A VPC Contribution to Venice to Expo 2015:

Designing a treasure hunt app to teach children the importance of water sustainability

An Interactive Qualifying Project

Submitted to the faculty of

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In partial fulfillment of the requirements for the Degree of Bachelor Science

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Authorship

All the members of this team contributed equally to the creation of this report.

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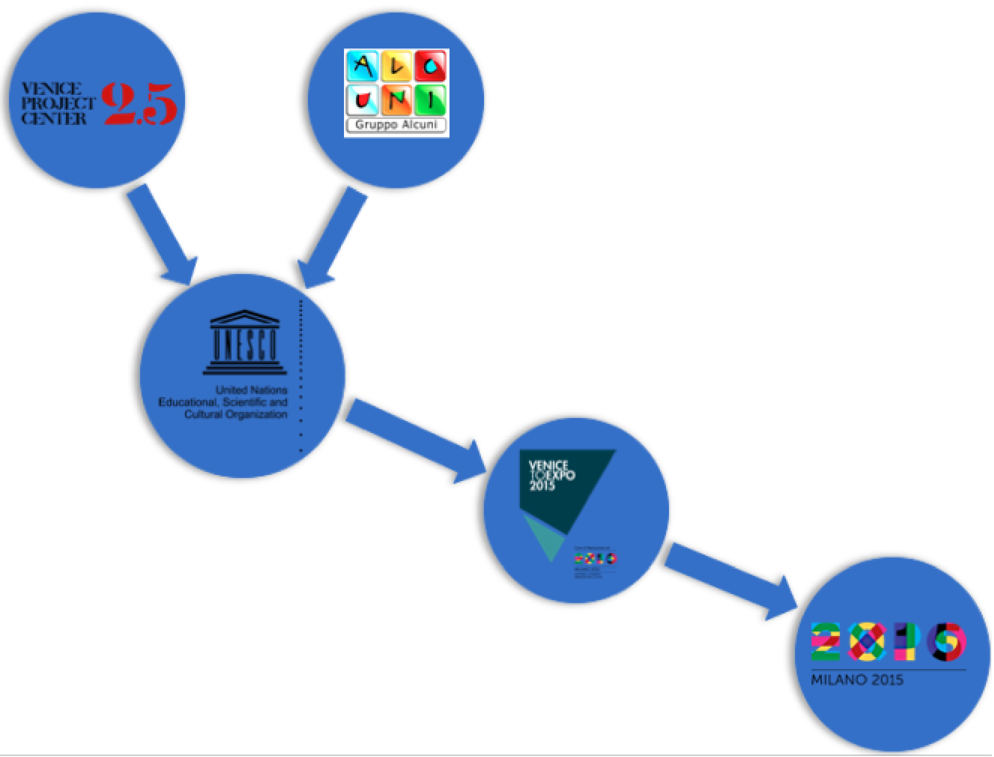
Abstract

The Venice Project Center's website holds a vast collection of data on the city of Venice that students have accumulated over the past 25 years. This data has become more accessible over the years. Our project developed an innovative way to leverage this data through the creation of a contextual and functionality design of a mobile application for a children's treasure hunt. This mobile application will serve as part of UNESCO's contribution to the Venice to Expo events in conjunction with the 2015 Milan Expo. The app acts as a guide through Venice to bring attention to places and objects in Venice that are often overlooked. It also aims to teach children about water sustainability. This mobile app demonstrates the value of the VPC data and will inspire future innovative uses.

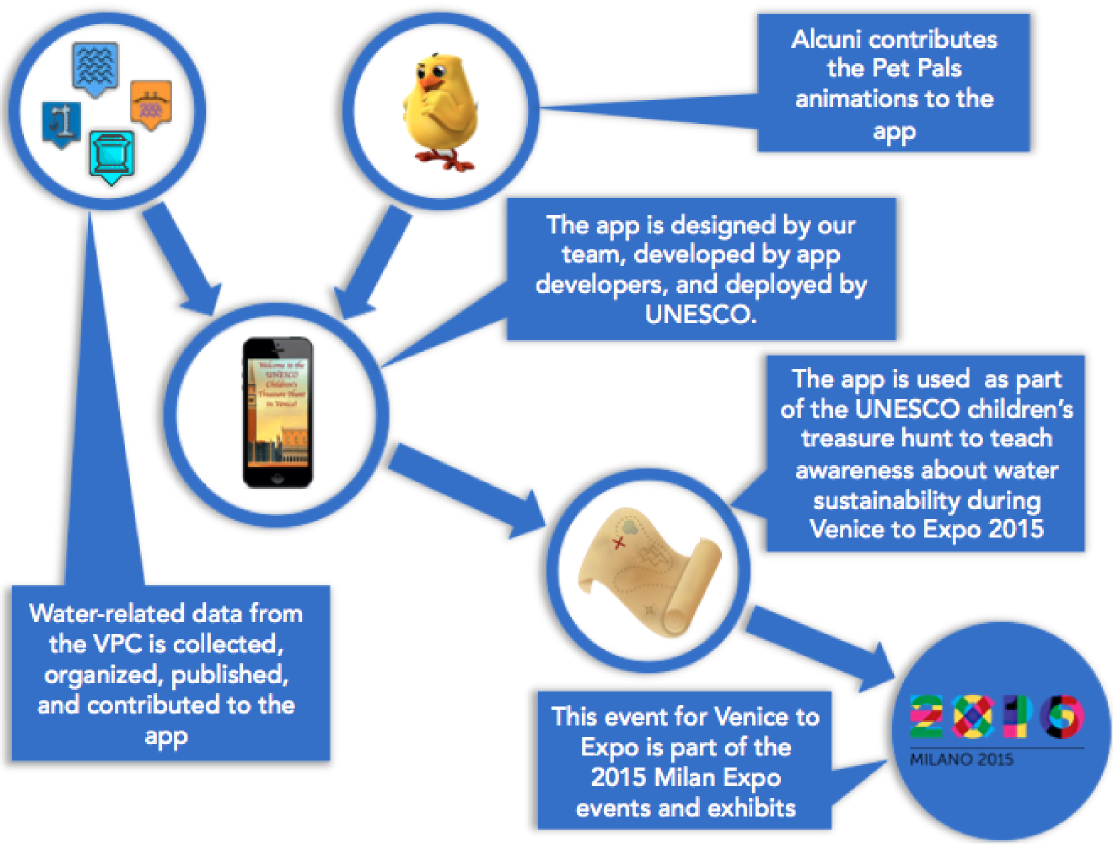
Executive Summary

The purpose of this project was to contribute to the creation of a mobile application that will be used in the Venice to Expo events and exhibits by UNESCO, a subdivision of the United Nations, in conjunction with the 2015 Milan Expo. The mobile application will be used in a children's treasure hunt that UNESCO has planned for the Expo events in Venice. This gave our project the opportunity to contribute water-related data from the Venice Project Center (VPC) to the mobile application. In addition to this, it gave our project the opportunity to contribute to the wellhead data set with our own data collection and analysis.

The UNESCO Office in Venice began collaboration between UNESCO, Gruppo Alcuni, a company that produces animated films and cartoon series, and our team, representing the VPC, in order to plan the children's treasure hunt. Our team relied on the relationships between these collaborators to complete our project. UNESCO has had a strong relationship with the VPC for over 20 years. They've worked on numerous projects together, including a published book on the canals of Venice and a non-profit organization aimed to preserve Venetian public art. This allowed UNESCO to have a better understanding of the data the VPC has to offer for incorporation into the mobile application. UNESCO has also had a long standing relationship with Alcuni. Together, through the H2Ooooh! Initiative, UNESCO and Alcuni have worked to educate children on the importance of water through a cartoon series.



Each member of this collaboration had a role in contributing to the children's treasure hunt mobile application. UNESCO is responsible for the organization, planning, and implementation of the event. Alcuni contributes their cartoon characters and artwork for both the mobile application and the treasure hunt board game. Finally, our team contributed relevant fields of data sets from prior VPC teams on canals, fountains, bridges, and rio terra for use in the mobile application. We also collected and completed the wellhead data set so that it could also be included in the mobile application. In addition to the provision of data, our team also created the contextual and functionality design of the mobile application.



We collected data from the 26 wellheads on the islands of the Venetian Lagoon to complete the existing wellhead data set. We collected 31 different data fields and calculated 22 more fields. This data was organized with the other 232 wellheads on Venice proper that have already been documented by past VPC teams. We also conditioned all 258 of these wellheads using 10 categories of damages. To display this data to the public, we created a map of the locations of each wellhead. We also created an interactive timeline showing the dates wellheads were built, as well as a map to display this data visually. All of this data was incorporated into Venipedia pages to give specific information about each wellhead, as well as general information about wellheads and wells. Finally, we used the finished wellhead data set along with the fountain, bridges, canals, and rio terra data sets for incorporation into the mobile application.

- **26** Wellheads Documented on the Lagoon Islands
- **31** Data Fields Collected and Organized
- **22** of These Data Fields Were Calculations
- **258** Wellheads in Total Conditioned
- **10** Categories of Damages
- **Visualization**: Map of Wellheads on Venice Proper and the Islands of the Lagoon
- **Timeline**: Depicts Dates of Wellheads Built
- **4** Venipedia Pages: Wellheads, Wellhead, Wells, Well
- **5** Data Sets Organized and Collected for the App

The final result of our project was the contextual design of the children's treasure hunt mobile application. In collaboration with UNESCO, Alcuni, and OKCS, an app developing company, our team finalized a design for the mobile application. This design incorporated the specifications designated by UNESCO, as well as the data collected by VPC teams, including our own. The significance of this project goes beyond contributing a mobile app design for the Venice to Expo events and exhibits. It aims to teach children about water sustainability and the importance of their role in society to preserve water as a precious resource. In addition, it guides visitors to Venice to less-known attractions in the city, including the UNESCO Office. This gives both tourists and Venetians the opportunity to learn about the rich culture of Venice, while focused on a very relevant theme of water. This mobile app also demonstrates the value of the VPC data, and hopefully it will inspire future innovative uses of this data.

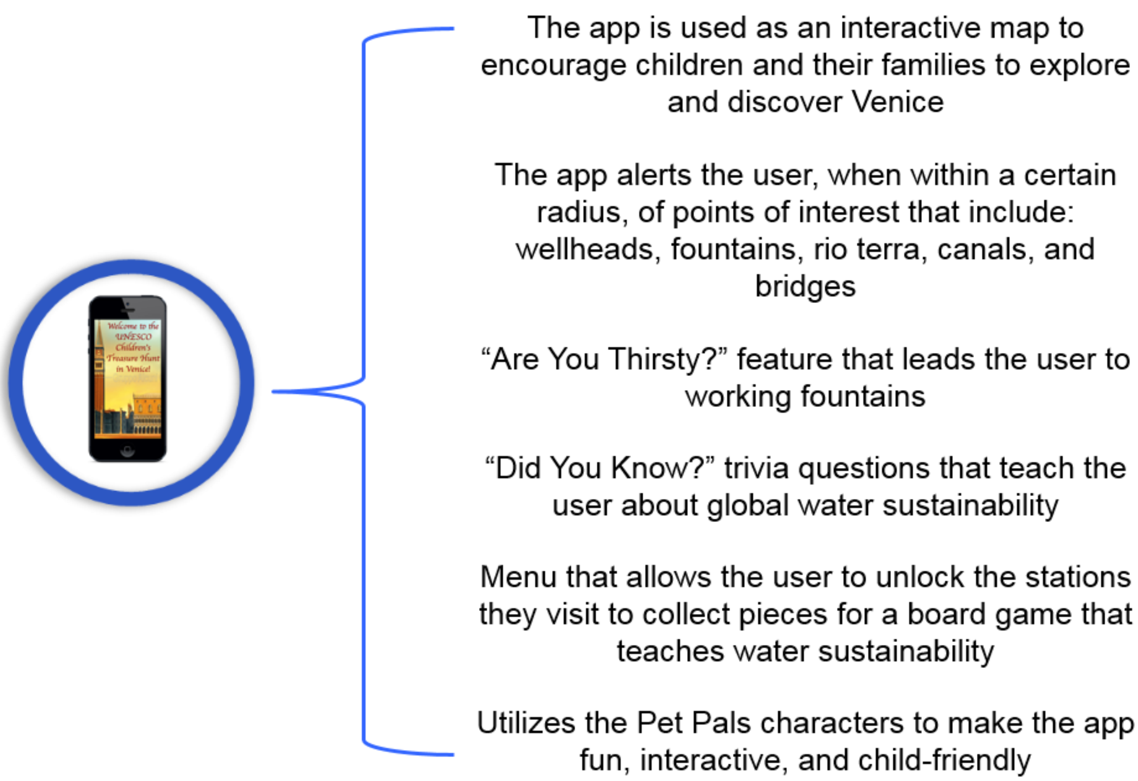


Table of Contents

List of Figures

1: Introduction

Venice is a unique city. Around every corner there is a work of art. Even the fountains, a source of public drinking water, are exquisitely decorated. In addition to works of art, the architecture in the city reflects its rich history. Venice, however, is not only known for its works of art and architecture, but also for its unique layout. Consisting of over 100 small islands, Venice proper is interlaced with canals, much like streets interlace other major cities. The foundation of the city is comprised of marble on top of wood pilings, keeping the city approximately one meter above sea level. Venice is so close to the water that it appears to be floating from afar. No other city in the world has a layout quite like it.

