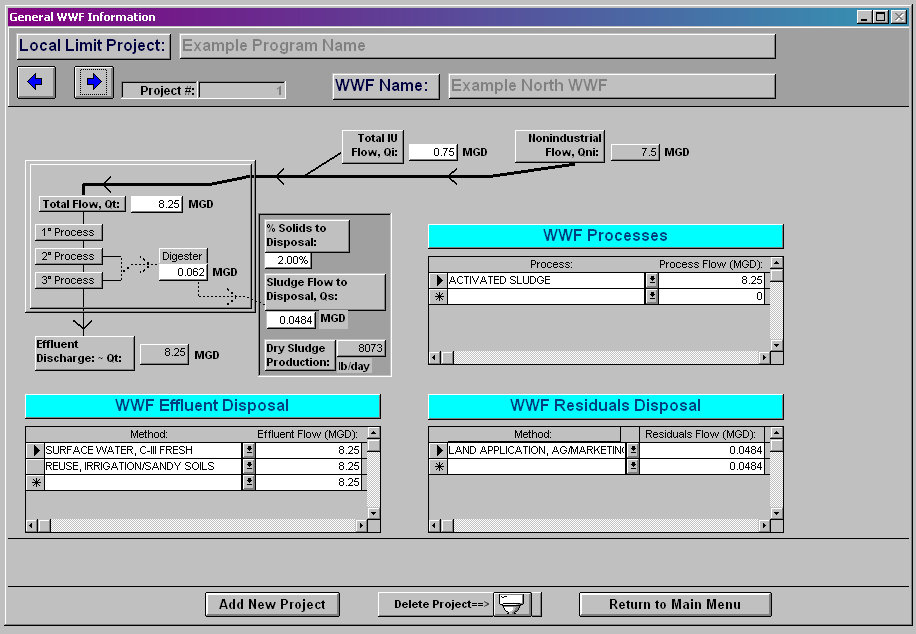


### WWF Residuals Disposal

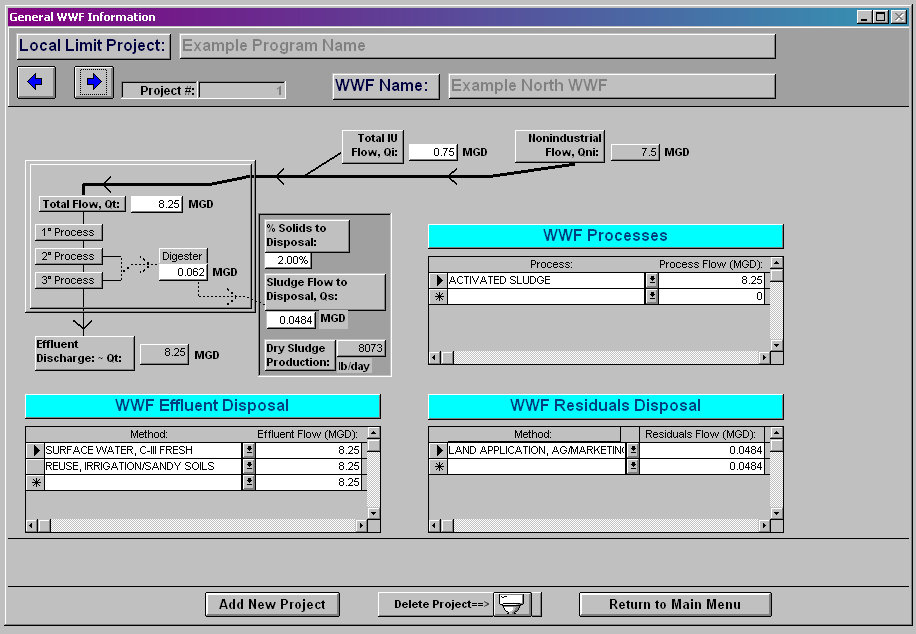
The user will chose the disposal method the WWF uses.

* Land Application Dedicated Site.
* Land Application Ag Marketing.
* Landfill.
* Incineration.

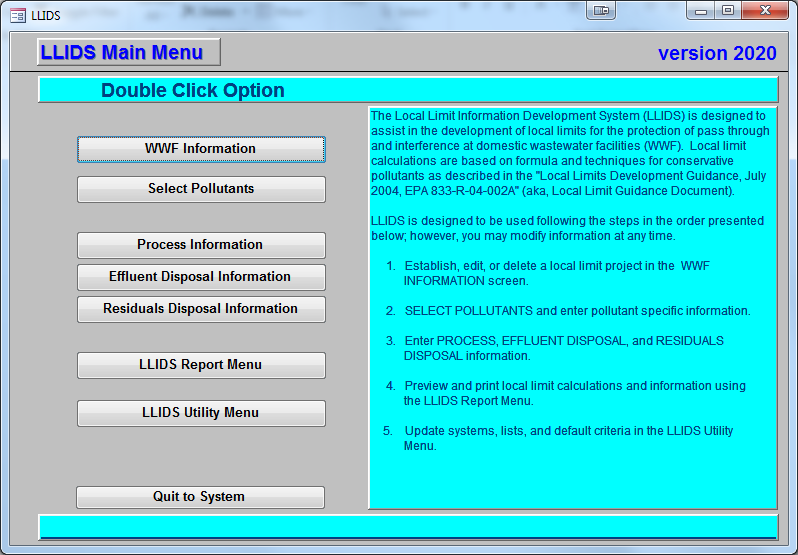
The program defaults to enter the total sludge flow to disposal (Qs) under residuals flow (MGD) to be used in the calculations.



Return to Main Menu” button will take you back to the main LLIDS menu.

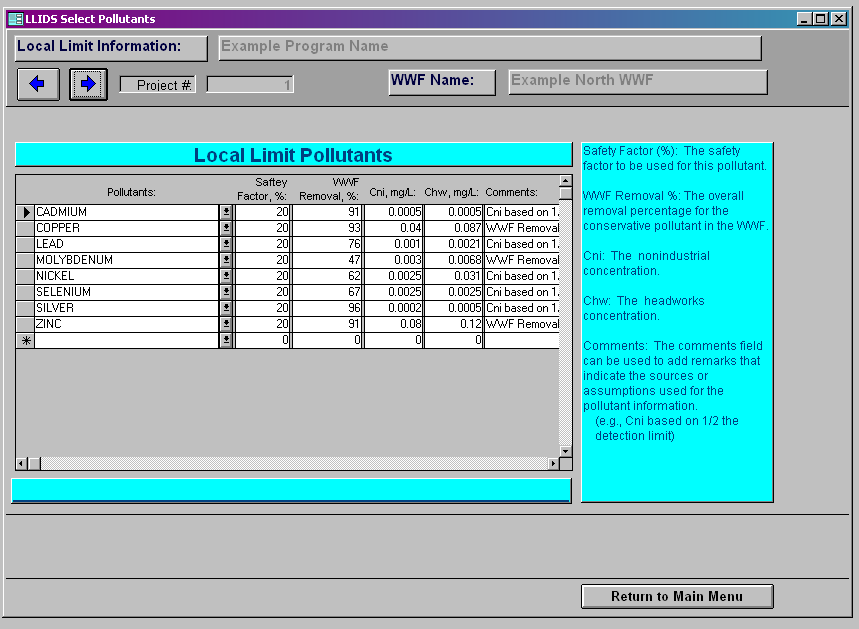


## Select Pollutants Button



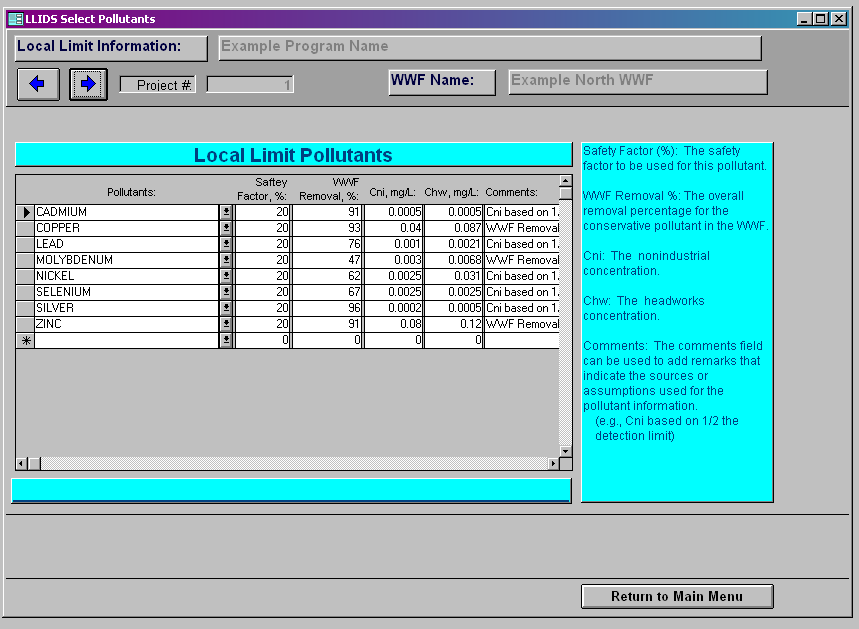
### Pollutants

These are the pollutants that the user desires to be evaluated for a local limit. The pollutants entered are usually all of the pollutants of concern that were sampled by the pretreatment program.



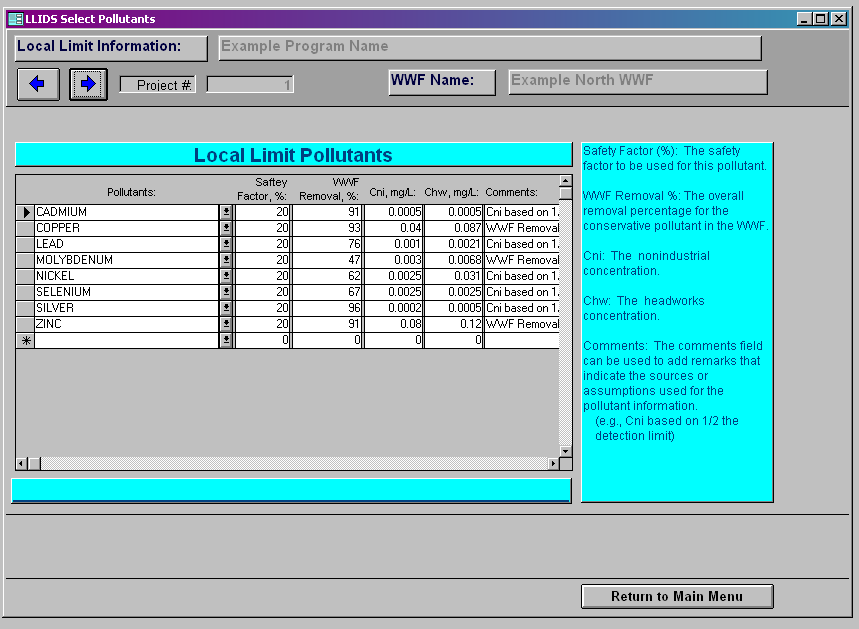
### Safety Factor

The main purpose of a safety factor is to address data uncertainties, and other uncertainties that can affect calculating an accurate local limit. Safety factors are usually set between 5% and 25%, as recommended by EPA. If the user is more confident in the precision and accuracy of the data, a lower safety factor may be used. Conversely, if the user is not very confident in the data, a larger safety factor may be used.



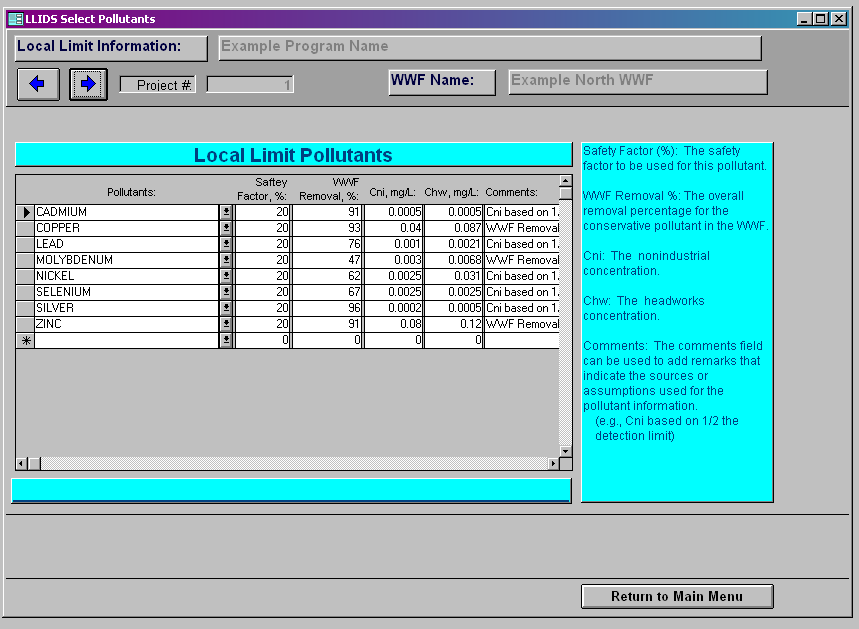
### WWF Removal (%)

The removal efficiencies for each pollutant are calculated by the user. This is explained in Part I of this manual.



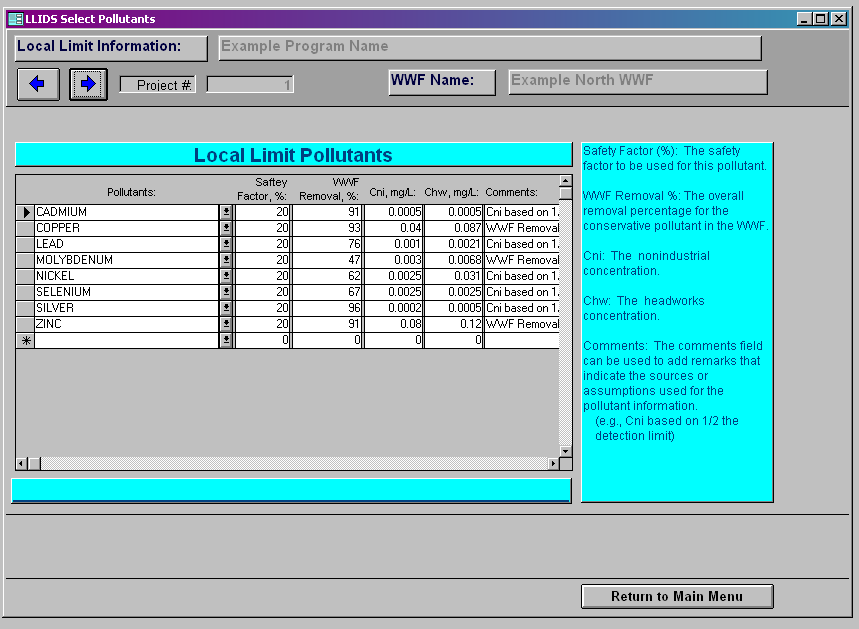
### Cni, background concentration average

This is the average concentration from the non-industrial sampling location, the background concentration. The data should be entered as mg/L.



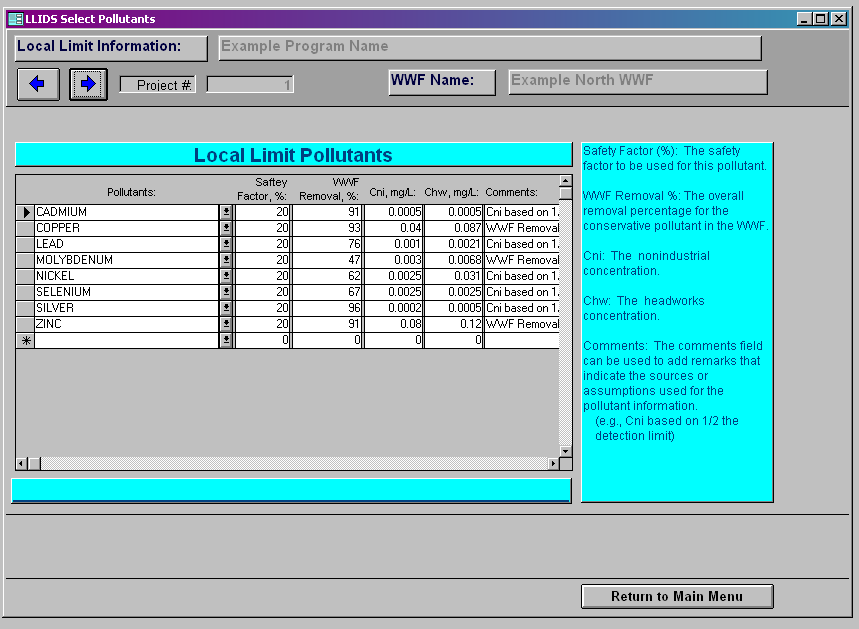
### Chw, Influent Concentration Average

This is the average concentration from the headworks of the plant, the influent sampling location. The data should be entered as mg/L.

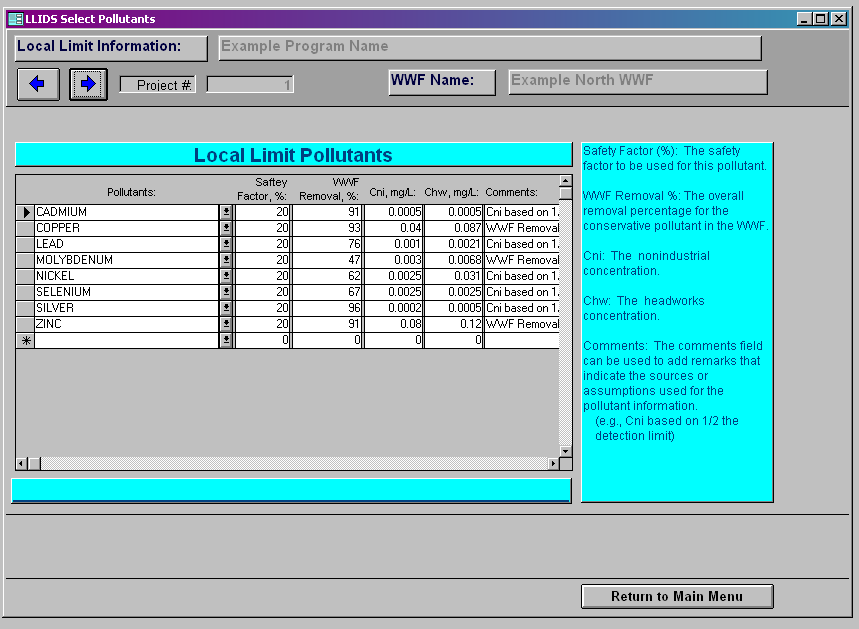


### Comments

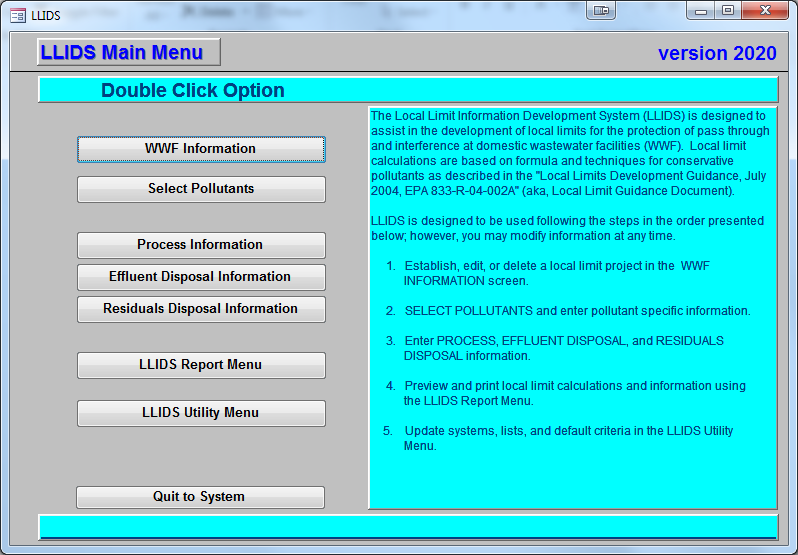
This text box gives the user the option to enter comments regarding the particular pollutant.



“Return to Main Menu” button will take you back to the main LLIDS menu.



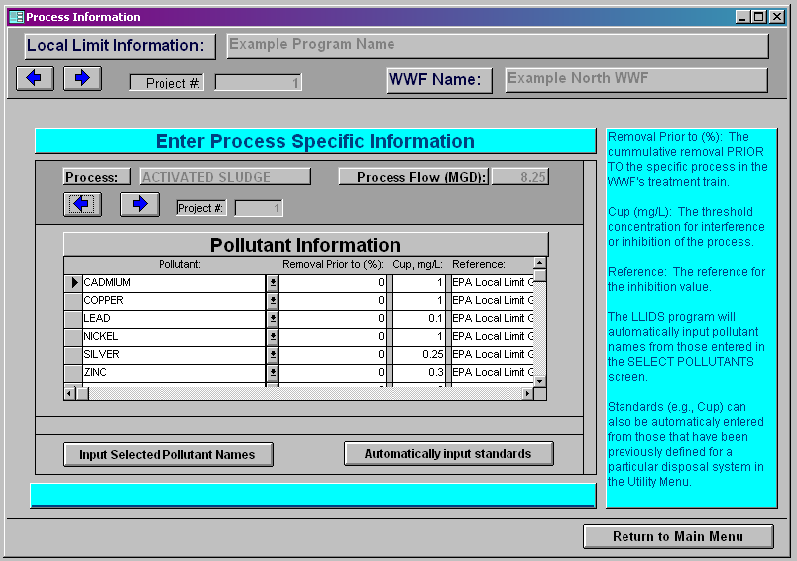
Process Information Button



### Pollutant

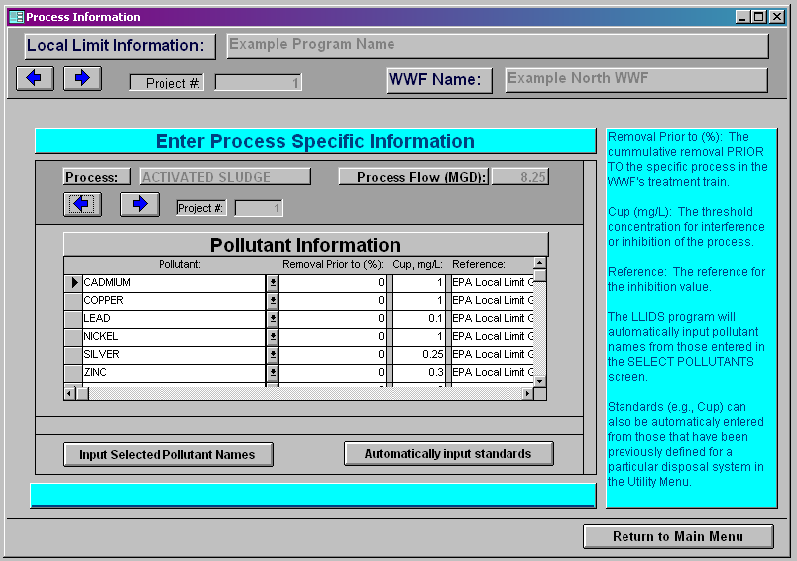
Input Selected Pollutant Names. This will input all pollutants that were listed in the Select Pollutants Screen.

The user can also individually select particular pollutants, if desired, by using the drop down menu within the table.



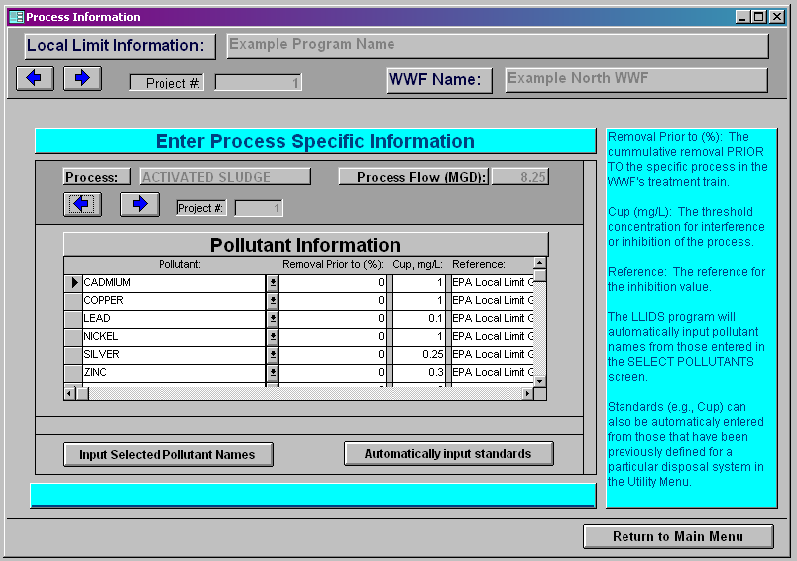
### Removal prior to (%)

This is usually left as zero for all pollutants. This column will be used if the pretreatment program sampled in between unit processes to obtain primary removal prior to entering the treatment process.

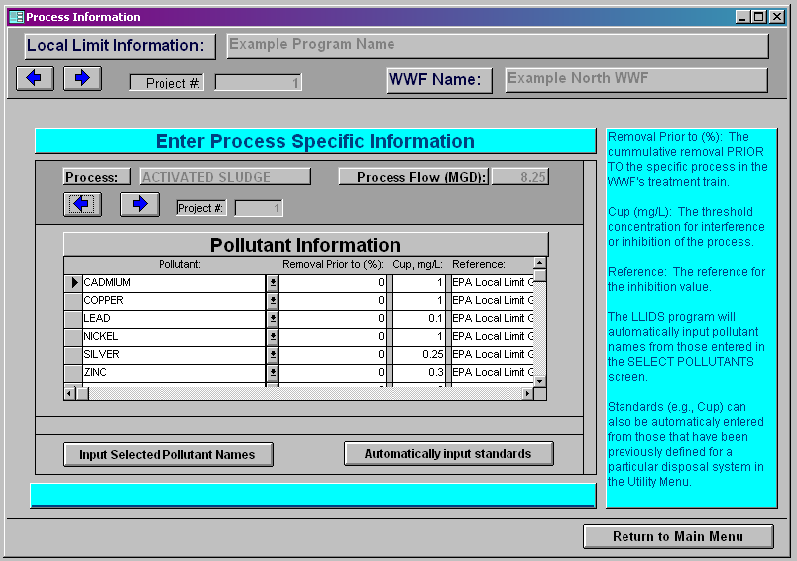


### Cup, Process Inhibition Standards

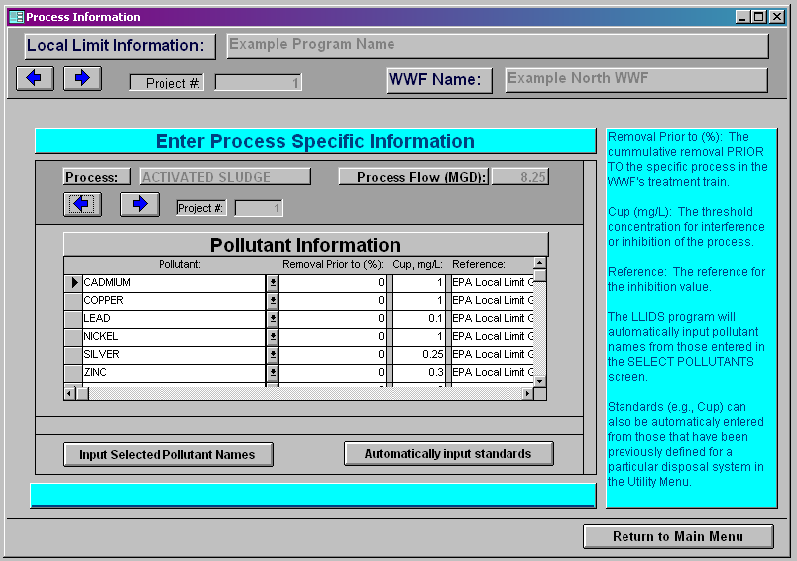
Automatically Input Standards. This button will automatically input the applicable inhibition values for the unit process selected. The user can also individually enter the inhibition value into the screen, if desired. Please refer to Part IV for the origin of these values.



