

---

# **Software Requirements Specification**

**for**

## **WasteWise**

**Version 1.0 approved**

**Prepared by**

Nur Shaqilah Izyan Binte Rosli  
Cheng Yi Hsuen  
Yoon Wonyeong  
Feng Yukun  
Gladys Woo Hui Min  
Sum Sze Wai Prisca  
Manikandan Praveen Kannappan

**Nanyang Technological University Team 1**

**26/08/2024**

# Table of Contents

<b>Table of Contents</b>	<b>ii</b>
<b>Revision History</b>	<b>ii</b>
<b>1. Introduction</b>	<b>1</b>
1.1 Purpose	1
1.2 Document Conventions	1
1.3 Intended Audience and Reading Suggestions	1
1.4 Product Scope	1
1.5 References	1
<b>2. Overall Description</b>	<b>2</b>
2.1 Product Perspective	2
2.2 Product Functions	2
2.3 User Classes and Characteristics	2
2.4 Operating Environment	2
2.5 Design and Implementation Constraints	2
2.6 User Documentation	2
2.7 Assumptions and Dependencies	3
<b>3. External Interface Requirements</b>	<b>3</b>
3.1 User Interfaces	3
3.2 Hardware Interfaces	3
3.3 Software Interfaces	3
3.4 Communications Interfaces	3
<b>4. System Features</b>	<b>4</b>
4.1 System Feature 1	4
4.2 System Feature 2 (and so on)	4
<b>5. Other Nonfunctional Requirements</b>	<b>4</b>
5.1 Performance Requirements	5
5.2 Security Requirements	5
5.3 Software Quality Attributes	5
5.4 Business Rules	5
<b>6. Other Requirements</b>	<b>5</b>
<b>Appendix A: Data Dictionary</b>	<b>5</b>
<b>Appendix B: Analysis Models</b>	<b>5</b>
<b>Appendix C: To Be Determined List</b>	<b>6</b>

## Revision History

Name	Date	Reason For Changes	Version

# **1. Introduction**

## **1.1 Purpose**

The purpose of WasteWise is to provide an efficient and user-friendly system for managing waste collection services. By enabling users to search for waste collectors by name or filter by location and waste class, WasteWise simplifies the process of finding the right service provider.

WasteWise also offers detailed information about waste collectors, including contact details, address locations, and license classes, along with user-generated ratings and comments. This ensures transparency, improves waste management efficiency, and enhances communication between the public, waste collectors, and regulatory bodies. Overall, the platform aims to streamline searching of waste collection options, supervise the performance of collectors and contribute to a smarter, cleaner environment.

## **1.2 Document Conventions**

**Software Requirement Specification Format** : This document follows IEEE standard. Priorities of higher level requirements are inherited by detailed level requirements.

**Font** : Times New Roman

**Main Header** : Size 18, Bold

**Subsection Header** : Size 14, Bold

**Content** : Size 12

Further conventions on the terms used could be found at Appendix A – Data Dictionary Section

## **1.3 Intended Audience and Reading Suggestions**

This document is intended for all stakeholders involved in the WasteWise project. This includes end-users such as the general public, waste collectors, and regulatory bodies, as well as software developers, project managers, marketing teams, testers, and any business partners involved. The document provides a comprehensive overview of the platform's functionality, its purpose, and the rationale behind each feature.

Each feature is described in detail, with examples and illustrations provided where necessary to enhance understanding of the system's layout and operation. For general users, regulatory bodies, and waste collectors, the document is best read in sequence to gain a complete understanding of the platform. For software developers and project managers, it is recommended to first review the overall description, followed by individual system features, and then the technical requirements, including external interfaces and non-functional requirements.

## 1.4 Product Scope

The WasteWise platform will be presented as a web-based application with a user-friendly interface. The application aims to simplify the process of finding and connecting with waste collection services by providing advanced search and filtering options. Users will be able to search for waste collectors by name or filter by location and waste class. The platform will also offer detailed information about each waste collector, including contact details, address, license class, and user-generated ratings and comments.

WasteWise is designed to facilitate better communication and transparency between the public, waste collectors, and regulatory bodies, ultimately contributing to a more efficient and effective waste management process.

## 1.5 References

- I. **IEEE 830-1998 Template** - Provides guidelines for writing software requirements specifications.
- II. **HTTP Status Code** - <https://developer.mozilla.org/en-US/docs/Web/HTTP/Status>
- III. **Figma Design Tool** - <https://www.figma.com/>

# 2. Overall Description

## 2.1 Product Perspective

WasteWise is an innovative web-based platform designed to streamline the process of managing waste collection services. The platform serves as a centralized directory for the public, waste collectors, and regulatory bodies, providing a comprehensive solution for searching and filtering, and managing waste collection services.

WasteWise allows users to easily find waste collectors by searching by name or filtering based on location and the specific class of waste they are licensed to collect. The platform leverages publicly available data to ensure that the information presented is accurate and up-to-date. Users can access detailed information about waste collectors, including contact details, address location, and the class of waste they are authorized to handle.

In addition to search and filter functionalities, WasteWise promotes transparency by displaying user-generated ratings and comments for each waste collector. This feature enables the general users to make informed decisions when selecting a waste collection service, based on the experiences of other users. Users can make reports which will be reviewed by regulators through our website.

The platform is designed to be user-friendly, with an intuitive interface that allows users of all technical skill levels to navigate and utilize its features effectively. By integrating these functionalities, WasteWise not only improves the efficiency of waste management but also fosters better communication and accountability among the public, waste collectors, and regulatory bodies.

## 2.2 Product Functions

This product will provide following functions:

- Finding waste collector:
  - Show list of available waste collector
    - Collectors can be viewed on a map by its geographical location
    - Collectors can be viewed by a list
  - Search and filter certain waste collector
    - Search by name
    - Filter by class of license and/or by location
  - Show information of waste collector
    - Showing contact numbers
    - Showing address location
    - Showing processable waste types authorized
- User registration
  - Users can register as general user and collector.
    - Domains, email address, username and password are required.
- User login
  - Users can log in with correct account particulars
    - Username or email address, and password are required
    - Passwords will be compared after hashing
- User Management
  - Users can update their particulars
    - User can change their name and email address
    - User can change their password
  - Users can review their activities
  - Rate certain collector
    - Rating requires a logged in user account, and anonymous users will be given a chance to log in.
    - User can rate collector in 5 stars
    - User can leave comment about collector
    - User can report illegal collector to associated regulation
- Regulator management
  - Regulator can list & view reported cases
  - Regulator can close cases when complete
  - Regulator can remove collector from the system if action is needed
- Collector management
  - Collectors can update their particulars.

## 2.3 User Classes and Characteristics

*<Identify the various user classes that you anticipate will use this product. User classes may be differentiated based on frequency of use, subset of product functions used, technical expertise, security or privilege levels, educational level, or experience. Describe the pertinent characteristics of each user class. Certain*

*requirements may pertain only to certain user classes. Distinguish the most important user classes for this product from those who are less important to satisfy.>*

## 2.4 Operating Environment

*<Describe the environment in which the software will operate, including the hardware platform, operating system and versions, and any other software components or applications with which it must peacefully coexist.>*

## 2.5 Design and Implementation Constraints

*<Describe any items or issues that will limit the options available to the developers. These might include: corporate or regulatory policies; hardware limitations (timing requirements, memory requirements); interfaces to other applications; specific technologies, tools, and databases to be used; parallel operations; language requirements; communications protocols; security considerations; design conventions or programming standards (for example, if the customer's organization will be responsible for maintaining the delivered software).>*

## 2.6 User Documentation

*<List the user documentation components (such as user manuals, on-line help, and tutorials) that will be delivered along with the software. Identify any known user documentation delivery formats or standards.>*

## 2.7 Assumptions and Dependencies

*<List any assumed factors (as opposed to known facts) that could affect the requirements stated in the SRS. These could include third-party or commercial components that you plan to use, issues around the development or operating environment, or constraints. The project could be affected if these assumptions are incorrect, are not shared, or change. Also identify any dependencies the project has on external factors, such as software components that you intend to reuse from another project, unless they are already documented elsewhere (for example, in the vision and scope document or the project plan).>*

