



## GREENER CLEANUPS

### ESTIMATING ENVIRONMENTAL FOOTPRINTS USING SEFA

**S**SPREADSHEETS FOR **E**ENVIRONMENTAL **F**FOOTPRINT **A**ANALYSIS

October 28, 2014

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## ***Purpose of SEFA Webinar***

- *Provide a basic understanding of SEFA*
- *Demonstrate general organization and specific functions of the SEFA worksheets*
- *Open forum for discussion of footprint analyses and advanced features in SEFA*

### **Notes:**

*This webinar will be very technical, getting into the details of the SEFA worksheets*

*Participants should already have a solid understanding of greener cleanups*

*Participants should already be familiar with EPA's Footprint Methodology*

**SEFA**

Spreadsheets  
for  
Environmental  
Footprint  
Analysis

*Additional  
experience likely  
needed to run a  
footprint analysis  
on SEFA*

Agenda			<div>SEFA</div> <div>           Spreadsheets for Environmental Footprint Analysis         </div>
1)	<b>Overview</b> Carlos Pachon	10 min	
2)	<b>Basics of SEFA</b> Karen Scheuermann	30 min	
3)	<b>Q/A on Basics</b> Carlos Pachon	10 min	
4)	<b>Demonstrate Key Features in SEFA</b> Karen Scheuermann	30 min	
5)	<b>Q/A on Key Features</b> Carlos Pachon	10 min	
6)	<b>Open Forum / Advanced Features</b> Karen Scheuermann / Carlos Pachon	15 min	
7)	<b>Wrap-up</b> Carlos Pachon	10 min	

## Overview of Greener Cleanups

→ **Green Remediation:** The practice of considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprints of cleanup actions

→ **Goal of Footprint Analysis:** Identify the most significant contributors to a project's environmental footprint and better focus efforts to reduce them

→ EPA published Footprint Methodology February 2012

→ SEFA is a companion tool to EPA's Footprint Methodology

→ SEFA was originally posted on Clu-in April 2012 and updated August 2014

Find the Footprint Methodology and SEFA at  
<http://clu-in.org/greenremediation/methodology/index.cfm>

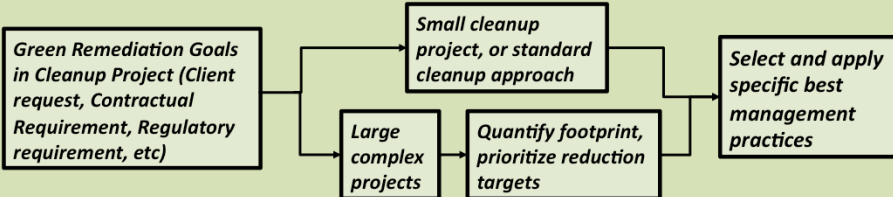
**SEFA**

Spreadsheets  
for  
Environmental  
Footprint  
Analysis

EPA's May 2013  
Webinar discussed  
the Methodology  
in greater detail

## ***The Role of Footprint Analysis in Greener Cleanups***

**SEFA**



→ **ASTM Standard Guide for Greener Cleanups (E2893):**

- Codifies best practices and defines a process for reducing environmental footprint
- Includes over 160 BMPs and outlines process for straight BMP application or use of quantification
- Useful protocol for contracting purposes
- Results in a transparent documented process that is reported publicly



[Cluin.org/greenremediation](http://Cluin.org/greenremediation)

**SEFA**

Spreadsheets  
for  
Environmental  
Footprint  
Analysis

## Green Remediation Focus

### Footprint Assessment

• Home

#### Methodology



EPA's Methodology for Understanding and Reducing a Project's Environmental Footprint supplements EPA's 2008 green remediation primer (EPA 542-F-08-001), an approach to quantify energy, air, and waste that comprise the environmental remedy. It also provides suggestions on how to during the remedy selection, design, implement phases. After finalizing the methodology in 2012, EPA publicly released the Spreadsheets for Environmental Footprint Analysis (SEFA), which are designed to help user methodology's metrics on a site-specific basis.

#### Spreadsheets for Environmental Footprint Analysis (SEFA) *\*Updated August 2014\**

EPA's Spreadsheets for Environmental Footprint Analysis (SEFA) are designed to assist EPA in conducting an

## Green Remediation Focus

### A Standard Guide for Greener Cleanups

• Home



**May 22, 2013, Web Seminar:**  
EPA's Methodology for Understanding and Reducing Environmental Footprint. This seminar discussed the regulatory framework, summarized the methodology, explained the steps of performing an environmental footprint analysis, and provided an overview of the SEFA spreadsheets.

[Click here to view the archived webinar.](#)


EPA representatives worked with ASTM International to develop a consensus-based standard intended to encourage property owners, agencies, responsible parties, developers and communities to voluntarily use greener practices for contaminated site cleanup. As a part of the standard development process, EPA's Office of Solid Waste and Emergency Response (OSWER), EPA regional offices and stakeholders developed a framework outlining the desired outcomes of a potential standard for greener cleanups. The framework reflected EPA's Greener Cleanups, which focus on five core elements associated with a cleanup project's environmental footprint.

ASTM International issued the final *Standard Guide for Greener Cleanups (E2895-13)* in November 2013. The guide includes:

- A systematic protocol to identify, prioritize, select, implement and report on the use of best management practices (BMPs) to reduce the environmental footprint of cleanup activities
- A list outlining more than 160 greener cleanup BMPs that are linked to the core elements of a greener cleanup and to relevant cleanup technologies
- Guidelines to quantify the environmental footprint of cleanup



**April 25, 2014, Web Seminar:**  
ASTM Greener Cleanup Standard Guide: An Intro. This seminar provided insight on development of a new Standard Guide for Greener Cleanups (ASTM E2895-13).