As a result of these unique qualities, water is extremely important to Venice. Water is important in the infrastructure and maintenance of the city as well as its art and history. Since water plays such an important role in the foundations and daily operations of the city, water-related data has been collected and published as academic papers and on the internet by the Venice Project Center (VPC). Data sets concerning canals, bridges, the sewer system, fountains, etc, have been and are being collected and published to the VPC's public website. Our team has also contributed to this vast database by completing and publishing the wellhead data set. Not only is this data readily accessible, it is also versatile.

There are many different ways that this data could be leveraged to benefit the city. Our team found a very unique way to do so. We have contributed several water-related data sets to the design and production of a children's app. This app was designed for a children's treasure hunt organized by UNESCO, the United Nations Educational, Scientific and Cultural Organization. Its purpose is to guide families to less known points of interest in Venice while teaching children about the importance of water sustainability. This treasure hunt is organized as part of the Venice to Expo initiative. The Venice to Expo initiative is a branch of the 2015 Milan Expo taking place in Venice. Our team created the contextual design of the app and provided data we collected, as well as relevant water-related data sets obtained from the VPC database.

The concrete results of our work have produced two deliverables:

- Completion and publication of all wellhead data

- Design and contribution of water-related data for the UNESCO children's treasure hunt mobile application

2: Background

Water is an important resource in every major city in the world, but no city utilizes it quite like Venice. As a result, the VPC has created a vast database of water-related data. Several of these datasets played a vital role in our project. Alongside these datasets, organizations such as UNESCO, Gruppo Alcuni and OKCS also played an important role. In order to understand this project, it is important to be familiar with these datasets and organizations.

2.1: Venice Project Center Water-Related Data

The Venice Project Center has collected, organized and published a vast amount of data, about many facets of Venice from art to infrastructure. The unique application our team found to leverage the water-related data from the VPC was its inclusion in the UNESCO children's treasure hunt mobile app. Specifically, we chose to include data on wellheads, fountains, canals, the sewage system, and bridges. This gave our team the opportunity to complete and publish the data set on wellheads, building on work from past teams.

2.1.1: Wellheads & Cisterns

As a series of islands surrounded by a salt-water lagoon, Venice lacks natural sources of freshwater. As a result, Venice found alternative ways to obtain freshwater for the city. In order to obtain freshwater, Venetians built well systems to collect and filter rain to store as freshwater. The general design of a well and cistern typically includes a clay basin that stores rainwater. This water collects through street-level drains, filters through fine river sand, and then accumulates in the basin. There is a brick or stonewall well shaft that allows access to the water from the street level. These wells served as sources of fresh water in Venice.

The water is retrieved from a structure called a wellhead. This is the only exposed part of the well. The wellhead appears as a circular basin with a lid above ground (Thomollari, 2004). As a centerpiece of many public squares in Venice, "They were always at the center of socialization and interactivity among Venetians" (Wainwright et al., 2000, pg 16). Wellheads often featured inscriptions and carvings of saints or family crests. The artistic and structural design of each wellhead is indicative of the art period it was built in (Huse, 1990). A wellhead as typically seen in Venice squares is shown below.

Figure 1: A Wellhead in Venice (Wellheads, 2012)

Even though these wellheads appear as ornamental works of art, they were also innovative in their practicality. The wellheads were designed to prevent animals, debris, or floodwater from polluting the clean water source stored below (Wainwright et al., 2000, pg 16). Venetians depended on this system for their fresh water supply until 1884, when a modern water supply system was established ("A city on the water but without fresh water," n.d.). Today, they no longer serve practical purposes (O'Connor et al., 2000, pg 16-18, 20-24).

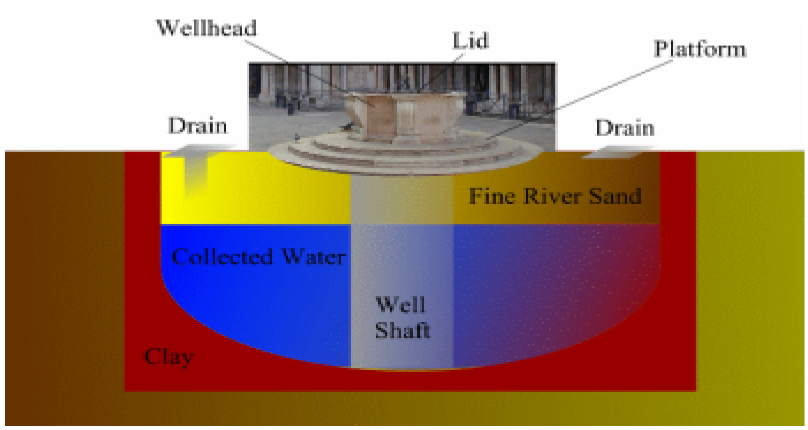


Figure 2: Cross Section of a Cistern (Wainwright et al., 2000, pg. 21)

There are 232 public wellheads located in the various squares of Venice proper. In the surrounding islands of the lagoon, there are 26 public wellheads. The wellheads on Venice proper are divided by *sestiere*, or district. Venice proper is divided into six *sestieri*. The figure below depicts the general distribution of public wellheads by *sestiere*.

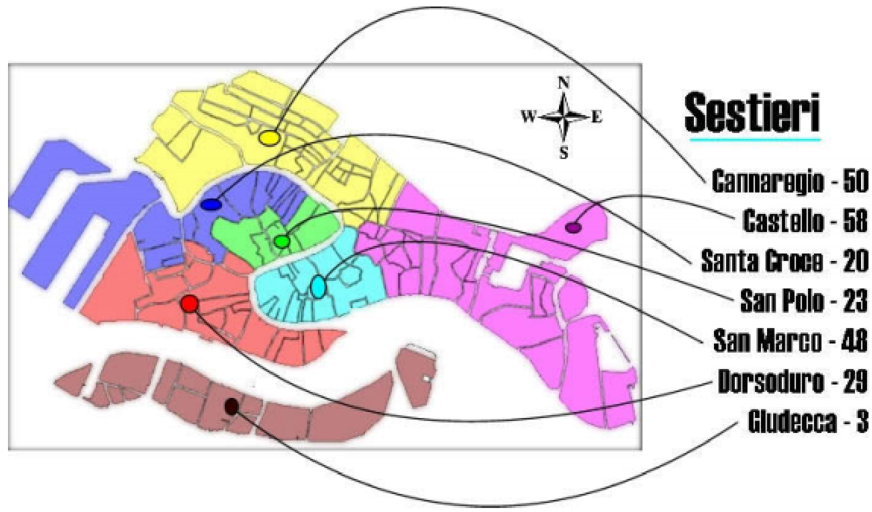


Figure 3: Six *sestieri* of Venice Proper (Wainwright et al., 2000, pg 16)

The database of public wellheads in Venice has been contributed to by multiple VPC teams. Past VPC teams have produced projects that have worked to document and collect information on both public and private wellheads, specifically to assist with their preservation as public art. These teams created detailed spreadsheets that contain measurements, decorative details, conditions, location, material, and style of the wellheads on Venice proper. These teams have also used this data to make calculations and informed conclusions mainly for the purpose of restoration of the wellheads.

Although the wells no longer function to provide water for the city, the wellheads are one of the many symbols of art and history in Venice. This data was deemed useful for inclusion in our project, specifically to be integrated into the UNESCO children's treasure hunt mobile application to indicate the locations of public wellheads on Venice proper.

2.1.1.1: Vera Da Pozzo Di Venezia

Vera Da Pozzo Di Venezia, read as 'The Wellheads of Venice' in English, is a book written by Alberto Rizzi. This book is a catalogue of the public wellheads on Venice and the islands of its lagoon.

> "In a move to prompt the safeguarding of this extremely important part of the decorative fabric of the city, the Superintendent of Ancient Monuments of Venice, now called the *Soprintendenza ai Beni Ambientali e Architettonici*, commissioned a first survey of the subject and in 1975, with the invaluable assistance of the architect Lucia Forno, we compiled a catalogue of the public wellheads in Venice and the lagoon area" (Rizzi, 1981).

The book gives detailed descriptions of each public wellhead in the city of Venice as well as on the following islands of the lagoon: *Murano, Burano, Torcello, Lido, San Pietro in Volta, Malamocco, Portosecco, Pellestrina* and *Chioggia*. The wellheads are numbered with a "Rizzi Number," which allows for easy tracking of any specific wellhead. The specific locations of each wellhead and a picture or several pictures are also given by this book.

Vera Da Pozzo Di Venezia was an invaluable resource in our wellhead data collection.

2.1.2: Fountains

Fountains are another display of artwork and history in Venice, but unlike wellheads, most of the fountains are functional. They are typically located in the center of the many public squares in Venice, and there are a total of 69 functioning fountains documented on Venice proper. A typical fountain is shown below. The database of public fountains in Venice has been contributed to by multiple VPC teams. Past VPC teams have produced projects that have worked to create a full catalog of Venetian fountains by locating the working and non-working fountains in Venice. This catalogue has been updated over the years by other teams, but the basis of this catalogue comes from the "Public Art Preservation in Venice: Non-public Wellheads and Fountains." The team that originally collected the data recorded over a dozen properties of each fountain (Kelly et al., 2004). Information about the damage level of the fountains was collected to help restoration efforts.

Figure 4: A Working Fountain in Venice (Fountains, 2012)

Another contribution of the fountain data is to aid an ongoing effort by the city of Venice to reduce the use of disposable water bottles. Typically residents and tourists in Venice drink water from disposable bottles, but this creates a lot of waste that must be disposed of. In order to prevent this, Venice is promoting the use of reusable water bottles filled from the fountains in place of disposable bottles (Rosenthal, 2009). In 2008, 100% Pubblica executed a campaign to reduce the waste of plastic water bottles in Venice by handing out reusable water bottles and maps of working fountains in the city. The map of functioning fountains in Venice produced by cummulative VPC projects paired with this map provides a quality resource for future use by the city. A map of working (green) and non-working (red) fountains in Venice is shown below. This data was deemed useful for inclusion in our project, specifically to be integrated into the UNESCO children's treasure hunt mobile application to indicate the locations of working fountains for drinking water.

Figure 5: The Locations of Fountains in Venice (Fountains, 2014)

2.1.3: Canals

Unlike any other city in the world, Venice is unique for using canals as roadways. In order to support the buildings above, the canal walls were built using materials that resist salt water damage. Despite these precautions, however, over time the canals have suffered mild to extensive damage in certain sections.

> "In December of 1990 a large cavity was found behind one of the walls lining the Rio Novo canal. What seemed to be a small hole on the exterior of the wall had actually eroded the supporting structures behind the wall. The Rio Novo canal had to be closed down since the supporting structures were on the verge of collapse" (Shevlin et al., 2000, pg 14).

There are two ways to preserve the canals. These include reducing damage caused by boat traffic and restoring the base of the canal walls. Damage caused by boat traffic can be reduced by introducing a speed limit within the lagoon (Marshall, 2007).

This speed limit is necessary as Venetians have replaced row boats with motor boats, such as cargo boats, taxis, and public buses. These are their main sources of transportation. The rise in number of these vehicles has created canal congestion. In the recent years, the exponential increase in tourism has also contributed to canal congestion (Novotny, 2008). The turbulence that canal congestion creates in the water of the canals causes significant structural damage to the canal walls.