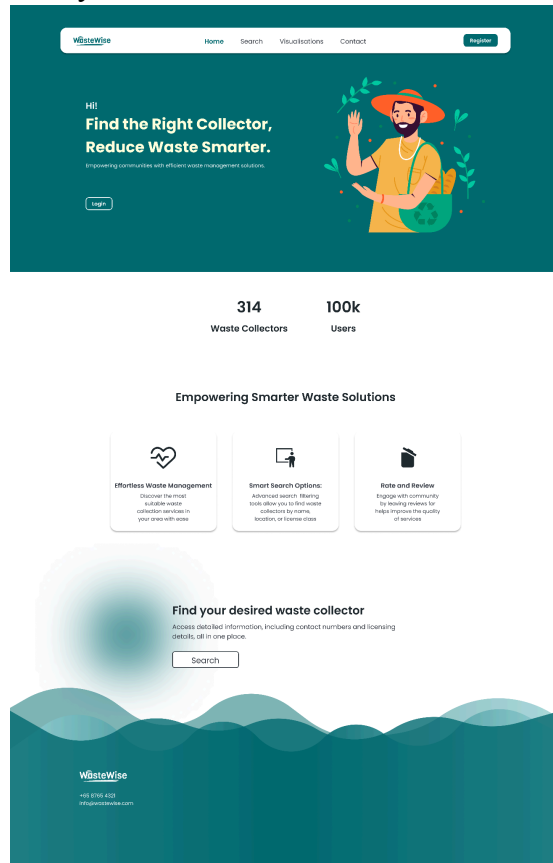
# 3. External Interface Requirements

## 3.1 User Interfaces

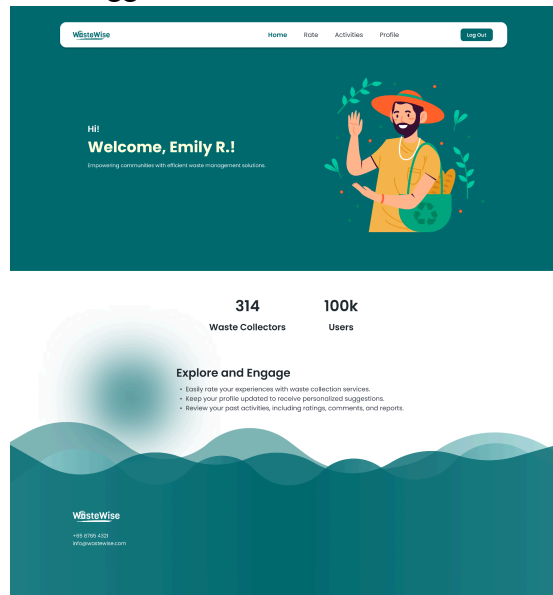
The user interface of WasteWise is designed to be displayed on multiple types of devices, but we focus on the layout of desktop devices. It's designed to be simple and user-friendly, with a navigation bar for better usability.

1. User landing page

## 1.1. Anonymous User




## 1.2. After logged in



## 2. Registration

## 2.1. Registration for general user



**WasteWise**

### Registration

**First Name**  
Enter your first name

**Last Name**  
Enter your last name

**Email**  
Enter your email address

**Password**  
Enter your password

**Re-enter password**  
Enter your password again

☐ I've read and agree with Terms of Service and our Privacy Policy

**Register**

A certificated collector on our listing? >> [Register as collector here](#)

Already have an account? [Sign In](#)

## 2.2. Registration for collector



**WasteWise**

### Collector Registration

**First Name**  
Enter your first name

**Last Name**  
Enter your last name

**Email**  
Enter your email address

**Password**  
Enter your password

**Re-enter password**  
Enter your password again


Select the collector you belong to

800 SUPER WASTE MGMT PTE LTD  
A & S MANAGEMENT SERVICES PTE LTD  
A & T WASTE WULAGE SERVICES PTE LTD and our  
A. K. LEE ENTERPRISES PTE LTD  
ADVANCE FACILITIES PTE LTD

**Register**

Already have an account? [Sign In](#)

## 3. Login



**WasteWise**

### Log in

**Email**  
Enter your email address

**Password**  
Enter your email address

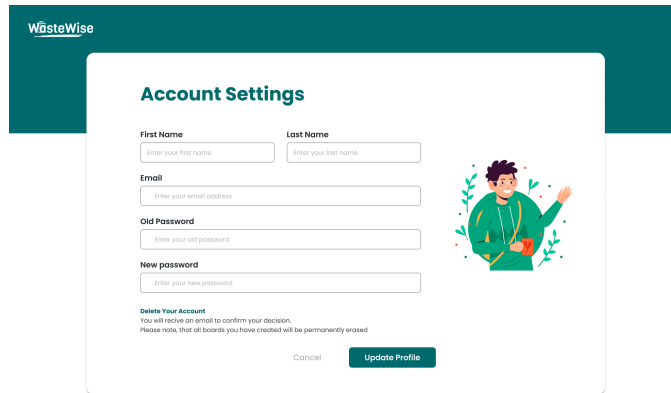
☐ Remember me [Forgot password?](#)

**Log in**

New user? [Registration](#)



## 4. Update Particular



The screenshot shows the 'Account Settings' form in the WasteWise application. The form is set against a dark teal header with the 'WasteWise' logo. It contains input fields for 'First Name', 'Last Name', 'Email', 'Old Password', and 'New Password'. A small illustration of a person with a recycling symbol is on the right. At the bottom, there is a 'Delete Your Account' warning and two buttons: 'Cancel' and 'Update Profile'.

**WasteWise**

### Account Settings

**First Name**  
Enter your first name

**Last Name**  
Enter your last name

**Email**  
Enter your email address

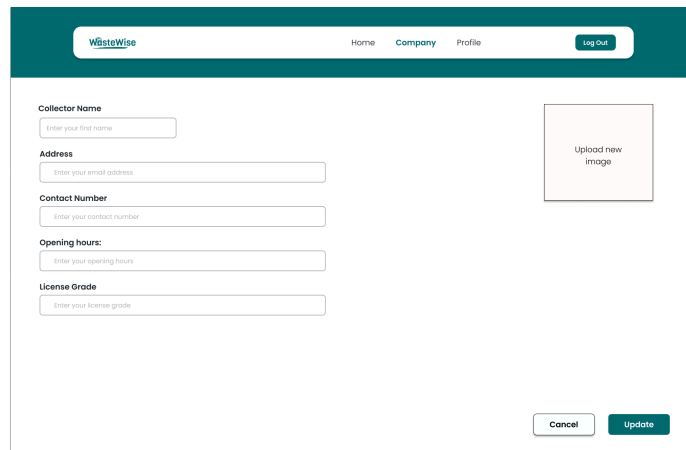
**Old Password**  
Enter your old password

**New Password**  
Enter your new password

**Delete Your Account**  
You will receive an email to confirm your decision.  
Please note, that all boards you have created will be permanently erased

[Cancel](#) [Update Profile](#)

## 5. Update collector information



The screenshot shows the 'Update collector information' form in the WasteWise application. The form is set against a dark teal header with the 'WasteWise' logo and navigation links: 'Home', 'Company', 'Profile', and a 'Log Out' button. The form contains input fields for 'Collector Name', 'Address', 'Contact Number', 'Opening hours', and 'License Grade'. A placeholder for an image with the text 'Upload new image' is on the right. At the bottom, there are 'Cancel' and 'Update' buttons.