Agenda			 Spreadsheets for Environmental Footprint Analysis
1) Overview	Carlos Pachon	10 min	
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7) Wrap-up	Carlos Pachon	10 min	

## Basics of SEFA

Spreadsheets  
for  
Environmental  
Footprint  
Analysis

### SEFA is...

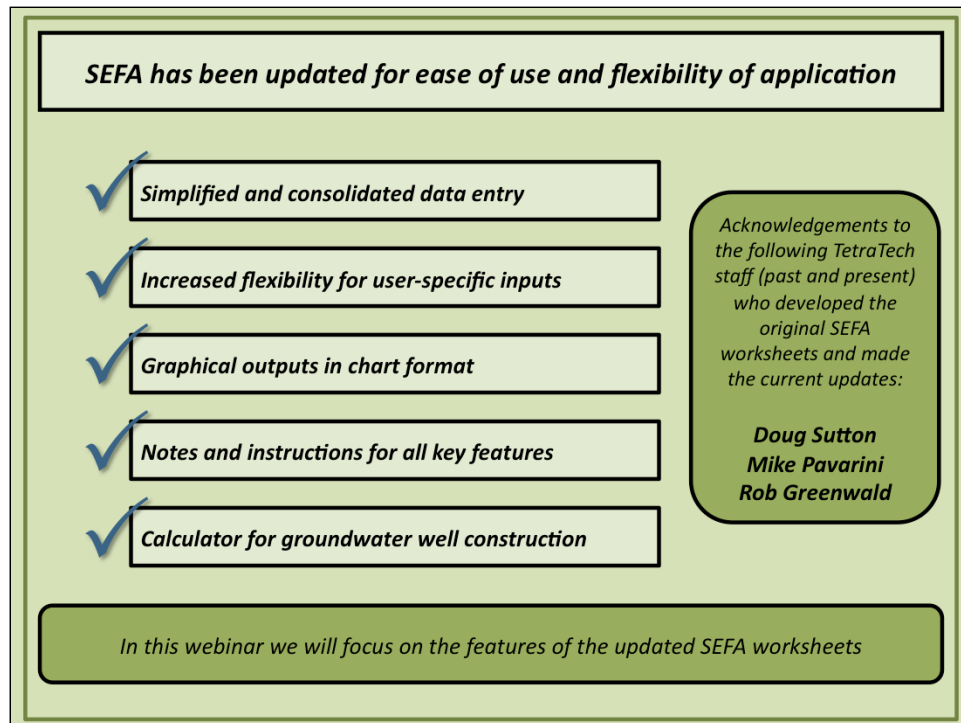
- a set of Excel workbooks developed by EPA
- designed for conducting environmental footprint analyses at clean-up sites
- compatible with EPA's Footprint Methodology
- set up in "blank slate" template format
- structured for inputting data, running calculations, and organizing outputs

*originally  
designed for  
internal EPA use*

*placed on EPA  
web page for  
public access*

*updated in  
August 2014*





## **Notes**

### **→ Simplified and consolidated data entry**

- \* all site and remedy data entry is consolidated in one workbook
- \* drop-down menus expanded for ease of selecting inputs

### **→ Increased flexibility for user-specific inputs**

- \* user overrides added for fuel usage rates
- \* capacity increased for user-defined footprint conversion factors

### **→ Graphical outputs in chart format**

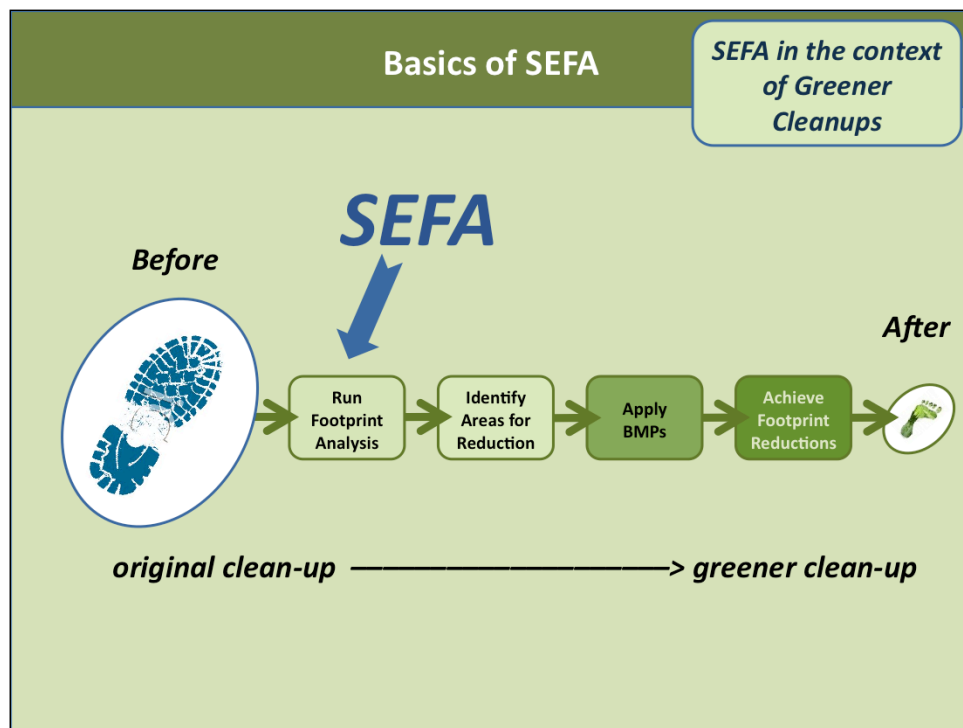
- \* bar charts and pie charts for results in energy usage and air emissions
- \* automatically populated

### **→ Notes and instructions for all key features**

- \* notes and instructions expanded and placed on new tabs in the excel workbooks
- \* abbreviated reminders and notes remain in the data entry tabs

### **→ Calculator for groundwater well construction**

Terminology and labels have also been updated for clarity and consistency.