Previous VPC teams have worked to document the 182 canals that weave through Venice, separating it into the many islands it is composed of (Canals, 2014). These teams have worked to collect information on the statistics of these canals, as well as various maps that indicate the locations, names, and other features of the canals of Venice. There is also data recorded on the hydrodynamics of the canals. Examples of these maps are depicted below.

Figure 6: Interactive Map of Canals on Venipedia (Canals, 2014)

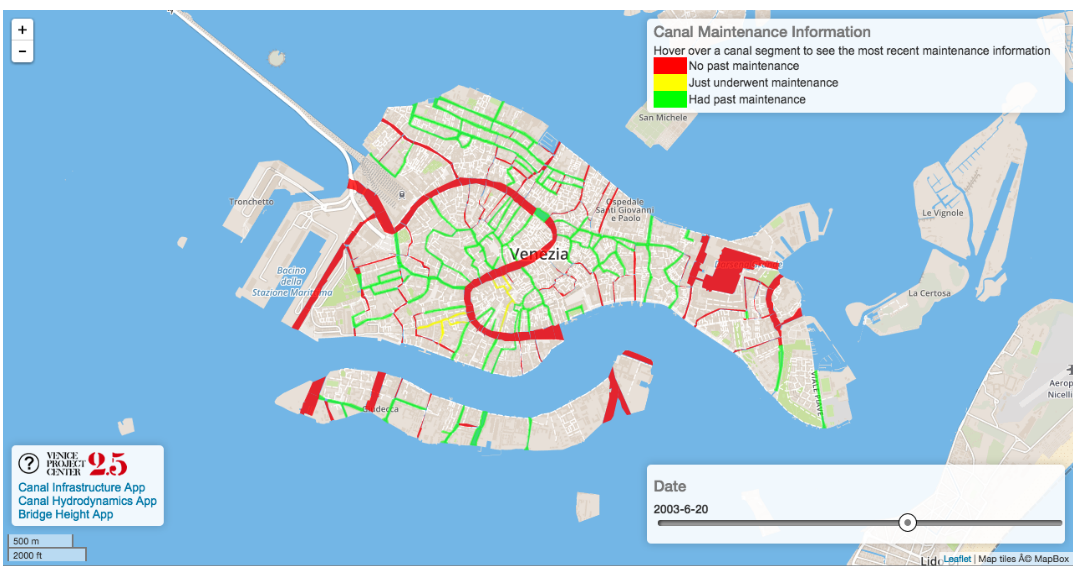


Figure 7: Canal Maintenance Information Visualization (Venice Project Center 2.5, n.d.)

It is necessary to be aware of the structure of the canals as well as the factors that influence their destruction. Sustainability is a main theme of the 2015 Milan Expo, and education and awareness about the sustainability of canals in Venice will be an important component of the events and exhibits.

2.1.4: Sewage System

In the 15th Century, Venice was considered one of Europe's cleanest cities. At the time, people all over the world would dispose of their waste in the city streets. Venetian streets, however, are canals that lead out into the lagoon surrounding the city. Consequently, the tides washed the waste out of the city twice a day. As a result, Venice devised one of the worlds first sewage disposal systems in the 16th century. The system is comprised of a gravity-driven collection of underground channels and drains called *fognatura,* a network of tunnels in the walls and under the pavement called *gatoli*, and outlets where sewage enters the canals called *sbocchi* (Sewage disposal, 2012).

Figure 8: A *Gatolo* (Sewage disposal, 2012)

This system has been partially updated with modern sewage treatment technologies, but much of the old sewer system is still in use today (Fletcher, 2005, pg 165). Today there is a central sewage treatment plant in Porto Marghera. Here, the sewage is treated before being released into the lagoon, however, some sewage is still released into the canals untreated (Astaiza, 2012). There are also 140 small sewage treatment plants installed throughout the city and more than 6000 septic tanks (Sewers, n.d.).

To adapt the city to modern standard purification requirements, it was imposed that septic tanks in homes and businesses and small sewage treatment plants must be constructed around the city. At the same time, an overall plan for the restoration of the sewers was drawn up. In the central historic areas, "characterized by a fragile urban fabric that does not allow radical surgery", the existing system can only be optimized. Meanwhile, in marginal areas, creation of a modern sewage system (pipes, valves etc.) can be achieved (Freemantle, 2000).

In order to optimize the existing system, the city plans to incorporate septic tanks, clean out sedimented material, restore the perimeter walls of *gatoli*, line the interior walls with waterproof materials (fiberglass sheathing or elastoplastic), include wells for inspection and maintenance of the sewers, adjust the locations of the exhaust ports in the canals, and reconstruct the network of storm water drains (*adeguamento e rinnovo del sistema fognario*, n.d.).

The VPC website contains a page that describes the process of sewage disposal in Venice, and this is another topic that was deemed useful for inclusion in our project. An image of the existing data the VPC has on the sewage system is shown below. Although, the integration of the sewage system data into the UNESCO children's treasure hunt mobile application was not as extensive as the wellheads and fountains. We found that depicting the function of the sewage system over time in Venice was useful for raising awareness about water sustainability for Venice to Expo.

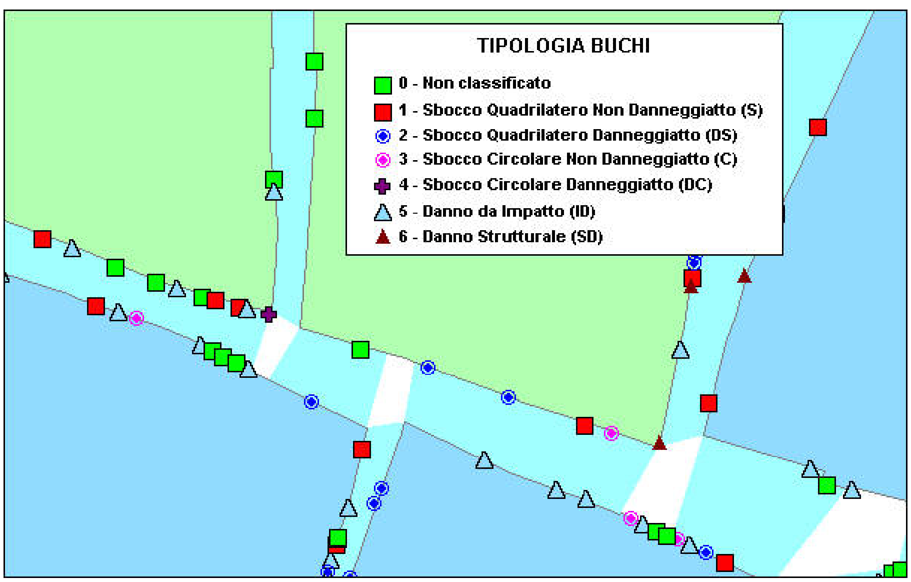


Figure 9: Sewer Map (Venice Project Center 2.5, n.d.)

2.1.5: Bridges

Bridges are imperative for the function of Venice. They are the infrastructure that unifies the city, as well as the fact that they play a major role in daily pedestrian traffic. Past VPC teams have produced projects that have worked to document and collect information on the 433 bridges on Venice proper (Bridges, 2014). These teams created detailed spreadsheets that contain data on bridges, and they have used this data to make calculations and informed conclusions for the purpose of their respective projects. This data has been used to calculate bridge statistics in Venice, as well as various maps that indicate the lengths, names, and other features of the bridges of Venice. There is also a dynamic map that was created to indicate bridge clearances at water heights and boat heights. An image of this map is shown below.

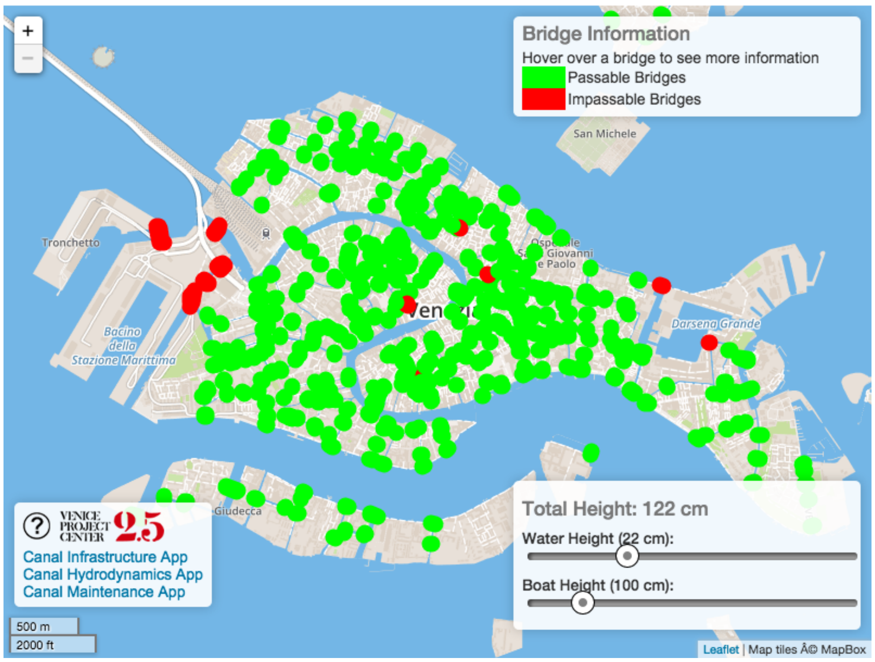


Figure 10: Bridge Clearances Visualization (Venice Project Center 2.5, n.d.)

The data that was useful for our project is the location and names of the bridges on a map, and the cross-sectional diagram of a bridge shown below for the purpose of explaining the unseen function of how bridges connect the islands of Venice.

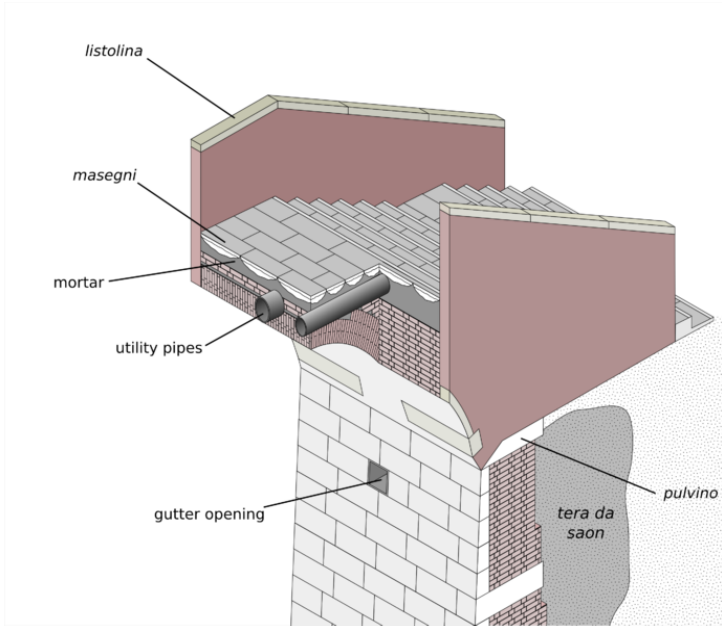


Figure 11: A Model of the Cross-Section of a Venetian Bridge (Bridges, 2014)

2.2: 2015 Milan Expo

The World's Fairs, now known as a World Expo, began in 1851, and there have been 66 registered Fairs since (ExpoMuseum / World's Fair History, n.d.). A World's Fair is a country's opportunity to display and showcase itself to the world. Typically these Fairs run for three to six months. Much like the Olympics, one country is selected at the end of the previous Expo to host the next Expo in one of its major cities. The host country constructs large convention centers and public spaces in preparation for the Fair. In these hubs, there are often public exhibits and various sources of entertainment. Some countries construct monuments specifically for the Fair. For example, France commissioned the Eiffel tower to be built for the 1889 World's Fair.

The Fairs have always displayed innovation and scientific advancements and provided entertainment for its visitors. Many inventions that changed the world have been revealed at a World's Fair. Some examples include the telephone, electrical outlets, x-ray machines, diesel engines, touch screens, and many more cutting-edge creations. The Fairs also have an entertainment aspect to them. With millions of visitors the host country has the challenge of entertaining a massive audience. For example, the Ferris wheel was revealed in the 1893

Chicago World's Fair. The incredible scale of these exhibitions shows the level of innovation and scientific advancement displayed at these Fairs.