**WasteWise** Home Company Profile [Log Out](#)

**Collector Name**  
Enter your first name

**Address**  
Enter your email address

**Contact Number**  
Enter your contact number

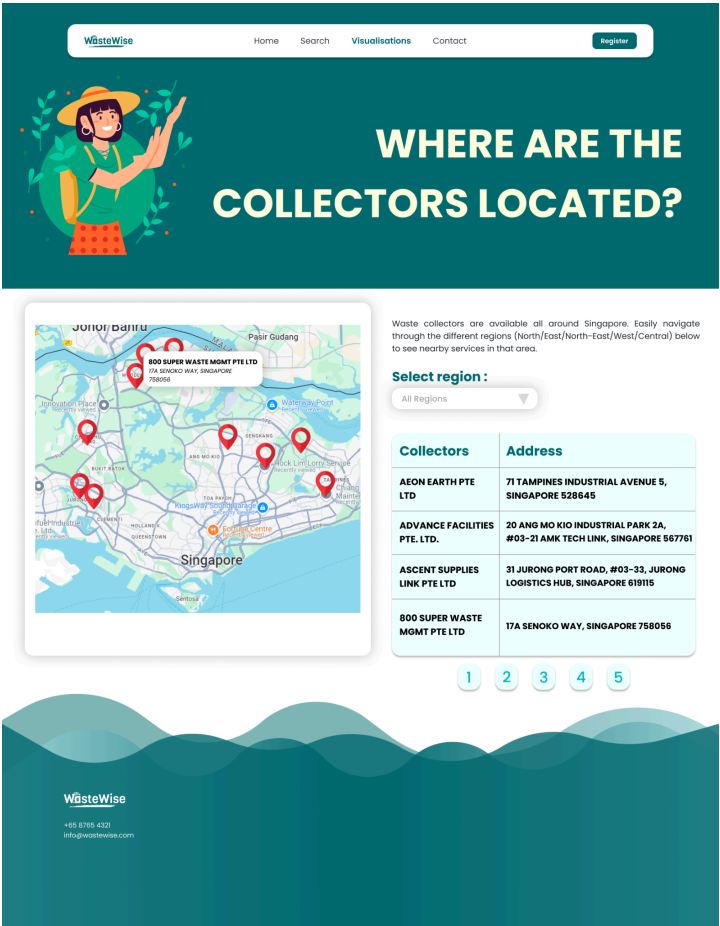
**Opening hours:**  
Enter your opening hours

**License Grade**  
Enter your license grade

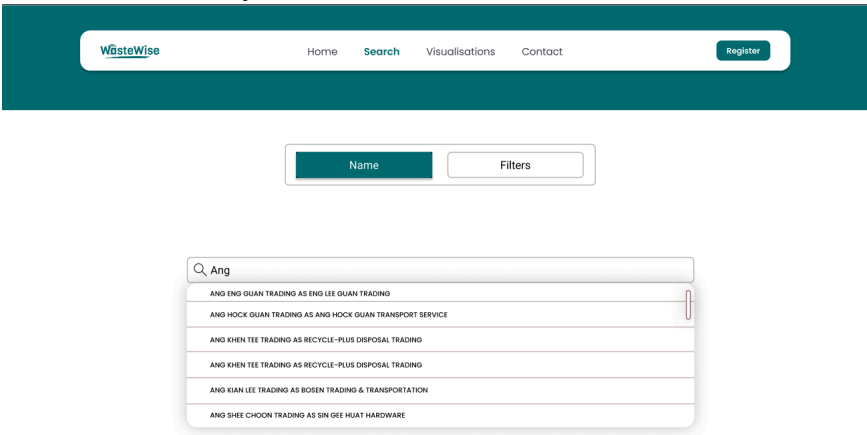
Upload new image

[Cancel](#) [Update](#)

6. Visualization for collectors



7. Search collectors by name



8. Search collectors by filters

WasteWise

HomeSearchVisualisationsContact

Register

Name

Filters

Address

Class of License

e.g., Tuas/639077...

A

B

C

SEARCH

Classes of general waste	Description
Class A	<ul style="list-style-type: none"><li>Inorganic waste such as unwanted furniture, electrical appliances, construction and renovation debris, matter settled out of ballast water in a ship and cut tree trunks and branches;</li><li>Bulky waste;</li><li>Non-putrefiable waste; and</li><li>Recyclable waste (excluding food waste).</li></ul>
Class B	<ul style="list-style-type: none"><li>Organic waste such as domestic refuse, food waste (excluding used cooking oil) and market waste; and</li><li>Waste with a high organic content which is putrefiable.</li></ul>
Class C	<ul style="list-style-type: none"><li>Sludge and other waste from grease interceptors;</li><li>Sewage, sludge and other waste from water-seal latrines, sewage treatment plants, septic tanks or other types of sewerage systems; and</li><li>Waste from sanitary conveniences not part of a sewerage system, including waste from sanitary conveniences which are mobile or in ships and aircraft.</li></ul>

9. Display collector particulars

WasteWise

HomeSearchVisualisationsContact

Register

800 SUPER WASTE MGMT PTE LTD	
Contact Number	63663800
Address	17A SENOKO WAY, SINGAPORE 758056
Class of Licence	A,B,C
Ratings	<div><div>★</div><div>★</div><div>★</div><div>★</div><div>★</div></div>
Comments	<div><div>John D. (August 22, 2024) "Excellent service! The team arrived on time and handled the waste efficiently. Highly recommend!"</div><div>Emily R. (August 18, 2024)</div></div>

BACK

10. Rate collector

WasteWise

HomeRateActivitiesProfile

Log Out

Collector Name

800 SUPER WASTE MGMT PTE LTD

Give your ratings

★

★

★

★

★

Comments

Enter your comments

Submit

BACK

11. Report collector

WasteWise

HomeRateActivitiesProfile

Log Out

Collector Name

800 SUPER WASTE MGMT PTE LTD

Reasons

Select Reason

Comments

Enter your comments

Submit

BACK

12. Regulator viewing cases page

WasteWise

HomeReports

Log Out

List Reports

Sort By :

Date Created

Created by User

Reported Collector

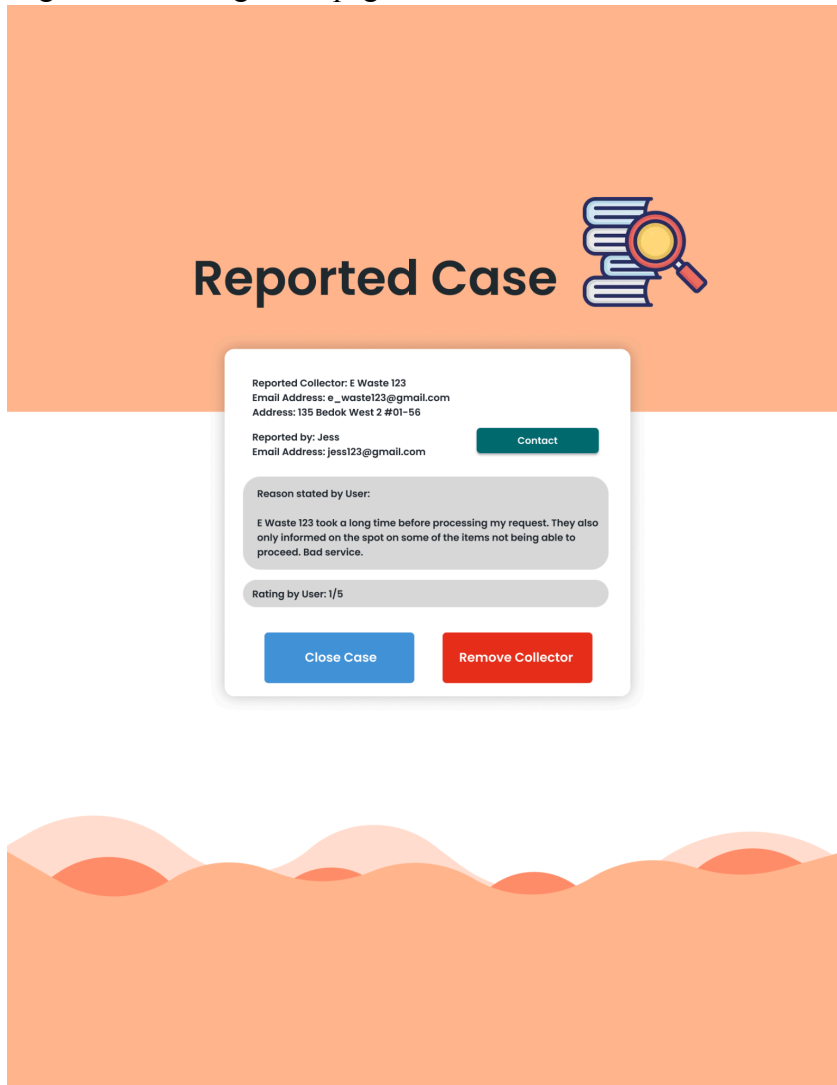
Date Created	Created by User	Reported Collector	
27/08/2024	Sample_User_12345	Sample_Collector_A	<a href="#">View Report</a>
29/08/2024	Sample_User_67890	Sample_Collector_B	<a href="#">View Report</a>
•	•	•	
•	•	•	
•	•	•	