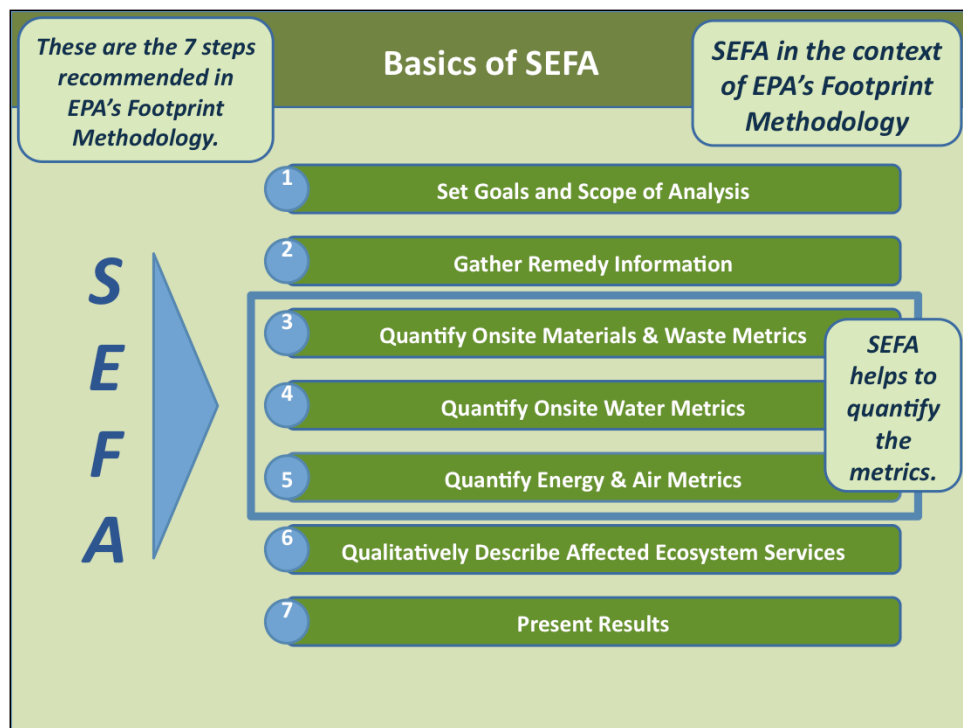
### Notes

→ To move from the larger footprint (before) to the smaller footprint (after), you will likely go through the following steps:

- \* Identify Areas for Reduction
- \* Apply BMPs
- \* Achieve Footprint Reduction

→ If you choose to do a footprint analysis, it would be most beneficial before you identify areas for reduction.

→ EPA's Footprint Methodology and SEFA can help you with the footprint analysis.



## Notes

These seven steps are described in detail in EPA's Footprint Methodology.

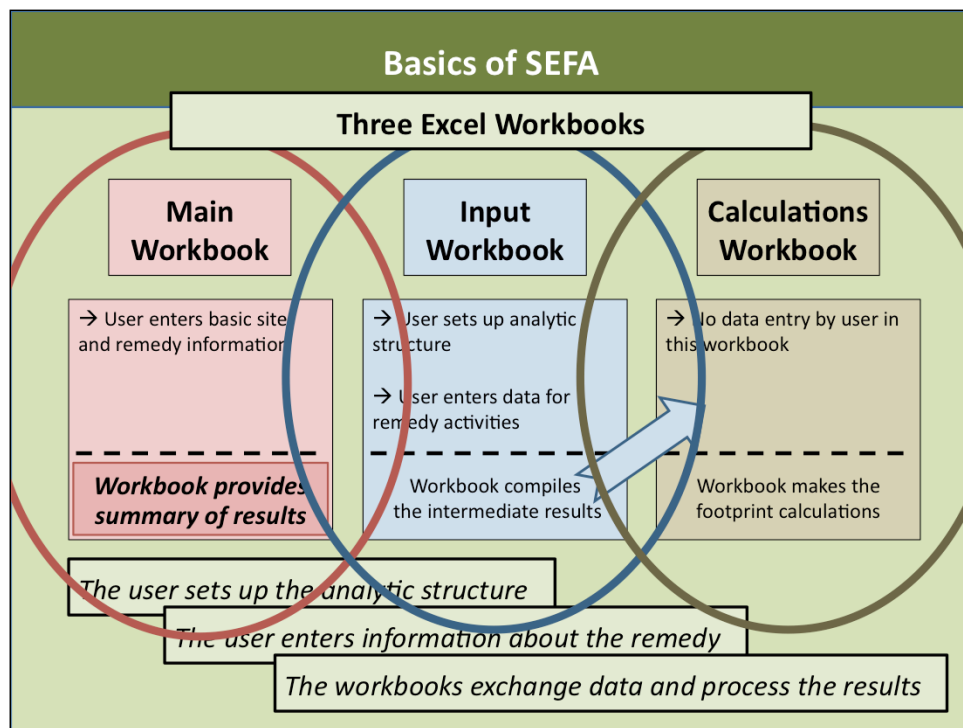
→Step 1. The project manager should establish the goals and scope of the footprint analysis to ensure that the questions of interest for the site and remedy are addressed. This is an important step, because the design of the footprint analysis will depend on the goals and scope. SEFA does not help with Step 1.

→Step 2. The project manager (or contractors or in-house experts conducting the footprint analysis) will gather the data required for the analysis. SEFA does not help with Step 2.

→Steps 3, 4, and 5. These are the “number crunching” steps of the Footprint Methodology. SEFA is designed to assist with Steps 3, 4, and 5.

→Step 6. The project manager should prepare a qualitative description of affected ecosystem services. SEFA does not help with Step 6

→Step 7. SEFA provides the numerical results of the analysis, but in Step 7 it will be up to the project manager to present and interpret the results.



**MAIN WORKBOOK**

*User sets up the basic structure of the footprint analysis*

Greener Cleanups: EPA Spreadsheets for Environmental Footprint Analysis - August 2014  
Main Workbook

Site Name  
Remedy

Green Hills  
Dig & Haul

Site Name and Remedy Name

Identify the site name and remedy name in the spaces above. These will be populated on all of the worksheets for the project.

the path name  
"Cal  
SEFA

*User may identify up to six Remedy Components ...*

*... to reflect stages of the remedy*

Component	Remedy Component Names*
Component 1	Site Investigation
Component 2	Excavation
Component 3	Soil Sent Off-Site
Component 4	Backfill
Component 5	Long-term Monitoring
Component 6	

\*Fill in unique names for Remedy Components (optional). These names will be populated on all of the worksheets for the project.

Intro to SEFA General Instructions Summary Totals by Scope and Component End

PAGE: 1 OF 1

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## Notes

- This is a screen shot of the tab in the Main Workbook where the user sets up the basic structure of the footprint analysis.
- There is also space at the bottom of the worksheet for adding a narrative description of the Site and Remedy.