Italy was selected to host the 2015 Milan Expo. The Fair will be hosted in the city of Milan. Known as the 2015 Milan Expo, the theme is "Feeding the Planet, Energy for Life" (Expo Milano 2015 - Feeding the Planet, Energy for Life, n.d.). The Expo will have a series of events and exhibits hosted in Venice, with the theme of water education and sustainability. Our contribution to the Venice events and exhibits supports the theme of water education and sustainability.

2.3: UNESCO

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is an intergovernmental organization that is a subdivision of the United Nations. It was established to build networks among peaceful nations beyond political and economic agreements. UNESCO strives to mobilize education, build intercultural understanding, pursue scientific cooperation, and protect freedom of expression (Introducing UNESCO, n.d.). This organization aims to achieve these goals mainly through education, as it plays a fundamental role in social and economic development. "The Organization focuses on increasing equity and access, improving quality, and ensuring that education develops knowledge and skills in areas such as sustainable development, HIV and AIDS, human rights and gender equality" (Education for the 21st Century, n.d.).

A year after the disastrous flood in 1966 in Venice, UNESCO was invited by the Italian government to play an international role in safeguarding Venice. In 1973, the Liaison Office for the Safeguarding of Venice was established. The UNESCO field office located in Venice functions as a center of development and information collection, analysis and circulation, as well as building critical skills and abilities of people in South-East Europe and the Mediterranean. It aims to improve prosperity and welfare for the citizens from these areas. Along with the UN, the UNESCO branch in Venice contributes to sustainable development through science and culture activities.

2.3.1: UNESCO Treasure Hunt

The UNESCO Venice Office plans to make significant contributions to the Venice component of the Milan Expo. On their website, they give a general description of what they hope to accomplish:

> "Some of the initially proposed initiatives currently under development include: exhibitions on UNESCO designations (World Heritage sites; Biosphere Reserves; Representative List of the Intangible Cultural Heritage) as best practices for sustainable development; the hosting of water-related international conferences; the promotion of "slow" and sustainable tourism along the historical waterways connecting Venice to its hinterland where many UNESCO designated sites are located; the organization of a treasure hunt to engage the many children and families visiting Venice along alternative itineraries throughout the city, in search for the "blue gold" (water), which would include the presence of actors and animators around the city offering an enriching and educating experience focused on the value of water and the importance to ensure its sustainability" (UNESCO to participate in Expo 2015 in Milan and Venice, Italy, 2014).

The team corresponded with a representative from UNESCO to gain further information on their contribution to the Venice to Expo initiative. Philippe Pypaert, a Program Specialist at the UNESCO field office in Venice, described that UNESCO currently plans to create a childrens treasure hunt for the duration of the Expo. The treasure hunt will consist of five or six activity stations spread throughout Venice. These activity stations are points of interest around Venice that are not the typical tourist attractions. Some examples of the stations include the UNESCO office, *Arsenale* (The Arsenal), and the Museum of Natural History. These activity stations will host interactive activities and exhibits centered around a theme of water. A child, accompanied by their parents, will begin at any activity station by downloading the treasure hunt mobile application. They will then discover their own path to any activity station using a map on the app. While en route to an activity station, water-related objects they are near will appear on the map. These objects include fountains, wellheads, bridges, and canals. A video will appear on the app explaining how the object works and it's importance to Venice, as well as a related "Did you know?" fact about water sustainability. The child also has the option to take a picture of the object that will save to the app, and they may also tap an icon for a link to more information about the object they are looking at. The child will also receive a prize at each activity station once it is completed. The prize at each station is a piece or part of a board game. Together, the pieces form a game similar to Trivial Pursuit that teaches the value of water and awareness of how to ensure its sustainability (pers.com Philippe Pypaert, 2014).

2.4: UNESCO Collaborators

In addition to collaborating with the VPC, UNESCO is working with other companies to prepare for the Venice to Expo events and exhibits in 2015. These companies and their contribution is described in more detail in the following sections.

2.4.1: Gruppo Alcuni

Gruppo Alcuni is a company that produces cartoons for audiences around the world. They produce animated 2D and 3D television series and feature films that promote positive values to help children develop diverse skills. Alcuni operates a production studio that produces and distributes the cartoons in addition to a group that produces the television programs. There is also a theater and a theme park run by Alcuni that is dedicated to their productions. They are headquartered in Treviso, Italy.

Gruppo Alcuni has an initiative called H20oooh! Project that aims to create a storyboard on the theme of water and issues related to its use, to its exploitation, and to its limited supply for children all over Italy. Alcuni is in collaboration with the UNESCO Venice office in order to promote this initiative. The H20oooh! Project involves the six Pet Pals, a 3D cartoon creation of Alcuni who are protagonists focusing on the issue of water conservation, and they are shown in the image below. Alcuni aims to express important messages about water conservation to children through these familiar cartoons. The UNESCO website states the importance of this topic,

> "Water should be freely accessible. Water is an essential element necessary for survival. But a large portion of our Earth's water is unsuitable for human consumption. Therefore, water becomes a privileged commodity" (H2Ooooh! water project, n.d.).

Figure 12: The Pet Pals (Pet Pals in Windland, n.d.)

There are a series of episodes that focus on different water-related issues that include topics such as water pollution, water conservation, and the right to water access. The importance of the collaboration between UNESCO and Alcuni is that UNESCO aims to inform and educate the public on new worldwide concepts of water civilization, while Alcuni can express these important messages to children through a fun and interesting cartoon series.

2.4.2: OKCS

OKCS, otherwise known as, Overkant, is an 'innovative and conceptual graphics studio' based in Asolo, Italy. They design and produce websites, digital magazines, and graphics for companies and individuals.

Figure 13: OKCS Logo (OKCS, n.d.)

They have worked with Gruppo Alcuni before on their Pet Pals Run game. For this game they were involved in the game design and scripting, interaction design and GUI (graphical user interface) design.

Figure 14: Alcuni Pet Pals Run Game Developed and Designed in Part by OKCS

3: Methodology

In order to achieve our deliverables we organized a step by step method for collecting and publishing all remaining wellhead data and designing the UNESCO children's treasure hunt mobile app. Data on wellheads all across Venice proper had already been collected and organized, but data on the wellheads for the islands in the lagoon had not been collected. The data that had already been collected had not been published. Once we collected the new data, we organized all of the data as a whole and published it. This data was collected according to a concise list of physical and spatial criteria.

In addition to wellhead data collection, we also designed a mobile application for the UNESCO children's treasure hunt in Venice. In collaboration with representatives from UNESCO and the Alcuni group, we designed the storyboard and mock up of the functionality of the app. We presented these to UNESCO to be included in the Venice events and exhibits during the 2015 Milan Expo.

We have described how we achieved these goals in a step by step methodology.

3.1: Contributing to the VPC database: Completing the Wellhead Inventory

The first deliverable of the project was to complete the Venice Project Center's data on wellheads in Venice. We have accomplished this by re-organizing pre-existing data and assessing it for missing pieces of data. Then, data was collected to update the pre-existing data and to create new data sets. All of this data was then organized, analysed, and published to the VPC website and Venipedia as accessible coherent information on wellheads in Venice.

3.1.1: Reorganizing Pre-Existing and Missing Data

The project reorganized pre-existing data on wellheads that was stored in spreadsheets created by past VPC teams. This data encompassed all of the wellheads on Venice proper and was used to ascertain the data that was missing. Data that was missing included wellhead data from the islands in the lagoon and certain data fields of wellheads on Venice proper. Additionally, we noted that a conditioning system was not created for any of the wellheads. To acquire all the necessary data, we completed field surveys in a format explained in further detail in Section 3.1.2.

Pre-existing data was collected and organized by past VPC teams. These teams included the 1995 WPI Wellhead Team, the 1996 and 1997 EARTHWATCH Teams, and the 2000 Preserving Venetian Wellheads Team. This data was collected and formatted in a very specific, succinct way. We referenced the logistical planning and strategies of these teams in our data collection. As a result, our data was recorded to reflect the formatting of previously collected public wellhead data (Thomollari, 2004, pg. 16). We remained consistent throughout our data collection so as to allow for accessibility of data.

3.1.2: Data Collection

The new data was collected, organized, and then integrated with the pre-existing data. The data concerning wellheads on Venice proper was updated with the missing dimensions, materials, and pictures. Wellhead data from the islands of the lagoon was also collected. In addition, new data on the current conditions of wellheads in both Venice proper and the surrounding islands of the lagoon was collected.

The pre-existing data was partially organized on an excel spreadsheet into a list of criteria of mostly physical and geographical attributes. We reviewed these criteria and generated our own list to collect data. These criteria are listed in Table 1, Appendix A.

Wellheads were also conditioned using 10 different damage types. These conditions were defined by past VPC teams. The definition of each data field can be seen in Table 3-2. The data fields were recorded for each side of the wellhead. Accretions 2, accretions 1, structural cracks, surface cracks, and graffiti were recorded as a count of how many occurrences there were of each of the damages. Grime 2, grime 1, surface damage 2, surface damage 1, and algae were recorded as a percentage of the surface area of each side. See Table 2, Appendix A.

3.1.2.1: Updating Data on Wellheads on Venice Proper

After reviewing the pre-existing data, we discovered that there was some missing data on the wellheads on Venice proper. Some of the criteria with missing data included pictures, certain physical dimensions, and material of the well. We also updated this spreadsheet by adding another category for the condition of the wellhead. Once this was done, the current wellhead data was updated and integrated with new data.

In order to collect the missing data, a new spreadsheet was created containing only wellheads that were missing data from certain criteria. Once the spreadsheet was ready for data collection, the wellheads in need of data were located using coordinates recorded by past VPC teams. These coordinates were put into Google maps. Once at the wellhead, we then recorded all data fields to ensure that data was up to date. If was out of our scope to update all the wellheads in Venice Proper, however, the team felt that updating wellheads that we needed to go to anyway would increase the accuracy of the data as a whole. Once the data was collected and organized in its own spreadsheet, it was combined with the original spreadsheet.

3.1.2.2: Collecting Data on Wellheads on the Islands of the Lagoon

Out of the approximately 30 islands surrounding Venice proper, data was collected from the following islands: *Murano*, *Burano*, *Torcello*, *Lido*, *Lido-Pellestrina*, and *Chioggia*. These islands were chosen because they contained wellheads cataloged in Alberto Rizzi's *Vera Da Pozzo Di Venezia* (Rizzi, 1981). The book also split the islands of *Lido* and *Lido-Pellestrina* by town. *Lido* was defined as *Lido* or *Malamocco*, a town in the southern end of the island. *Lido Pellestrina* was defined as *San Pietro in Volta*, *Portosecco*, and *Pellestrina* (North to South). *Pellestrina* was then broken up into four *sestiere*: *Busetti*, *Zennari*, *Scarpa*, *Brasiola*. All of these islands were inhabited and could only be reached from Venice proper by boat.

Data collection began during the third week of term. To work efficiently, the team split into two groups; one stayed behind and designed the UNESCO children's treasure hunt app, while the other group collected wellhead data. Before going out to collect data on the islands, the group first determined the approximate locations of the wellheads using Google maps and Alberto Rizzi's *Vera Da Pozzo Di Venezia* (Rizzi, 1981). The address or description of locations of the wellheads were provided so the team used Google Maps and Google Street view to locate the approximate location of the wellheads.

Once the locations were known, the group traveled to an island, found the wellhead, and collected data according to the list of criteria depicted in Table 1, Appendix A. The data was then organized into a spreadsheet containing wellhead data for all the islands.

3.1.3: Organization and Analysis of Data

Once all of the data had been collected in the field, it was then organized to show all the data for both Venice proper and the islands of the lagoon. This was broken into three spreadsheets: Wellhead Descriptions and Measurements, Wellhead Conditions, and Wellhead Data for Publishing. Within these spreadsheets we made all of our calculations and analysis of the data.

3.1.3.1: Wellhead Descrpriptions and Measurments Spreadsheet

There were two purposes of this spreadsheet. The first purpose was to combine all of the measurement and description data for the wellheads on Venice proper and the islands of the lagoon. This was necessary to have all of the data stored in the same location. This involved aligning columns from the previously collected data with our new island data. There were also data fields that were added for the wellheads from Venice proper for the sake of calculations. These fields included whether the wellhead had a platform or not, whether the wellhead had a lid or not, etc. These fields were done using IF functions in the spreadsheet.