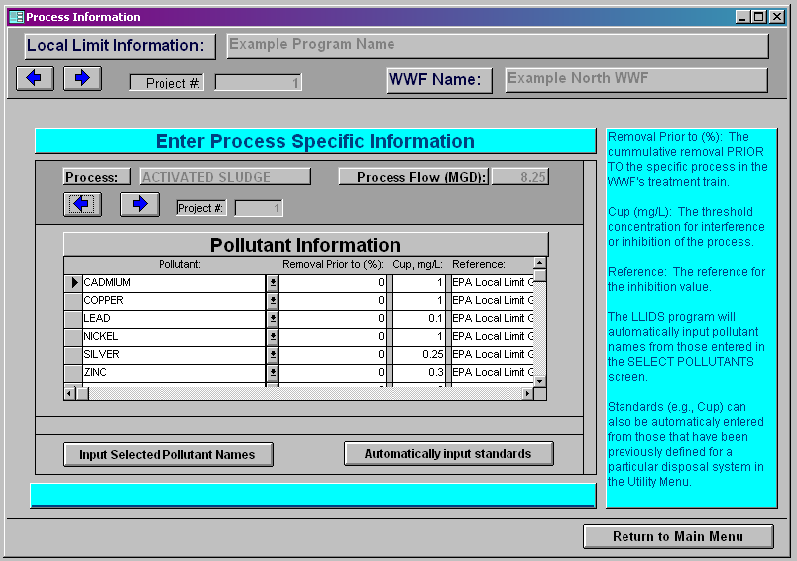
The program will automatically enter the default references used, if another value is used other than the default, the user should enter the reference of where the value was obtained.



If there is more than one process, the arrows adjacent to the process names allow the user to toggle between the processes chosen on the WWF information screen.

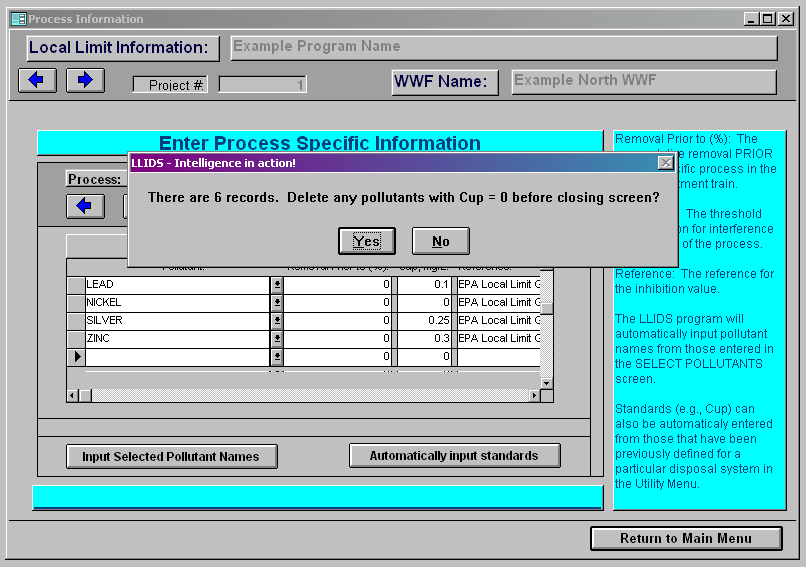


“Return to Main Menu” button will take you back to the main LLIDS menu.

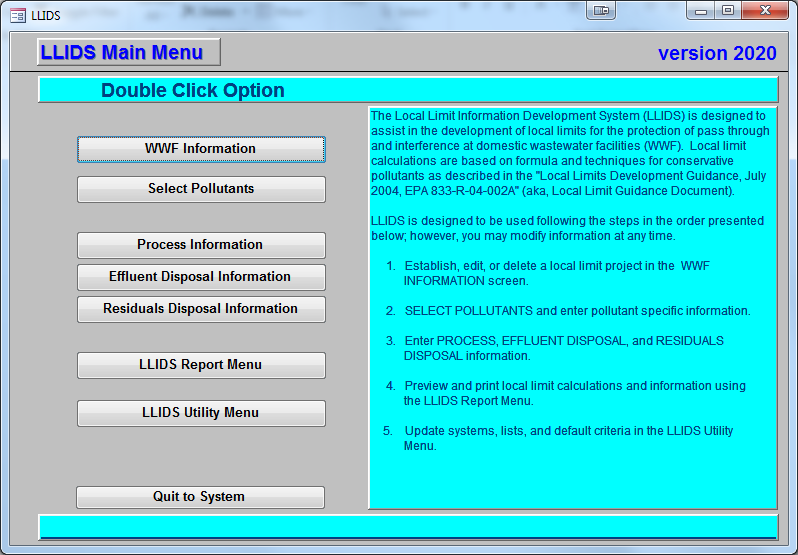


The program will also ask you in a pop-up screen “Delete any pollutants with Cup =0 before closing?”

The program asks you this if there are pollutants listed in the table that does not have associated limits with them. The user can click yes or no, it will not change the local limits, it will “clean up” the reports and will not list the pollutants that do not have limits to base the local limits on for the particular processes.



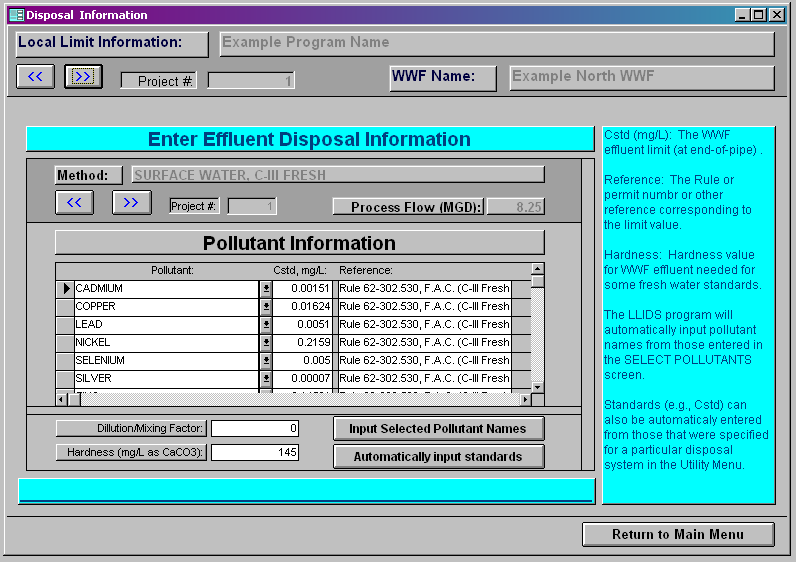
## Effluent Disposal Information Button



### Enter Effluent Disposal Information

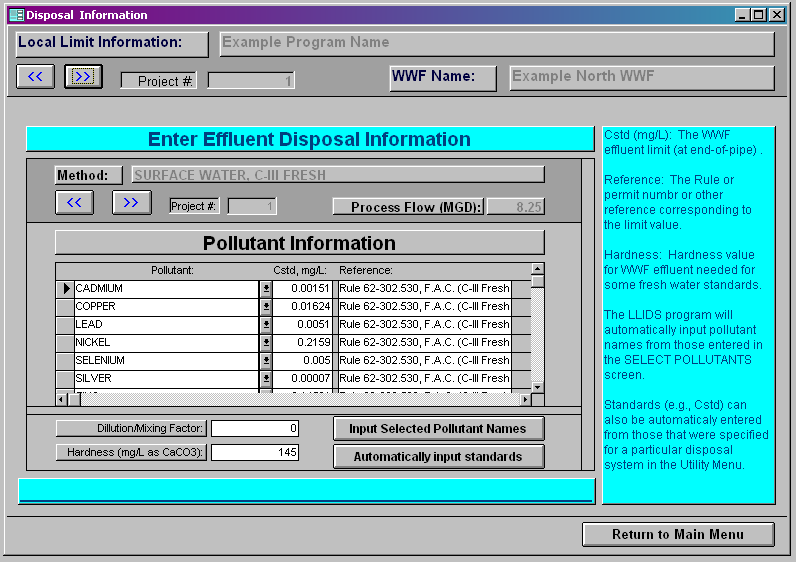
*Dilution/Mixing Factor.* This is used when a WWF has a mixing zone to meet water quality standards and will take the mixing zone into account when calculating a local limit.

*Hardness concentration.* This is used for certain class III fresh water quality standards. The hardness value should be entered as mg/L of CaCO3. This needs to be entered prior to clicking the “Automatically Input Standards” button. If the hardness value must be changed, the user must re-enter the pollutants, enter the new hardness concentration, and then click the “Automatically Input Standards” button respectively in order.



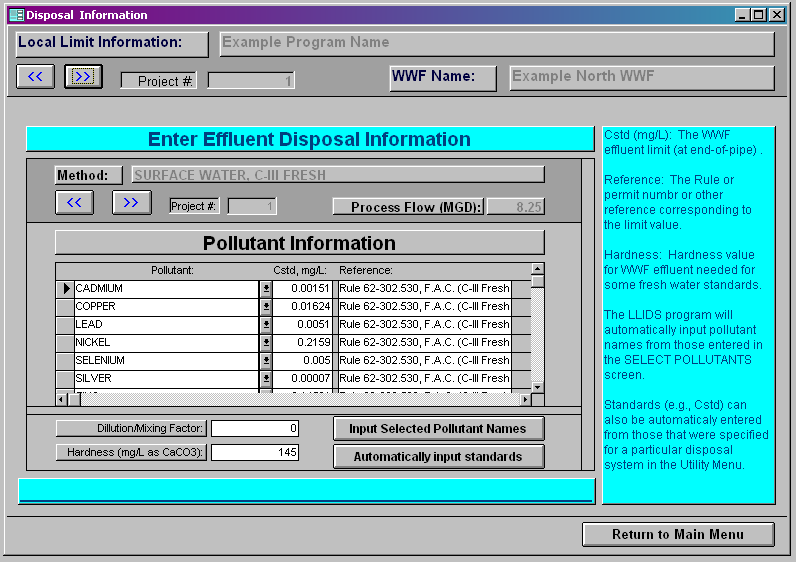
### Pollutant

Input Selected Pollutant Names. This will input all pollutants that were selected in the Select Pollutants Screen. The user can also individually select particular pollutants, if desired, by using the drop down menu within the table.

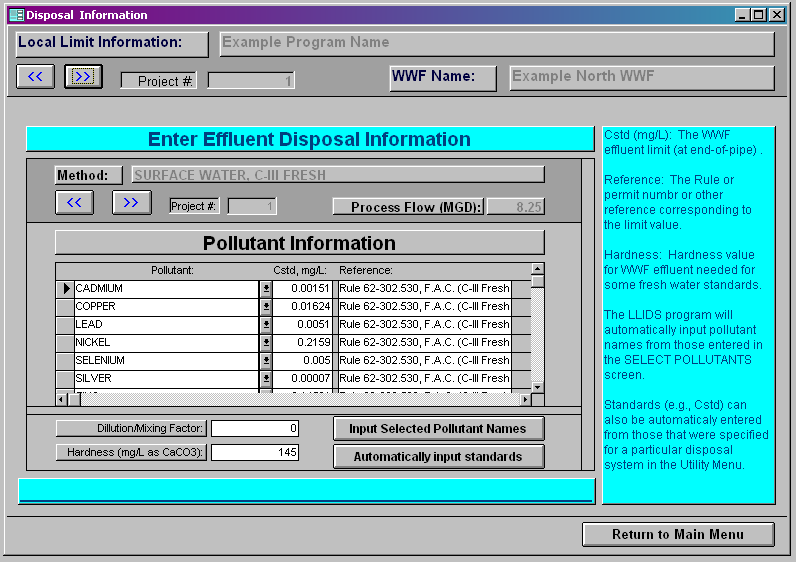


### Cstd, Effluent Disposal Standards

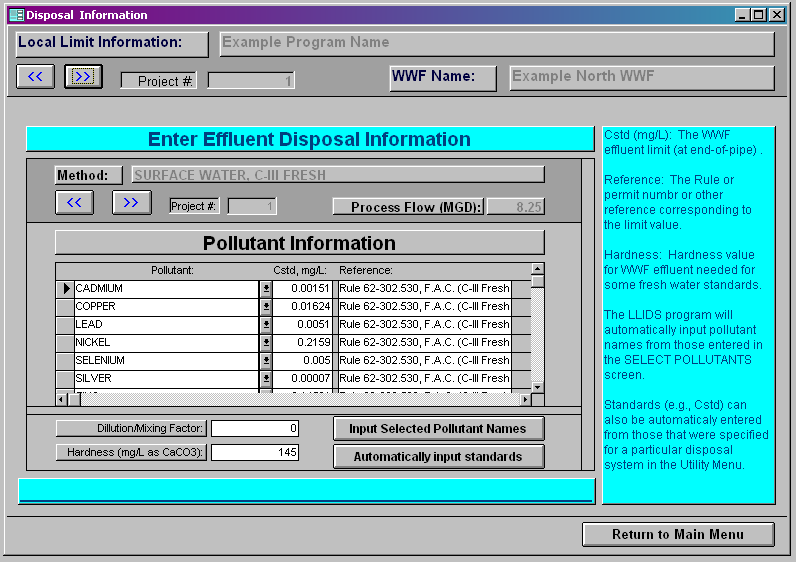
Automatically Input Standards. This button will automatically input the applicable effluent standards for the effluent disposal option selected. The user can also individually enter the applicable effluent limit into the screen, if desired. Please refer to the Utility Menu section for the origin of these values.



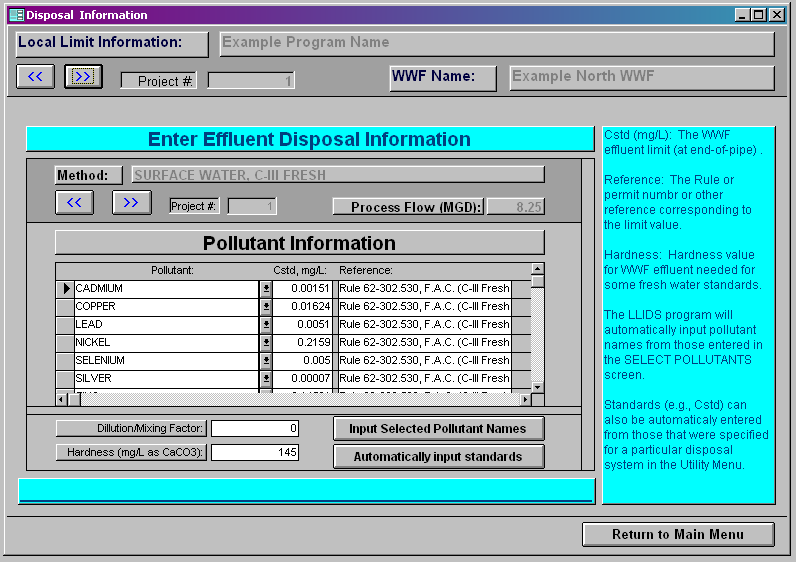
The program will automatically enter the default references used, if another value is used other than the default, the user should enter the reference of where the value was obtained.



If there is more than one effluent disposal type, the arrows adjacent to the disposal type allow the user to toggle between the methods chosen on the WWF information screen.

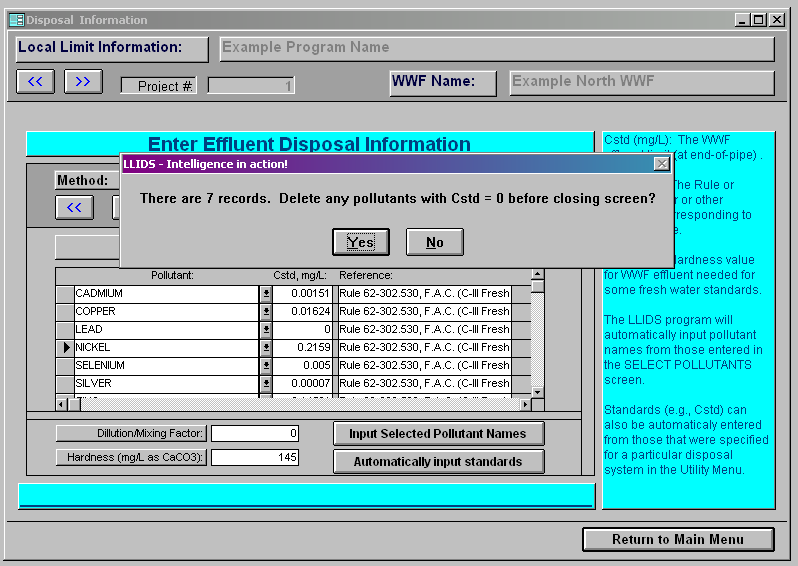


“Return to Main Menu” button will take you back to the main LLIDS menu.

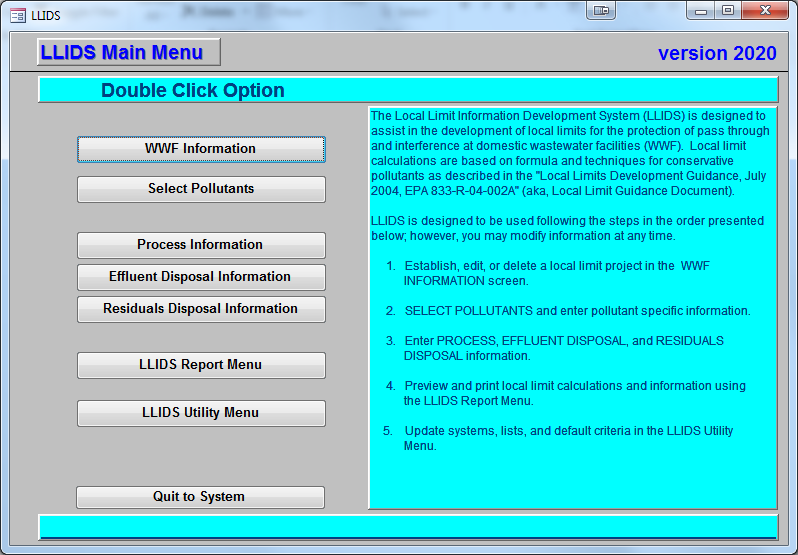


The program will also ask you in a pop-up screen “Delete any pollutants with Cstd =0 before closing?”

The program asks you this if there are pollutants listed in the table that do not have limits associated with the effluent disposal option. The user can click yes or no, this will not change the local limits, it will only “clean up” the reports and will not list the pollutants that do not have effluent limits to base the local limits on for the particular effluent disposal and pollutant.

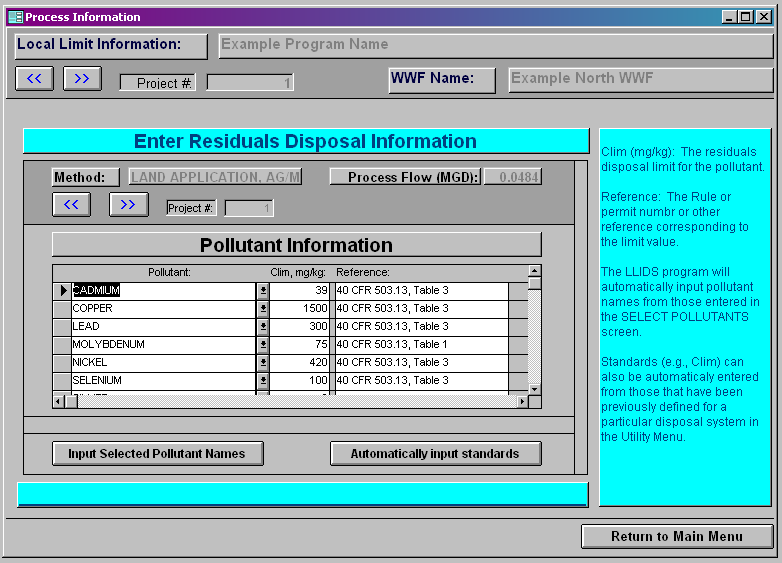


## Residuals Disposal Information Button



### Pollutant

Input Selected Pollutant Names. This will input all pollutants that were selected in the Select Pollutants Screen. The user can also individually select particular pollutants if desired.



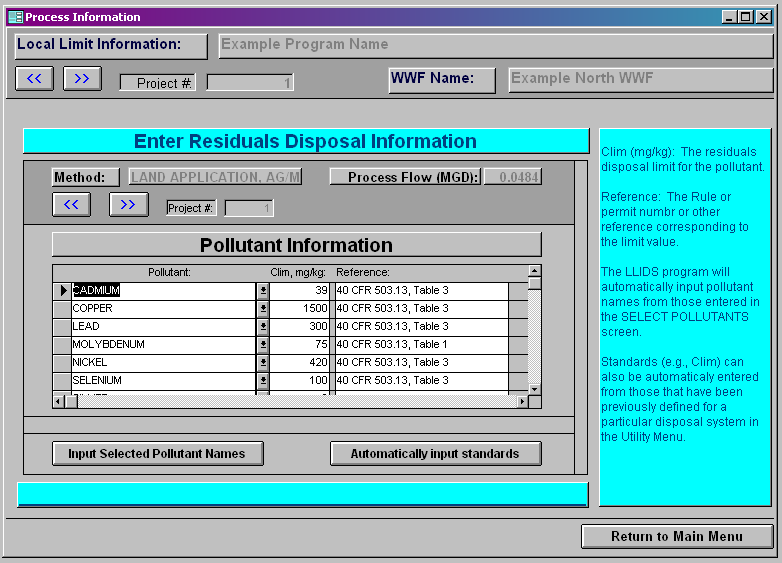
### 

### Clim, Residuals Disposal Standards

Automatically Input Standards. This button will automatically input the applicable residuals limits for the residuals disposal option selected.

The user can also individually enter the applicable residuals limit into the screen, if desired.

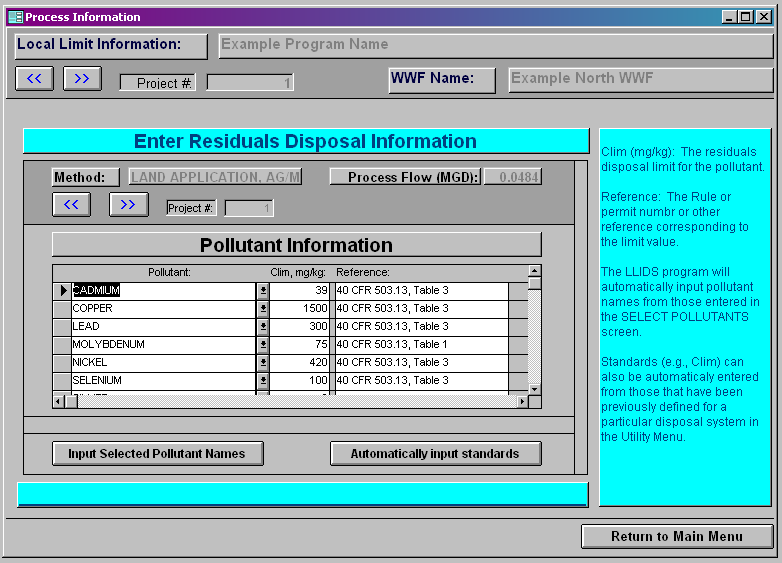
Please refer to Part IV for the origin of these values.



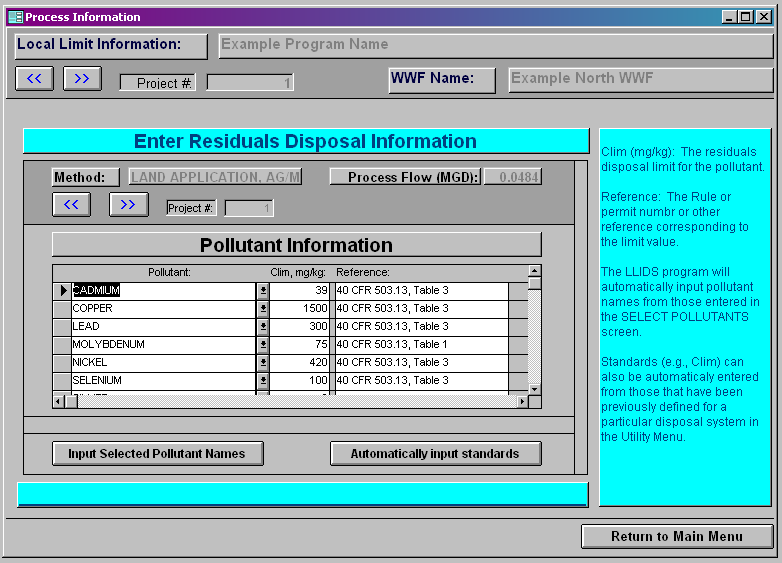
The program will automatically enter the default references used, if another value is used other than the default, the user should enter the reference of where the value was obtained.

*Incineration.* There are no default limits for this type of disposal, the user will have to enter the limits if there are limits that must be met by the WWF.

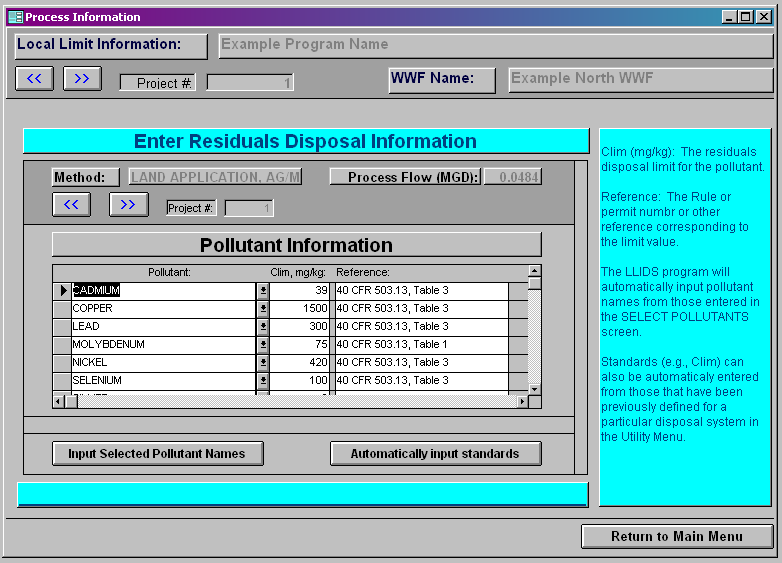
*Landfill.* There are no default limits for this type of disposal, the user will have to enter the limits if there are limits that must be met by the WWF.