MAIN WORKBOOK

User sets up the basic structure of the footprint analysis

Greener Cleanups: EPA Spreadsheets for Environmental Management  
Main Workbook

Site Name:

Remedy:

Identify the site name and remedy name. These names will be populated on all of the worksheets.

Enter the path name (if not saved in the default location, "Calculations" will be used).

Path Name:

Calculations File Name:

**The Remedy Components can be set up to differentiate among various aspects of the remedy.**

- different stages of the remedy
- alternative remedy designs
- specific remedy activities
- separate years in the remedy

Component	Remedy Component Names*
Component 1	Hazardous Waste Transport
Component 2	Municipal Solid Waste Transport
Component 3	Remediation Materials
Component 4	Grid Electricity
Component 5	Off-Site Services
Component 6	Personnel Transportation

\*Fill in unique names for Remedy Components (optional). These names will be populated on all of the worksheets for the project.

Intro to SEFA

General

Instructions

Summary

Totals by Scope and Component

End

PAGE: 1 OF 1

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## Notes

→The way in which you set up the Remedy Components will depend on the goals and scope of the footprint analysis.

→For example:

\* **Different stages of the remedy.** You may have questions about how the footprints for the various stages of the remedy differ from one another (illustrated here for a dig & haul remedy).

\* **Alternative remedy designs.** You may want to compare permutations of the same basic remedy (illustrated here for a pump & treat remedy).

\* **Specific remedy activities.** You may want to consolidate all similar activities into key groups such (illustrated here for fuel usage, waste management, etc.)

\* **Separate years in the remedy.** You may want to track the footprint for each year of the remedy (illustrated here for a bioremediation remedy).

→The user should establish the goals and scope of the footprint analysis in advance, and then set up the Remedy Components to reflect the goals and scope.



INPUT WORKBOOK

User sets up the structure for data entry

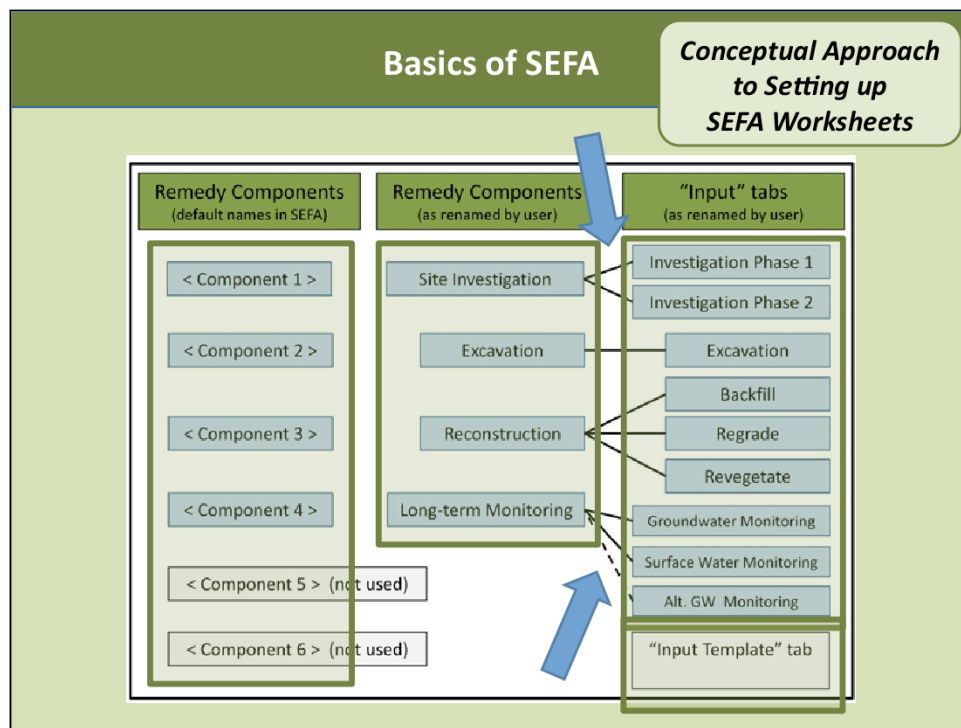
The screenshot shows the 'Input Worksheet for Site Investigation' with several key features and annotations:

- Annotations:**
  - Top Right:** "User sets up the structure for data entry"
  - Left Side:** "User sets up a data entry tab for each activity in the footprint analysis"
  - Center:**
    - Make a copy of the Input Template tab
    - Name the new tab to reflect the activity
  - Right Side:** "Up to 14 data entry tabs can be included in each footprint analysis."
- Worksheet Structure:**
  - Site Investigation Tab:** Contains sections for "Please specify which Remedial Component this Input will be used in, per 1.1", "Remedial Steps", "Example Data: Estimated Groundwater Flow", and "Other Data, and References".
  - Activity Tabs:** A row of tabs at the bottom includes "Site Investigation", "Excavation", "Soil Sent Off-Site", "Backfill", and "Groundwater Monitoring".
  - Data Entry Tables:** Each activity tab contains detailed tables for recording data. For example, the "Site Investigation" tab includes tables for "Equipment Type", "Equipment Use", "Excavation", "Soil Sent Off-Site", "Backfill", and "Groundwater Monitoring".
- Footer:** The bottom of the worksheet shows "Input Instructions", "Detailed Notes and Explanations", "Input Summary", and a navigation bar with "ALCULATE" and "PAGE 2 OF 15".

## Notes

→ The number of tabs you make and what activities you use them for will depend on the goals and scope of the footprint analysis.





## Notes

→ This illustrates the conceptual approach to organizing the Remedy Components and the data entry tabs.

→ SEFA is set up with default names for the Remedy Components (Main Workbook), and a single Input Template tab (Input Workbook).

→ In this schematic representation:

- \* Four of the Remedy Components have been named by the user.
- \* Data entry tabs have been made for nine separate activities.
- \* Each of the activities is associated with the one of the Remedy Components.

→ This allows flexibility for the user to subdivide the Remedy Components, if that is useful for the goals of the footprint analysis.

### Taking a closer look at the Input Template

***The pink and yellow cells provide user flexibility in data entry***

→Reminder: this is data entry worksheet where the majority of the remedy information is entered.