The second purpose of this spreadsheet was to calculate the approximate surface area of the wellhead and its platform. To calculate surface area of the wellhead, we made a few assumptions to simplify our calculation. Our first assumption was that each wellhead would be treated as the extruded shape of its rim. For example, a wellhead with a hexagonal rim would have it’s surface area calculated as if it was a hexagonal prism. Figure 15 shows our first assumption. Here the transparent blue area shows our calculated surface area. Our second assumption was for the platform.

Figure 15: Hexagonal Prism Assumption

We calculated the surface area of the platform by extruding the bottom perimeter to the bottom of the wellhead. For example, a circular platform with any number of steps would be treated as a cylinder. This made our calculation simpler because we did not need to measure each platform’s step height and width. This data was not available from the wellheads in Venice proper. Figure 16 shows our assumption for the platform. The top surface area of the wellhead was then found by calculating the area of the shape of the rim and subtracting either the area taken up by the lid or by the opening.

Figure 16: Cylindrical Assumption

Once our assumptions were determined we needed to create a spreadsheet that could determine the shape of the wellhead. This was crucial because with over 200 wellheads, it would take too much time to calculate the surface area of the wellheads by hand. We started the calculations by creating four columns for the base, rim, and platform dimensions. The four columns for each dimension were radius, width, side 6, and side 8. We determined the shape of the wellhead by using the fields: Number of Sides, Circular Bottom, Circular Top, Platform

Sides, and Platform Circular. The spreadsheet then uses conditional statements to determine the shape and either record the dimension or record “NULL”. For example, the wellhead in Figure 17 would have a base radius, a rim side 8, and a platform radius. This wellhead would record “NULL” for the remaining 9 columns.

Figure 17: Example Wellhead

Using this information, we used formulas to determine surface area for the wellhead and platform based on the shape of the wellhead. In our final result, we had a value for the surface area of the platform, outside of the wellhead, top of the wellhead, and lid of the wellhead. We also totaled the top and outside of the wellhead to get a value for the surface area of the wellhead. Our final spreadsheet can be seen in the Appendix E.

3.1.3.2: Wellhead Condition Spreadsheet

Past VPC teams have recorded data on the condition categories listed in Table 3, Appendix A. This data was organized in a database for all the wellheads in Venice Proper. In order to calculate the condition of each wellhead we first needed to take the data from the database and transfer it into a spreadsheet. We organized the spreadsheet by listing the 10 damage types across the top, but we split each field into 8 columns. This was necessary for wellheads that were 8 sided. Each row then has the data for each side of any given wellhead. The total for all the sides of each wellhead was calculated for each of the 10 damage types. This resulted in 10 totals for each wellhead. An example of this can be seen in Figure 18.

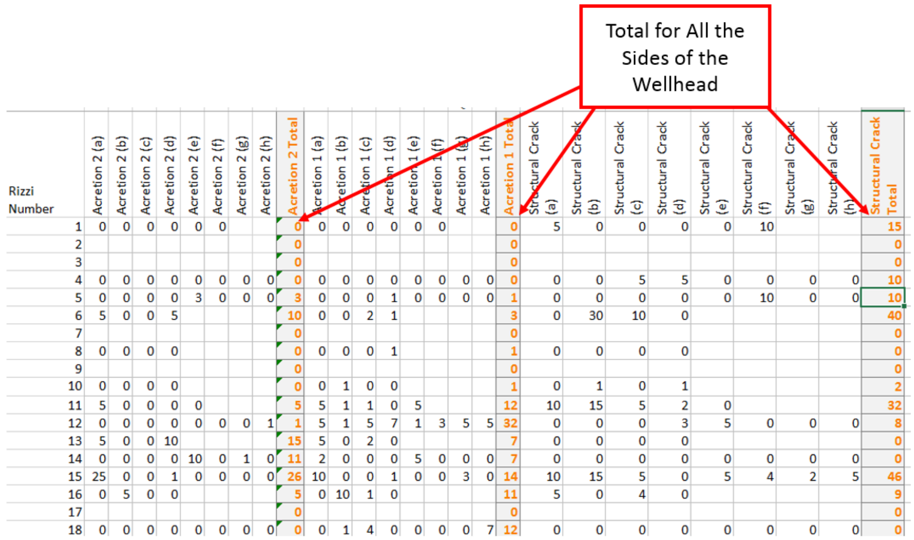


Figure 18: Example of Conditions Spreadsheet

We scaled the totals for each wellhead to condition them. This was done by creating a minimum and maximum value based on each category. The total values of each category, for each wellhead, was divided by the maximum for that category and multiplied by 15 to create a scaling factor. The table in Table 3, Appendix A represents the minimum and maximum values for each category.

Once each wellhead had a scaled total for each category, the totals were all weighted by category and totaled. Our weighting factors can be seen in Table 4, Appendix A. We determined these weighting factors by focusing on structural damage. Categories such as surface damage and structural cracks are more crucial to the survival of the wellhead rather than graffiti or grime. Finally, we scaled the final condition total to a scale of 0-100. A rating of 100 represented a wellhead that was in very bad condition and a rating of 0 represented a wellhead in very good condition. This allowed us to create a list of wellheads in order of condition. Our final spreadsheet can be seen in Appendix E.

3.1.3.3: Wellhead Data for Publishing

The final spreadsheet created was used to store data used for publishing to the VPC website and Venipedia. We created this by taking all the data fields from both of the two previous spreadsheets that were applicable for publishing. We left out fields such as Base Radius or Rim Width. These types of fields were only necessary for calculations. We also copied and pasted only the value of cells that were determined using a formula, not the formulas themselves.

3.1.4: Publishing

One of the tools needed to publish data was the City Knowledge Console, or the CK Console. The CK Console is a tool created by Professor Fabio Carrera and his collaborators in order to format data for use in web applications such as the VPC website. The data was uploaded to the console, and the console was used to generate Venipedia page templates. The CK console was also used to create and publish maps on the VPC website showing locations of wellheads both on Venice proper and on the islands of the lagoon, and this can be shown in Figure 19 and Figure 20 respectively.

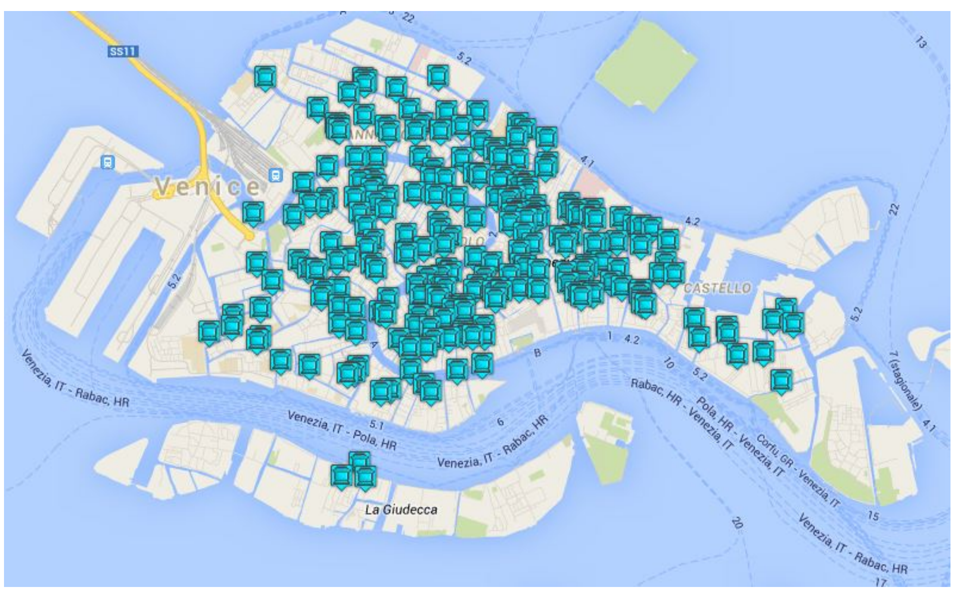


Figure 19: Locations of Wellheads on Venice Proper

Figure 20: Locations Wellheads on Islands of the Lagoon

3.1.4.1: Creating and Editing Venipedia Pages

Upon completing the wellhead inventory, we created Venipedia pages. These pages describe the structure and function of a typical wellhead and well system, as well as individual pages for each wellhead. Two of these pages already existed; the 'Wellheads' page and the 'Wellhead' page. The singular 'Wellhead' page described the general structure and function of a typical wellhead, while the 'Wellheads' page described the total number and locations of the wellheads. These pages only referred to wellheads on Venice proper. Our team edited these pages to include information on the wellheads of the island of the lagoon as well as more in depth information on each page. The 'Wellhead' page now describes in more detail the structure and function of a typical wellhead, featuring clearer diagrams and images, while the 'Wellheads' page now describes more aspects of Venetian history and culture that wellheads are a part of.

This page also describes their total number and locations, including the wellheads of the islands of the lagoon.

In addition to these edited pages, our team created two new pages called ‘Well’ and ‘Wells’. These pages serve the same purpose as the singular and plural pages for wellheads, but for wells, or cisterns. The ‘Well’ page describes in detail the structure and function of a typical underground well system in Venice, while the ‘Wells’ page describes their total number and locations. Once these four pages were written and published, a template was created on the CK console for the individual wellhead pages. Through the CK console, these templates were filled with information from the data we uploaded and were published to Venipedia.

Unlike these templates, the singular and plural well and wellhead pages were edited through the Venipedia website, while the individual pages were published straight from the CK console and edited through Venipedia.

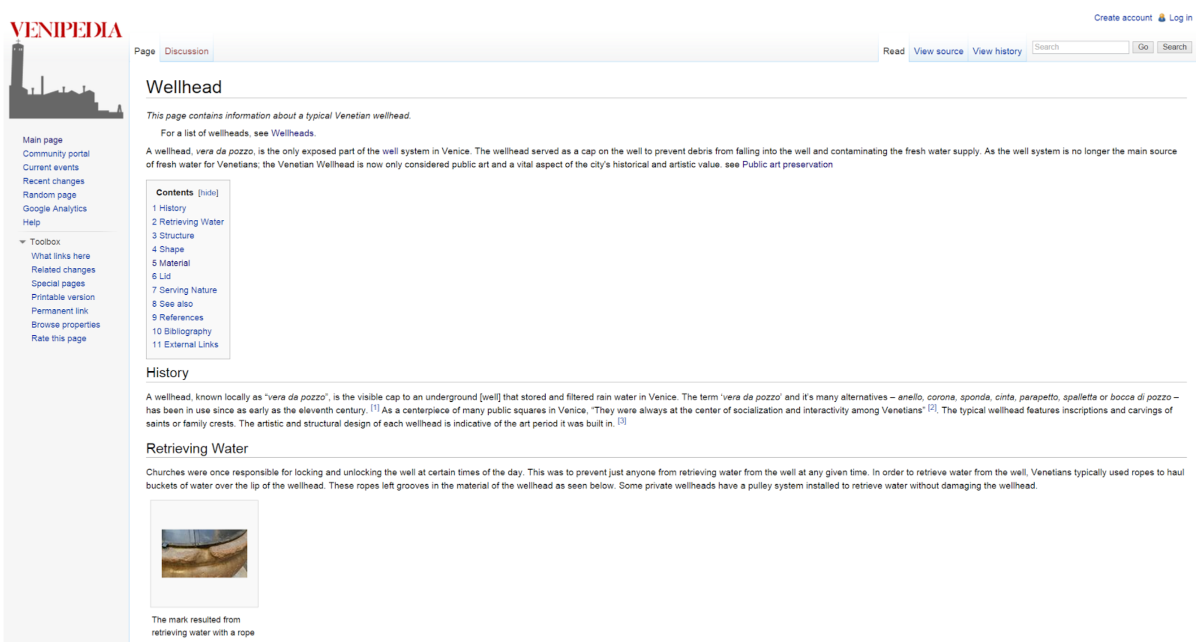


Figure 21: Example of the Wellhead Venipedia

3.1.4.2 Creating Visualizations of the Data

In addition to the Venipedia pages, we also created visualizations: an interactive map and a timeline. These visualizations were created in the CK console and published to the VPC website. The interactive map shows current locations of wellheads on Venice proper as well as on the islands of the lagoon. This map is shown in Figure 19 and Figure 20. The timeline shows the appearance of wellheads in and around Venice Proper as you move through the centuries. The timeline ranges from before 1000 AD to present day Venice. The map is accessible from the 'Wellheads' section under the 'Public Art' tab on the VPC website, while the timeline is accessible from the 'Visualizations' tab. Figure 22 depicts the timeline.