If there is more than one residuals disposal type, the arrows adjacent to the process names allow the user to toggle between the methods chosen on the WWF information screen.

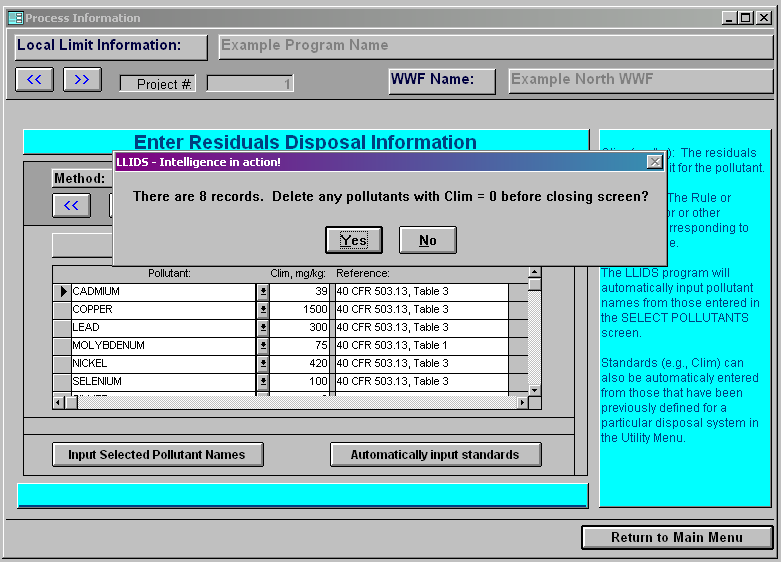


“Return to Main Menu” button will take you back to the main LLIDS menu.



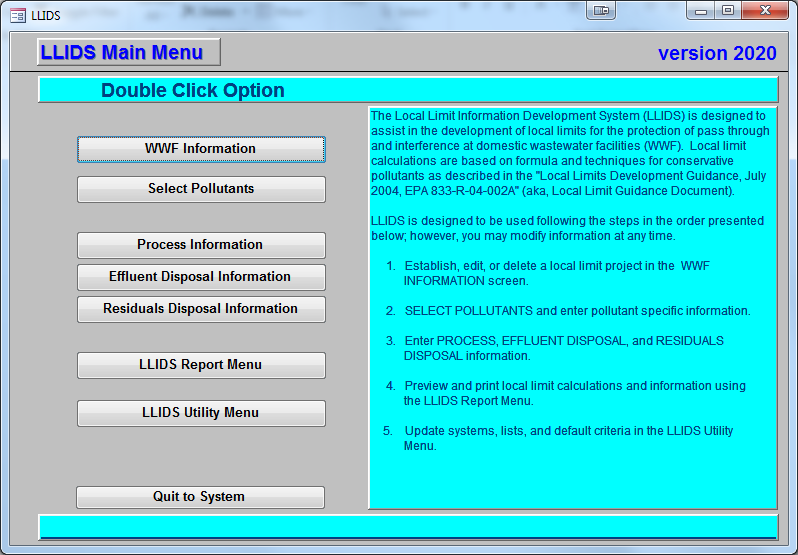
The program will also ask you in a pop-up screen “Delete any pollutants with Clim =0 before closing?”

The program asks you this if there are pollutants listed in the table that does not have associated limits with them. The user can click yes or no, it will not change the local limits, it will “clean up” the reports and will not list the pollutants that do not have limits to base the local limits on for residuals.

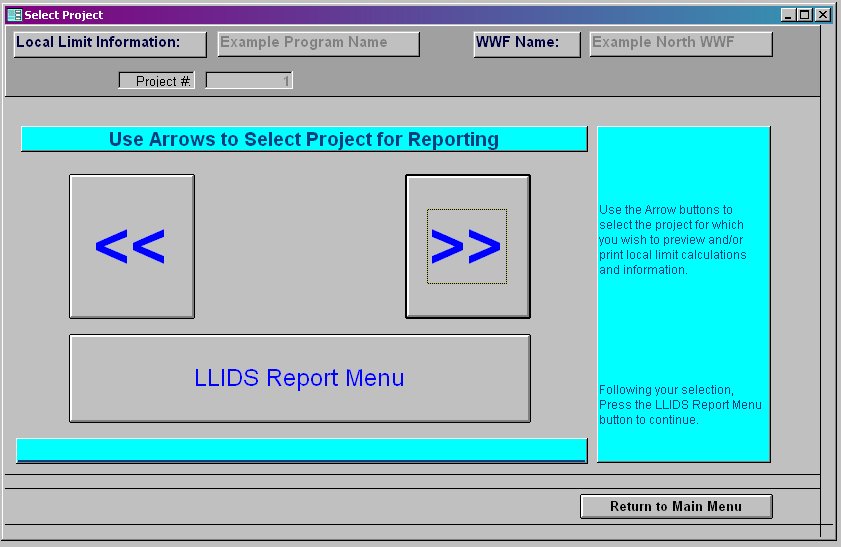


# PART III

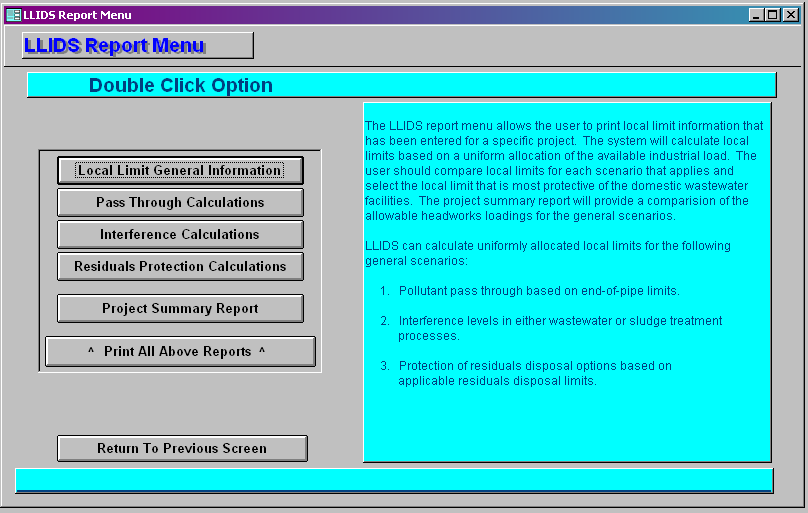
**LLIDS Report Menu**



Scroll to the desired project using the arrows and click on the “LLIDS Report Menu” button to enter the “LLIDS Report Menu” screen.



## Local Limit General Information Report

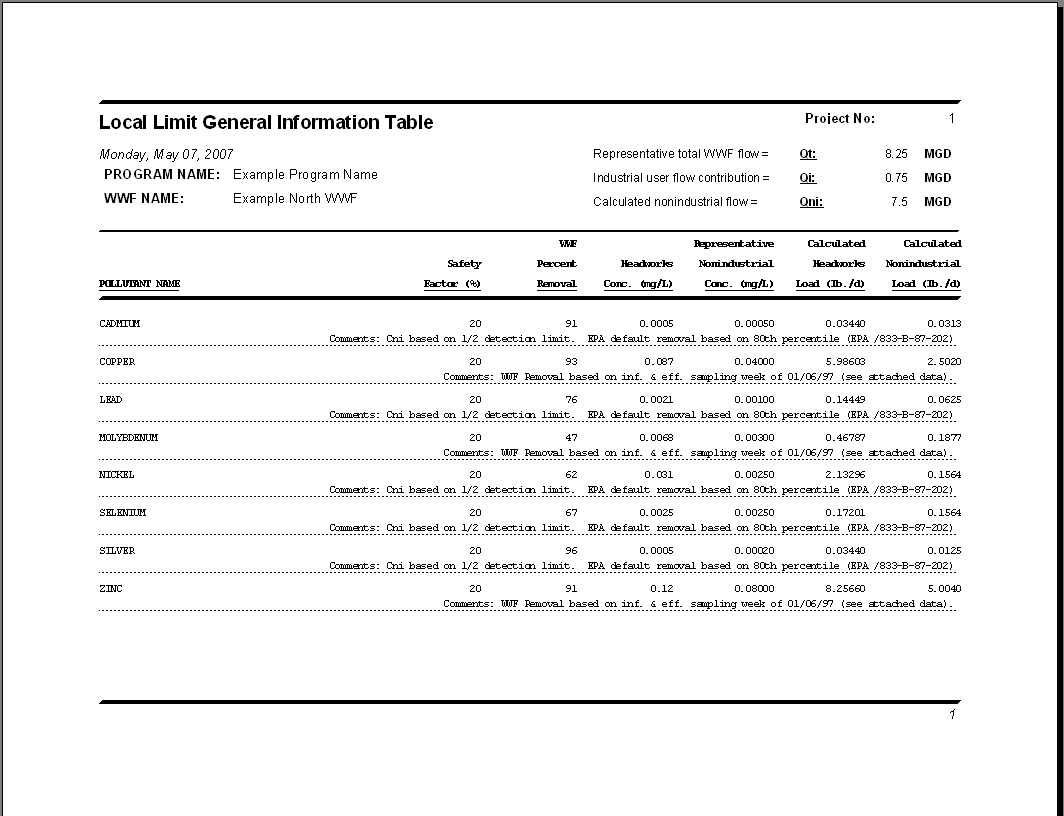


This report summarizes the entries that were made in the “Select Pollutants” screen.

### Project Information Block

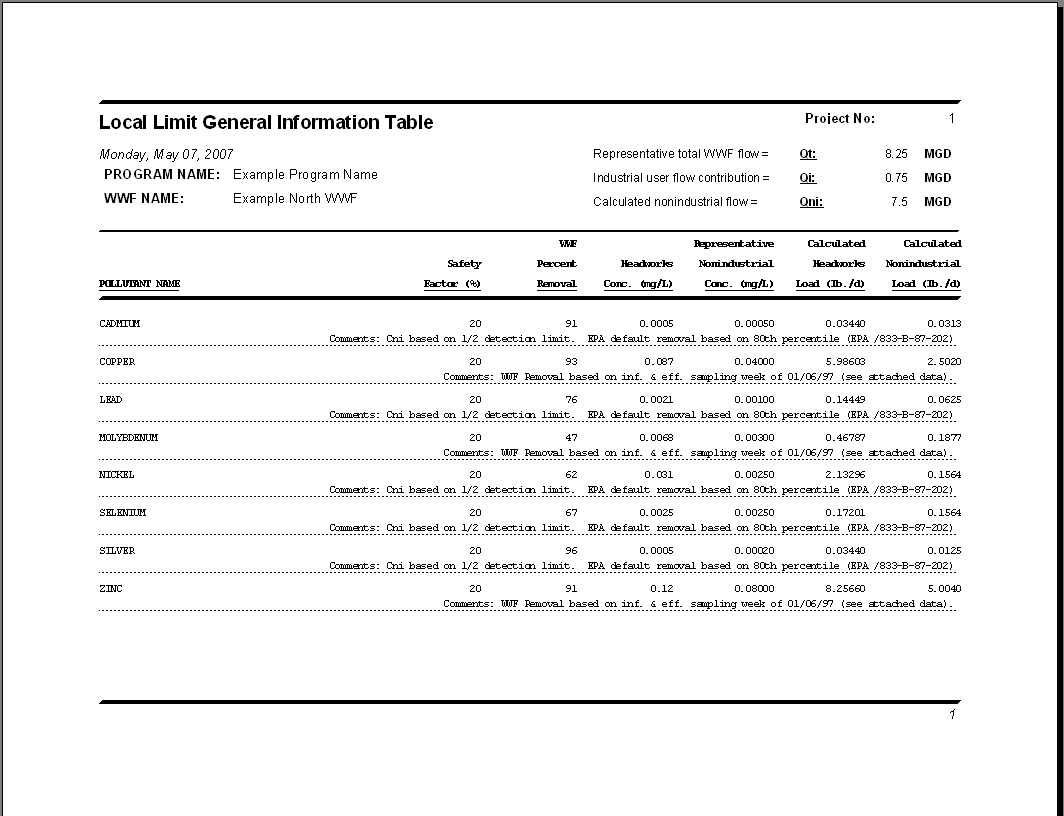
The top of the report sheet lists general information about the project. This includes:

* The report name: “Local Limit General Information Table;”
* Date report was generated (the date is based on the user’s computer settings);
* Program name, as entered by the user when a new project was created;
* WWF name, as entered by the user when a new project was created;
* The unique project identification number, assigned by the LLIDS program;
* Representative total WWF flow, Qt, entered by the user into the WWF Information screen;
* Industrial user flow contribution, Qi, entered by the user into the WWF information screen; and
* Calculated non-industrial flow, Qni, value was calculated by LLIDS on the WWF Information screen.



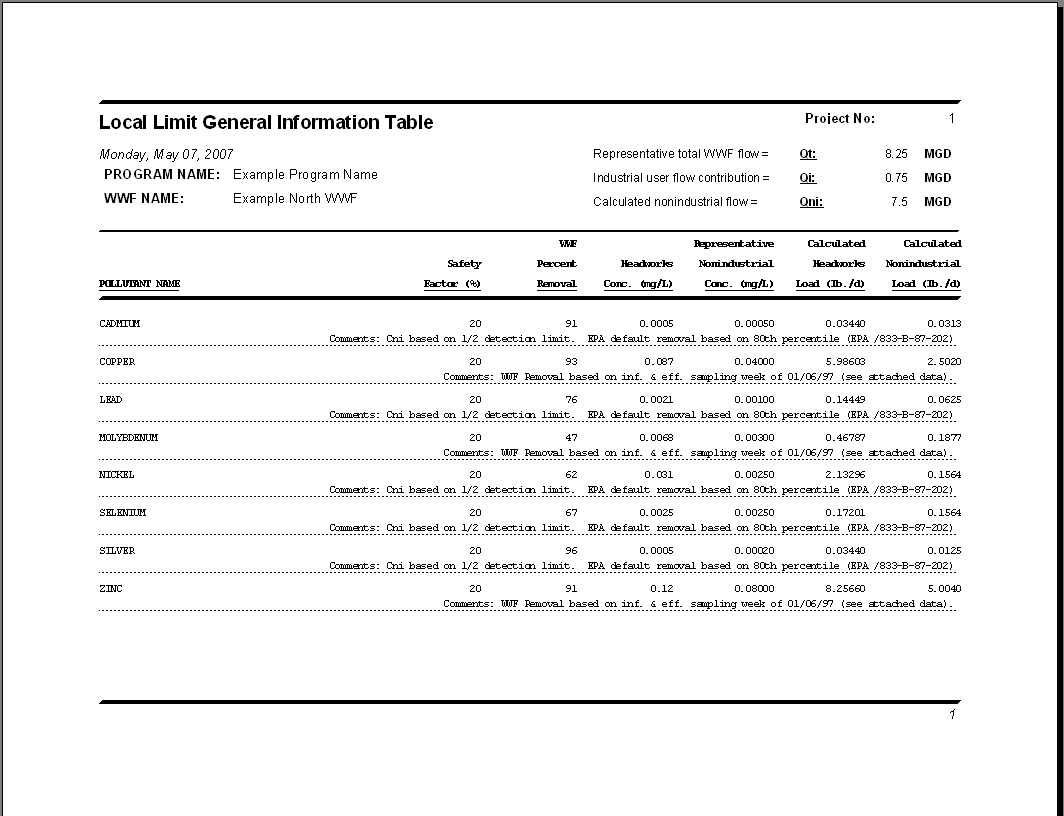
### Pollutant Name.

The pollutants listed in this report are those that were selected by the user on the “Select Pollutants” screen.



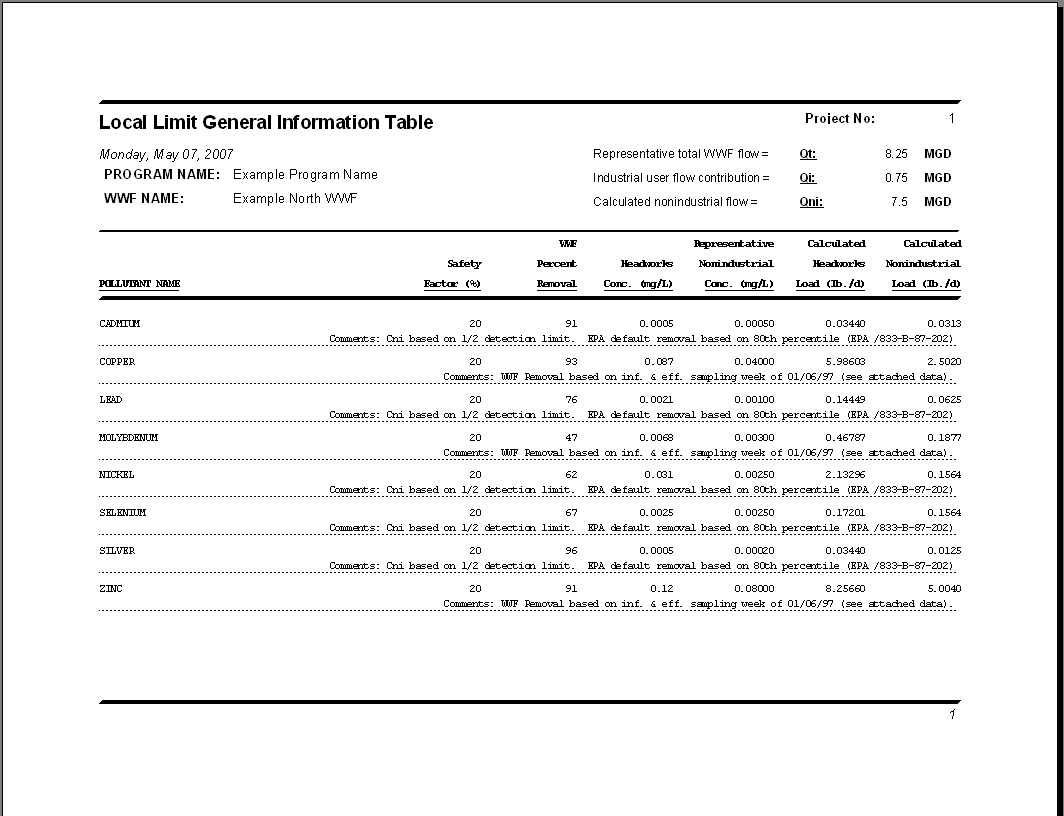
### Safety Factor.

The safety factors listed in this report are the ones that were entered by the user on the “Select Pollutants” screen.



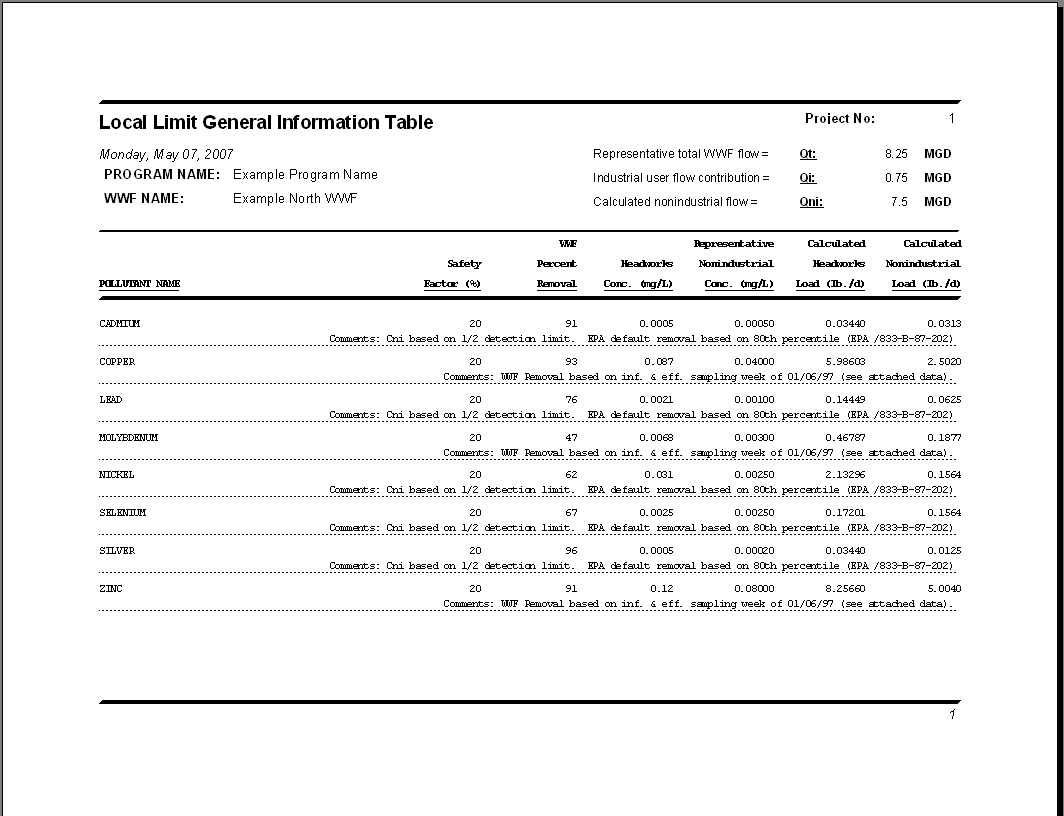
### WWF Percent Removal.

The percents removals listed in this report are the ones that were entered by the user on the “Select Pollutants” screen.



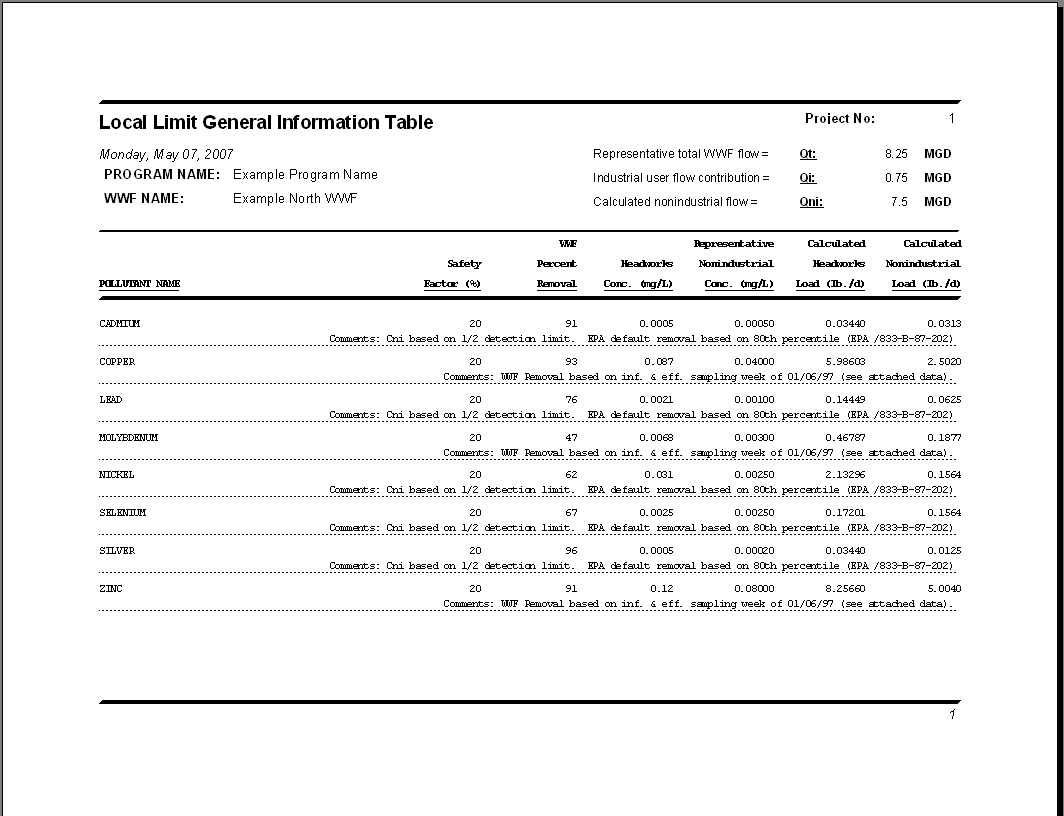
### Headworks Concentration.

This is the average concentration (in mg/L) from the headworks of the plant, the influent sampling location, entered as Chw on the “Select Pollutants” screen.



### Representative Non-Industrial Concentration.

This is the average concentration (in mg/L) from the non-industrial sampling location, the background concentration entered as Cni on the “Select Pollutants” screen.