INPUT WORKBOOK

User enters specific information about the remedy

[Link to Remedy Component](#)

Input Template page 1

**Personnel Transportation**

Participant	Mode of Transport	Vehicle Type	Mode of Transportation	Transport Fuel Type	Total Distance (mi)	Fuel Type	Fuel Usage (Gallons)	Fuel Cost (\$)	Fuel Type	Fuel Usage (Gallons)	Fuel Cost (\$)	Accident or Injury

**On-site Equipment Use**

Equipment Type	Equipment ID	Equipment Description	Equipment Hours	Equipment Fuel Type	Equipment Fuel Usage (Gallons)	Equipment Fuel Cost (\$)	Equipment Fuel Type	Equipment Fuel Usage (Gallons)	Equipment Fuel Cost (\$)

**On-Site Electricity Usage**

Equipment Type	Equipment ID	Equipment Description	Equipment Hours	Equipment Fuel Type	Equipment Fuel Usage (Gallons)	Equipment Fuel Cost (\$)	Equipment Fuel Type	Equipment Fuel Usage (Gallons)	Equipment Fuel Cost (\$)

**Natural Gas and Landfill Gas**

Equipment Type	Equipment ID	Equipment Description	Equipment Hours	Equipment Fuel Type	Equipment Fuel Usage (Gallons)	Equipment Fuel Cost (\$)	Equipment Fuel Type	Equipment Fuel Usage (Gallons)	Equipment Fuel Cost (\$)

General

Input Instructions

Detailed Notes and Explanations

Input Summary

Input Template

Grid Electricity

User Defined Factors

Well Material Calcula

CALCULATE

19

Looks like lots of blank cells to fill in, but...
 

- use only the cells that are relevant to the site
- enter as much (or as little) detail as needed

User should note any assumptions and items that are screened out

**INPUT WORKBOOK**

*User enters specific information about the remedy*

[illegible]

**INPUT WORKBOOK**

*User enters specific information about the remedy*

The screenshot displays the 'Input Worksheet for Input Template' with several tabs and data entry sections. The tabs at the bottom are: General, Input Instructions, Detailed Notes and Explanations, Input Summary, Input Template, Grid Electricity, User Defined Factors, and Well Material Calculator. The 'Input Template' tab is active, showing a table with columns: Item, Units, Quantity, and Notes. The table contains several rows of data, including 'Other Energy Use and Air Emissions' and 'Other Voluntary Renewable Energy Use'. There are also sections for 'Off-Site Laboratory Analysis' and 'Space for Notes, References, and Supporting Calculations'. The 'Off-Site Laboratory Analysis' section includes a table with columns: Item, Material or Energy, and Total (twh). The 'Space for Notes, References, and Supporting Calculations' section is a large text area for additional information. The 'Other Energy Use and Air Emissions' section includes a table with columns: Item, Units, Quantity, and Notes. The 'Other Voluntary Renewable Energy Use' section includes a table with columns: Item, Units, Quantity, and Notes. The 'Off-Site Laboratory Analysis' section includes a table with columns: Item, Material or Energy, and Total (twh). The 'Space for Notes, References, and Supporting Calculations' section is a large text area for additional information.

INPUT WORKBOOK

[Link to the Input Summary tab](#)

**User enters the names of the data entry tabs**

**On-site diesel use**

**Diesel & gasoline for transport**

**Input**

Remedy Component Number →	1	2	3	4	5
On-site Renewable Energy					
Renewable electricity generated on site	0	0	0	0	0
Renewable gas combusted on-site for energy use	0	0	0	0	0
On-site Renewable use	0	0	0	0	0
User-defined on-site renewable energy use #1	0	0	0	0	0
User-defined on-site renewable energy use #2	0	0	0	0	0
On-site Non-renewable Energy					
Grid electricity	0	0	0	0	0
On-site diesel use	0	0	0	0	0
User-defined on-site non-renewable energy use #1	0	0	0	0	0
User-defined on-site non-renewable energy use #2	0	0	0	0	0
Other On-site Emissions					
On-site GHG process emissions	0	0	0	0	0
On-site GHG emissions	0	0	0	0	0
On-site carbon use	0	0	0	0	0
GHG emissions by fuel	0	0	0	0	0
Other on-site GHG emissions	0	0	0	0	0
Other on-site GHG emissions	0	0	0	0	0
Other on-site GHG emissions	0	0	0	0	0
Transportation					
Transportation gasoline use	0	0	0	0	0
Transportation gasoline use	0	0	0	0	0
User-defined transportation gasoline use #1	0	0	0	0	0
User-defined transportation gasoline use #2	0	0	0	0	0
Renewable Energy					
Transportation bio-diesel use	0	0	0	0	0
User-defined renewable energy transportation #1	0	0	0	0	0
User-defined renewable energy transportation #2	0	0	0	0	0

**This tab compiles the inputs and results from the data entry tabs**

**Subtotals are compiled for each data entry tab and (not shown) for each Remedy Component**

**Three pages of compiled results**

**The results are sent to the Calculations Workbook**

## Notes

→ This is a screen shot of the Input Summary tab in the Input Workbook.

→ A maximum of 14 data entry tabs can be compiled at one time on this tab.

**CALCULATIONS WORKBOOK**

*Make footprint calculations*

Greener Cleanup: EPA Spreadsheets for Environmental Footprint Analysis / August 2011