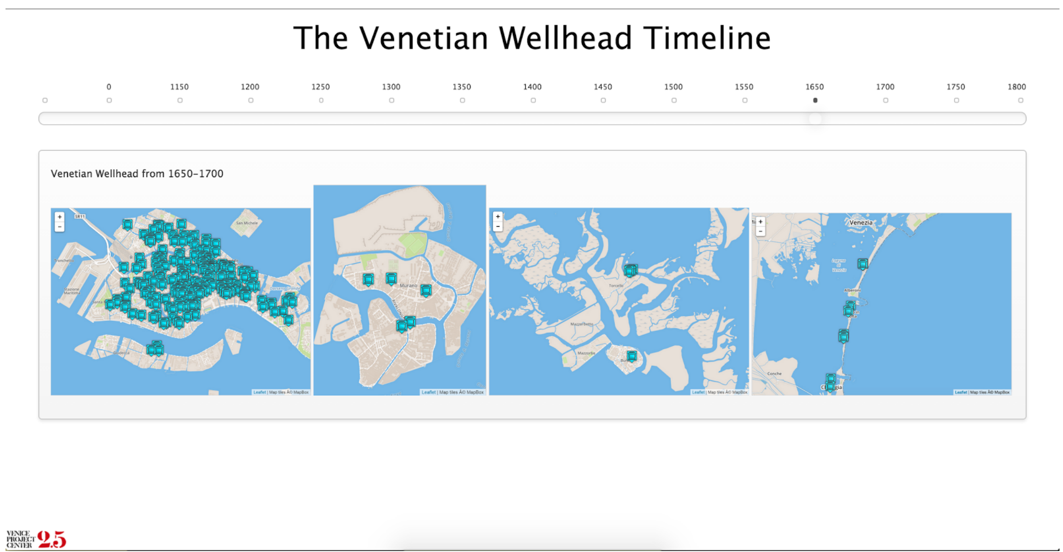


Figure 22: The Venetian Wellhead Timeline

3.2: Designing UNESCO's Treasure Hunt App

The second deliverable of this project was to design an app for the UNESCO Treasure Hunt and to contribute data to this design. The design consisted of a storyboard and a simple mockup created using the JustInMind app mockup tool. This design was presented to UNESCO and Gruppo Alcuni to be developed into a mobile application for inclusion in the Venice to Expo 2015.

3.2.1: Defining Specifications of the App

The first step taken in the design process was to define the specs of the app. Our UNESCO liaison, Philippe Pypaert, defined most of the specs of the app in our first and second meeting with him. The specs decided on initially were as follows. A full 2D map of Venice, a connection to the board game designed by Gruppo Alcuni, six activity stations, facts about water sustainability, short lessons on the infrastructure of Venice, and a way to access more information from sources like the VPC website or Venipedia. These short lessons would use the VPC data to demonstrate how Venice works by explaining certain aspects of Venetian infrastructure. These aspects included fresh water sources (wells and fountains), mobility (canals, *rio tera,* and bridges), the sewage system, and the foundation of the city.

Our team helped finalize these specs by visiting prospective locations for activity stations, researching common aspects of a smartphone application for children, and putting together an initial scratch mockup to demonstrate the flow of the app.

3.2.2: Brainstorming and Designing

Once the specifications were finalized, the team began to brainstorm ideas for the app. Ideas were quickly translated into a simple mockup created using the JustInMind mockup tool. This mockup was organized into a powerpoint presentation that described each screen and its purpose. The presentation also explained the flow of the app and what could be possible in the finished product.

3.2.3: Incorporation of Feedback into App Design

The mockup was presented to our advisors as well as our UNESCO liaison, Philippe Pypaert. We received feedback from both parties and began brainstorming and redesigning the app accordingly. Afterwards, the team met with Alcuni and representatives from OKCS several times to incorporate their feedback into the app design. After every meeting the team would convene to incorporate the new feedback into the design.

During the course of this review and feedback loop, UNESCO, Alcuni, and OKCS asked the team for specific data in specific formats. For UNESCO, the team conducted research and formulated 50+ water-related facts and questions to be incorporated into the children's treasure hunt to teach them about the importance of water sustainability. The team also conducted a brief survey to determine how many people in Venice, particularly families with children, had internet access on their phones and how many used their phones for navigation around Venice. For Alcuni, the team created storyboards of how to explain the infrastructure of Venice as specified in section 3.2.1. The full story board sent to Alcuni can be found in Appendix C. For OKCS, the team organized spreadsheets of data for wellheads, fountains, bridges, canals, and *rio tera.* This data mainly consisted of coordinates of each object, date built, name, ID number and, for wellheads, the material it was made of.

3.2.4: Completing the Contextual App Design

The design was completed and tested using the mockup tool JustInMind, which allows the user to test their mockup on their smartphone or on a web browser to view the functioning of the app. Once the design was tested on one of the team member's smartphones, the team evaluated the functioning of the app and returned to the design to fine tune and polish the design before completing it and presenting the design to UNESCO, Alcuni, and OKCS.

4: The Final Contextual Design and Function of the Mobile Application

The final contextual design of the mobile application was presented to UNESCO, Alcuni, and our advisers in such a way as to express the incorporation of contributions from all participating entities. This section describes the design and function of the app in a similar fashion. It describes the general function of the app, how the VPC data has been utilized, how the Pet Pals have been incorporated, and how the app will teach children the importance of water sustainability.

4.1: The Tutorial

As the app was designed for children, a tutorial was installed. The tutorial appears once the app is opened and explains how to play the game as well as the general function of the app.

Figure 23: App Tutorial

The tutorial is lead by one of the Pet Pals, Moby, who is most often portrayed as the leader. Once Moby leads the player through a brief tutorial of the app, the player chooses a character, enters their name or a nickname, and the game begins.

Figure 24: Moby

Figure 25: Choose a Character

4.2: The Map

The treasure hunt is a game designed to teach children the importance of water sustainability in Venice as well as to show them a side of Venice that tourists seldom see. As such, the treasure hunt application was also designed to be child-friendly and entertaining. The main area of the app is the map. This is where the user can reach all other sections and functions of the app. This is a stylized map of Venice similar to google maps with a cartoon theme analogous to the theme of the Pet Pals animations. At the beginning of the game the map is empty of any icons. It is explained in the tutorial that the player must explore Venice on their own in order to find the designated stations from which they can collect the 'Treasure'. This 'Treasure' refers to pieces of a water-themed board game designed by Alcuni also featuring the Pet Pals.

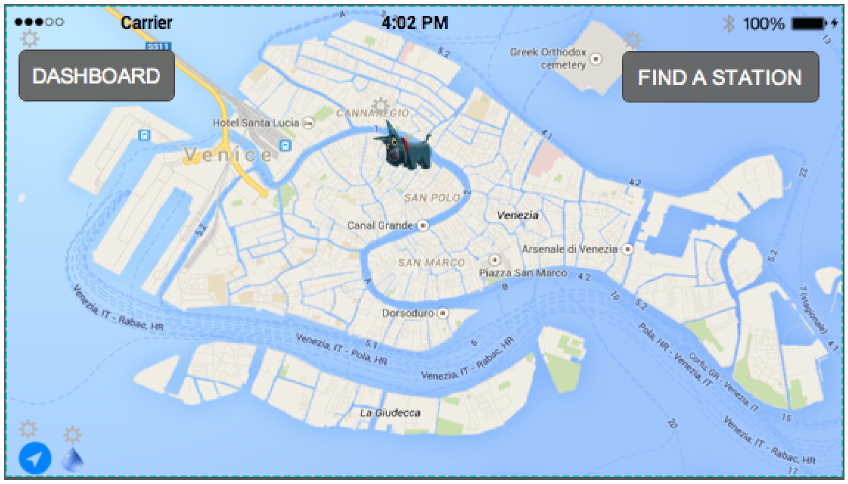


Figure 26: Empty Map

As the player advances in the game, the app keeps record of the stations and other points of interest the player has already visited. As such, the map begins to fill with icons as the game is played.

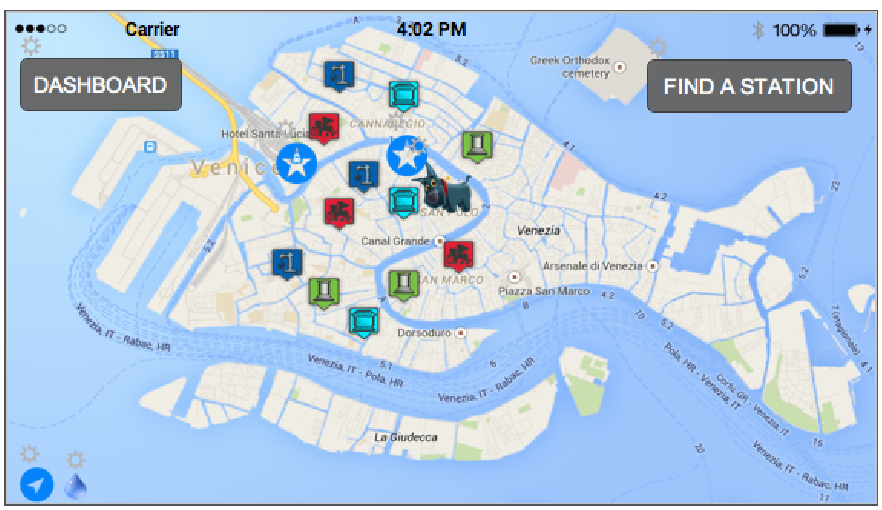


Figure 27: Icons Showing Progress On Map

From the map, the player can reach the Dashboard of the game. The player can also be shown the location of the nearest station by pressing the 'Find A Station' button. However, this button does not lead the player to the station; it only shows the location so that the player must find their own way. This encourages the player to explore Venice on their own rather than to simply follow instructions a map.

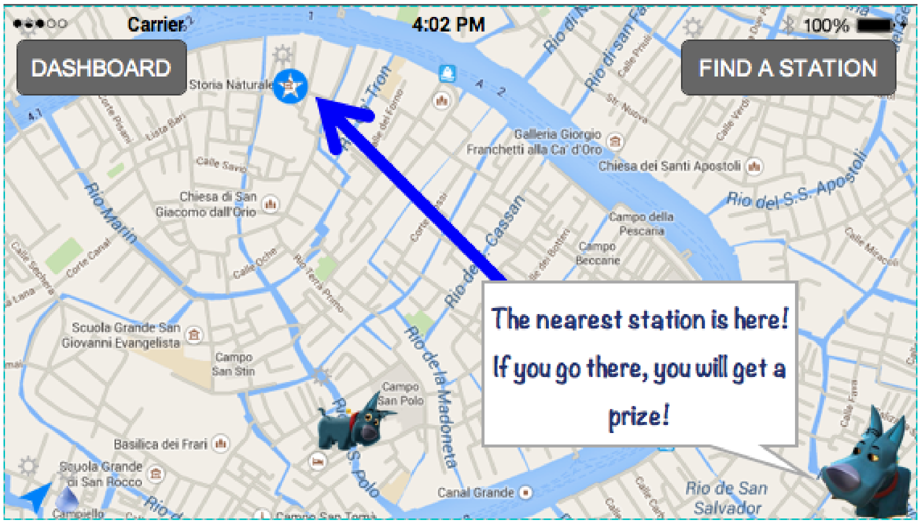


Figure 28: Find a Station

Within the programming of the app, a radius of approximately 200 meters surrounds the player's location on the map. This radius serves to identify stations or points of interest that are nearby. Once the map identifies a station or point of interest within the radius, a notification will appear showing the player the location of the station or point of interest.