### Calculated Headworks Load.

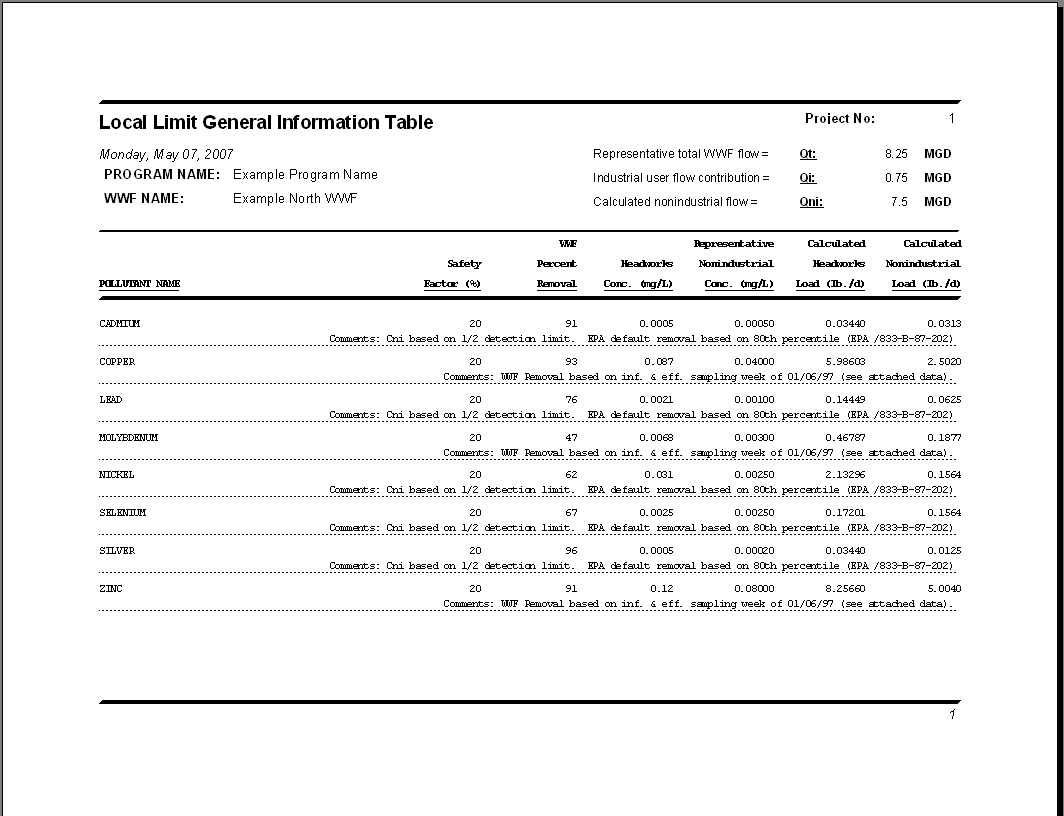
Calculated headworks load is the amount of a particular pollutant in the headworks (influent) on a mass-basis of pounds per day (lb/day). Headworks load is calculated by LLIDS using the following equation:

headworks load equation

Where: HL = headworks loading (lb/day)

Qt = total WWF flow (MGD)

Chw = average influent concentration (mg/L)



### Calculated Non-Industrial Load.

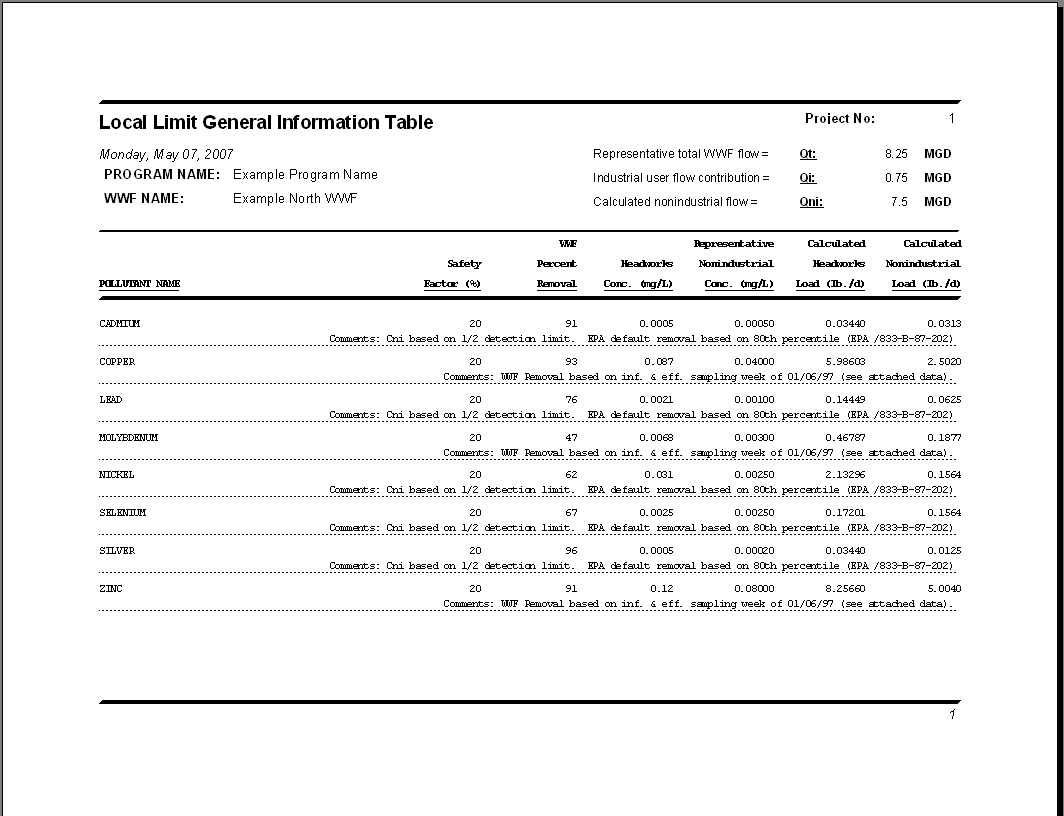
Calculated non-industrial load is the amount of a particular pollutant in the non-industrial wastewater (background) on a mass-basis of pounds per day (lb/day). The non-industrial load is calculated by LLIDS using the following equation:

non-industrial load equation

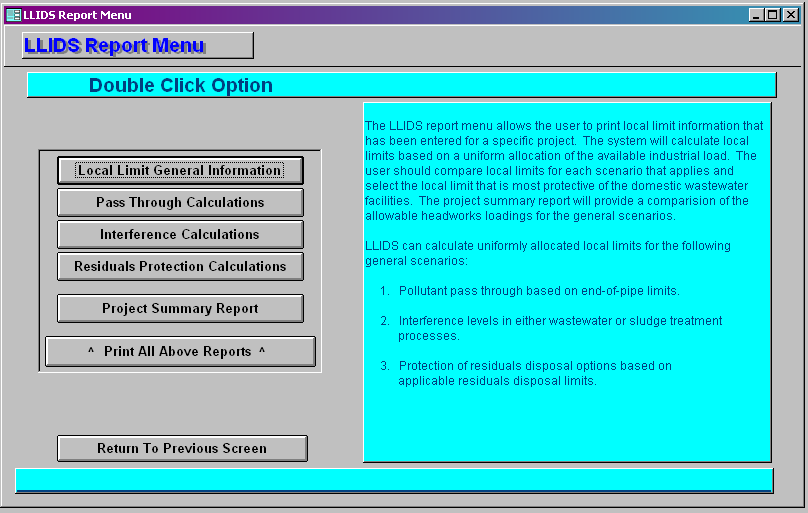
Where: HLni = non-industrial loading (lb/day)

Qni = non-industrial WWF flow (MGD)

Cni = average background concentration (mg/L)



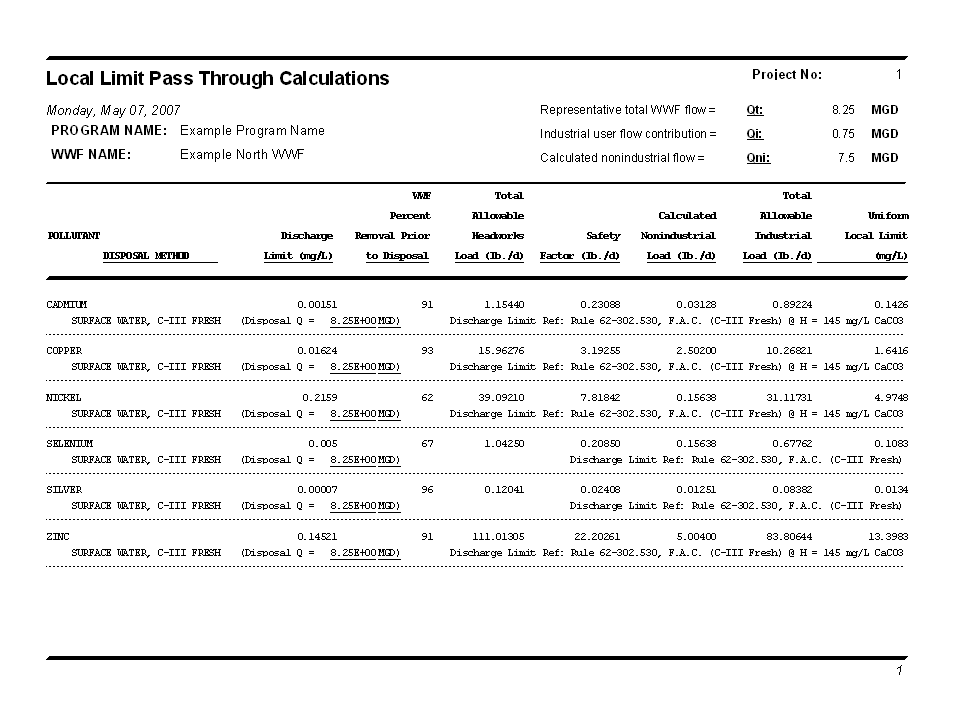
## Pass Through Calculations Report



### Project Information Block

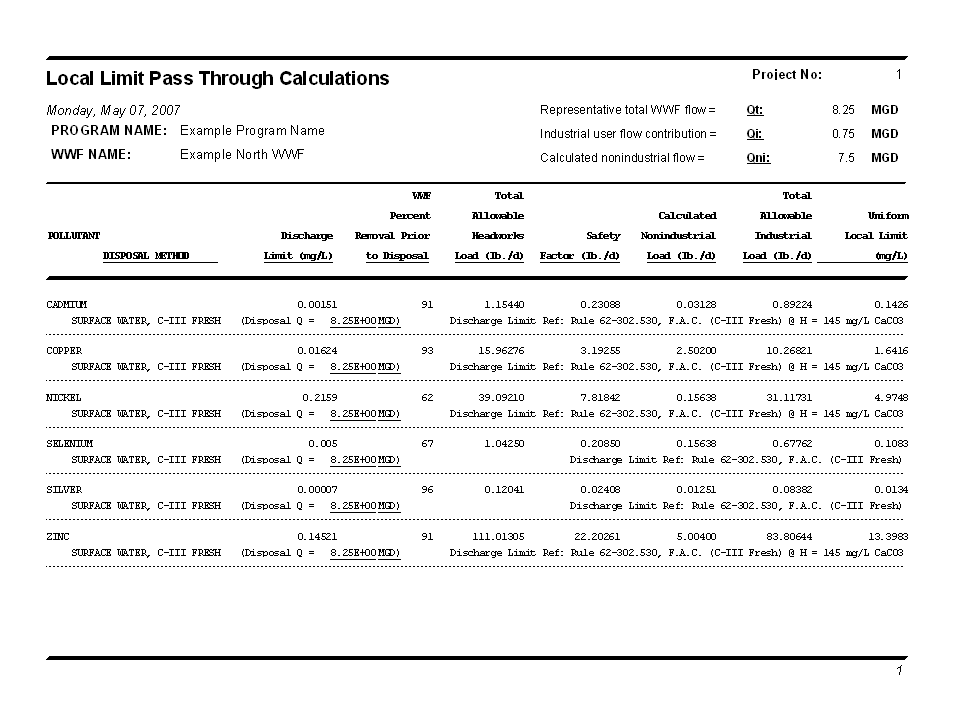
The top of the report sheet lists general information about the project. This includes:

* Report name: “Local Limit Pass Through Calculations;”
* Date report was generated (the date is based on the user’s computer settings);
* Program name, as entered by the user when a new project was created;
* WWF name, as entered by the user when a new project was created;
* The unique project identification number, assigned by the LLIDS program;
* Representative total WWF flow, Qt, entered by the user into the “WWF Information” screen;
* Industrial user flow contribution, Qi, entered by the user into the “WWF Information” screen; and
* Calculated non-industrial flow, value calculated by LLIDS on the “WWF Information” screen.



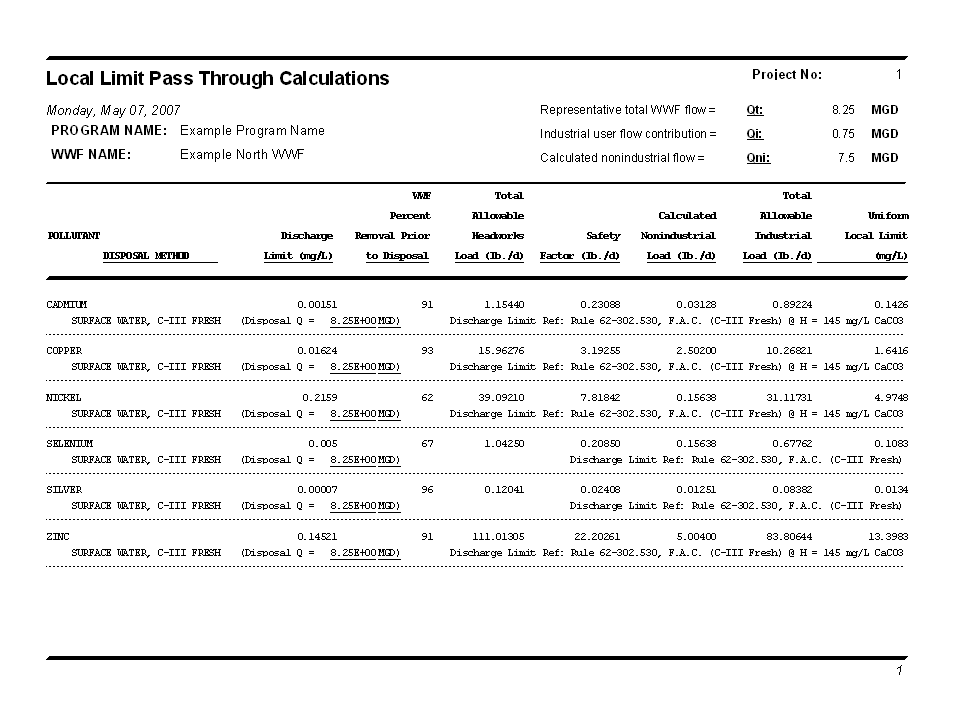
### Pollutant.

The pollutants listed in this report are those that were selected by the user on the “Effluent Disposal Information” screen.



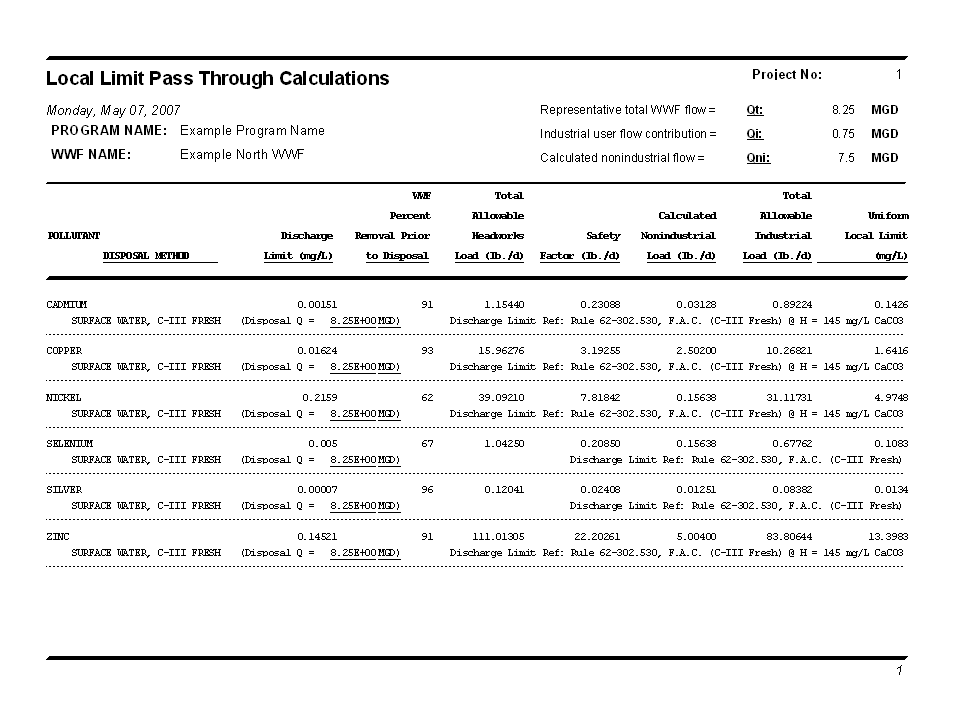
### Disposal Method.

The disposal methods listed in this report are those that were selected by the user on the “Effluent Disposal Information” screen.



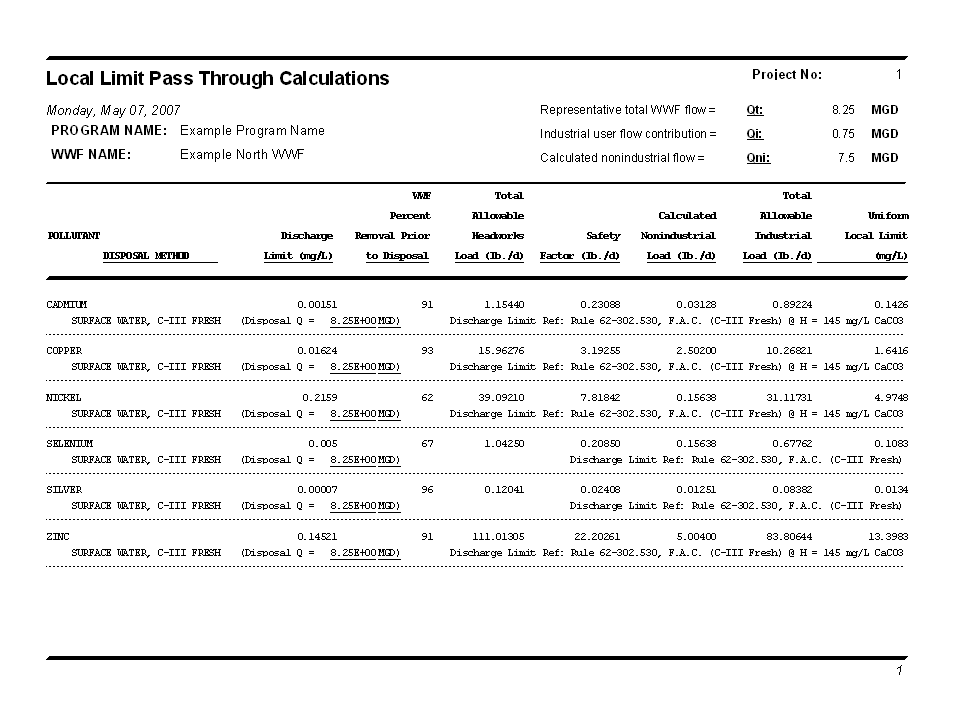
### Discharge Limit.

This value is listed as Cstd on the “Effluent Disposal Information” screen.



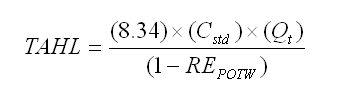
### WWF Percent removal prior to disposal.

These are the removals that were entered by the user into the “Select Pollutants” screen.



### Total Allowable Headworks Load.

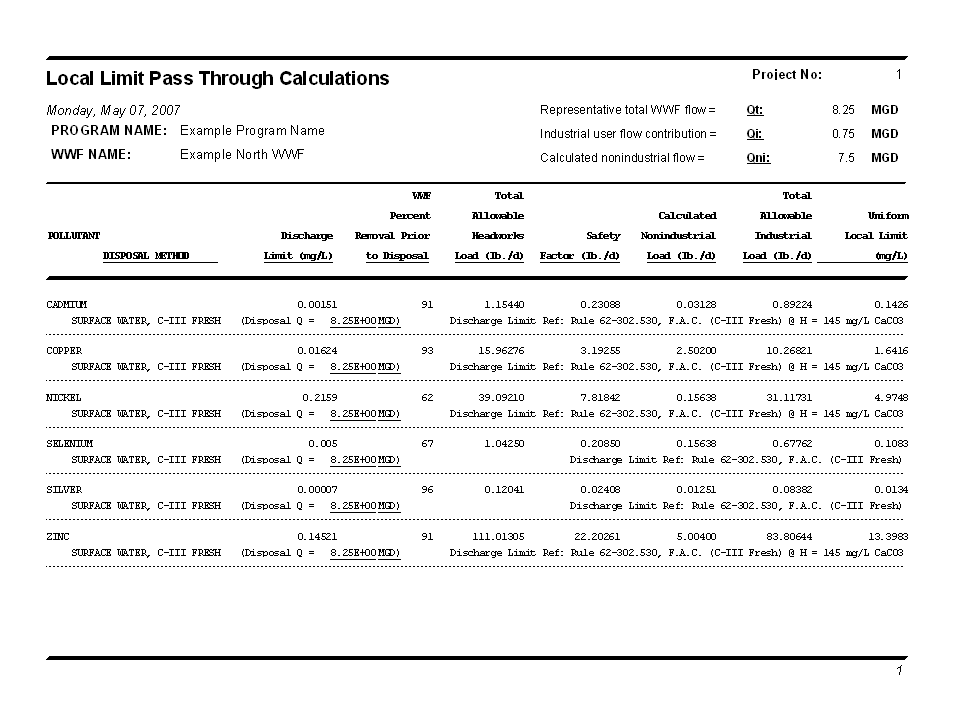
The total allowable headworks load on this report is the maximum amount of a pollutant that a WWF can receive in one day based on the effluent limit the WWF must meet and the removal efficiency of the WWF. Total allowable headworks loading based on water quality discharge limits is calculated as follows:



Where: TAHL= total allowable headworks loading (lb/day)

Cstd = discharge limit (mg/L)

Qt = average wastewater treatment plant flow (MGD)

REPOTW= average removal efficiency (decimal)

### Safety Factor.

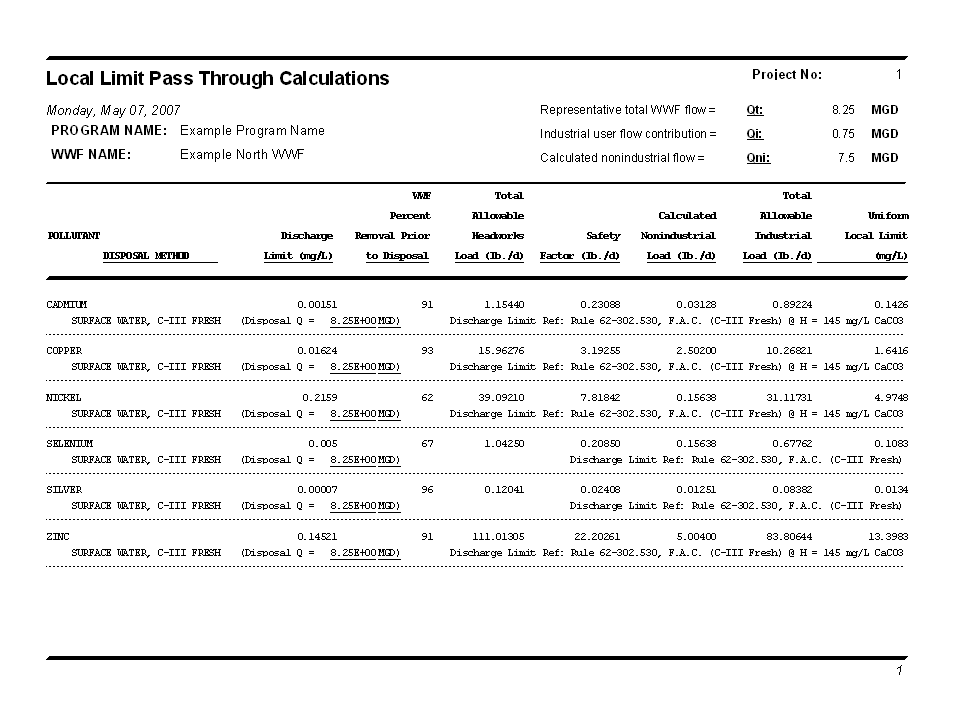
The safety factor loading is calculated as follows:

Safety Factor Equation

Where: SFload = safety factor loading (lb/day)

TAHL = Total allowable headworks loading (lb/day)

SF = safety factor (decimal)



### Calculated Non-Industrial Load.

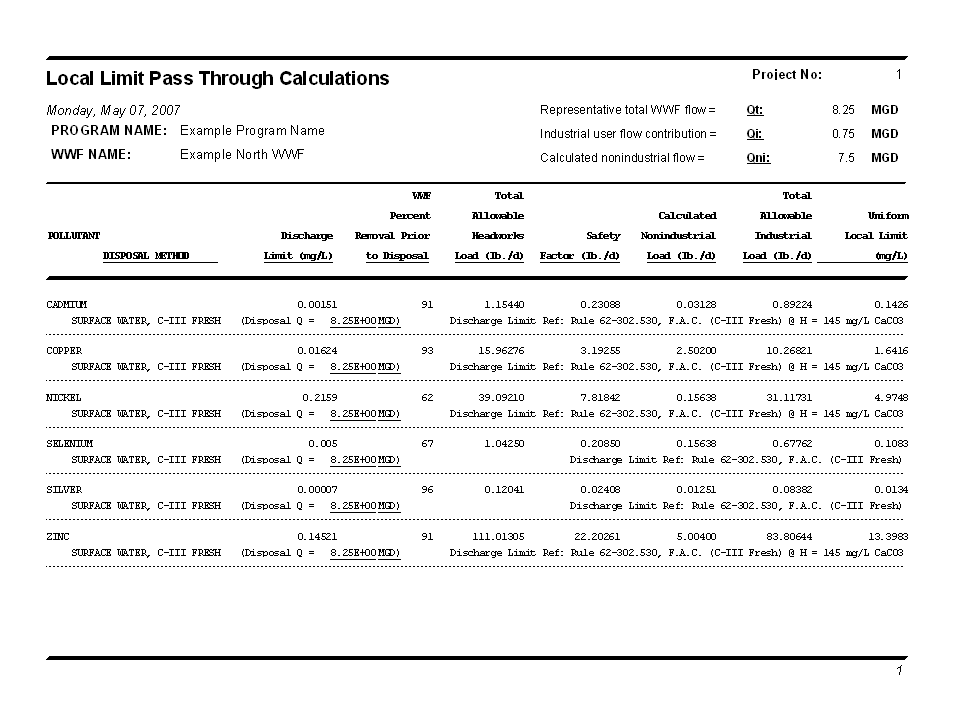
This is the same value as reported on the General Information Report. The non-industrial load is calculated by LLIDS using the following equation:

non-industrial load equation

Where: HLni = non-industrial loading (lb/day)

Qni = non-industrial WWF flow (MGD)

Cni = average background concentration (mg/L)



### Total Allowable Industrial Load.

Once the TAHL is determined for pass-through, the non-industrial loading and safety factor allowances are subtracted from the TAHL to determine the total allowable industrial loadings (TAIL), as follows:

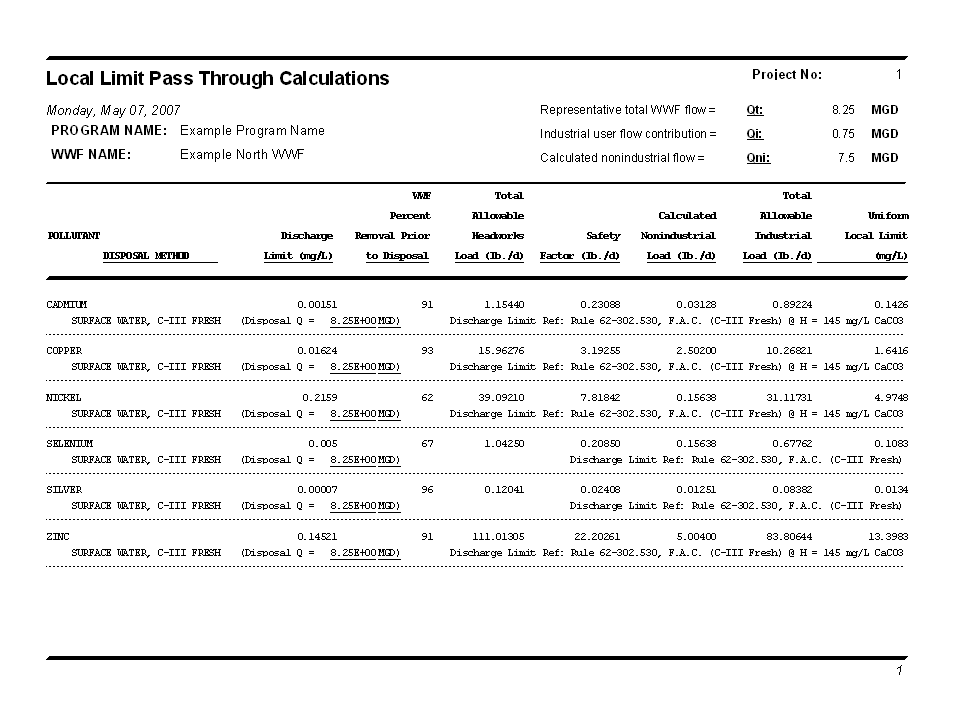
total allowable industrial load equation

Where: TAIL= total allowable industrial loading (lbs/day)

TAHL= total allowable headworks loading (lbs/day)

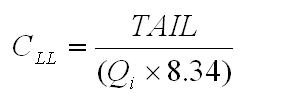
HLni = non-industrial loading (lb/day)

SFload = safety factor loading (lb/day)



### Uniform Local Limit.

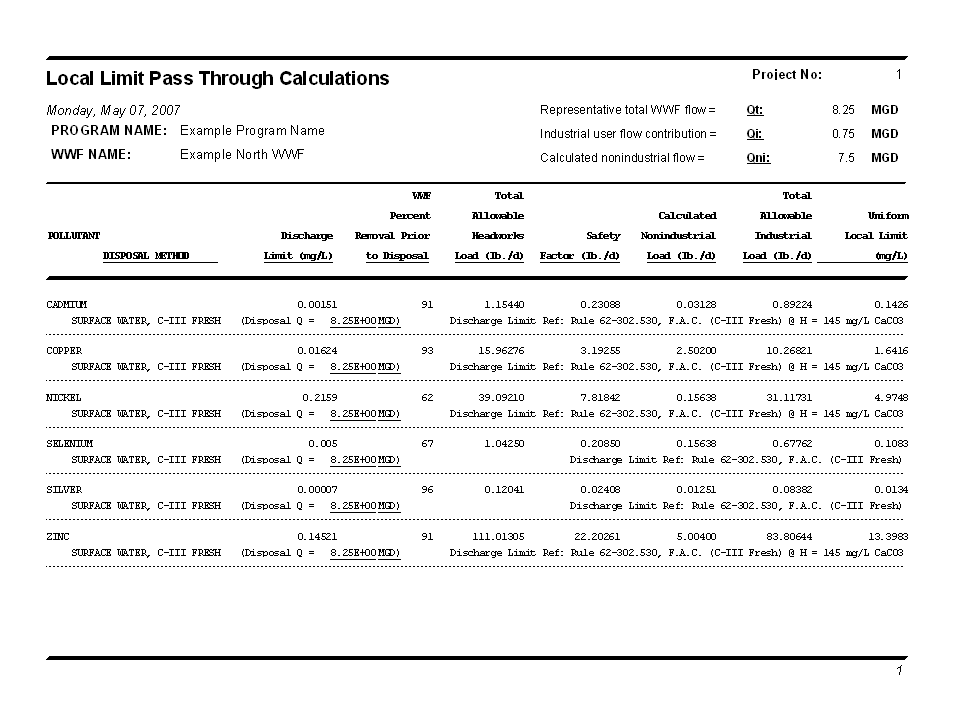
Once the TAIL is determined for pass through, LLIDS calculates a uniform local limit based on the total industrial user flow, as follows:



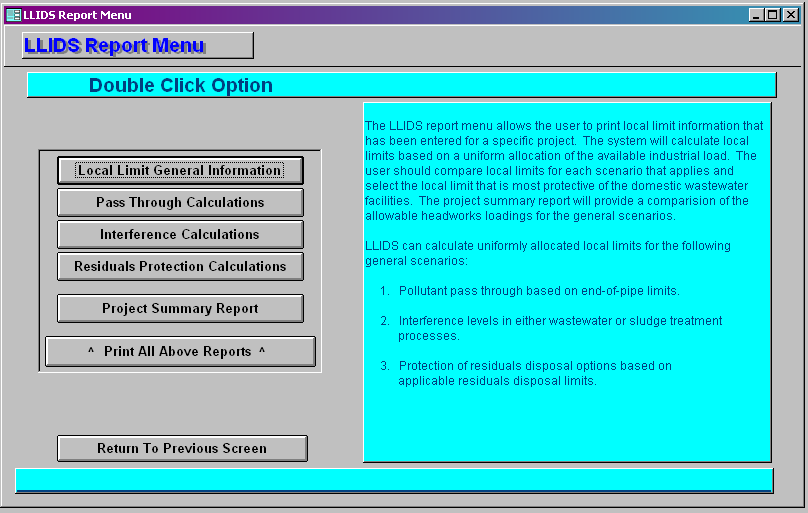
Where: CLL = local limit in concentration (mg/L)

TAIL = total allowable industrial loading (lbs/day)

Qi = industrial user flow (MGD)



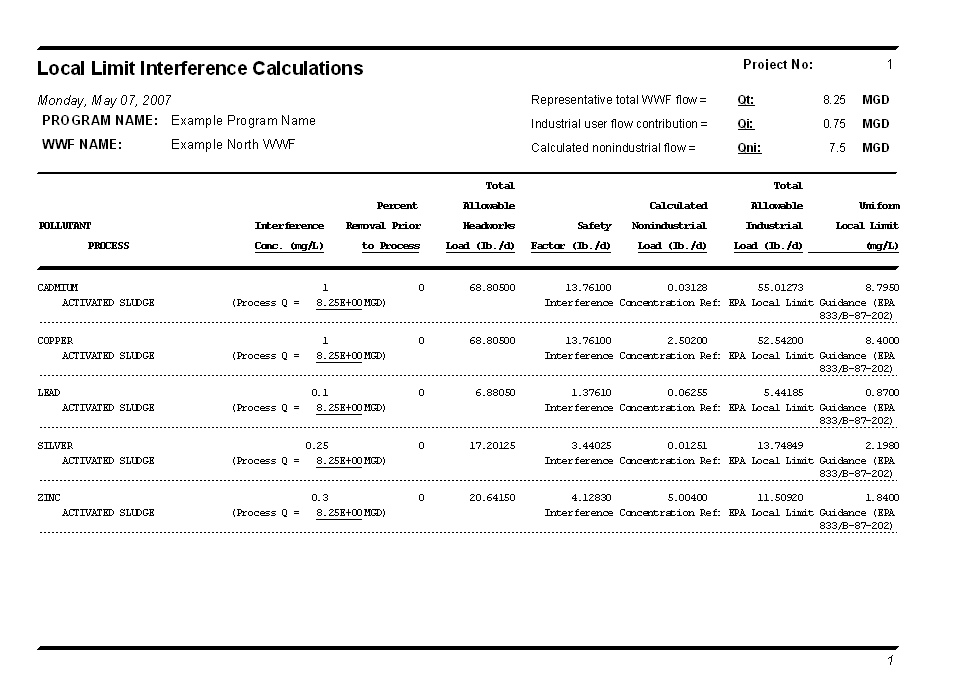
## Interference Calculations Report



### Project Information Block

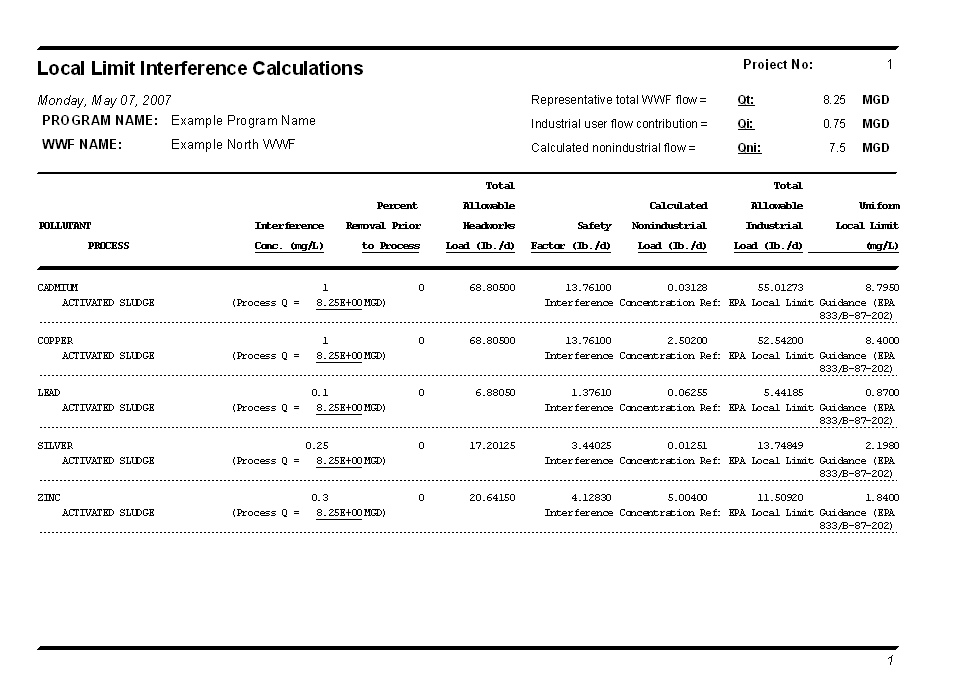
The top of the report sheet lists general information about the project. This includes:

* Report name: “Local Limit Interference Calculations;”
* Date report was generated (the date is based on the user’s computer settings);
* Program name, as entered by the user when a new project was created;
* WWF name, as entered by the user when a new project was created;
* The unique project identification number, assigned by the LLIDS program;
* Representative total WWF flow, Qt, entered by the user into the “WWF Information” screen;
* Industrial user flow contribution, Qi, entered by the user into the “WWF Information” screen; and
* Calculated non-industrial flow, value calculated by LLIDS on the “WWF Information” screen.



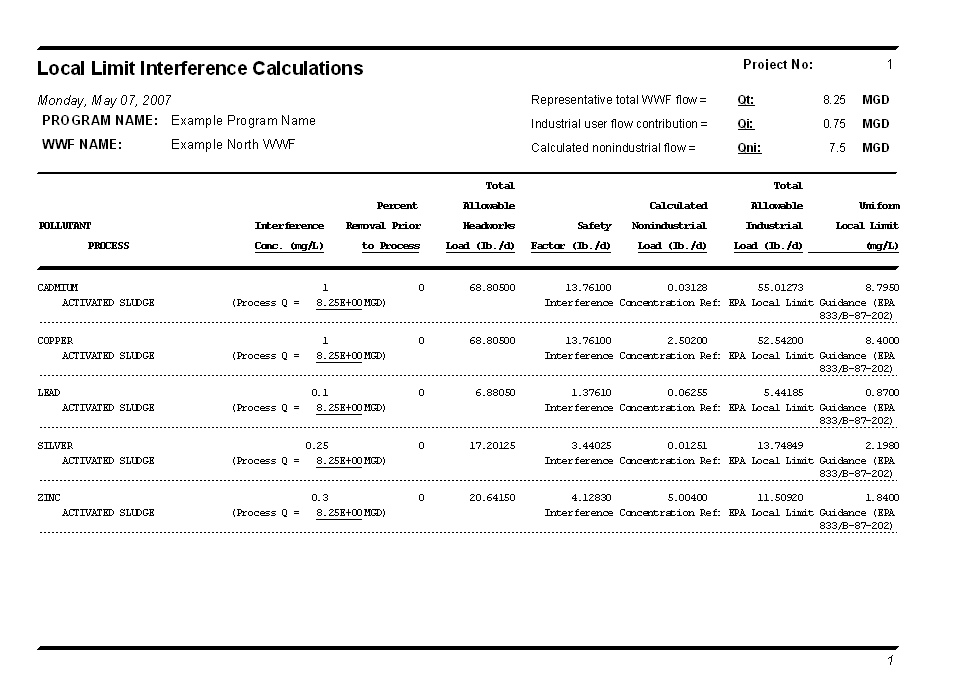
### Pollutant.

The pollutants listed in this report are those that were selected by the user on the “Process Information” screen.



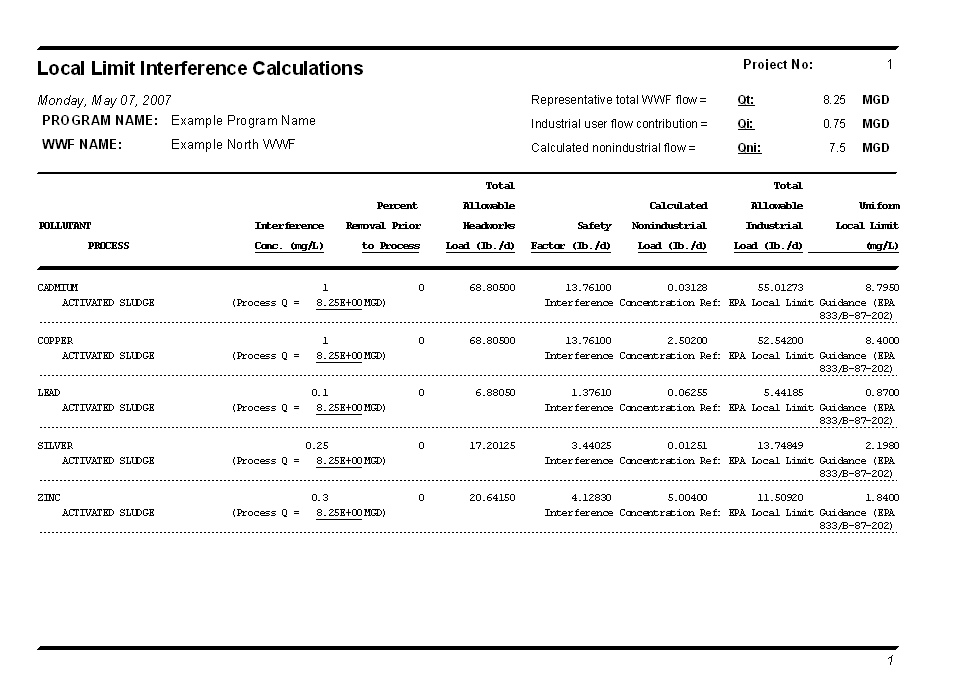
### Process.

The processes listed in this report are those that were selected by the user on the “Process Information” screen.



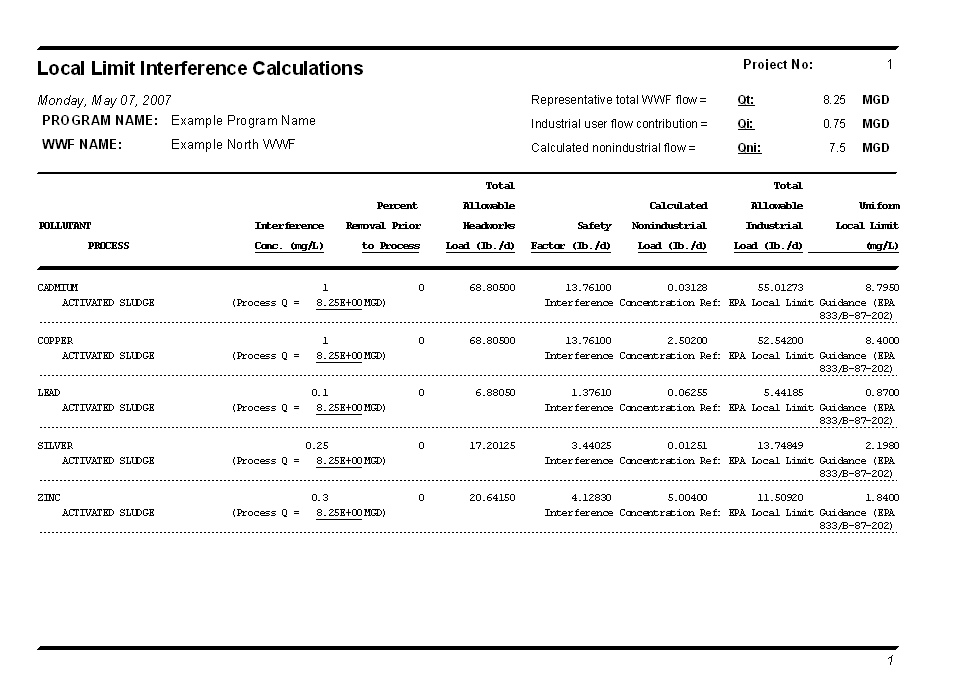
### Interference Concentration.

This is the value that is listed as Cup on the “Process Information” screen.



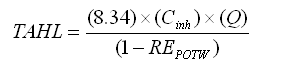
### Percent Removal Prior to Process.

This is the value entered by the user into the “Process Information” screen. This is usually left as zero for all pollutants.



### Total Allowable headworks load.

The total allowable headworks load on this report is the maximum amount of a pollutant that a WWF can receive in one day based on the inhibition limit where any concentrations greater than the inhibition limit may cause interference problems at the WWF and based on the removal efficiency of the WWF. Total allowable headworks loading based on inhibition limits is calculated as follows:

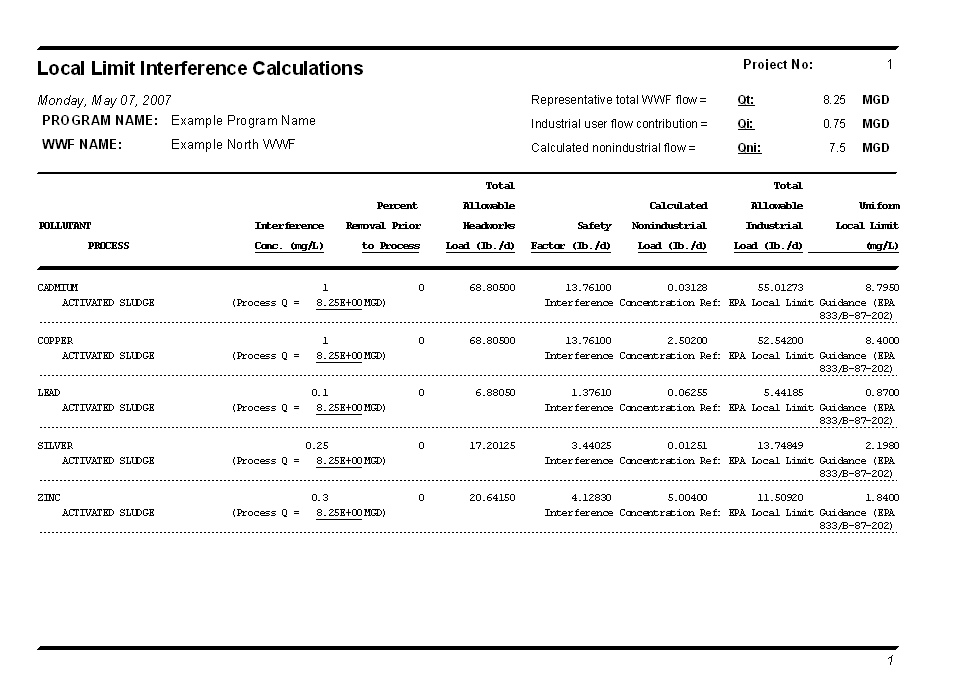


Where: TAHL= total allowable headworks loading (lbs/day)

Cinh = inhibition limit (mg/L)

Q= average wastewater treatment plant flow (MGD)

REPOTW= removal efficiency of primary treatment (decimal) (usually assumed to be zero)



### Safety Factor.

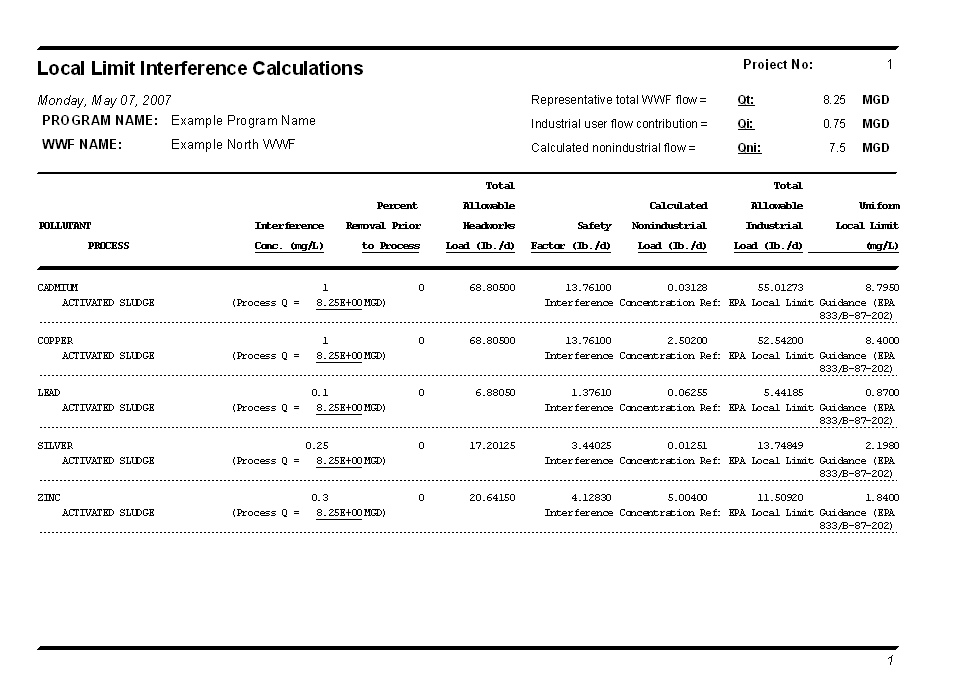
The safety factor loading is calculated as follows:

Safety Factor Equation

Where: SFload = safety factor loading (lb/day)

TAHL = Total allowable headworks loading (lb/day)

SF = safety factor (decimal)



### Calculated Non-Industrial Load.

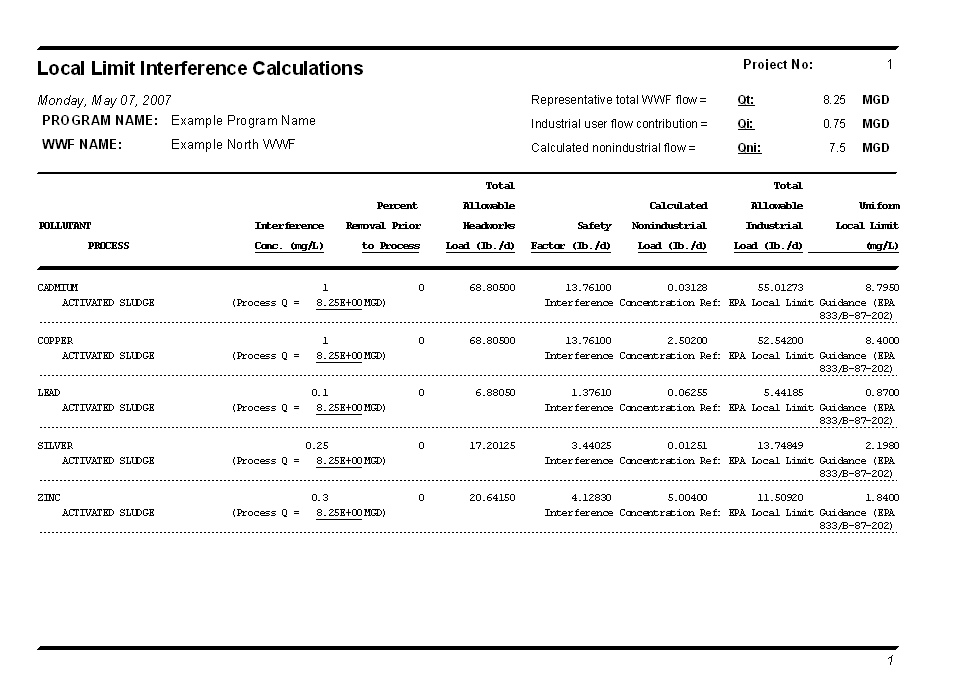
This is the same value as reported on the General Information Report. The non-industrial load is calculated by LLIDS using the following equation:

non-industrial load equation

Where: HLni = non-industrial loading (lb/day)

Qni = non-industrial WWF flow (MGD)

Cni = average background concentration (mg/L)



### Total Allowable Industrial Load.

Once the TAHL is determined for interference, the non-industrial loading and safety factor allowances are subtracted from the TAHL to determine the total allowable industrial loadings (TAIL), as follows:

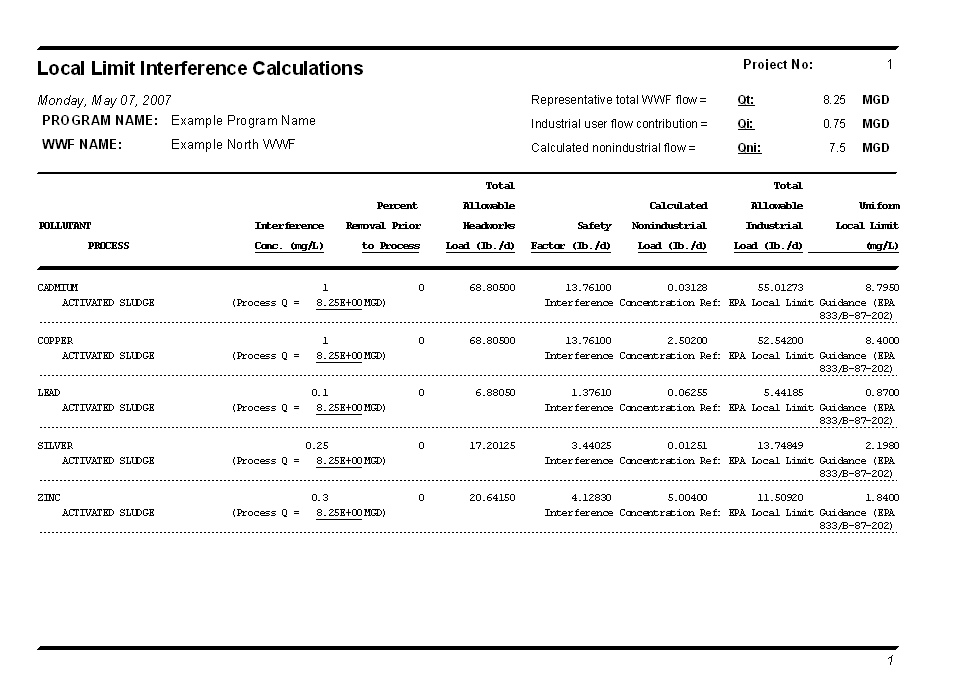
total allowable industrial load equation