Green Hills  
Dig & Haul  
All Components

All Components			Off Site Footprint (Scope 3b)									
Category	Units	Usage	Energy	GHG	NOx	SOx	PM	HAPs				
<b>Construction Materials</b>												
Concrete	dry-ton	0	3.9071						1.17E-05	0	0.000079	0
Concrete	ton	0	0.00919						0.00001	0	0.00001	0
General sand/clay	ton	0	0.000022						0.000000	0	0.000000	0
Asphalt	ton	20000	0.001						0.000004	12.8	0.000002	0.0000
Plastic/polymer system (installed)	W	0	0.0016						0.000003	0	0.000000	0
PVC	ton	0	0.002						0.000003	0	0.000000	0
Reinforced steel	ton	0	0.0016						0.000003	0	0.000000	0
Steel	ton	0	0.0044						0.000003	0	0.000000	0
Other refined construction materials	ton	0	0.01477						0.000003	0	0.000000	0
Other refined construction materials	ton	0	0.000023	0	0.00133	0	0.000000	0	0.000013			
<b>Notes:</b>												
<b>Fuel Processing</b>												
Cherese wharf	ton	0	0.000002	0	0.000003				0.000000	0	0.000000	0
Emulsified asphalt	ton	0	0.0000	0	0.0000				0.000000	0	0.000000	0
Melroe	ton	0	0.0011	0	0.000024	0	0.000000	0	0.000000	0	0.000000	0
Vegetation	ton	0	0.0014	0	0.0014	0	0.000000	0	0.000000	0	0.000000	0
Other vegetation (cherry, etc.)	ton	0	0.000	0	0.0000	0	0.0000	0	0.0000	0	0.0000	0
<b>Notes:</b>												
<b>Fuel Processing</b>												
Blenders produced	gal	330.2	0.001	0.0002	4.4	15.0033	0.000	2.4018	0.019	0.000	0.000	0.000
Diesel produced	ccf	0	0.000	0	0.0	0.000	0	0.000	0	0.000	0	0.000
Gasoline produced	gal	330.2	0.001	0.0002	4.4	15.0033	0.000	2.4018	0.019	0.000	0.000	0.000
Natural gas produced	ccf	0	0.000	0	0.0	0.000	0	0.000	0	0.000	0	0.000
<b>Notes:</b>												
<b>Public water</b>												
Public water	gal/1000	4000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>Notes:</b>												

The Calculations Workbook receives results from the Input Workbook ...

... and applies footprint conversion factors.

Seven pages of footprint calculations

No data entry by the user in this Workbook ...  
 ... but the user may access the intermediate results from the worksheets.

Results are sent to Main Workbook

## Notes

→ This is a screen shot of one of the tabs in the Calculations Workbook which receives the results of the Input Workbook. This is where the footprint calculations are made.

→ There is a calculations tab for each Remedy Component, and for all Remedy Components combined.

→ The footprint conversion factors in this table are based on information from public sources and references are included in the SEFA workbooks.

→ The intermediate results in the Calculations Workbook are useful for understanding nuances of the footprint.

→ The metrics on this worksheet are calculated and compiled as suggested in the Footprint Methodology.

## MAIN WORKBOOK

## Summarize and present results

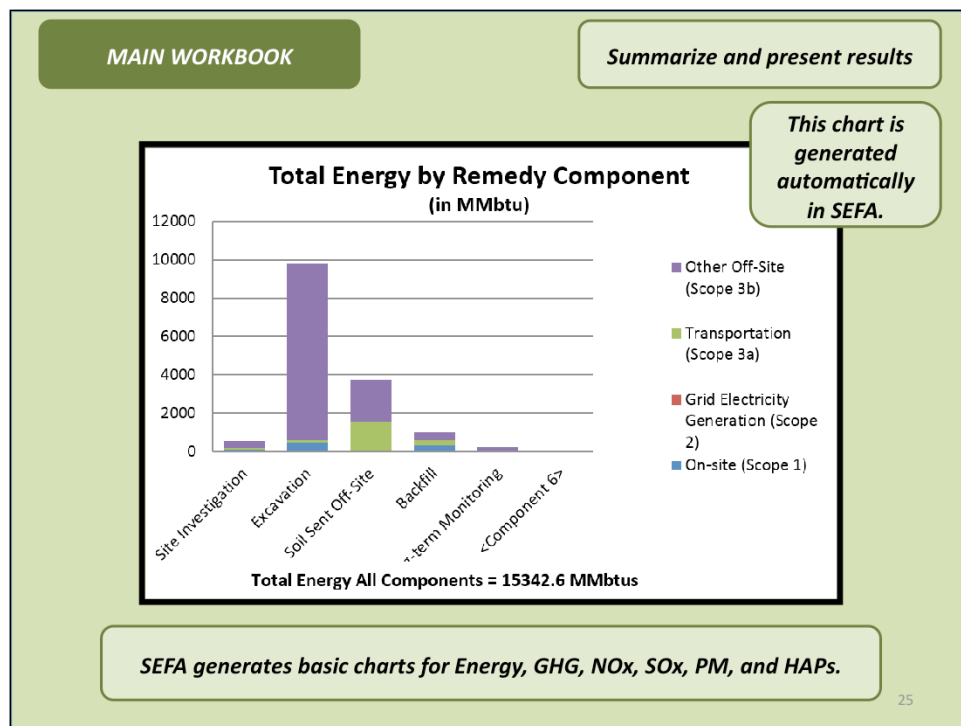
Core Element	Environmental Footprint Summary							
	Metric	Unit of Measure	Site Investigation	Excavation	Soil Sent Off-Site	Backfill	Long-term Monitoring	Total
Materials & Waste	Defined materials used on site	Tons	0	160	0	0	0	160
	% of refined materials from recycled or reused material	%		9%				9%
	Unrefined materials used	Tons	0	0	0	7,000	0	7,000
	% of unrefined materials from recycled or reused material	%				99%		99%
Waste	On-site innocuous waste disposed of off-site	Tons	10	0	1,112	0	0	2,222
	On-site hazardous waste disposed of off-site	Tons	0	300	7,000	0	0	8,000
	On-site materials used for backfill	Tons	0	0	0	0	0	0
	On-site materials used for excavation	Tons	0	0	0	0	0	0
Water (used on-site)	Drinking water use	MG	0	2.3	0	1.7	0	4.2
	Drinking water use	MG	0	0	0	0	0	0
	Surface water use	MG	0	0	0	0	0	0
	Reclaimed water use	MG	0	0	0	0	0	0
	Steam water use	MG	0	0	0	0	0	0
	Other water resource #1	MG	0	0	0	0	0	0
Energy	On-site renewable energy generated on-site	MWh	0	0	0	0	0	0
	On-site renewable energy generated on-site	MWh	0	0	0	0	0	0
	On-site renewable energy generated on-site	MWh	0	0	0	0	0	0
	On-site renewable energy generated on-site	MWh	0	0	0	0	0	0
	On-site renewable energy generated on-site	MWh	0	0	0	0	0	0
	On-site renewable energy generated on-site	MWh	0	0	0	0	0	0
Air	On-site NOx, SOx, and PM emissions	Pounds	117	605	0	401	1	1,122
	On-site HAP emissions	Pounds	0	0	0	0	0	0
	Total NOx, SOx, and PM emissions	Pounds	738	7,656	11,203	1,372	205	21,133
	Total NOx emissions	Pounds	469	5,154	4,738	951	168	9,480
	Total SOx emissions	Pounds	237	3,420	1,773	256	123	5,810
	Total PM emissions	Pounds	22	1,081	4,401	62	14	5,593
Air	Total HAP emissions	Pounds	8	89	41	1	4	144
	Total greenhouse gas emissions	Tons CO2e	43	681	328	77	17	1,147

This table compiles the results as recommended in EPA's Footprint Methodology.