WasteWise

+65 9265 4328

info@wastewise.com

## 13. Regulator handling cases page



The image shows a web form titled "Reported Case" on an orange background. The form is a white card with a shadow. It contains the following elements:

- Title:** "Reported Case" in large black font, accompanied by an icon of a magnifying glass over a stack of books.
- Reported Collector:** "E Waste 123", "Email Address: e\_waste123@gmail.com", "Address: 135 Bedok West 2 #01-56".
- Reported by:** "Jess", "Email Address: jess123@gmail.com". A green "Contact" button is next to this section.
- Reason stated by User:** A text area containing the message: "E Waste 123 took a long time before processing my request. They also only informed on the spot on some of the items not being able to proceed. Bad service."
- Rating by User:** A progress bar showing "1/5".
- Buttons:** A blue "Close Case" button and a red "Remove Collector" button at the bottom.

Below the form is a decorative orange wavy border.

14. Regulator remove collector page

## Remove Collector

Reported Collector: E Waste 123  
Email Address: e\_waste123@gmail.com  
Address: 135 Bedok West 2 #01-56

Reason for Removal:

Submit

**WasteWise**  
+65 6769 4321  
info@wastewise.com

## 15. Activity record page



## 3.2 Hardware Interfaces

1. This app requires a mobile or desktop device that supports the latest version of web browsers.
2. This app requires a stable internet connection to transmit data with the server.

## 3.3 Software Interfaces

1. This app requires a stable version of the latest internet browser.
  - 1.1. Google Chrome, Microsoft Edge (Chromium Version)
  - 1.2. Safari
  - 1.3. Firefox
1. This app is built with the following architecture
  - a. Front-End:

- i. Vue.js - A javascript framework for front-end development.
- b. Back-End:
  - i. MySQL - Database
  - ii. Golang Fiber - Provide a fast and high-efficiency application with REST API support.

### 3.4 Communications Interfaces

1. This app follows HTTPS and TCP/IP protocol to establish connections between front-end and back-end.

## 4. System Features

### 4.1 Visualization

#### 4.1.1 Description

All parties can view visualizations of the different waste collection services available in different regions across Singapore.

#### 4.1.2 Use Case

Use Case ID:	VIS1		
Use Case Name:	Visualization		
Created By:	Nur Shaqilah Izyan Binte Rosli	Last Updated By:	
Date Created:	26/08/2024	Date Last Updated:	



Actor:	Public User
Description:	User can filter the map & list based on the region selected to display waste collection services in that area.
Preconditions:	System must be able to retrieve data to display the map & list.
Postconditions:	User are able to view the locations of various waste collection services according to the selected geographic area.
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> <li>1. User navigates to Visualisations Page</li> <li>2. By default, system will display all of the different waste collection services across Singapore</li> <li>3. User selects a particular region (All Regions/East / West / Central / North / North-East)</li> <li>4. System retrieves exact data for that region and updates the visualisation to reflect waste collection services in that area.</li> </ol>
Alternative Flows:	<p>VIS1.AC.1 If selected region has no waste collection services</p> <ol style="list-style-type: none"> <li>1. System displays “No waste collection services available in this area”</li> <li>2. User can choose to view another region or access other functionalities.</li> </ol>
Exceptions:	<p>VIS1.EX.1 If data cannot be retrieved/displayed</p> <ol style="list-style-type: none"> <li>1. System displays “Unable to display data. Please try again later.”</li> </ol>

	<ol style="list-style-type: none"> <li>2. User is to wait till the data loads. If problem persists, contact support.</li> <li>3. User can choose to view another region or access other functionalities.</li> </ol>
Includes:	NIL
Special Requirements:	NIL
Assumptions:	<ol style="list-style-type: none"> <li>1. The data retrieved is up-to-date.</li> <li>2. The user is connected to the Internet.</li> <li>3. User browser supports map api.</li> </ol>
Notes and Issues:	NIL

#### 4.1.3 Functional Requirements

1. The system must display a map & list showing all the waste collection services across Singapore by default when the user accesses the Visualisations Page.
  - 1.1. The system should display an error message: “Unable to display data. Please try again later.” if the map or list fails to appear.
2. The system must display a drop-down list of geographic regions (All Regions/North/East/West/North-East/Central) for the user to select.
  - 2.1. Upon user’s selection, the system must retrieve the exact data for the selected region.
  - 2.2. The system must then update the map & list to display the waste collection services located in the selected region.
  - 2.3. The system should display a message: “No waste collection services available in this area.” if there are no waste collection services available in the selected region.
  - 2.4. In the case where the data could not be retrieved, the system should display an error message: “Unable to display data. Please try again later.”

## 4.2 Search (By Name)

### 4.2.1 Description

Users can search for a specific waste collector by entering the collector's name. The results will show the details/information of a particular waste collector, including contact number, address, and the class of licensed.

### 4.2.2 Use Case

Use Case ID:	SEA1		
Use Case Name:	Search (By Name)		
Created By:	Cheng Yi Hsuen	Last Updated By:	
Date Created:	26/08/2024	Date Last Updated:	

Actor:	Public User
Description:	Users can search for a specific waste collector by entering the collector's name. The results will show the details/information of a particular waste collector, including contact number, address, and the class of licensed.
Preconditions:	The waste collector must be registered in the platform's database.
Postconditions:	The system lists waste collectors matching the search query, and the user can view and select a specific collector for more details.
Priority:	High

Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"> <li>1. The user navigates to the search page.</li> <li>2. The user enters the name of the waste collector in the search field.</li> <li>3. The system lists the matching collector(s) from the database.</li> <li>4. The user clicks on the collector they intend to search.</li> <li>5. The system displays the collector details to the user.</li> </ol>
Alternative Flows:	<p>SEA1.AC.1 If no matching collector is found</p> <ol style="list-style-type: none"> <li>1. The system will display a "Waste Collector Not Found" message in real-time.</li> <li>2. Users will modify their searches.</li> </ol>
Exceptions:	<p>SEA1.EX.1 If data cannot be retrieved/displayed</p> <ol style="list-style-type: none"> <li>1. System displays "Unable to display data. Please try again later."</li> <li>2. User is to wait till the data loads. If problem persists, contact support.</li> <li>3. User can choose to access other functionalities.</li> </ol>
Includes:	Display Information
Special Requirements:	NIL
Assumptions:	<ol style="list-style-type: none"> <li>1. The data retrieved is up-to-date.</li> <li>2. The user is connected to the Internet.</li> </ol>
Notes and Issues:	NIL

#### 4.2.3 Functional Requirements

1. The system must provide a search functionality for users to find waste collectors by name.
  - 1.1 The system must display a text field labeled "Name of Waste Collector" where users can input the name of collectors.
  - 1.2 The system must provide a real-time search suggestions list as the user types the names of collectors.
  - 1.3 The system must allow users to select a collector by pressing the "Enter" key when the bar is on the selected collector or clicking the bar of the collector.
2. The system must retrieve and display the details of the waste collector when the collector is selected.
  - 2.1 The system must query the database for the collector selected by the user.
  - 2.2 The system must display collector information for the matching collector.
3. The system must display a "Waste Collector Not Found" message if no matching company is found in the database on any point of words typed.

### 4.3 Search (By Filters)

#### 4.3.1 Description

Users can filter waste collectors based on the location of the collectors, the specific class of waste they are licensed to collect or both filters. This feature helps users find the waste collection service in a certain region and/or collectors that handle a specific type of waste.