Where: TAIL= total allowable industrial loading (lbs/day)

TAHL= total allowable headworks loading (lbs/day)

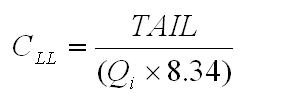
HLni = non-industrial loading (lb/day)

SFload = safety factor loading (lb/day)



### Uniform Local Limit.

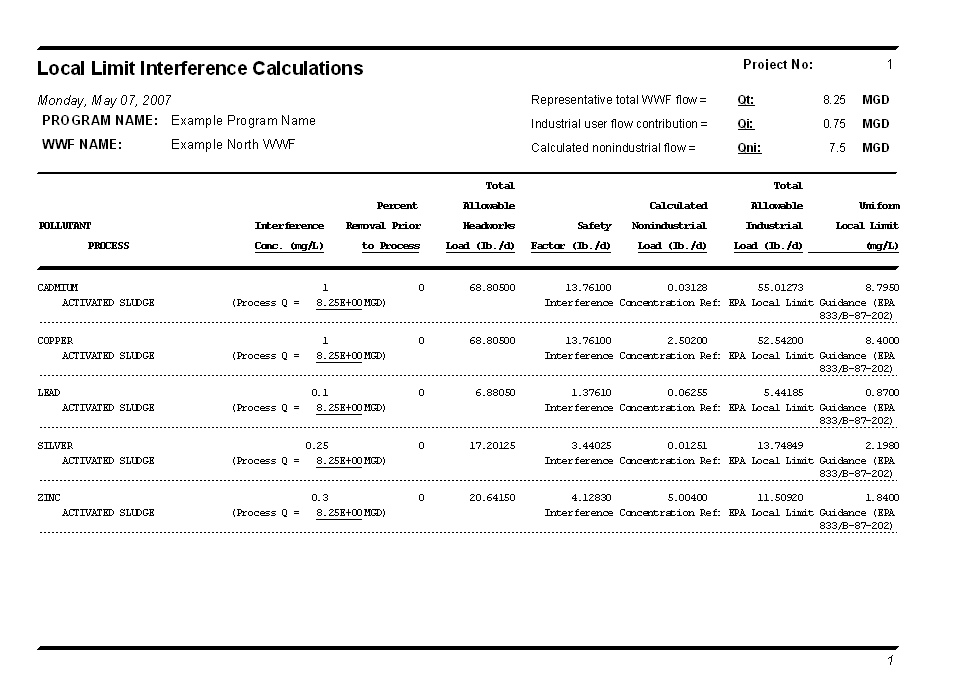
Once the TAIL is determined for interference, LLIDS calculates a uniform local limit based on the total industrial user flow, as follows:



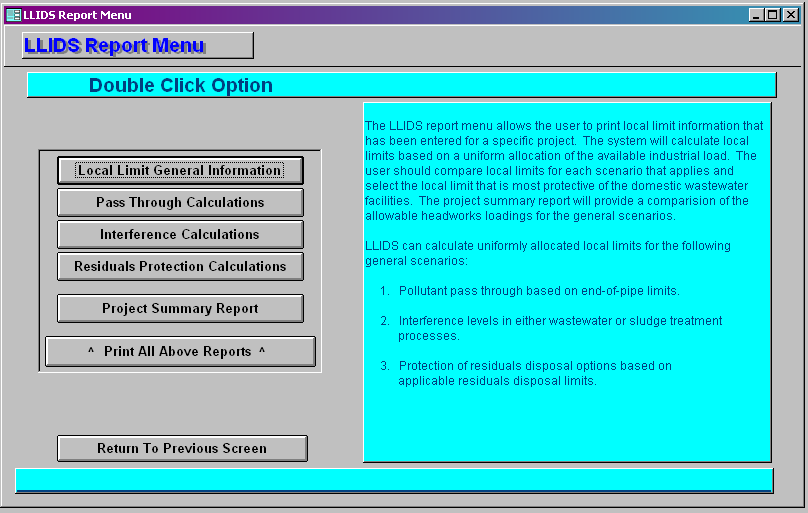
Where: CLL = local limit in concentration (mg/L)

TAIL = total allowable industrial loading (lbs/day)

Qi = industrial user flow (MGD)



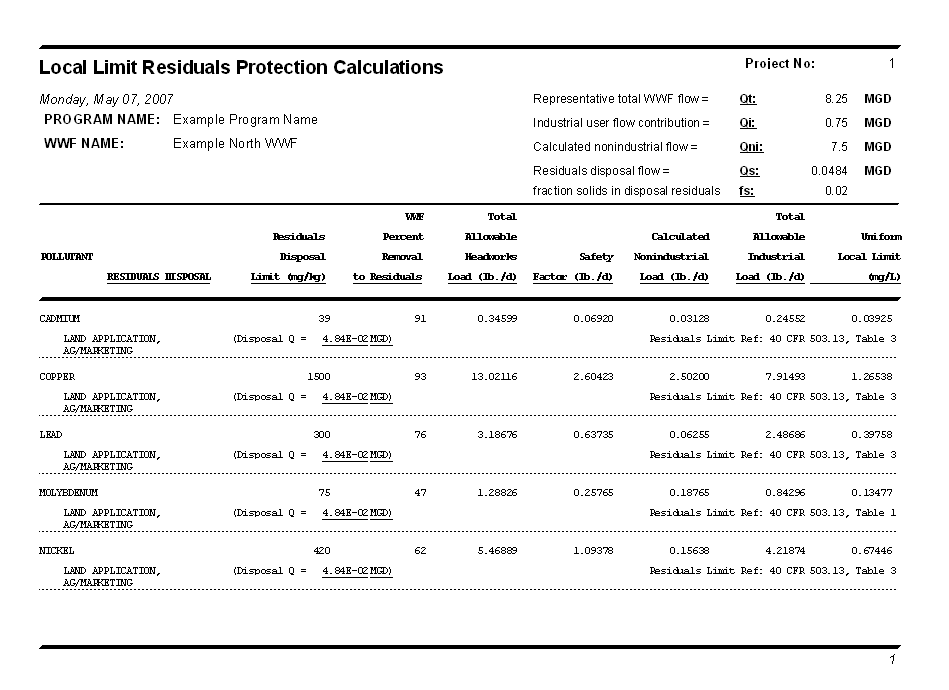
## Residuals Protection Calculation Report



### Project Information Block

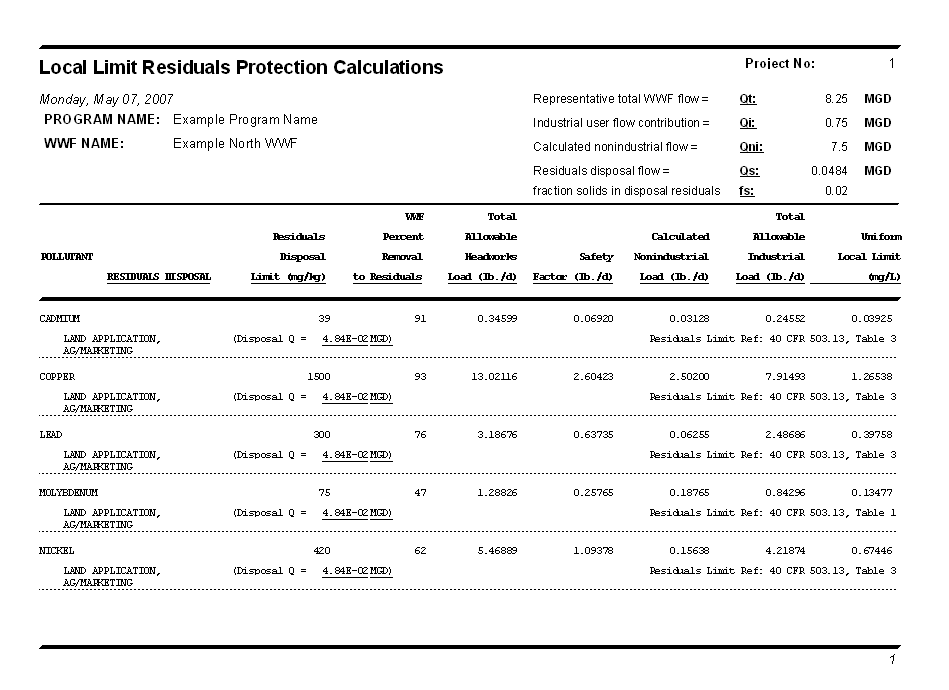
The top of the report sheet lists general information about the project. This includes:

* The report name: “Local Limit Residuals Protection Calculations;”
* Date report was generated (the date is based on the user’s computer settings);
* Program name, as entered by the user when a new project was created;
* WWF name, as entered by the user when a new project was created;
* The unique project identification number, assigned by the LLIDS program;
* Representative total WWF flow, Qt, entered by the user in the WWF Information screen;
* Industrial user flow contribution, Qi, entered by the user in the WWF information screen;
* Calculated non-industrial flow, value calculated by LLIDS in the WWF Information screen;
* Residuals disposal flow, Qs, entered by the user into the “WWF Information” screen; and
* Fraction solids in disposal residuals, fs, entered as “% solids to disposal” by the user in the “WWF Information” screen.



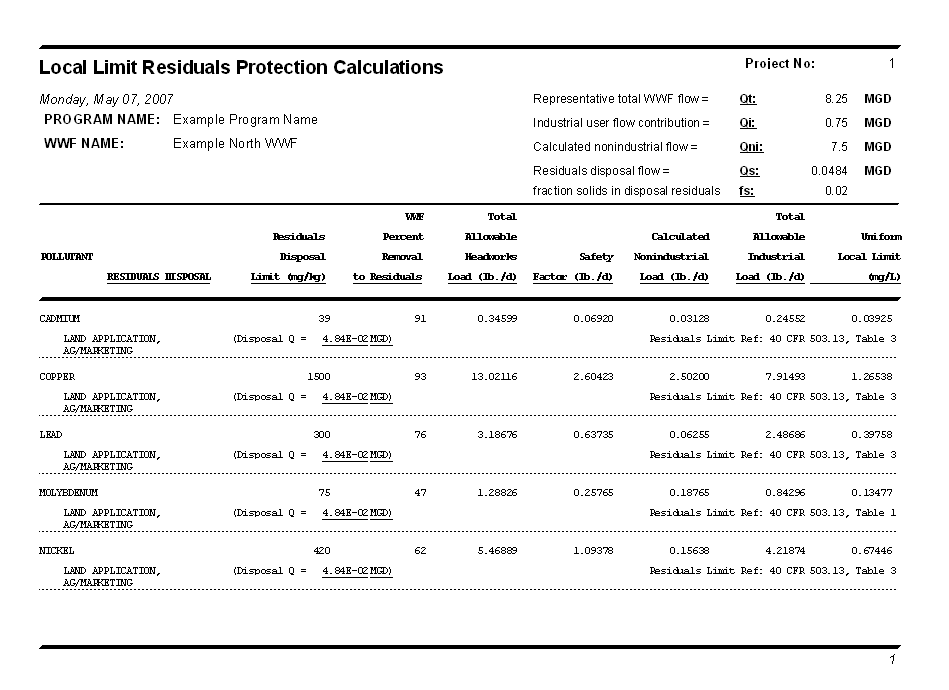
### Pollutant.

The pollutants listed in this report are those that were selected by the user on the “Residuals Disposal Information” screen.



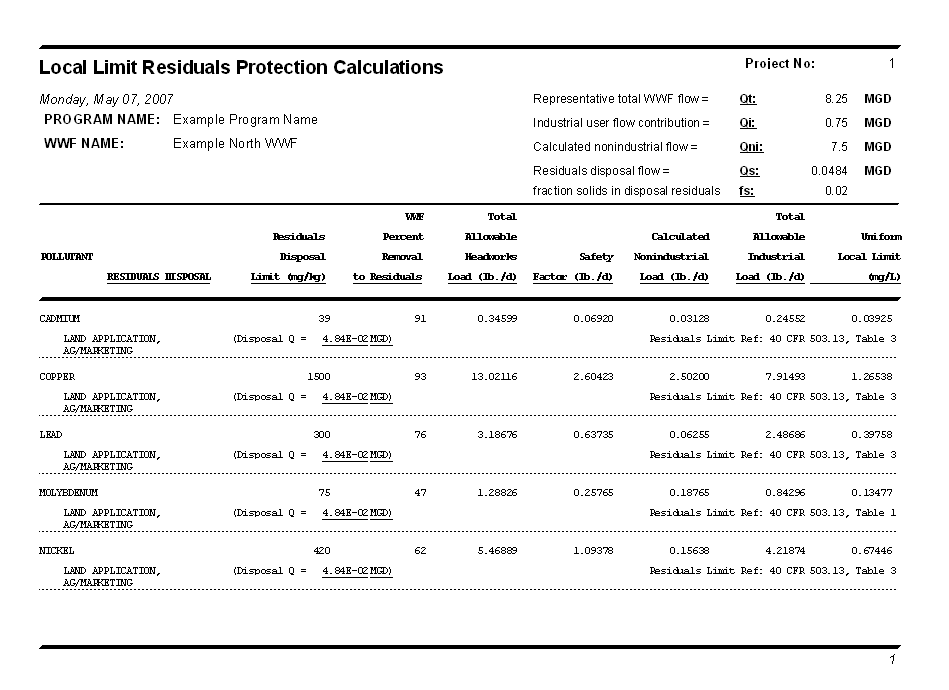
### Residuals Disposal.

The disposal methods listed in this report are those that were selected by the user on the “Residuals Disposal Information” screen.



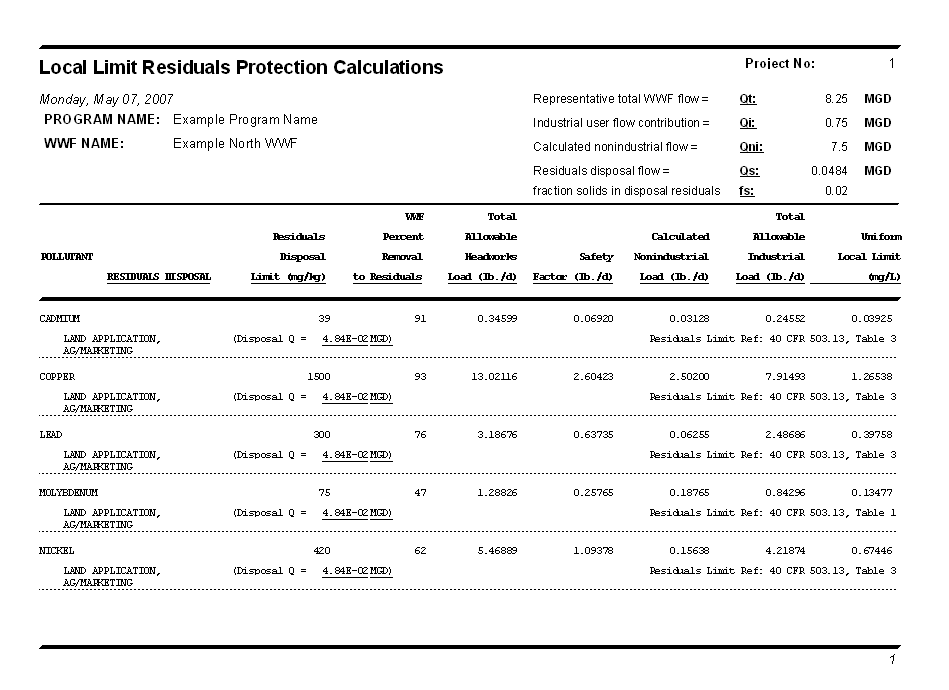
### Residuals Disposal Limit.

This is the value listed as Clim on the “Residuals Disposal Information” screen.



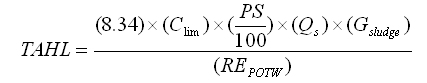
### WWF Percent Removal to Residuals.

This value is entered by the user into the “Process Information” screen.



### Total Allowable Headworks Load.

The total allowable headworks load on this report is the maximum amount of a pollutant that a WWF can receive in one day based on the residuals limit the WWF must meet and the removal efficiency of the WWF. Total allowable headworks loading based on residuals limits is calculated as follows:



Where: TAHL= allowable headworks loading (lb/day)

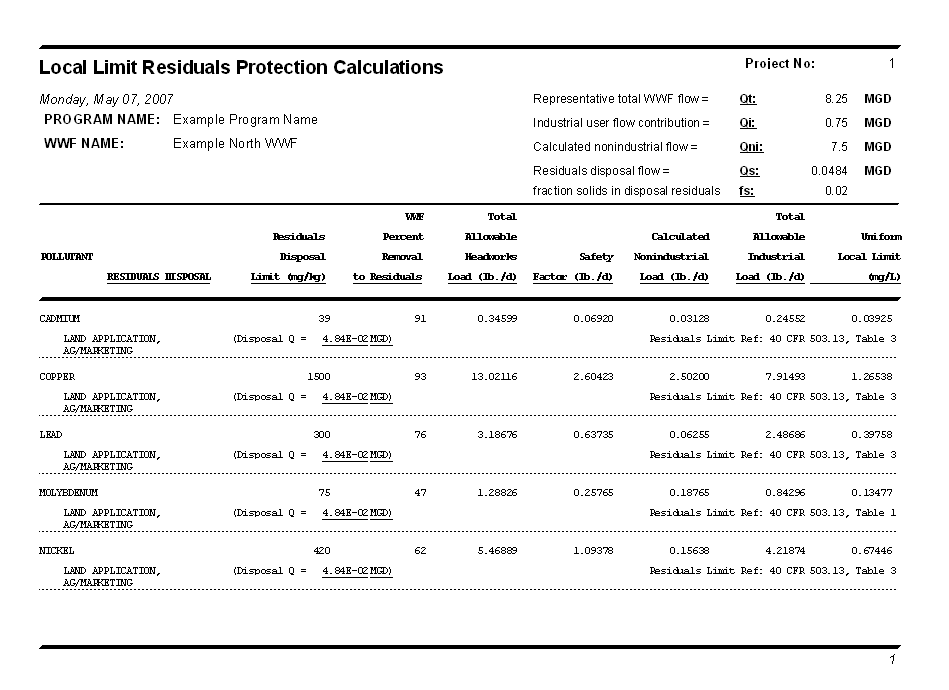
Clim = sludge land application limit (mg/kg)

PS= percent solids of sludge to disposal

Qs = sludge flow rate to disposal (MGD)

Gsludge = specific gravity of sludge (kg/L) (LLIDS uses a value of 1)

REPOTW= average removal efficiency (decimal)



### Safety Factor.

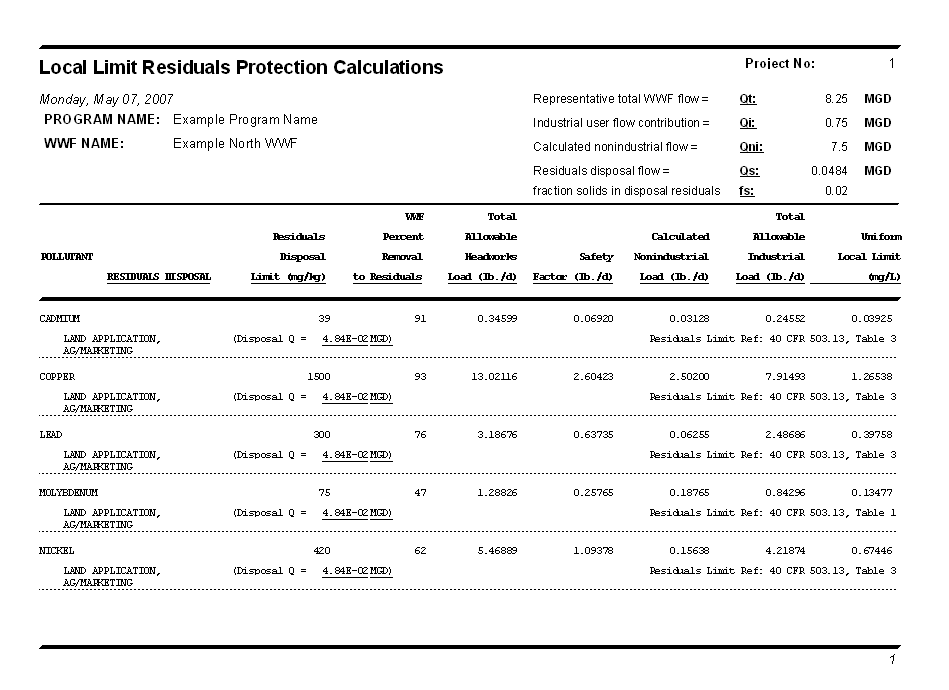
The safety factor loading is calculated as follows:

Safety Factor Equation

Where: SFload = safety factor loading (lb/day)

TAHL = Total allowable headworks loading (lb/day)

SF = safety factor (decimal)



### Calculated Non-Industrial Load.

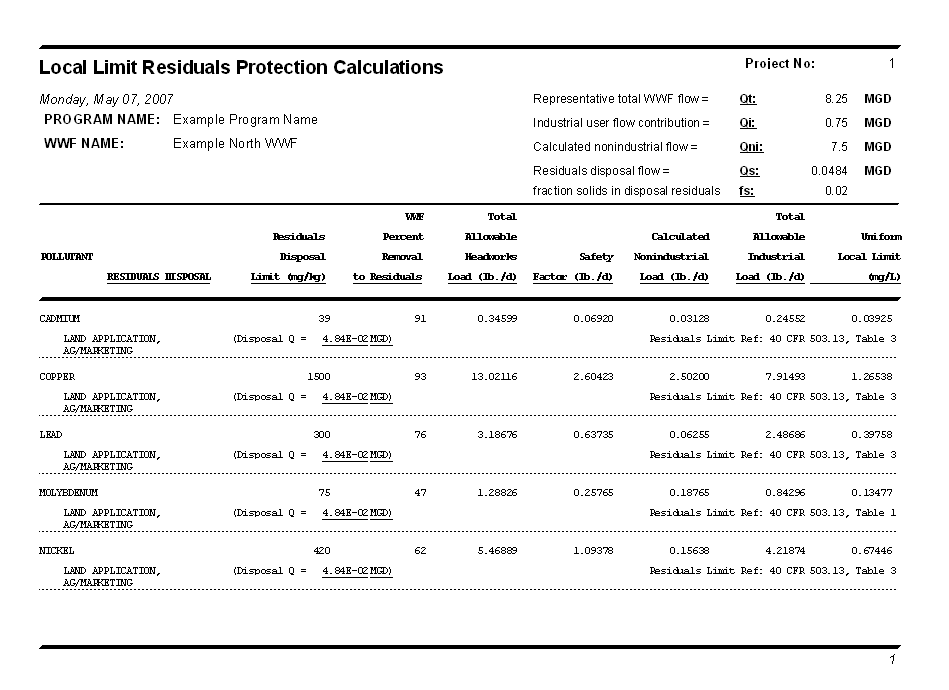
This is the same value as reported on the General Information Report. The non-industrial load is calculated by LLIDS using the following equation:

non-industrial load equation

Where: HLni = non-industrial loading (lb/day)

Qni = non-industrial WWF flow (MGD)

Cni = average background concentration (mg/L)



### Total Allowable Industrial Load.

Once the TAHL is determined for residuals, the non-industrial loading and safety factor allowances are subtracted from the TAHL to determine the total allowable industrial loadings (TAIL), as follows:

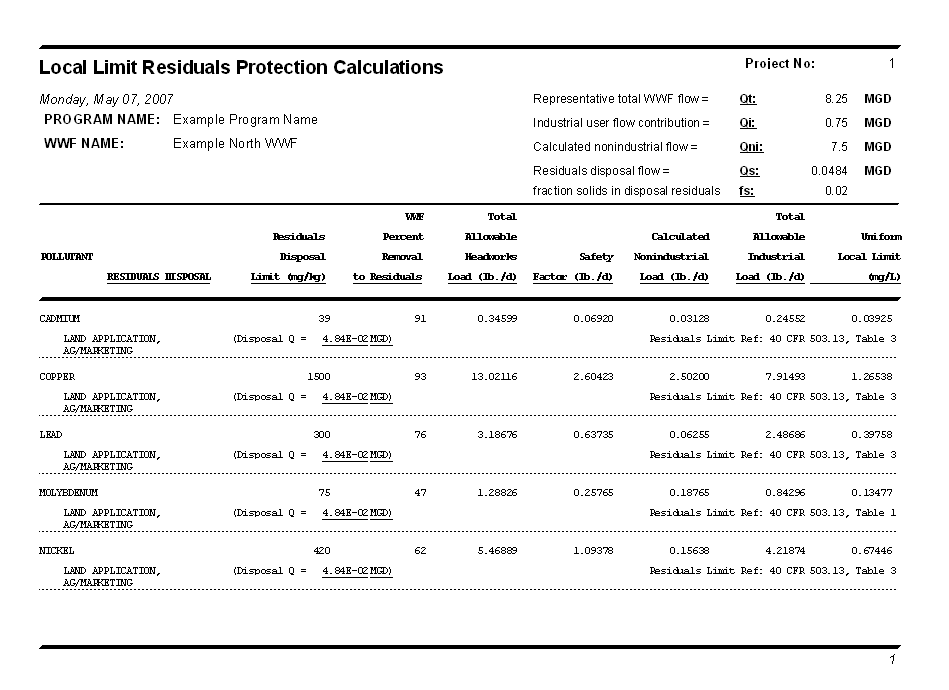
total allowable industrial load equation

Where: TAIL= total allowable industrial loading (lbs/day)

TAHL= total allowable headworks loading (lbs/day)

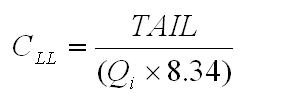
HLni = non-industrial loading (lb/day)

SFload = safety factor loading (lb/day)