## Notes

- This is a screen shot of the Summary Table in the Main Workbook, where the results of the footprint analysis are presented.
- The metrics on this worksheet are presented as suggested in the Footprint Methodology, for the core elements of Materials, Waste, Water, Energy, and Air Emissions.

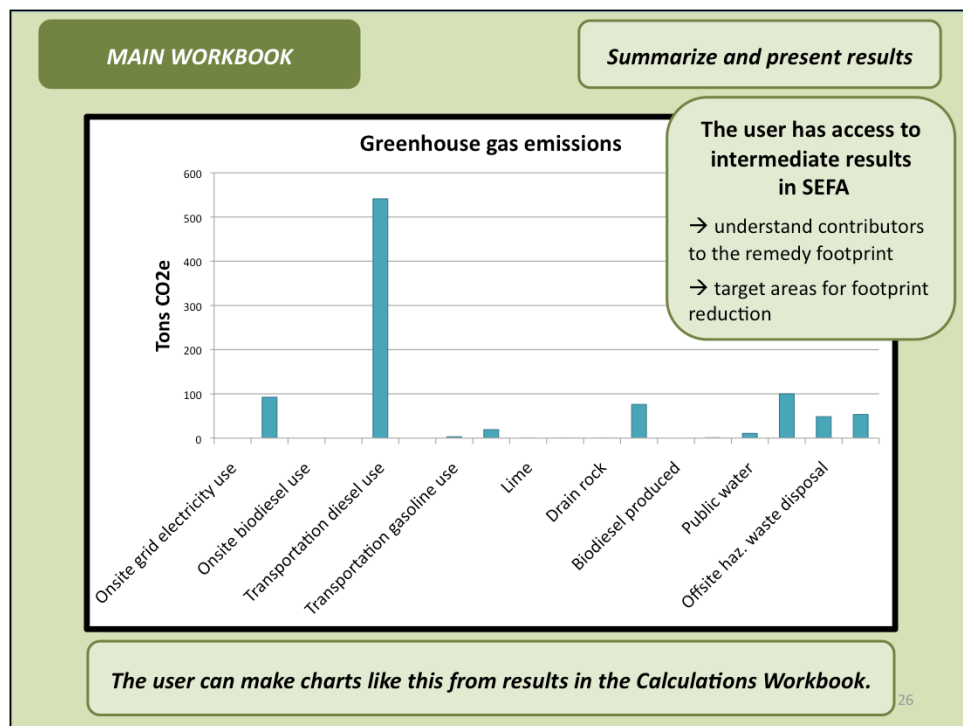




## Notes

→ This is an example of a chart that is generated in the Main Workbook.

→ This type of chart is useful for identifying which Remedy Components have the largest footprints.



## Notes

→ This is an example of a chart that the user can make with relative ease from the intermediate results in the Calculations Workbook.

→ This chart is not provided automatically by the SEFA workbooks.

## Basics of SEFA

### Testing Alternative Scenarios



What if....

... I use reclaimed water instead of public water for dust control?

?

... I use biodiesel instead of conventional diesel?

?

... I conduct more extensive site investigation, leading to reduction of the amount of contaminated soil sent to the landfill?

?

*SEFA can be used to compare footprints for alternative scenarios*

### Notes

→ The SEFA workbooks are designed to allow the user to assess alternative scenarios or BMPs fairly easily.

## Basics of SEFA

Spreadsheets  
for  
Environmental  
Footprint  
Analysis

### SEFA is...

- a set of Excel workbooks developed by EPA
- designed for conducting environmental footprint analyses at clean-up sites
- compatible with EPA's Footprint Methodology
- set up in "blank slate" template format
- structured for inputting data, running calculations, and organizing outputs

*Can be set up to  
reflect any  
remedy design*

*Automatically  
applies footprint  
conversion  
factors*

*Compiles results  
consistent with  
EPA Methodology*

<b>Agenda</b>		
<b>1) Overview</b> Carlos Pachon	10 min	✓
<b>2) Basics of SEFA</b> Karen Scheuermann	30 min	✓
<b>3) Q/A on Basics</b> Carlos Pachon	10 min	←
<b>4) Demonstrate Key Features in SEFA</b> Karen Scheuermann	30 min	
<b>5) Q/A on Key Features</b> Carlos Pachon	10 min	
<b>6) Open Forum / Advanced Features</b> Karen Scheuermann / Carlos Pachon	15 min	
<b>7) Wrap-up</b> Carlos Pachon	10 min	



Spreadsheets  
for  
Environmental  
Footprint  
Analysis

Agenda			<div>SEFA</div> <div>Spreadsheets for Environmental Footprint Analysis</div>
1) Overview	Carlos Pachon	10 min ✓	
2) Basics of SEFA	Karen Scheuermann	30 min ✓	
3) Q/A on Basics	Carlos Pachon	10 min ✓	
4) Demonstrate Key Features in SEFA	Karen Scheuermann	30 min ←	
5) Q/A on Key Features	Carlos Pachon	10 min	
6) Open Forum / Advanced Features	Karen Scheuermann / Carlos Pachon	15 min	
7) Wrap-up	Carlos Pachon	10 min	

## Demonstrate Key Features in SEFA

**(A) Brief walk-through of the workbooks**

- Highlight some features that don't show up on screenshots
- Will visit only a few tabs in the workbooks

**(B) Demonstrate three key features in SEFA**

- Add a new activity to the remedy
- Provide the fuel mix for grid electricity
- Add new remedy material with unique footprint conversion factors