#### 4.3.2 Use Case

Use Case ID:	SEA2		
Use Case Name:	Search (By Filters)		
Created By:	Cheng Yi Hsuen	Last Updated By:	
Date Created:	26/08/2024	Date Last Updated:	

Actor:	Public User
Description:	The user applies filters based on location and/or class of license to find relevant waste collectors.
Preconditions:	The waste collector must be registered in the platform's database with its location data and class of license.
Postconditions:	The system presents a list of waste collectors that match the selected filters, allowing the user to choose a collector for detailed information.
Priority:	High
Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"><li>1. The user navigates to the filtering page.</li><li>2. The user enters a location or part of address.</li><li>3. The user selects a license class (e.g. A, A &amp;B).</li><li>4. The user clicks on the search button.</li><li>5. The system retrieves and displays a list of collectors that match the criteria.</li><li>6. The user clicks on a collector in the list to view detailed information about that collector.</li><li>7. The system displays the collector details to the user.</li></ol>
Alternative Flows:	<p>SEA2.AC.1 If no company matches the filters</p> <ol style="list-style-type: none"><li>1. The system will display a "No results found" message.</li><li>2. Users will modify the filters to search.</li></ol>

Exceptions:	SEA2.EX.1 If data cannot be retrieved/displayed  1. System displays “Unable to display data. Please try again later.” 2. User is to wait till the data loads. If problem persists, contact support. 3. User can choose to access other functionalities.
Includes:	Display Information
Special Requirements:	NIL
Assumptions:	1. The data retrieved is up-to-date. 2. The user is connected to the Internet.
Notes and Issues:	NIL

### 4.3.3 Functional Requirements

1. The system must provide filtering options to allow users to search for waste collectors based on location and waste class.
  - 1.1 The system must display a text field labelled "Enter Location" where users can input their location.
  - 1.2 The system must provide buttons labelled A, B, and C for users to click on to turn on the filters of the selected license class.
  - 1.3 The system must contain a hint icon next to the buttons of the license class that shows the predefined waste class options corresponding with their license class when the user hovers over the icon.
  - 1.4 The system must allow users to apply one or both filters (location and license class) to the search query.
  - 1.5 The system must allow users to reset the filters with a "Reset" button.
2. The system must retrieve and display a list of collectors that match the selected filters after the user clicks on the search button.

- 2.1 The system must query the database for collectors that match the selected location and/or license class.
- 2.2. The system must display all possible collectors of the chosen filter and if the filter is blank, it will show all possible collectors by default.
- 2.3. The system must allow users to select a collector by pressing the "Enter" key when the bar is on the selected collector or clicking the bar of the collector.
- 2.4. The system must display a "No results found" message if no collectors match the selected filters.
- 3. The system must retrieve and display the details of the waste collector when a collector is selected by the user.
  - 3.2. The system must query the database for the collector selected by the user.
  - 3.1 The system must display collector information for the matching collector.

## 4.4 Display Information

### 4.4.1 Description

Once a waste collector is selected from the search results, the system displays detailed information about that collector.

### 4.4.2 Use Case

Use Case ID:	DIS1		
Use Case Name:	Display Information		
Created By:	Cheng Yi Hsuen	Last Updated By:	
Date Created:	26/08/2024	Date Last Updated:	



Actor:	Public user
Description:	After selecting a waste collector from the search results, the user views the detailed information about the collector, which includes contact number, location, and license class.
Preconditions:	The waste collector must be registered in the platform's database.
Postconditions:	The user is presented with comprehensive details of the selected waste collector.
Priority:	High
Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"><li>1. The system retrieves the detailed information of the selected waste collector from the database.</li><li>2. The system displays the following information to the user:<ol style="list-style-type: none"><li>a. Contact number</li><li>b. Address</li><li>c. License class</li><li>d. Ratings</li><li>e. Comments</li></ol></li></ol>
Alternative Flows:	NIL
Exceptions:	<p>DIS1.EX.1 If data cannot be retrieved/displayed</p> <ol style="list-style-type: none"><li>1. System displays “Unable to display data. Please try again later.”</li><li>2. User can choose to access other functionalities.</li></ol>

Includes:	NIL
Special Requirements:	NIL
Assumptions:	<ol style="list-style-type: none"> <li>1. The data retrieved is up-to-date.</li> <li>2. The user is connected to the Internet.</li> </ol>
Notes and Issues:	NIL

### 4.4.3 Functional Requirements

1. The system must display information for a selected waste collector.
  - 1.1 The system must show the contact numbers associated with the waste collector.
  - 1.2 The system must display the location of the waste collector in a physical address.
  - 1.3 The system must display the license class of the waste collector.

## 4.5 Rating Directory

### 4.5.1 Description

General user can provide feedback on waste collector by rating their services, leaving comments and making reports.

### 4.5.2 Use Case

Use Case ID:	RAT1		
Use Case Name:	Rating directory		
Created By:	Yoon Wonyeong	Last Updated By:	

Date Created:	26/08/2024	Date Last Updated:	
---------------	------------	--------------------	--

Actor:	General User
Description:	A general user can rate a waste collector and leave a comment based on their experience with them. User can also report illegal collector to associated regulation
Preconditions:	<ol style="list-style-type: none"> <li>1. General User must be logged in and have used the waste</li> <li>2. The waste collector must be listed in the directory</li> </ol>
Postconditions:	<ol style="list-style-type: none"> <li>1. The rating and comment are stored in the system and correctly associated with the corresponding waste collector</li> <li>2. The rating contributes to the collector's overall score</li> <li>3. Reported illegal collector will be added to reported collectors list.</li> </ol>
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> <li>1. General Users navigate to directory entry of the desired waste collection company</li> <li>2. General users write a comment in the provided text box</li> <li>3. General Users input the rating out of 5</li> <li>4. General Users submit the rating and the comment</li> <li>5. System stores the rating and updates the company's listing</li> </ol>

Alternative Flows:	<ol style="list-style-type: none"> <li>1. If public user is not logged in, they are prompted to log in</li> <li>2. If the general user does not input rating or comment, they are prompted to input the necessary fields.</li> <li>3. General Users can choose to report illegal collector using report button</li> </ol>
Exceptions:	If the system fails to save the rating or comment, an error message is displayed and the user is prompted to retry
Includes:	NIL
Special Requirements:	NIL
Assumptions:	<ol style="list-style-type: none"> <li>1. The data retrieved is up-to-date.</li> <li>2. The user is connected to the Internet.</li> </ol>
Notes and Issues:	NIL

#### 4.5.3 Functional Requirements

1. The system shall allow users to leave a rating
  - 1.1. General User can select a rating between 1 and 5 stars for a given waste collector
  - 1.2. General User will be provided with a text box to enter comments about their experience with the collector
2. The system shall store the rating
  - 2.1. System shall associate the rating and comment with the corresponding collector
  - 2.2. Failure in storing the data will prompt the user to retry
3. The system shall ensure that only logged-in users can submit ratings and comments
  - 3.1. System shall prompt the user to log in if not logged in
4. The system shall allow for reporting of illegal collector
  - 4.1. System shall mark the associated collector with blacklist
  - 4.2. System shall store the blacklist

## 4.6 Display Activities Done

### 4.6.1 Description

General users are able to view a table record of the activities they have partaken in, such as rating, commenting, and reporting.

### 4.6.2 Use Case

Use Case ID:	DAD1		
Use Case Name:	Display Activities Done		
Created By:	Nur Shaqilah Izyan Binte Rosli	Last Updated By:	
Date Created:	30/8/2024	Date Last Updated:	

Actor:	General User
Description:	General users are able to view a table displaying their past activities. These activities include any past reports, comments, ratings made by the user, specifying the date and time.
Preconditions:	The general user must be logged in.
Postconditions:	The user should be able to view the table of past activities in an understandable format.

Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> <li>1. User navigates to Activities Page</li> <li>2. The system will display a table of activities done by the user, including any comments, ratings, reports made.</li> <li>3. For reports, the system should display a 'Remarks' section to inform the user whether the reported collector has been investigated: 'Contacted' or 'Not Contacted'.</li> </ol>
Alternative Flows:	<p>DAD1.AC.1 If no activities has been done by the user</p> <ol style="list-style-type: none"> <li>1. System will display "No activities done. Any comments/ratings/reports made will be shown here."</li> <li>2. User can choose to rate, comment, report or access other functionalities.</li> </ol>
Exceptions:	<p>DAD1.EX.1 If activities data cannot be retrieved/displayed</p> <ol style="list-style-type: none"> <li>1. System displays "Unable to display activities done. Please try again later."</li> <li>2. User is to refresh the page till the data loads. If problem persists, contact support.</li> <li>3. User can choose to access other functionalities.</li> </ol>
Includes:	NIL
Special Requirements:	NIL
Assumptions:	<ol style="list-style-type: none"> <li>1. The data retrieved is up-to-date.</li> <li>2. The user is connected to the Internet.</li> </ol>

Notes and Issues:	NIL
-------------------	-----

### 4.6.3 Functional Requirements

1. The system must display a table showing all the activities done by the user when the user accesses the Activities Page.
  - 1.1. If the user has past activities, the system must display a table of the following:
    - Serial Number (S/N)
    - The type of activity
    - Content of activity
    - The time and date of activity
    - Remarks
  - 1.2. If the user does not have any past activities, the system must display “No activities done. Any comments/ratings/reports made will be shown here.”
  - 1.3. The system should display an error message: “Unable to display activities done. Please try again later.” if the table fails to appear.

## 4.7 User Registration

### 4.7.1 Description

Allow non logged users from different domains to register for an account. Proper particulars such as domain, email address, username and password are needed.

### 4.7.2 Use Case

Use Case ID:	REG1		
Use Case Name:	User Registration		
Created By:	Feng Yukun	Last Updated By:	Feng Yukun
Date Created:	27/08/2024	Date Last Updated:	31/08/24

Actor:	Public user
Description:	Allow non logged users from different domains to register for a general user account. Proper particulars such as email address, username and password are needed.
Preconditions:	User is not logged in.
Postconditions:	User successfully registered and the system will automatically log the user in.
Priority:	High
Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"> <li>1. User clicks the “Sign up” button.</li> <li>2. System prompts the user to enter email address, name, password and confirm password.</li> <li>3. User enters all fields required and clicks “Sign up”.</li> <li>4. System checks whether all fields are valid.</li> <li>5. System stores fields in the database.</li> <li>6. System prompts the “registration successful” message.</li> <li>7. System log the user in.</li> </ol>
Alternative Flows:	<p>REG1.AC.1 If the email address is taken by other user</p> <ol style="list-style-type: none"> <li>1. System prompts “ Email address is already registered. Do you want to proceed to login?”</li> <li>2. System returns to step 2.</li> </ol> <p>REG1.AC.2 If the password doesn’t meet the requirements</p> <ol style="list-style-type: none"> <li>3. System prompts “ Passwords do not meet the requirements”</li> </ol>



	<p>4. System returns to step 2.</p> <p>REG1.AC.3 If the confirm password is different with password</p> <p>5. System prompts “ Confirm password should be the same.”</p> <p>6. System returns to step 2.</p> <p>REG1.AC.4 If user chooses to register as collector</p> <p>1. System prompts a new page for user.</p> <p>2. System prompts the user to enter email address, name, password and confirm password.</p> <p>3. System prompts the user to choose the directory entry they belong to.</p> <p>4. User enters all fields required and clicks “Sign up”.</p> <p>5. System returns to step 4.</p>
Exceptions:	NIL
Includes:	NIL
Special Requirements:	NIL
Assumptions:	<p>1. The data retrieved is up-to-date.</p> <p>2. The user is connected to the Internet.</p>
Notes and Issues:	NIL

#### 4.7.3 Functional Requirements

1. User is able to register as general user
  - 1.1. Regulator should be pre-registered in the backend and cannot be created by this function.
  - 1.2. Collector users should be registered on a separate page.
  - 1.3. The system must display all fields needed to be entered
    - 1.3.1. The text field consists of email.

- 1.3.2. The text field consists of name.
- 1.3.3. The text field consists of password.
- 1.3.4. The text field consists of confirm password.
- 1.3.5. When users want to register as a collector, the field should include the directory they belong to.
  - 1.3.5.1. Directory entry is selected by a drop-down list.
- 1.4. Every field should be filled before “Sign up” button can be clicked
- 1.5. The system must verify every field when user click “Sign up” button
  - 1.5.1. Email given should be a valid email address
  - 1.5.2. Email given should be never used by other existing users.
  - 1.5.3. Name can be used by other users because it won’t be used as a login field.
  - 1.5.4. Password should be at least 8 characters and at most 16 characters
  - 1.5.5. Password should contain at least one uppercase character and one special character
  - 1.5.6. When certain fields is invalid, the system should prompt error messages describing the reason.
- 1.6. When all fields are valid, the system should register the user.
  - 1.6.1. The system should store all fields in database
    - 1.6.1.1. The password should be stored after hash encryption
  - 1.6.2. The system should login the user and return to the original page.

## 4.8 User Login

### 4.8.1 Description

Allow registered users to log in when they are not logged in. Before performing restricted actions, such as users rating the collectors, collectors updating particulars, and regulator processing reported cases, users must log in.

### 4.8.2 Use Case

Use Case ID:	LOG1
Use Case Name:	User Login

Created By:	Feng Yukun	Last Updated By:	Feng Yukun
Date Created:	27/08/2024	Date Last Updated:	31/08/2024

Actor:	Public user (login to become General User, Regulator, Waste Collector, Admin)
Description:	Allow registered users to log in when they are not logged in. Before performing restricted actions, such as users rating the collectors, collectors updating particulars, and regulator processing reported cases, users must log in.
Preconditions:	User is not logged in.
Postconditions:	User successfully logs in.
Priority:	High
Frequency of Use:	High
Flow of Events:	<ol style="list-style-type: none"> <li>1. User enters domain, with email and password into text fields.</li> <li>2. The system verifies the fields given by the user with the database.</li> <li>3. System logs the user in and jumps to the original page.</li> </ol>
Alternative Flows:	<ol style="list-style-type: none"> <li>1. LOG1.AC.1 If the email cannot be found in database <ol style="list-style-type: none"> <li>a. System prompts “ Incorrect email address or password!”</li> <li>b. System returns to step1.</li> </ol> </li> <li>2. LOG1.AC.2 If the password is not correct</li> </ol>

	<ul style="list-style-type: none"> <li>a. System prompts “ Incorrect email address or password!”</li> <li>b. System returns to step1.</li> </ul> <p>3. LOG1.AC.3 If domain is not correct</p> <ul style="list-style-type: none"> <li>a. System prompts “ User in the domain cannot be found!”</li> <li>b. System returns to step1.</li> </ul>
Exceptions:	NIL
Includes:	NIL
Special Requirements:	NIL
Assumptions:	<ul style="list-style-type: none"> <li>1. The data retrieved is up-to-date.</li> <li>2. The user is connected to the Internet.</li> </ul>
Notes and Issues:	NIL

#### 4.8.3 Functional Requirements

1. User must be able to login to the system
  - 1.1. The system must display text fields for users to enter.
    - 1.1.1. The fields should consist of domain
      - 1.1.1.1. The domain should be selected by a dropdown list.
    - 1.1.2. Text fields should consist of email address.
    - 1.1.3. Text fields should consist of password.
  - 1.2. Every field should be filled before “Sign up” button can be clicked
  - 1.3. The system must verify every field when user click “Login” button
    - 1.3.1. Domain should be the same in the database.
    - 1.3.2. Email address should be existing in the database.
    - 1.3.3. Password should be the same in the database.
      - 1.3.3.1. Password should be compared after hash encryption
  - 1.4. When certain fields are not valid, the system should prompt error messages.
    - 1.4.1. When email is not found in the database, the system prompts “ Incorrect email address or password!”