### Uniform Local Limit.

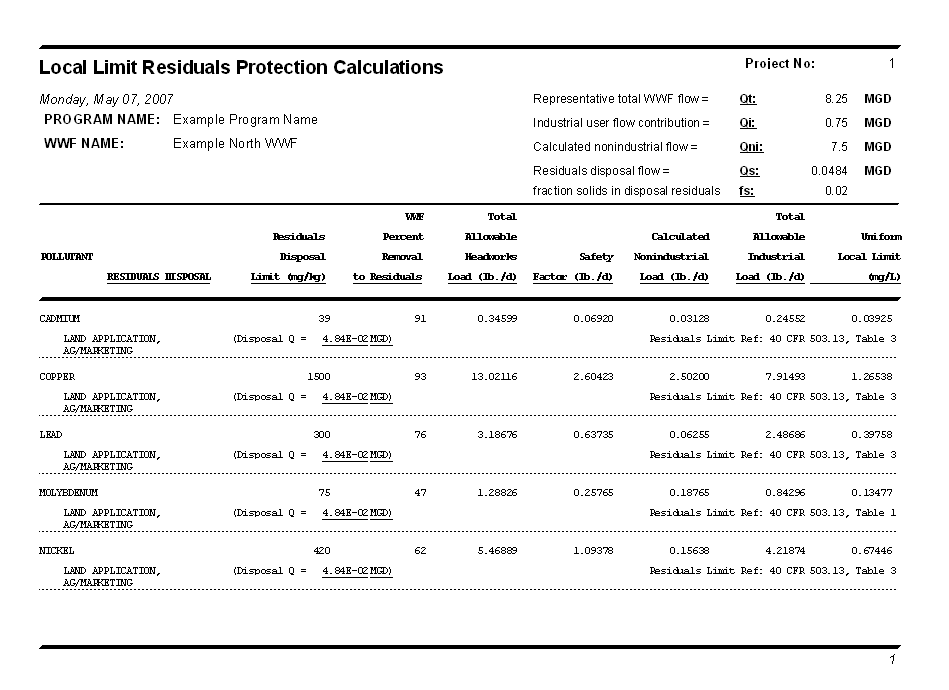
Once the TAIL is determined for residuals, LLIDS calculates a uniform local limit based on the total industrial user flow, as follows:



Where: CLL = local limit in concentration (mg/L)

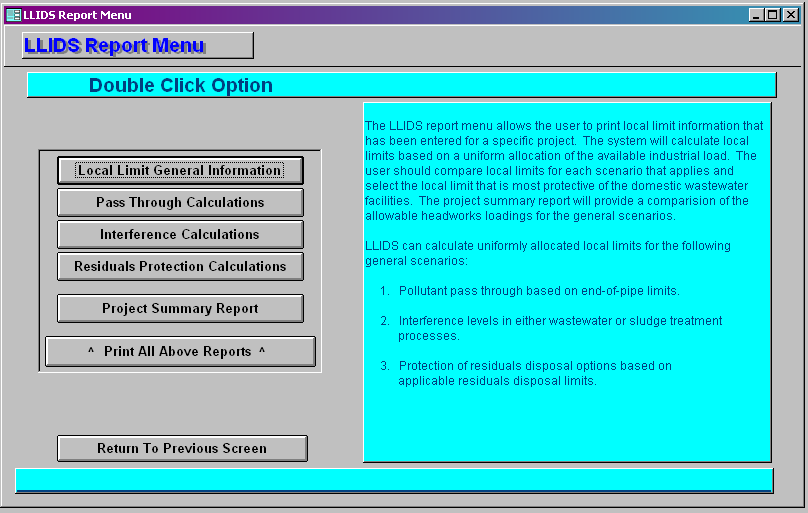
TAIL = total allowable industrial loading (lbs/day)

Qi = industrial user flow (MGD)

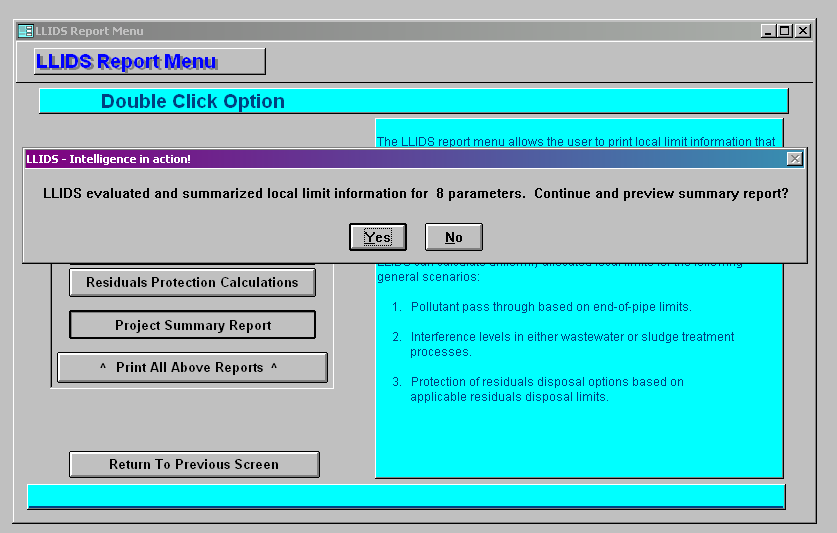


## Project Summary Report

This report summarizes the calculations conducted by the other reports, determines the most limiting TAHL, and determines the resultant uniform local limit based on the most limiting TAHL.



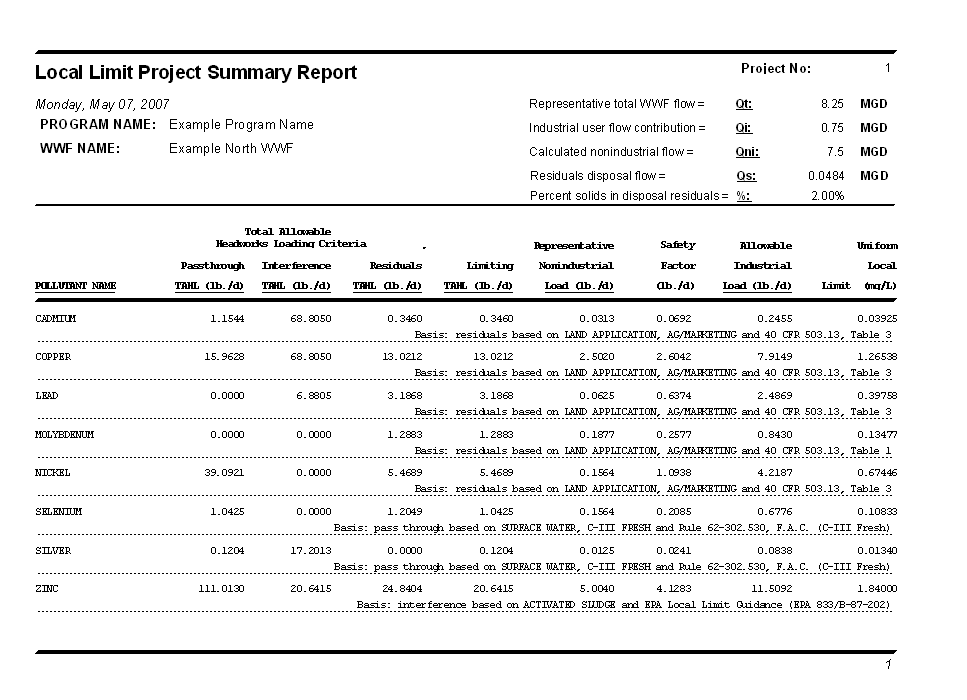
Calculations and comparison of the local limits are conducted when report button is clicked.



### Project Information Block

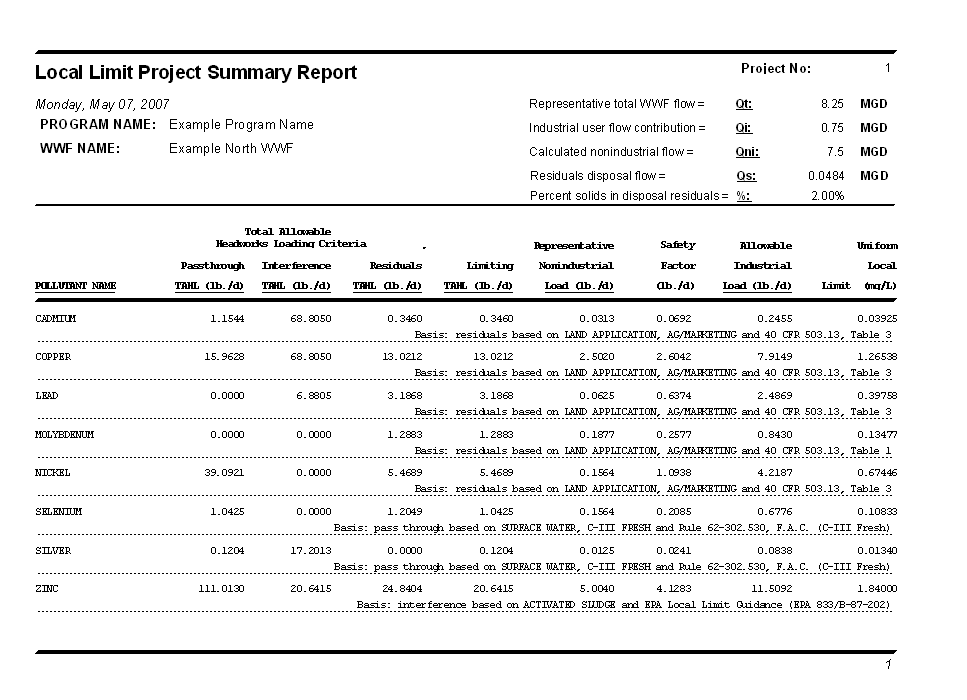
The top of the report sheet lists general information about the project. This includes:

* The report name: “Local Limit General Information Table;”
* Date report was generated (the date is based on the user’s computer settings);
* Program name, as entered by the user when a new project was created;
* WWF name, as entered by the user when a new project was created;
* The unique project identification number, assigned by the LLIDS program;
* Representative total WWF flow, Qt, entered by the user into the WWF Information screen;
* Industrial user flow contribution, Qi, entered by the user into the WWF information screen; and
* Calculated non-industrial flow, value calculated by LLIDS in the WWF Information screen;
* Residuals disposal flow, Qs, entered by the user into the “WWF Information” screen; and
* Percent solids in disposal residuals, %, entered by the user in the “WWF Information” screen.



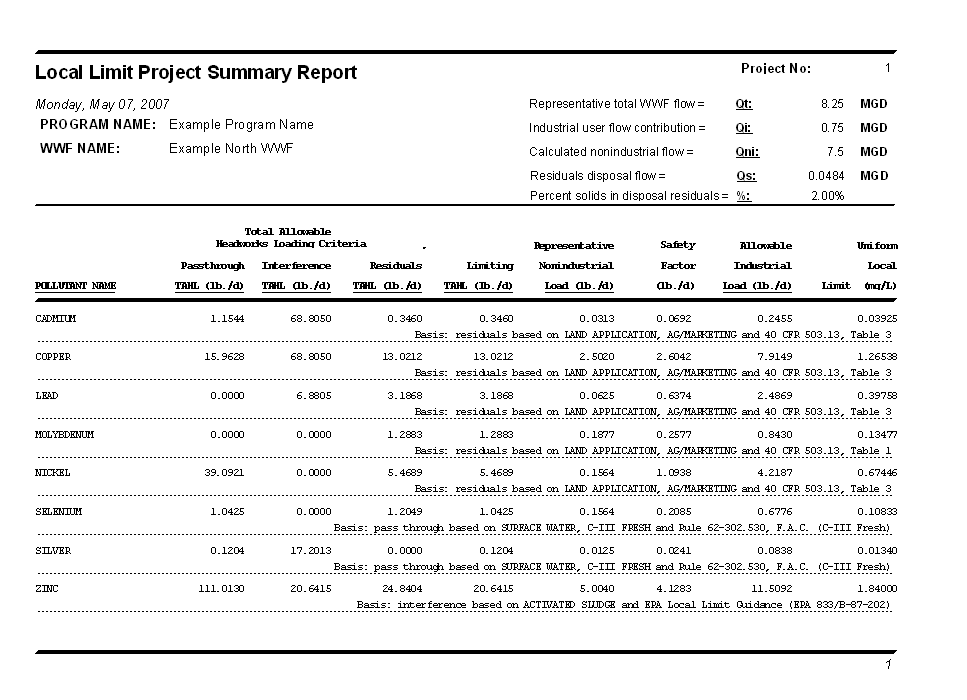
### Pollutant Name.

The pollutants listed in this report are those that were selected by the user on the “Select Pollutants” screen.



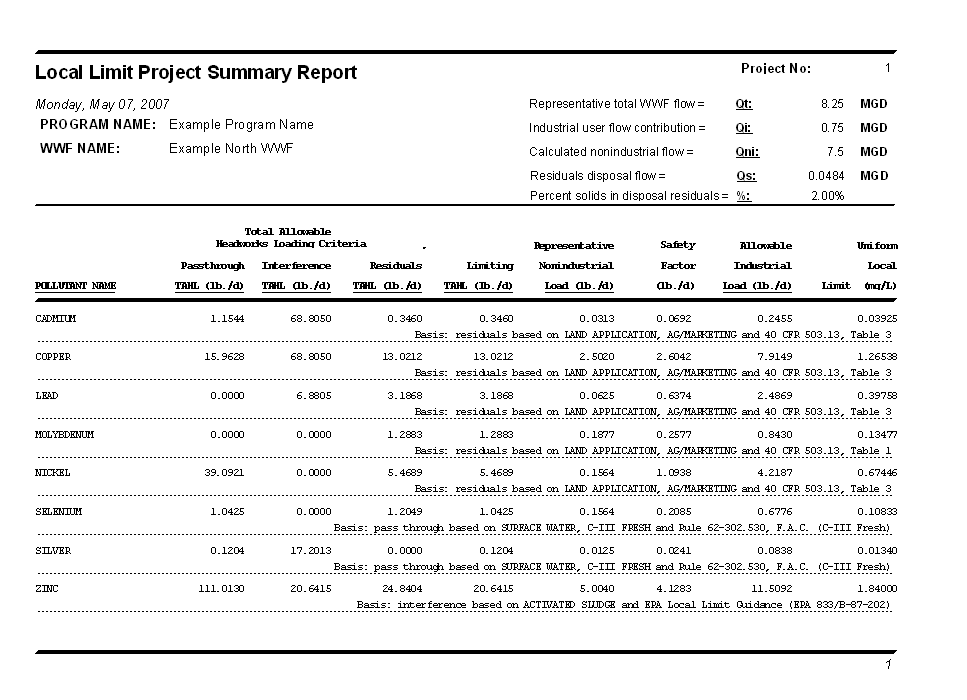
### Total Allowable Headworks Loading Criteria.

Pass through TAHL. This is the total allowable headworks loading that was calculated by the “Local Limit Pass Through Calculations” report.



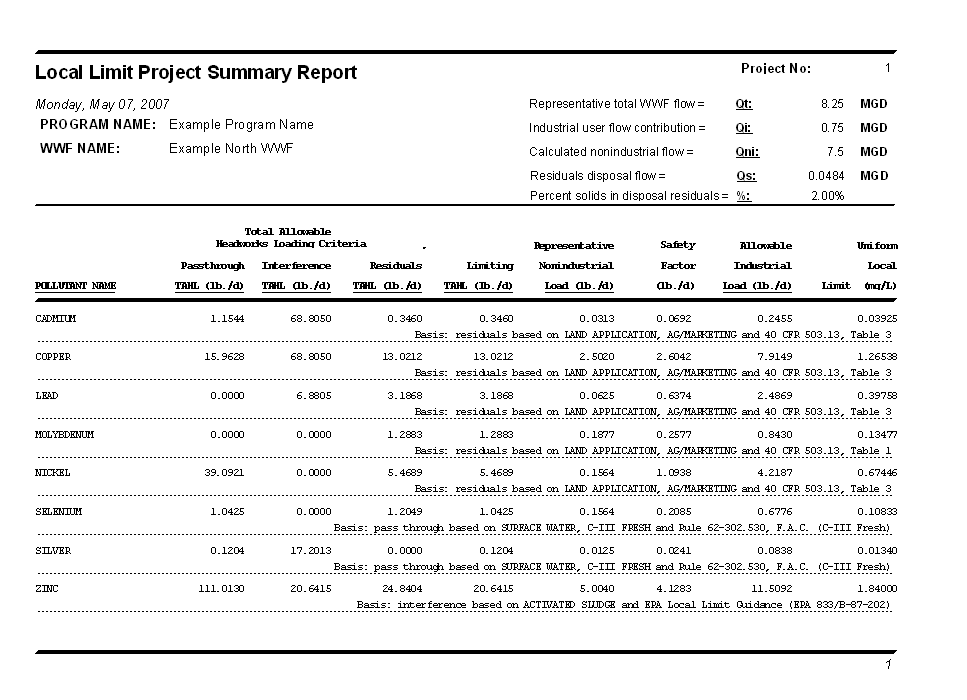
### Interference TAHL.

This is the total allowable headworks loading that was calculated by the “Local Limit Interference Calculations” report.



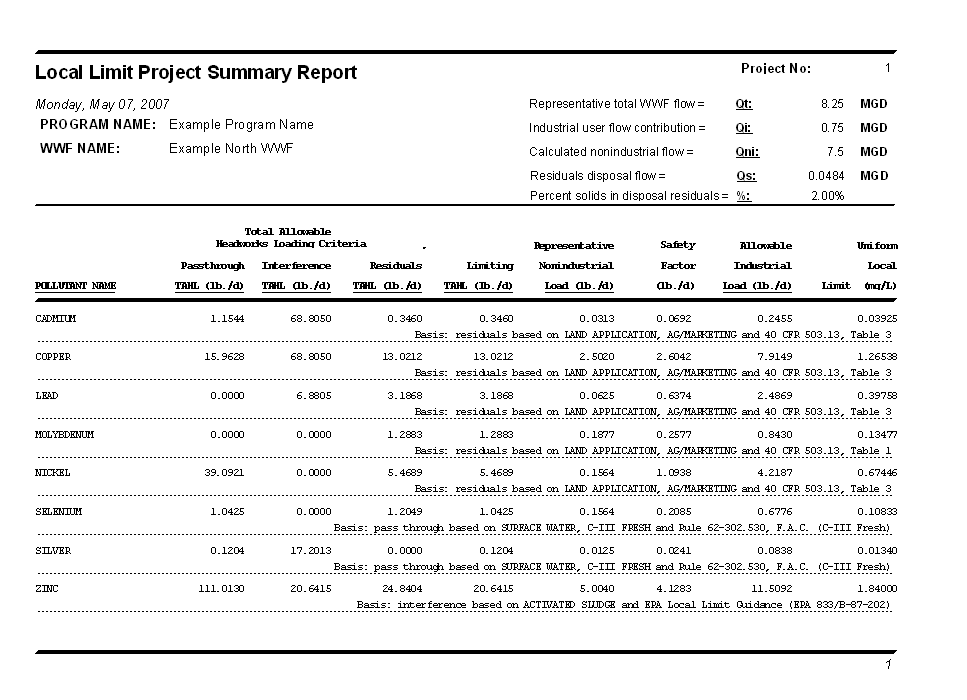
### Residuals TAHL.

This is the total allowable headworks loading that was calculated by the “Local Limit Residuals Protection Calculations” report.



### Limiting TAHL.

This is the most stringent of the pass through, interference and residuals TAHLs.



### Representative Non-Industrial Load.

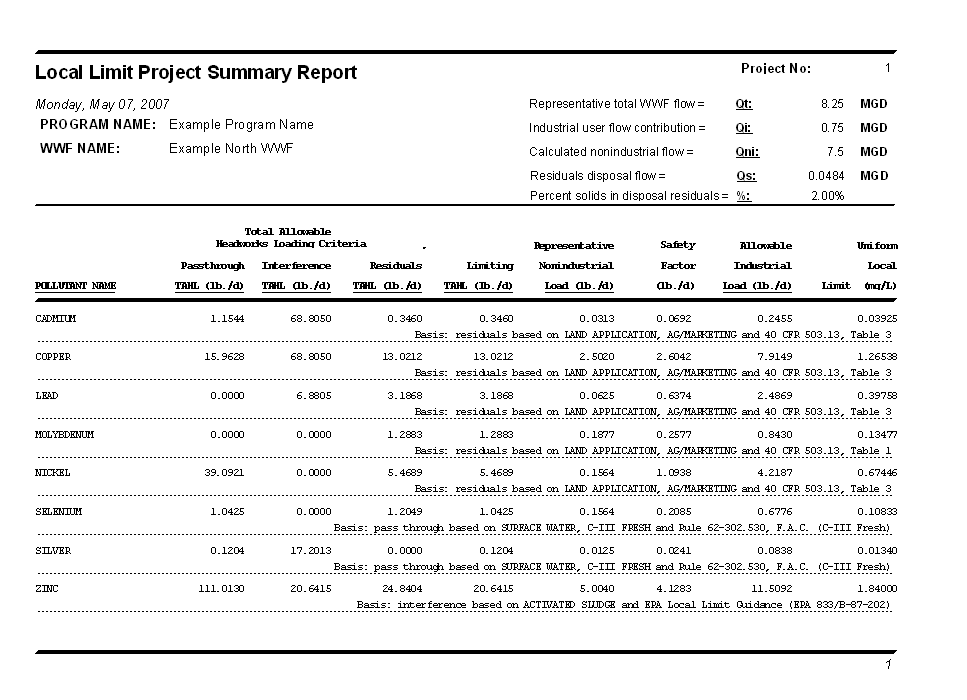
This is the same value as reported on the General Information Report. The non-industrial load is calculated by LLIDS using the following equation:

non-industrial load equation

Where: HLni = non-industrial loading (lb/day)

Qni = non-industrial WWF flow (MGD)

Cni = average background concentration (mg/L)



### Safety Factor.

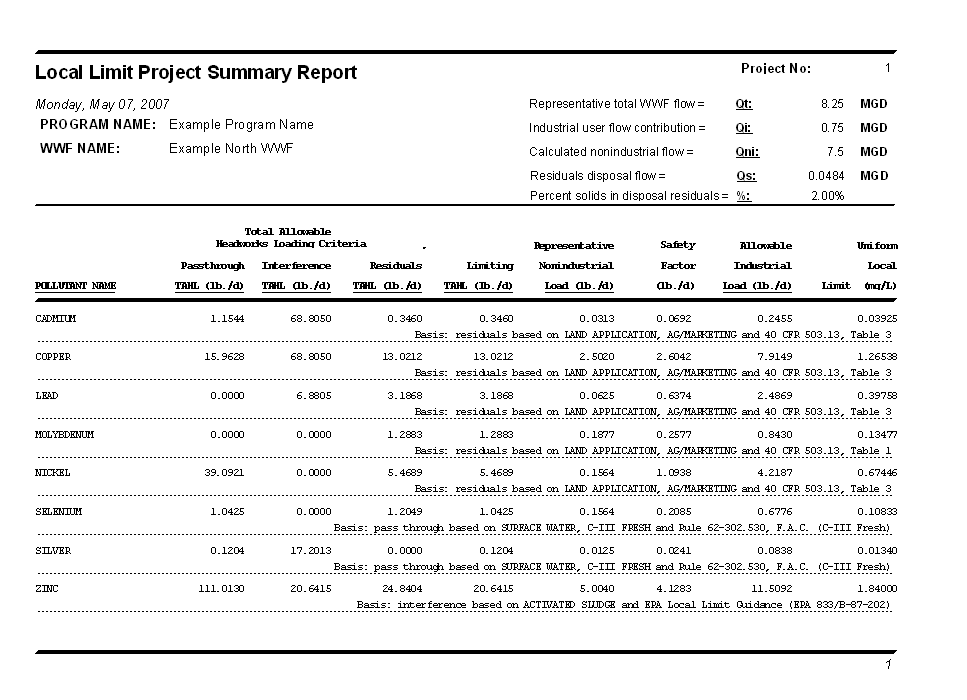
The safety factor loading is calculated as follows:

Safety Factor Equation

Where: SFload = safety factor loading (lb/day)

TAHL = Total allowable headworks loading (lb/day)

SF = safety factor (decimal)



### Total Allowable Industrial Load.

The non-industrial loading and safety factor allowances are subtracted from the most limiting TAHL to determine the total allowable industrial loadings (TAIL), as follows:

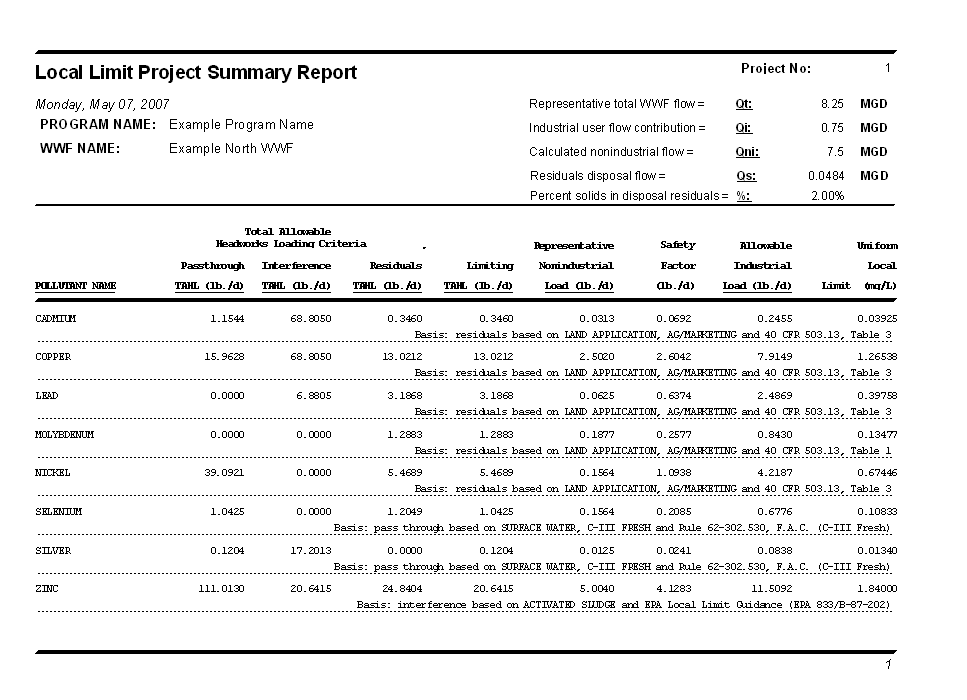
total allowable industrial load equation

Where: TAIL= total allowable industrial loading (lbs/day)

TAHL= total allowable headworks loading (lbs/day)

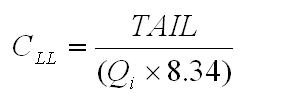
HLni = non-industrial loading (lb/day)

SFload = safety factor loading (lb/day)