*Instructions in SEFA  
provide information  
on these three  
features*

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## Demonstrate Key Features in SEFA

*Our  
Hypothetical  
Site*

*Simple  
Dig & Haul  
Remedy*



### Remediation at "Green Hills" Site

- conduct site investigation
- excavate contaminated soil
- transport soil to off-site landfill
- backfill excavated areas
- pump and treat system
- conduct groundwater monitoring



*In this demonstration a new activity (regrading) will be added to the remedy.*

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## Demonstrate Key Features in SEFA

*Instructor opens SEFA Workbooks and demonstrates  
key features in the worksheets*

*All three  
workbooks must  
be open at the  
same time*

## Demonstrate Key Features in SEFA

Recap

- *this has been a very simple site and remedy*
- *for a real site, can enter as much or as little detail as may be appropriate*

### **SEFA provides:**

- *format for data entry*
- *application of footprint conversion factors*
- *compilation of results*

### **The user:**

- *sets up structure of analysis to reflect site*
- *provides remedy inputs and documentation*
- *enters data directly into the spreadsheets*

*Your footprint analysis  
can be tailored to  
specific questions at  
your site*

*EPA is using SEFA at  
some of our cleanup  
sites and we welcome  
the use of SEFA by site  
owners and PRPs*

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## Demonstrate Key Features in SEFA

**SEFA has additional features such as:**



**Modeling renewable energy sources**



**Modeling carbon storage (e.g. from planting trees)**



**Overriding fuel usage rates**





**Representing alternative modes of transport and fuels**

*Instructions in  
SEFA provide full  
information on  
these features*

*Tutorial illustrating  
all features of SEFA  
will be available on  
Clu-in*

*These and other features in SEFA allow flexibility for accurately modeling  
specific site and remedy conditions.*

Agenda			<div>SEFA</div> <div>           Spreadsheets for Environmental Footprint Analysis         </div>
1) Overview	10 min	✓	
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Carlos Pachon			
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Karen Scheuermann / Carlos Pachon			
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Carlos Pachon			

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Agenda			<div>SEFA</div> <div>Spreadsheets for Environmental Footprint Analysis</div>
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## ***Wrap-up***

- *SEFA is one part of EPA's Greener Cleanups approach*
- *The SEFA worksheets are available on EPA's Clu-in website*
- *EPA is continuing to use SEFA for our footprint analyses*
- *We welcome the use of SEFA by site owners and PRPs*
- *We'd love to hear of your experiences. If you have interesting application of SEFA let's get the word out.*

## Estimating Environmental Footprints Using SEFA

### **Resources**

#### **Footprint Methodology (full document)**

[www.clu-in.org/greenremediation/subtab\\_b3.cfm](http://www.clu-in.org/greenremediation/subtab_b3.cfm)

#### **Footprint Methodology (2-page fact sheet)**

[www.clu-in.org/greenremediation/methodology/docs/GR\\_Overview\\_of\\_Footprint\\_Methodology\\_FS\\_3-29-12.pdf](http://www.clu-in.org/greenremediation/methodology/docs/GR_Overview_of_Footprint_Methodology_FS_3-29-12.pdf)

#### **SEFA Worksheets**

[www.clu-in.org/greenremediation/subtab\\_b3.cfm](http://www.clu-in.org/greenremediation/subtab_b3.cfm)

### **Contacts**

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### ***Other Related Topics***

#### **BMP Fact Sheets**

[www.clu-in.org/greenremediation/](http://www.clu-in.org/greenremediation/)

#### **Profiles of Green Remediation**

[www.clu-in.org/greenremediation/tab\\_d.cfm](http://www.clu-in.org/greenremediation/tab_d.cfm)

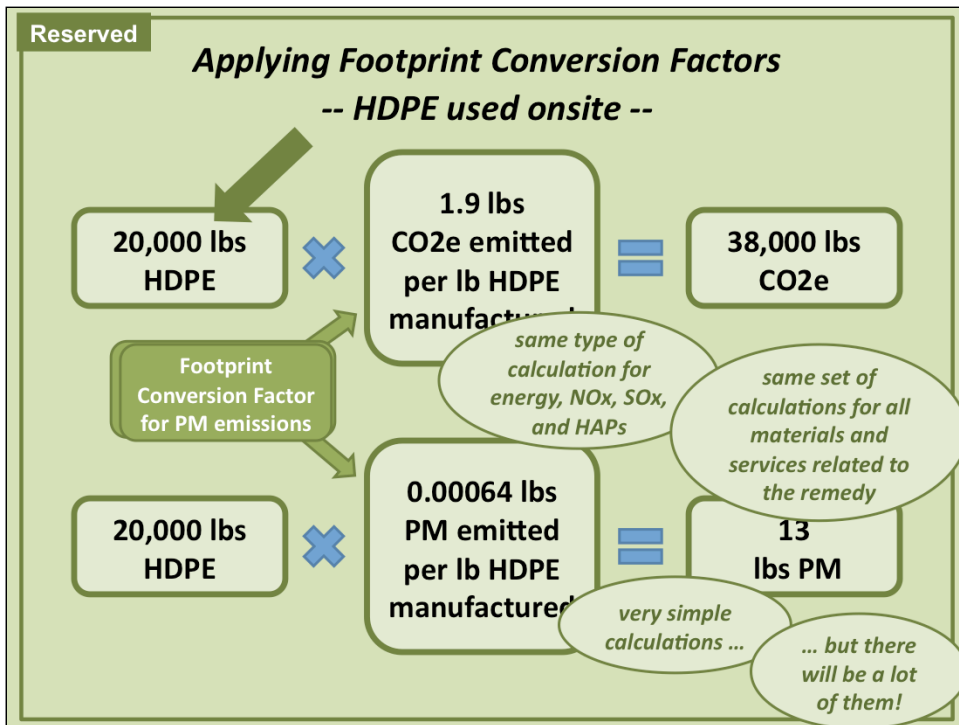
#### **Archived Webinars**

[www.clu-in.org/greenremediation/subtab\\_b6.cfm](http://www.clu-in.org/greenremediation/subtab_b6.cfm)



*Thank you for your  
interest in Greener  
Cleanups!*





#### Notes

→ This slide reserved for use if needed to demonstrate the application of footprint conversion factors.