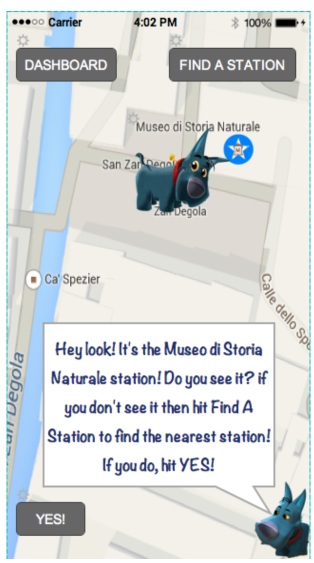


Figure 29: You Found a Station

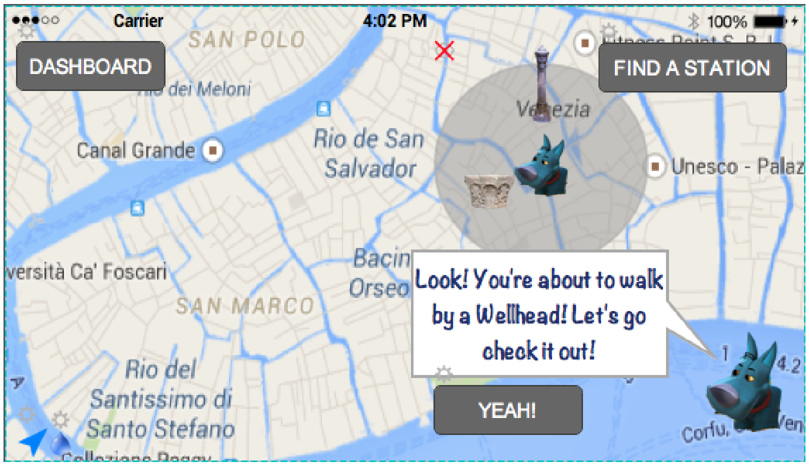


Figure 30: You Found a Wellhead

The two buttons on the bottom left corner of the screen are a ‘Location’ button and the ‘Are you thirsty?’ button respectively from left to right. The ‘Location’ button zooms into the player’s current location from the full map and the ‘Are you thirsty?’ button shows the location of the nearest working fountains and explains that the water is safe to drink.

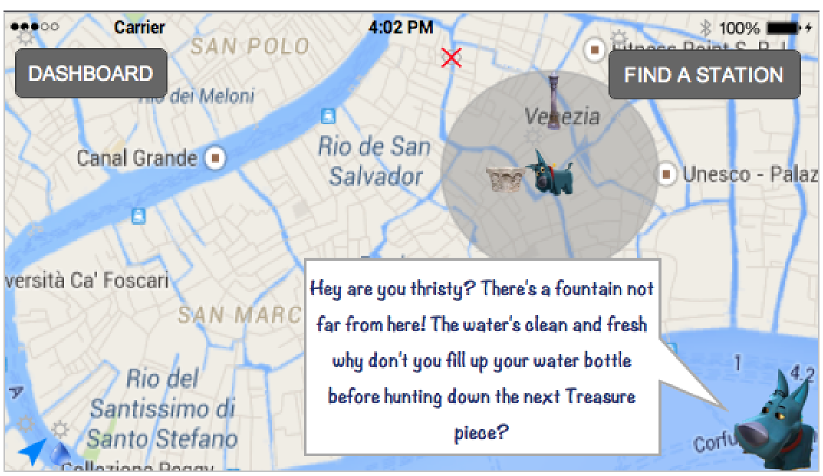


Figure 31: Are You Thirsty?

4.3: How the Data is Utilized

This is where the VPC data is utilized. Our team contributed spreadsheets of data for fountains, wellheads, bridges, *rio tera* and canals. These spreadsheets of data contained the coordinates, names, and dates built for the aforementioned objects. It is the coordinates data that makes it possible to detect when the player is nearby a fountain or *rio tera* and notify them in the app. When the player reaches one of these objects, more options will appear on the screen to either take a picture, access more information from the web, view a video of how the object works or view on the "Did You Know?" questions related to this object.

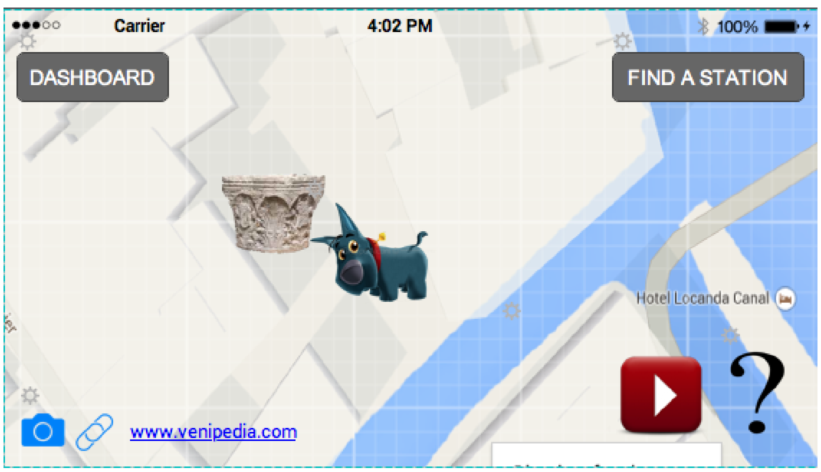


Figure 32: You Found a Wellhead

The links to more information will be links leading to Venipedia pages, the VPC websites and/or websites owned by the UN. The videos will be short animations created by Alcuni. Our team designed the storyboards of these animations. These storyboards provided simple explanations for how Venice works, such as how Venetians obtained fresh water in the past and how the foundation of the city is structured.

The "Did You Know?" questions are centered on the wider issue of water sustainability, unlike the animations that focus on Venice. These questions are split into categories such as 'mobility,' 'drinking water,' etc., and they are attached to objects that also fall under these categories. For example, a fact about drinking water would belong to the cache of questions connected to wellheads and fountains. It will be programmed such that the when the player comes across a fountain or wellhead, the “Did You Know?” question will be taken from a cache of questions under the category of ‘drinking water’. A question will not be reused within a single game. The app will record which “Did You Know?” questions have been used already.

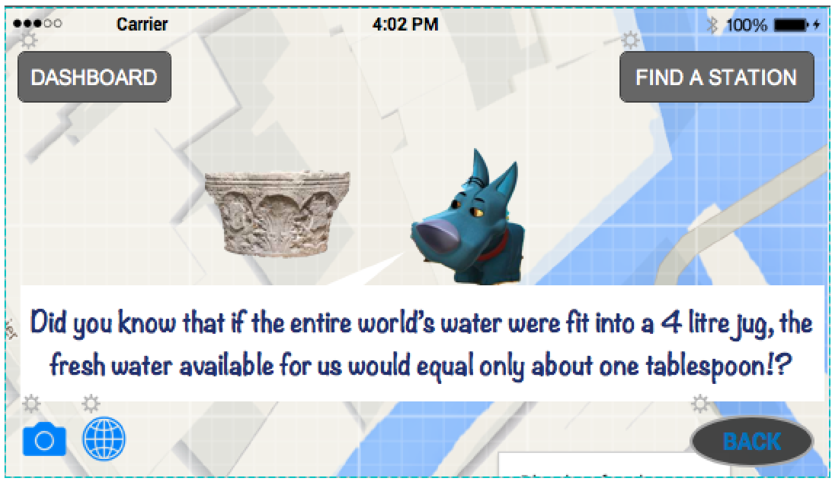


Figure 33: Did You Know?

4.4: The Dashboard

The Dashboard, or Menu, of the game is a console from which the player can view the ‘Treasure’ they’ve collected so far and the pictures they’ve taken through the app. The player can also see their current notifications and go into the Help menu from where they can watch the tutorial again if needed. There is also a settings option from where the player can change the setting of the game. Common setting such as volume and brightness can be changed. There is also the option to turn off notifications.

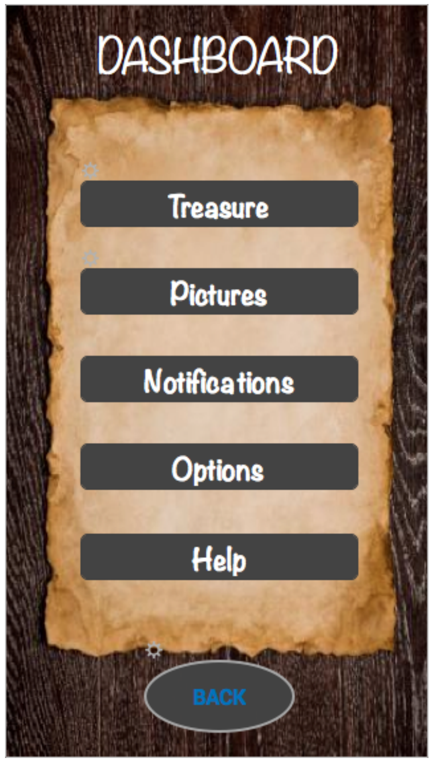


Figure 34: Dashboard

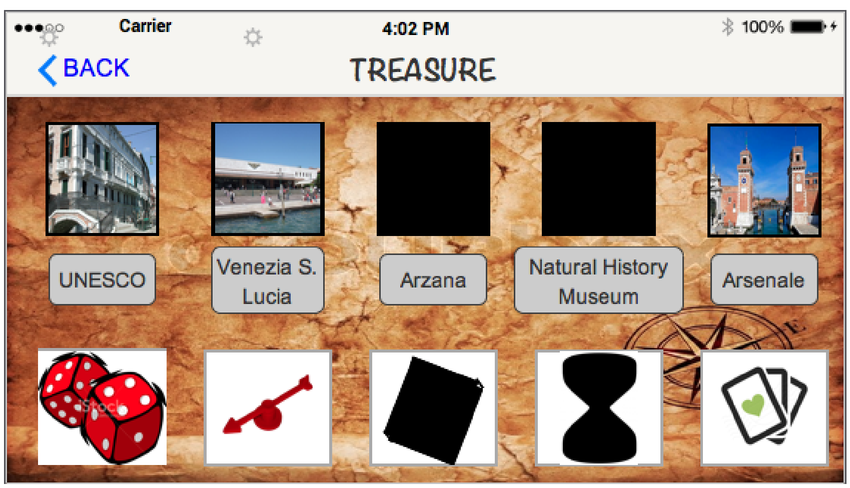


Figure 35: 'Treasure'

5: Analysis of Wellhead Data

The concrete results of this project are: the completion of the wellhead data on the VPC website and the design of the UNESCO children's treasure hunt app. This chapter describes in detail the results of our work and how they will be presented.

5.1: Completed Wellhead Database

One of the deliverables of our project was to complete the wellhead data set, including the islands of the Venice lagoon, and publish the data to the VPC website and Venipedia. We filled the data in all fields previously specified by past VPC teams. In total there were 232 wellheads in Venice proper and 26 wellheads in the islands of the lagoon. In this section, the final results of the completed wellhead data is as follows.

5.1.1: Wellhead Status

Wellheads can be classified in five different ways: public, semi-public, private, missing, or inaccessible. A semi-public wellhead is defined as a wellhead that inside property that is open to the public. See Figure 36.

Figure 36: Semi-Public Wellhead

The wellheads in Venice proper had numerous private, missing, and inaccessible wellheads. Our team only focused on wellheads that were public. Figure 37 represents the total number of wellheads in each status by *sestiere*. This figure represents the wellheads in Venice proper. The number of private wellheads decreases as you move away from the *San Marco sestiere*. We made no conclusion to this trend, however we suspect that this is due to the value of real estate as you get closer to the *San Marco* area.

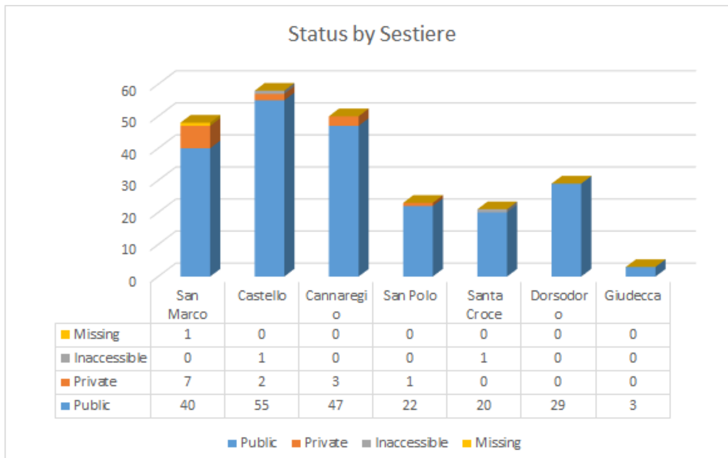


Figure 37: Total Number of Public and Semi-Public Wellheads by *Sestiere*

Travelling to the islands of the lagoon, we found that none of the wellheads outside of Venice proper from Alberto Rizzi's book were missing, inaccessible, semi-public, or private. From this observation we found that out of the 258 wellheads in Venice, 241 were public, 13 were private, 1 was missing, 2 were inaccessible, and 1 was semi-public. Figure 38 represents the percentage of each status.