### Uniform Local Limit.

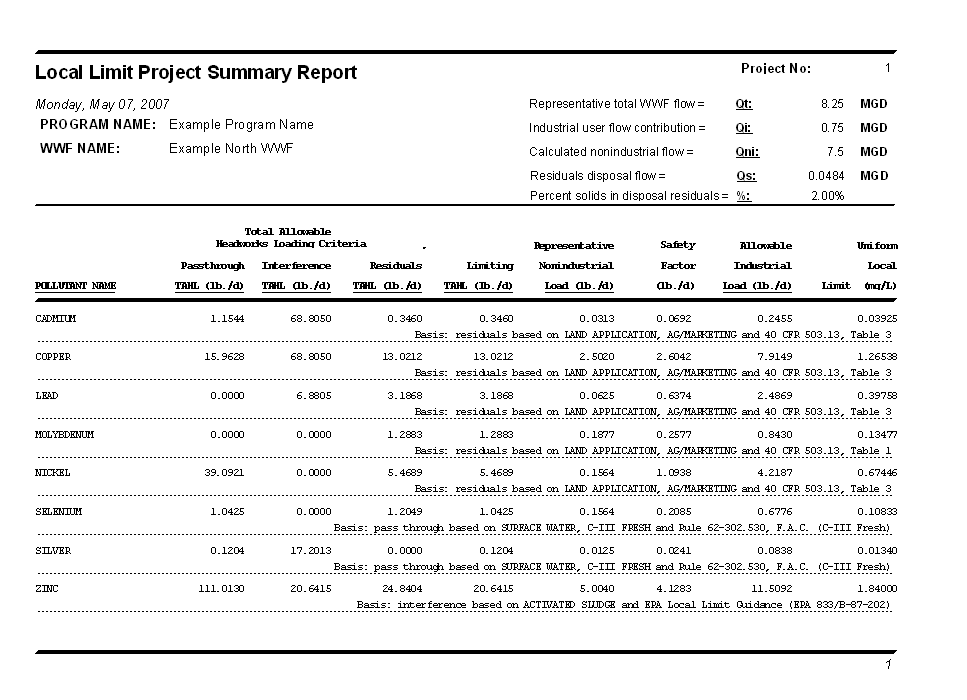
Once the TAIL is determined from the most limiting TAHL, LLIDS calculates a uniform local limit based on the total industrial user flow, as follows:



Where: CLL = local limit in concentration (mg/L)

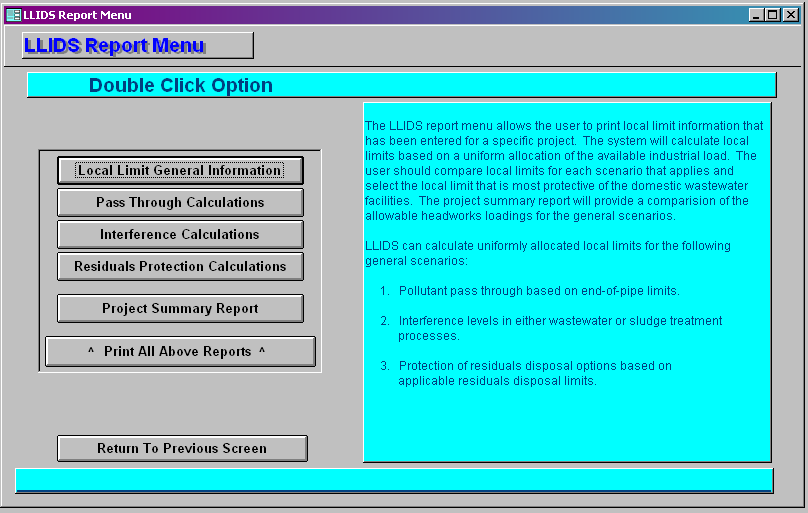
TAIL = total allowable industrial loading (lbs/day)

Qi = industrial user flow (MGD)

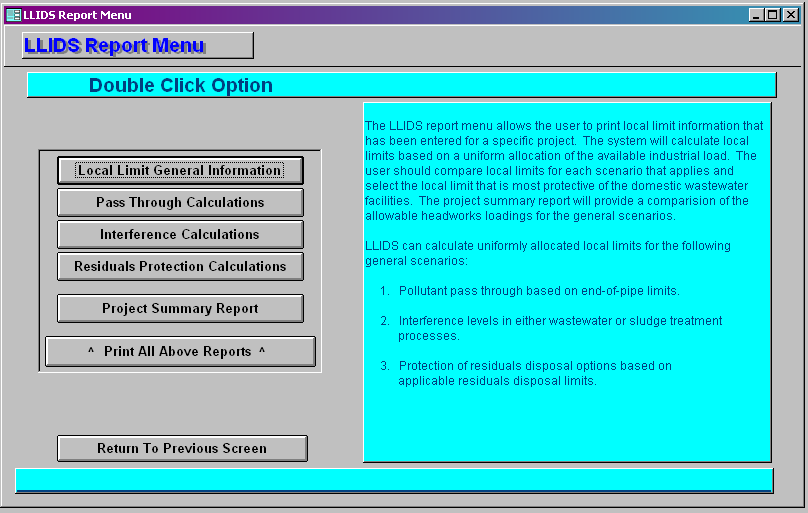


## Print All Above Reports Button

The Print All Above Reports button will print all of the report listed above, but the user will not be able to preview the reports before they are printed.



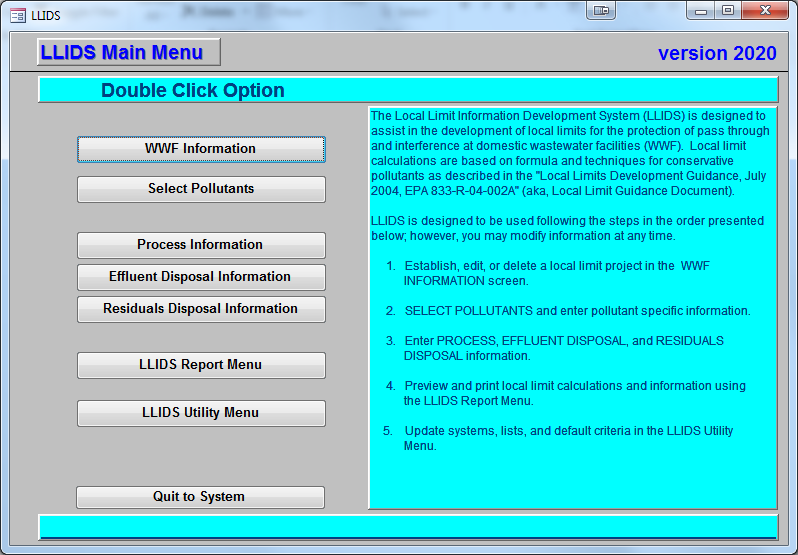
Return to previous screen button will take you back to the previous menu.



All reports are printed to the default printer of the computer the program is installed on.

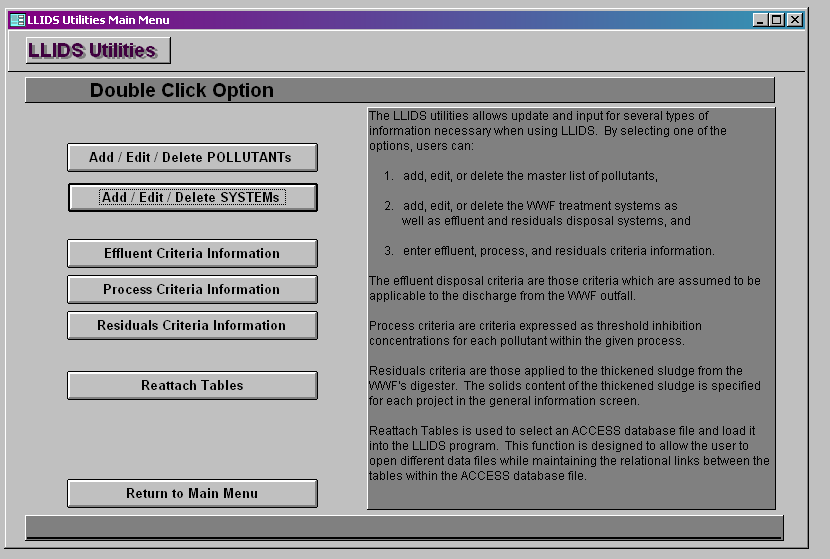
# PART IV

**LLIDS Utility Menu**

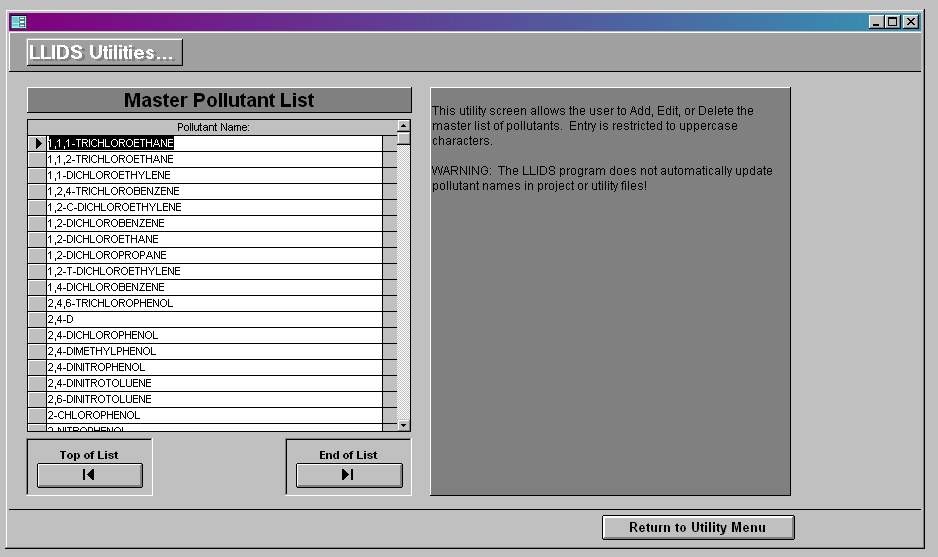


## Add/Edit/Delete Pollutants

This screen adds and deletes pollutants from the master list.

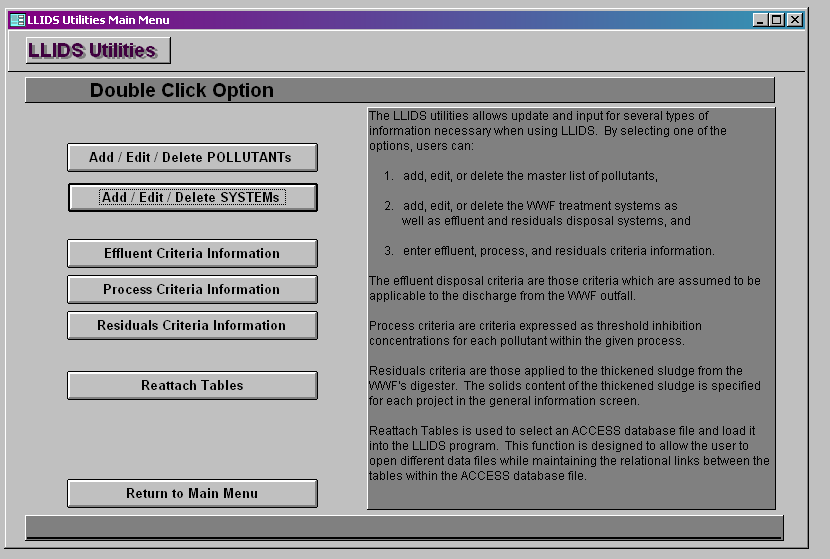


The LLIDS pollutant list is constrained by the pollutants listed in this table. If there are additional parameters that are needed to calculate local limits that are not on the default list, the user can enter these pollutants here.



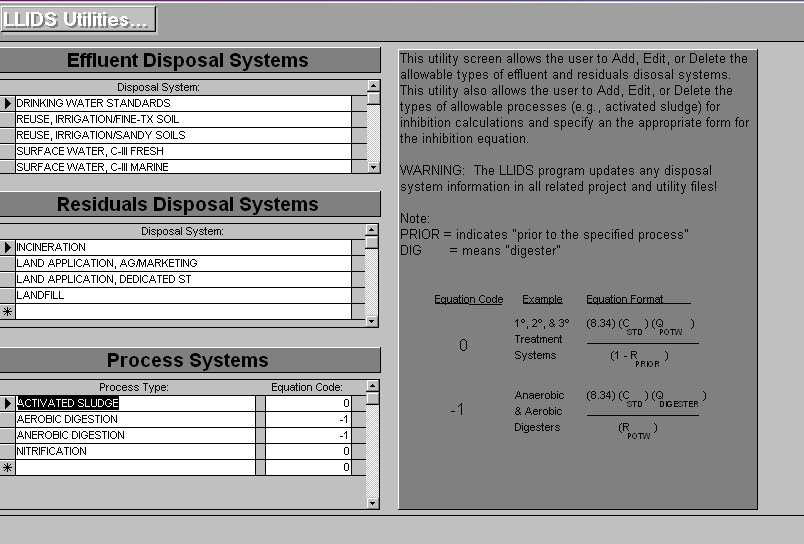
## Add/Edit/Delete System

This screen allows the user to add and delete disposal options for the effluent and the residuals and it also allows the user add and delete WWF processes.



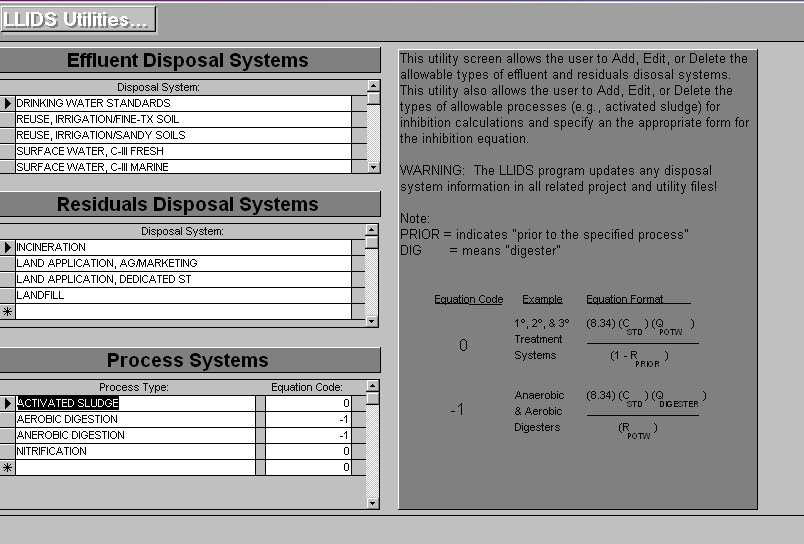
## Effluent Disposal Systems.

This includes the surface water types and reuse types. Since the effluent disposal type list is constrained, the user can enter additional effluent disposal types here.



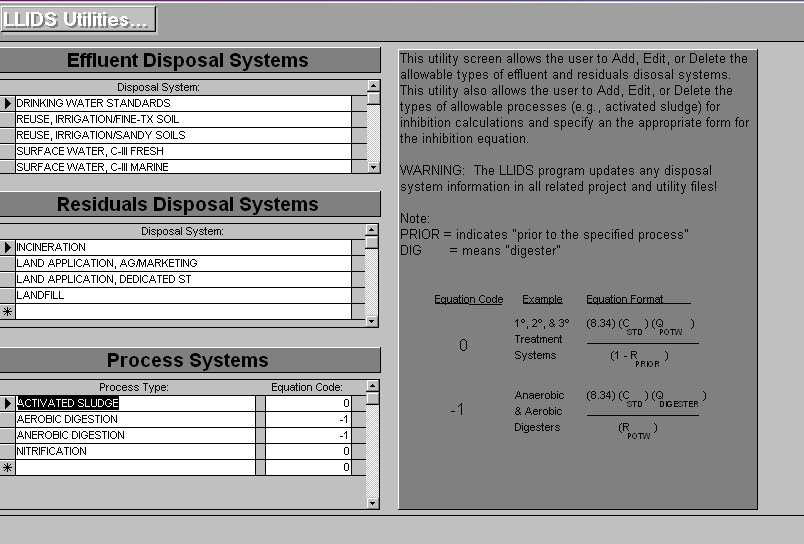
## Residuals Disposal Systems.

This includes the land application for residuals, incineration or landfill. Usually there are not other options for residuals disposal than what is already listed in the table.



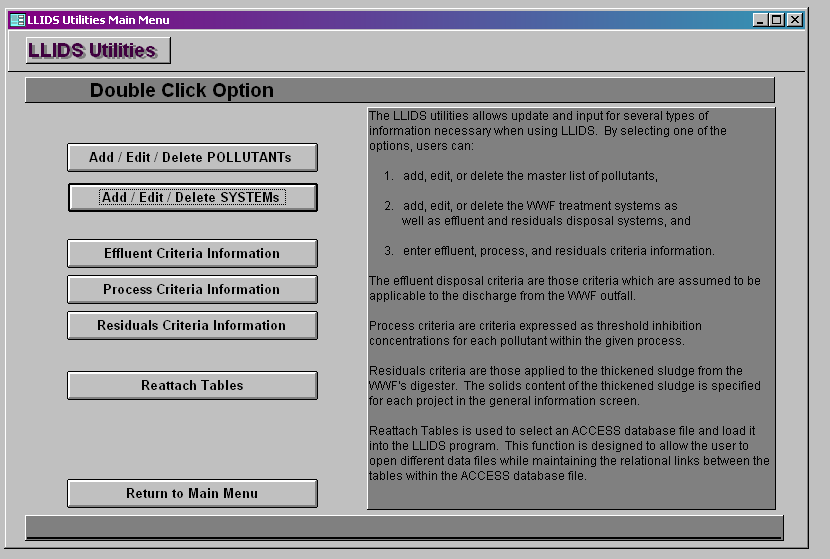
## Process System.

This includes the types of treatment that occur within the wastewater treatment plant, such as activated sludge, nitrification, etc.



## Effluent Criteria Information.

This allows the user to edit, change and delete effluent criteria limits for each of the effluent disposal options.



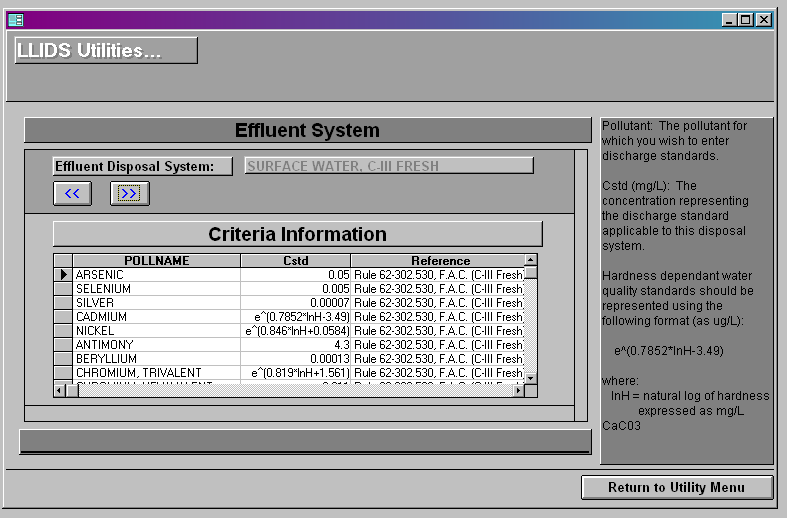
The effluent limits used by LLIDS are based on the following:

* Reuse criteria is based on EPA’s Guidelines for Water Reuse Manual (EPA/625/R-92/004).
* The surface water criteria are based on Chapter 62-302, F.A.C.\*

\*The water quality standards must be verified by the user to insure adherence with the current rule. See the Important Note in the introduction of this document.

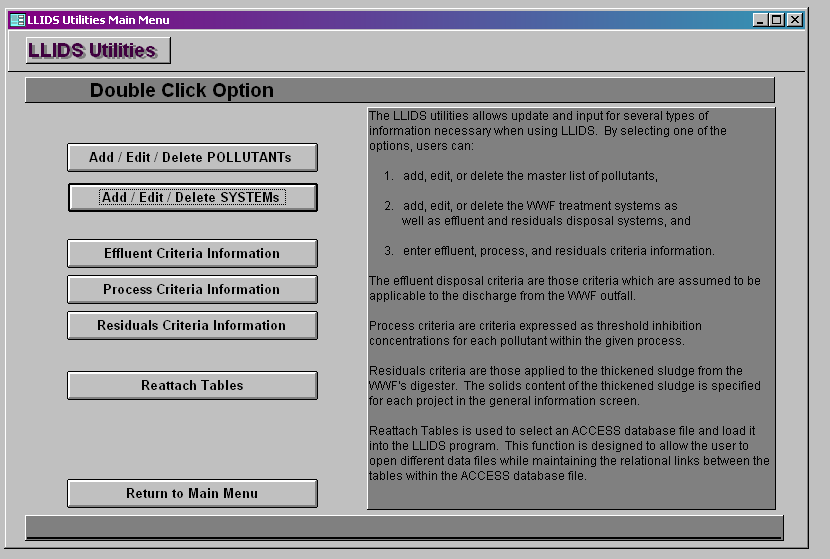
Effluent limits for each disposal option are included here.

The arrows adjacent to the disposal type allow the user to scroll through the effluent disposal options.



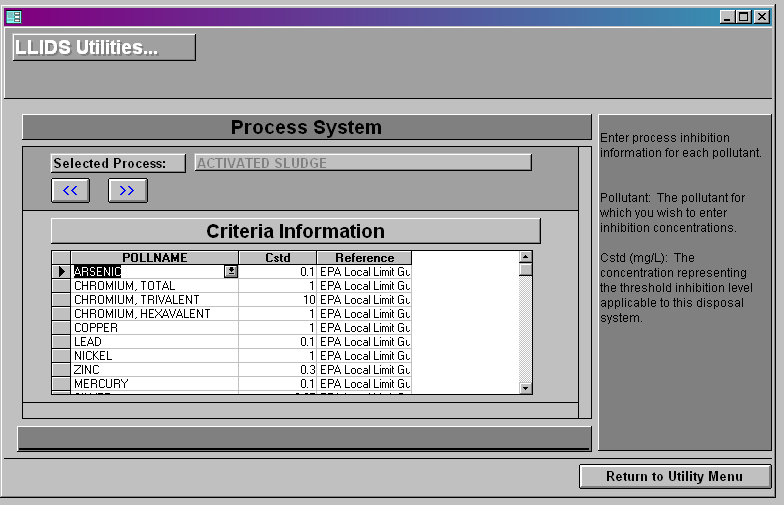
## Process Criteria Information.

This allows the user to edit, change and delete process inhibition values for each of the process systems.



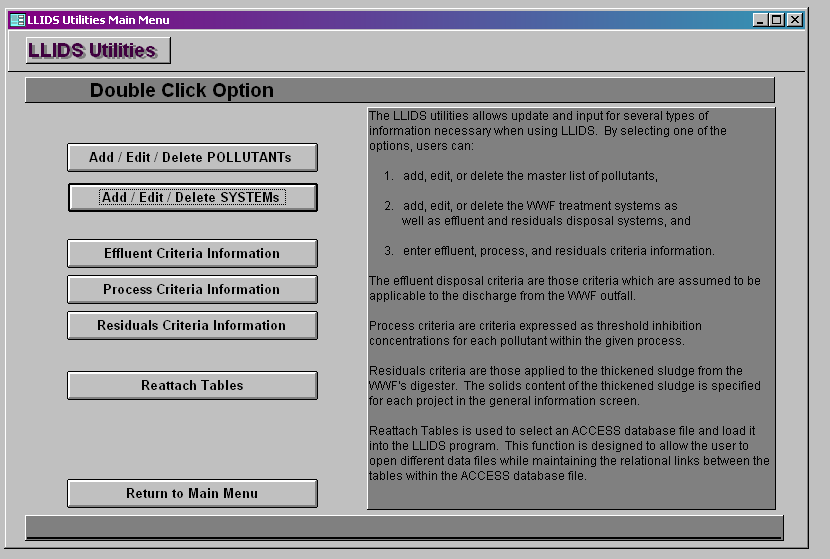
The values used for process limits are from EPA 2004 *Local Limits Development Guidance* Appendix G. The default values used by LLIDS are the lower end of the ranges listed in Appendix G, if the pollutant has a list of ranges.

The arrows adjacent to the process type allow the user to scroll through the effluent disposal options.



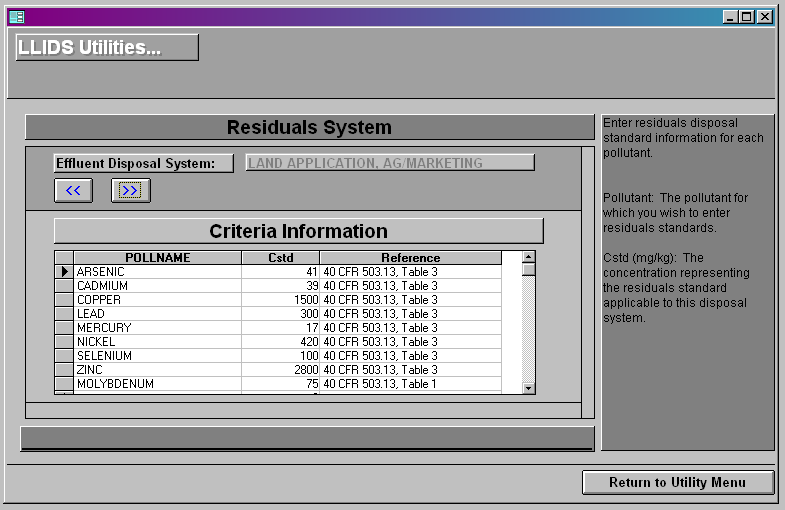
## Residuals Criteria Information.

This allows the user to edit, change and delete residual criteria limits for each of the residual disposal options.



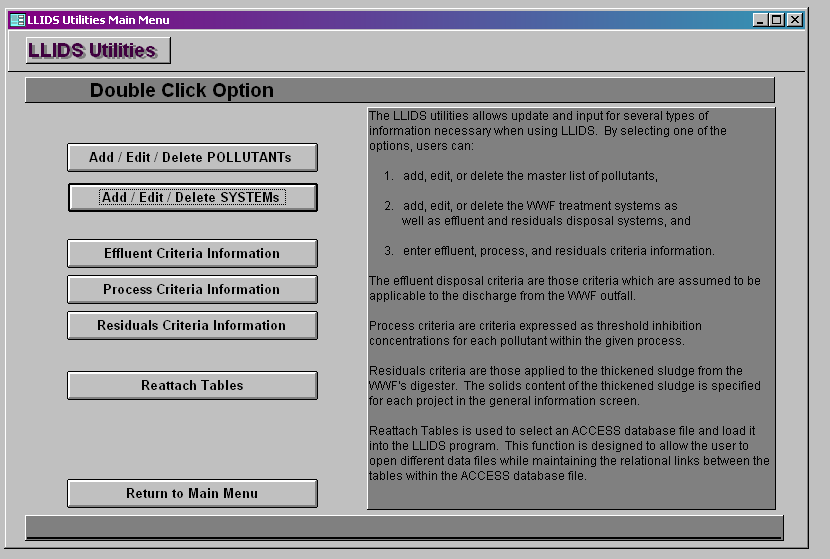
The limits used by LLIDS are based on 40 CFR 503.13 Tables 1 and 3 residual limits. There are no standard residuals limits listed in LLIDS for disposal by landfill or incineration. The user will have to add applicable limits to the tables.

The arrows adjacent to the process type allow the user to scroll through the effluent disposal options.



## Reattach Tables.

This is if you have your own tables of limits. Most programs do not use this function.



## Quit to System.

This button ends the LLIDS session and closes the program. The data is saved on the hard drive where the program is installed to.