- 1.4.2. When the password is not correct, the system prompts “ Incorrect email address or password!”
- 1.4.3. When the domain is not correct, the system prompts “ User in the domain cannot be found!”
- 1.5. When all fields are valid, the system should register the user.
  - 1.5.1. The system should login the user and return to the original page.

## 4.9 Update User Profile

### 4.9.1 Description

Users are able to edit their profile, including name and email address. They are also able to change their passwords.

### 4.9.2 Use Case

Use Case ID:	UUP1		
Use Case Name:	Update User Profile		
Created By:	Feng Yukun	Last Updated By:	Feng Yukun
Date Created:	29/08/2024	Date Last Updated:	31/08/2024

Actor:	General User
Description:	Users are able to edit their profile, including name and email address. They are also able to change their passwords.
Preconditions:	1. General users must be logged in

Postconditions:	1. General users have updated their profile
Priority:	High
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> <li>1. Users login to the system</li> <li>2. Users clicks the “profile” button</li> <li>3. System shows every text field that users can edit</li> <li>4. Users edit fields they intend to update</li> <li>5. Users submit the update</li> <li>6. System saves changes to database</li> </ol>
Alternative Flows:	1. UUP1.AF-1 If user is not logged in, they are prompted to log in before proceeding
Exceptions:	NIL
Includes:	NIL
Special Requirements:	NIL
Assumptions:	1. The user is connected to the Internet.
Notes and Issues:	NIL

#### 4.9.3 Functional Requirements

1. Users must be able to change their profile.
  - 1.1. Users must be able to change their names

- 1.2. Users must be able to change their email account
  - 1.2.1. New email account must not be used by other users
- 1.3. Users must be able to change their password.
  - 1.3.1. Old password is required when changing password.
  - 1.3.2. New password should be stored after hash encryption.

## 4.10 Close Reported Case

### 4.10.1 Description

Once reported cases have been checked through, the regulators can close the case. Closing the case which has been verified ensures that all reported cases are regularly regulated and updated.

### 4.10.2 Use Case

Use Case ID:	CRC1		
Use Case Name:	Close Reported Case		
Created By:	Gladys Woo Hui Min	Last Updated By:	
Date Created:	30/08/2024	Date Last Updated:	

Actor:	Regulator
Description:	Regulator closes the reported case once verified.
Preconditions:	<ol style="list-style-type: none"> <li>1. Regulator must be logged in</li> <li>2. Waste collector must be registered in the system</li> <li>3. Case must be submitted by Case User</li> </ol>

Postconditions:	1. Update collector with new rating and close case
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> <li>1. Regulator is in the page of selected case</li> <li>2. Regulator looked through and verified accuracy and severity</li> <li>3. Regulator evaluates based on severity and type of case (e.g., does not follow protocol, does not dispose correctly)</li> <li>4. Regulator toggles on button “Contact” and “Contacted” once user is contacted on the updates</li> <li>5. Regulator close case through “Close Case” button</li> <li>6. Case is deleted from the system</li> </ol>
Alternative Flows:	<ol style="list-style-type: none"> <li>1. CRC1.AF-1 If regulator is not logged in, they are prompted to log in before proceeding</li> <li>2. CRC1.AF-2 Case has to be closed otherwise follow-up is required.</li> </ol>
Exceptions:	NIL
Includes:	NIL
Special Requirements:	NIL
Assumptions:	<ol style="list-style-type: none"> <li>1. The data retrieved is up-to-date.</li> <li>2. The user is connected to the Internet.</li> </ol>
Notes and Issues:	NIL



### 4.10.3 Functional Requirements

1. Regulator is in the page of the selected case showing comments and ratings of the reported waste collector
2. Regulator sees the details of user who reported and the collector
3. Button toggles between “Contact” and “Contacted” for regulator to indicate whether they have contacted the user for updates on the reported case
4. Regulator close case through “Close Case” button
5. Case raised is deleted from the system

## 4.11 Remove Reported Collector

### 4.11.1 Description

Regulators can remove reported waste collectors if found to be unregulatory. Reasons have to be made clear before submitting the removal.

### 4.11.2 Use Case

Use Case ID:	RRC1		
Use Case Name:	Remove Reported Collector		
Created By:	Gladys Woo Hui Min	Last Updated By:	
Date Created:	30/08/2024	Date Last Updated:	

Actor:	Regulator
Description:	Regulator removes the reported collector with reasons attached.

Preconditions:	<ol style="list-style-type: none"><li>1. Regulator must be logged in</li><li>2. Waste collector must be registered in the system</li><li>3. Case must be submitted by Case User</li></ol>
Postconditions:	<ol style="list-style-type: none"><li>1. Update collector with new rating and close case</li></ol>
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"><li>1. Regulator pressed “Remove” button</li><li>2. Regulator types in reason for removing waste collector in a text box</li><li>3. Regulator submits through a “Submit” button and collector is removed from the system</li><li>4. System sends an email containing the reason for removal attached from the text box to the email of the collectors.</li></ol>
Alternative Flows:	<ol style="list-style-type: none"><li>1. RRC1.AF-2 If text box is empty, prompt regulator to enter reason</li><li>2. RRC1.AF-3 Case has to be submitted otherwise collector is not removed.</li></ol>
Exceptions:	NIL
Includes:	NIL
Special Requirements:	NIL
Assumptions:	<ol style="list-style-type: none"><li>1. The data retrieved is up-to-date.</li></ol>

	2. The user is connected to the Internet.
Notes and Issues:	NIL

#### 4.11.3 Functional Requirements

1. Regulator is in the page of the selected case and clicks on “Report” button
2. Regulator types in reason for removing waste collector in a text box
3. Regulator submits the case through a “Submit” button
4. Case submitted for removal of collector is deleted from the system
5. Waste collector is removed from the system.

### 4.12 Update Collector Profile

#### 4.12.1 Description

Waste collection collectors are able to view the account they created and make edits to it. They can change their personal information(eg. name, address, license grade) in the system.

#### 4.12.2 Use Case

Use Case ID:	UPC1		
Use Case Name:	Update Collector Profile		
Created By:	Sum Sze Wai Prisca	Last Updated By:	Sum Sze Wai Prisca
Date Created:	26/08/2024	Date Last Updated:	30/08/2024

Actor:	Waste collector
--------	-----------------

Description:	Collectors can make changes to their account particulars
Preconditions:	Collectors must be logged in and able to access their profile
Postconditions:	Collectors' details should be successfully updated
Priority:	Medium
Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> <li>1. Collector navigates to profile page</li> <li>2. System displays current profile details (e.g. Collector Name, Address)</li> <li>3. If collector wishes to make any changes or merge, they can do so by pressing 'Edit' button</li> <li>4. The system provides editable fields for the collector to update their information.</li> <li>5. The collector makes the necessary changes to the particulars by typing in the text fields.</li> <li>6. The collector submits the changes by pressing the 'Save' button.</li> <li>7. The system updates the profile with a message "Saved successfully."</li> </ol>
Alternative Flows:	UPC1.AC.1 If the collector does not wish to make changes they can return to the previous page by clicking the 'Cancel' button.
Exceptions:	UPC1.EX.1 If changes are not saved (unsuccessful) <ol style="list-style-type: none"> <li>1. System displays an error message 'Update unsuccessful!'</li> <li>2. Collector is prompted to try again.</li> </ol>

Includes:	NIL
Special Requirements:	NIL
Assumptions:	<ol style="list-style-type: none"> <li>1. The data retrieved is up-to-date.</li> <li>2. The user is connected to the Internet.</li> </ol>
Notes and Issues:	NIL

### 4.12.3 Functional Requirements

1. The collectors and public must be able to see all the collectors' profile details.
  - 1.1. The system must have a page to display the collector's name, address, contact number and type of license grade
2. The system must include an 'Edit' button at the top of the profile page.
  - 2.1. When the 'Edit' button is clicked:
    - 2.1.1. The system must switch to 'Edit' mode, enabling editable fields for the user.
    - 2.1.2. The system must display input fields for modifying the collector name, address, contact number, type of license grade.
  - 2.2. In 'Edit' mode, the system must include:
    - 2.2.1. A 'Save' button to confirm and apply changes.
    - 2.2.2. A 'Cancel' button to discard changes and revert to the view-only mode.
3. The system must be able to detect any errors in saving updated information and display the message 'Update unsuccessful!'
4. After successfully saving changes, the system must provide a confirmation message indicating that the profile has been updated.
  - 4.1. The updated profile details must be immediately reflected on the profile page.
  - 4.2. The system must show the message 'Update successful'.

## 4.13 List Reports

### 4.13.1 Description

Regulators can use the ‘list reports’ functionality to list and view the reports of collectors made by users and sort the reports accordingly. Regulators can view the specific details of each report in the search result if needed.

#### 4.13.2 Use Case

Use Case ID:	LR1		
Use Case Name:	List Reports		
Created By:	Manikandan Praveen Kannappan	Last Updated By:	
Date Created:	26/08/2024	Date Last Updated:	

Actor:	Regulator
Description:	Regulator can list reports created by users, for decision making and administrative purposes, and sort the reports accordingly. Regulator can also view specific details of a report in the list view
Preconditions:	<ol style="list-style-type: none"> <li>1. Regulator must be logged in</li> <li>2. Case should not be a closed/removed case</li> <li>3. Report should have been submitted by a user beforehand</li> </ol>
Postconditions:	NIL
Priority:	Medium

Frequency of Use:	Medium
Flow of Events:	<ol style="list-style-type: none"> <li>1. Regulator is in the home page and clicks on 'Reports'</li> <li>2. The regulator is redirected to another display which shows the list of all active reports made by users</li> <li>3. Regulator chooses to sort the list of reports by either 'date created', 'user' who made the report, or the reported 'collector'</li> <li>4. Regulator chooses whether to sort the selected filter in 'ascending' or 'descending' order</li> <li>5. Regulator selects a particular report to view more specific details</li> </ol>
Alternative Flows:	LR1.AC.1 There are no active reports made by users and the system displays 'No active reports currently!' when regulator clicks on 'List Reports'
Exceptions:	NIL
Includes:	NIL
Special Requirements:	NIL
Assumptions:	<ol style="list-style-type: none"> <li>1. The data retrieved is up-to-date.</li> <li>2. The user is connected to the Internet.</li> </ol>
Notes and Issues:	NIL

#### 4.13.3 Functional Requirements

1. Ensure the system has a 'Reports' button for the regulator to click on in the home page

- 1.1. When the 'Reports' button is clicked:
  - 1.1.1. If there are active reports, the system displays the list of active reports with default sorting
    - 1.1.1.1. Ensure the system allows the regulator to sort the reports based on either of the following fields: 'date created', 'user', or 'collector'
      - 1.1.1.1.1. Regulator can sort the fields in either 'ascending' or 'descending' order
    - 1.1.1.2. Ensure the system allows regulator to 'view report' for specific details of a particular report
  - 1.1.2. If there are no active reports, the system displays a warning message 'No active reports currently!'

## 5. Other Nonfunctional Requirements

### 5.1 Performance Requirements

- 1. System should ensure that the map loads within 5 seconds.
  - 1.1. The map must display icons which show the locations of waste collection points across the whole of Singapore.
    - 1.1.1. The icons must be bright in color.
    - 1.1.2. The users can click on the icon to view in greater detail about the waste collection point
      - 1.1.2.1. Users can view the name of waste collector
      - 1.1.2.2. Users can view the full address of the collection point
  - 1.2. The map must display the different locations of waste collection points based on the region selected (All Regions/North/North-East/Central/East/West).
    - 1.2.1. The map should update almost immediately (within 5 seconds) to accommodate the region selected.
  - 1.3. Users can expand the map to view all collection points in Singapore, or minimize the map to focus on a specific area
    - 1.3.1. Users can expand/minimize by focusing the cursor on an area and using '+'/'-' keys or scrolling (when using a mouse)
- 2. The search function must provide real-time suggestions when the user types.
  - 2.1. Before the user types, the search function provides suggestions based on user's previous search history
  - 2.2. When the user types, the search function suggests waste collection points based on user's search history, followed by distance from current location
    - 2.2.1. Each suggestion comes with a tag indicating whether the waste collection point was 'previously searched' and the distance from current location, 'xx km'



3. Saving and loading of ratings/comments should be completed within 5 seconds.
  - 3.1. Upon saving a rating, the average rating should be updated within 5 seconds, reflecting the average rating of all users over time
  - 3.2. The system should display the time at which the comment was made next to the comment header
    - 3.2.1. The time should be in the format 'xx min/hr/day/year ago', displaying how recent was the comment made
  - 3.3. The system should display the user who made the comment along with any rating if they had provided a rating

## 5.2 Security Requirements

1. Name of the user who reported a waste collector should not be disclosed to anyone except the regulators in charge of the report case.
  - 1.1. Only general users, not public users, can make reports for authentication purposes.
2. Product has to comply with the Singapore Personal Data Protection Act
  - 2.1. Have clear consent forms for data collection and processing.
3. General users and collectors' past activities should only be visible to themselves and not accessible by any other party
4. Before any action can be taken, the user has to log in to their account for accountability

## 5.3 Software Quality Attributes

1. The map that shows the locations of waste collection points must be compatible with various devices and screen sizes (Adaptability)
  - 1.1. The map interface should adjust its layout and zoom levels automatically to provide a consistent and usable experience across different devices
2. Font size of comments should be readable for all devices (Usability)
  - 2.1. Text should all be of at least size 12
3. Information should be reflected in a language the user understands (Usability)
  - 3.1. The application should offer more widely-used language options like English, Malay, Tamil and Chinese, with a user-friendly interface for switching between languages.
4. The system should be designed for easy updates and maintenance, with clear documentation of code to allow developers to implement changes and fix bugs efficiently. (Maintainability)
  - 4.1. Codebase should have separate modules for user management, reporting, mapping among other features. Documentation should include detailed guidelines for developers on how to update or add new features so as to avoid disrupting the existing functionality of the program.

## 5.4 Business Rules

1. When suspicious activity is observed, regulators can access the general user or collector's activity history.
2. Other than themselves, only regulators can edit general users and collectors' information
  - 2.1. The admin's access to modify data is restricted based on their role and authorization level.
  - 2.2. If the change is significant, the regulator's action may be subjected to approval from higher authorities.

## Appendix A: Glossary (Data Dictionary)

Term	Description
Public User	Any individual that interacts with the waste management website. Users can register as general users, collectors or regulators.
General User	General users that registered in the system, other than collectors, regulators and admin.
Collector	An entity/company that is responsible for collecting and managing waste. Collectors may specialize in different types of waste and operate in specific geographical areas.
Regulator	A user with administrative rights who oversees and manages compliance with waste management regulations. Regulators can review reports made by users, and take necessary actions.
Profile	The particulars of a user, including names, email address, passwords, and their domain.
Waste	Material that is discarded and requires disposal, primarily general waste.
Map	A digital interface displaying the locations of waste collectors across Singapore, helping users to locate nearby collection services.
Waste Class/ License Class	Categories of general waste based on licensing classes, including Class A, B, and C. These classes define the types of waste and handling requirements.
Rating	A feedback system allows users to evaluate collectors based on their performance, rated on a scale from 1 to 5 stars, with 5 stars representing the highest level of service.

Comment	A certain paragraph submitted by users with the rating, where users can leave their evaluation of a certain collector.
Report	A formal complaint submitted by users to alert regulators about illegal unauthorized waste collection activities.
Front-end	Refers to the presentation layer of our software. In this context it is the U/I and U/X.
Back-end	The part of system that is not directly accessed by the user, responsible for storing and manipulating data
Admin	Refers to administrator accounts used for back-end managements with highest permissions, such as editing databases directly.
API	API serves as the intermediary between the front-end and back-end for transfer of data.
Text Field	A text box user can interact with, which allows users to key in information required
Drop-down list	An interactive list allows the user to choose one value from either by clicking or hovering over the menu.

## Appendix B: Analysis Models



## Appendix C: To Be Determined List

<Collect a numbered list of the TBD (to be determined) references that remain in the SRS so they can be tracked to closure.>