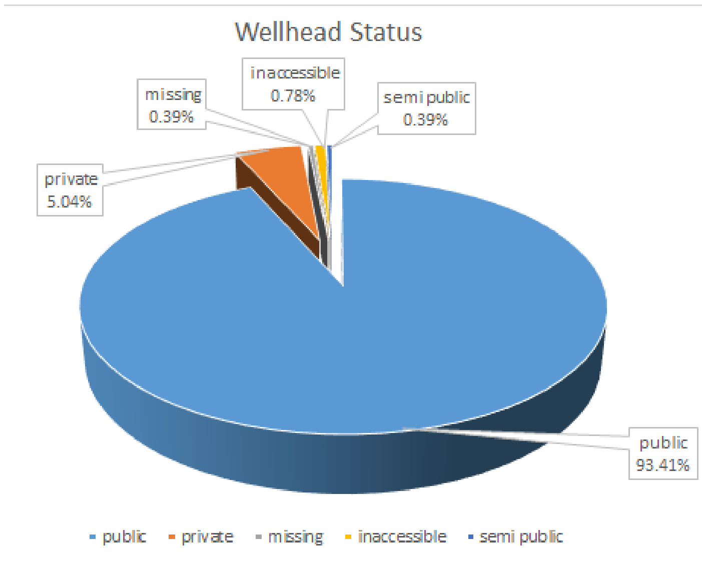


Figure 38: Percentage of Wellhead Status

5.1.2: Wellhead Location

One of the most important pieces of data we recorded for each wellhead was its GPS location. Without the latitude and longitude of each wellhead, we would not be able to create an accurate map of the wellheads in Venice. Previous teams have recorded the coordinates for wellheads on Venice proper. These locations can be seen in Figure 39. The wellheads in Venice proper are also not proportionally distributed by *sestiere*.

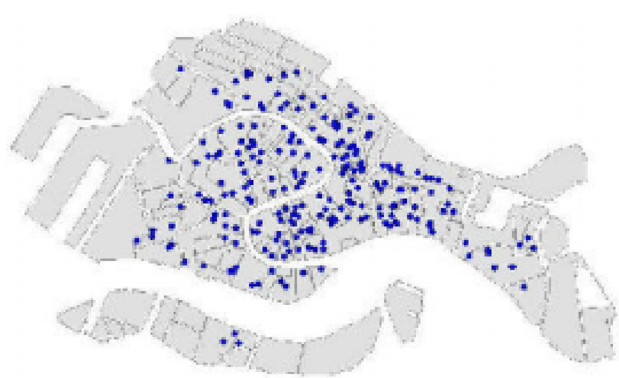


Figure 39: Wellhead Locations on Venice Proper

In total, Alberto Rizzi's book gave descriptions of 24 wellheads on the islands and we found 2 wellheads that were not shown. Figure 40 represents the location of wellheads on each island.

Wellheads on the Islands of the Venice

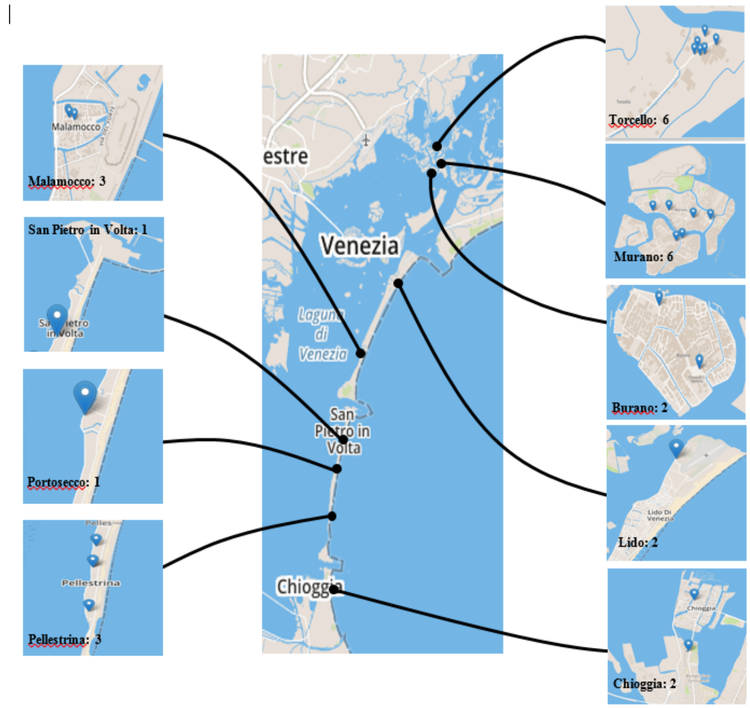


Figure 40: Locations of Wellheads on the Islands of the Lagoon

We determined the locations of all wellheads on both Venice proper and the islands of the lagoon. We found than there were in 258 wellheads in total. Figure 41 represents how many wellheads were in each *sestiere* or island. The islands have been broken up into *sestiere* for the purpose of this graph. The island of *Lido* encompasses the wellheads of both *Lido* and *Malamocco*. In addition, the island of *Lido-Pellestrina* encompasses the wellheads of *San Pietro in Volta*, *Portosecco*, and *Pellestrina*. We made these distinctions based on Alberto Rizzi's wellhead catalog (Rizzi, 1981).

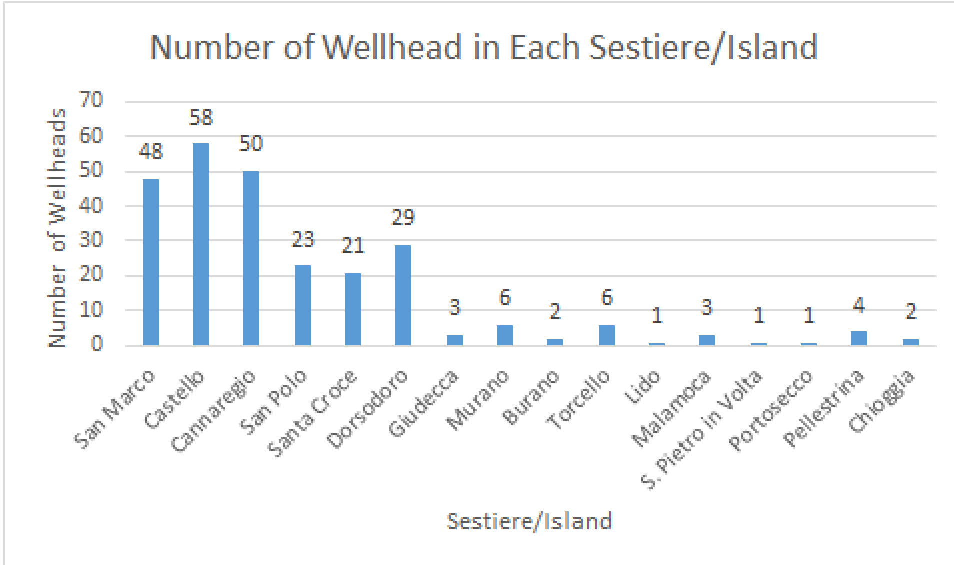


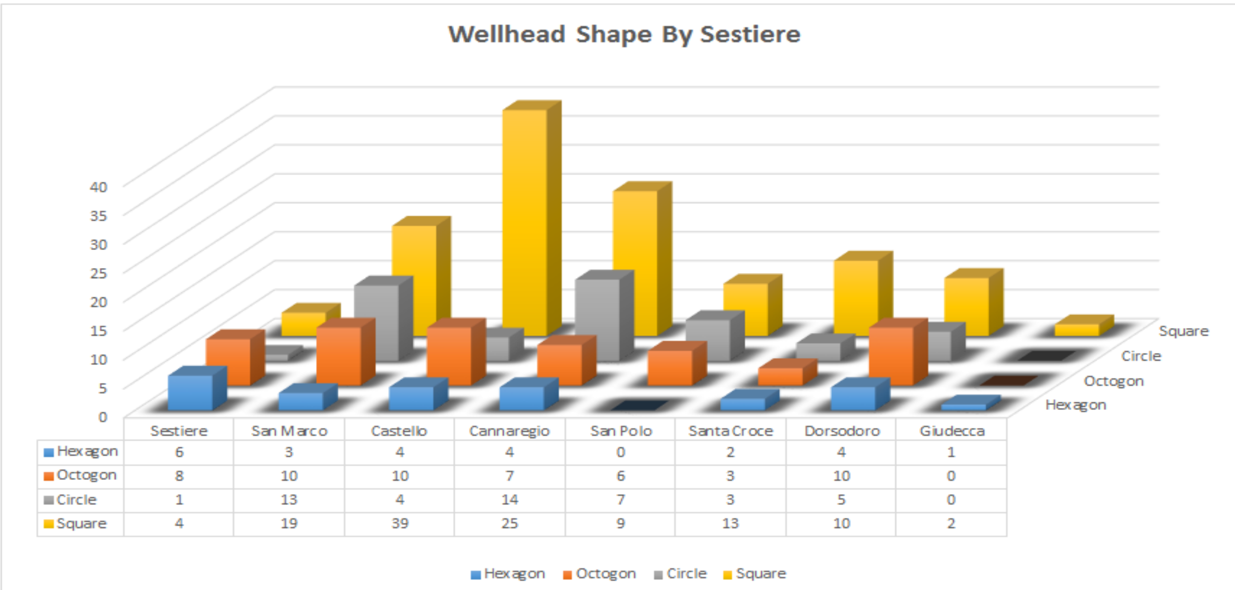
Figure 41: Total Number of Wellheads by Sestiere/Island

5.2.3: Wellhead Shape

Wellheads come in a variety of shapes. From our finding, we found that there are 7 types of wellheads. Wellheads can have a rim that is either 1, 4, 6, or 8 sided. They may also have a circular bottom or a non-circular bottom, however, all the wellheads with a circular rim also have a circular bottom. Figure 42 represents the most uncommon wellhead shape, a wellhead that has a 4 sided rim, but a non-circular bottom.

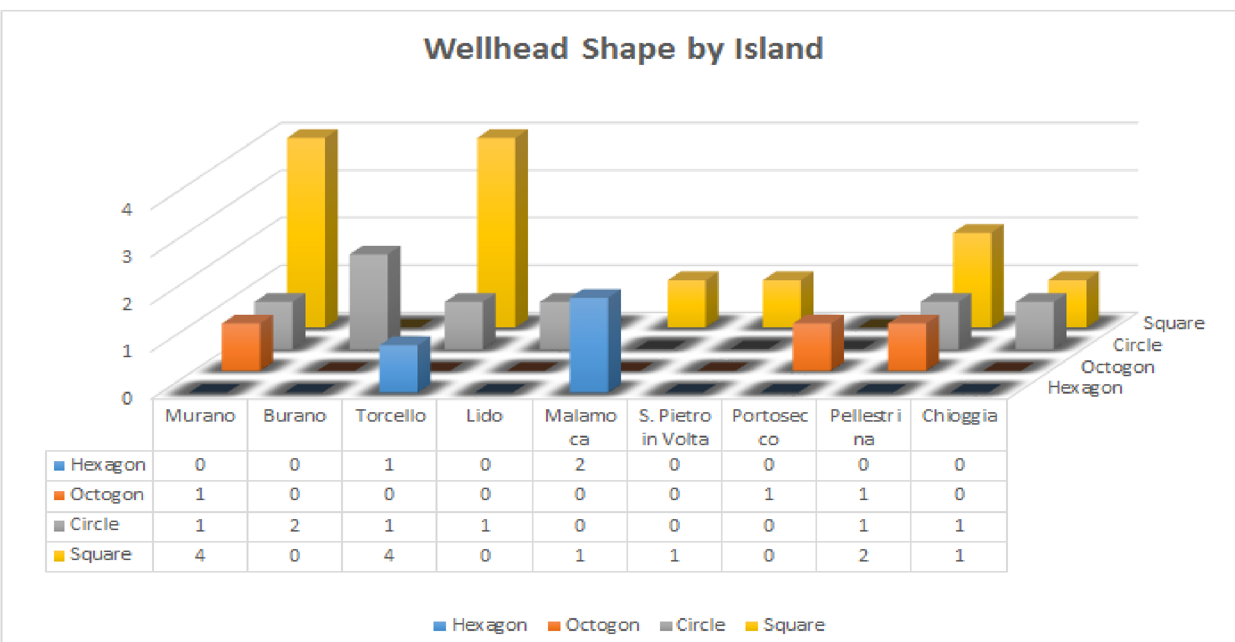
Figure 42: Most Uncommon Wellhead Shape

Figures 43 and 44 represent the number of wellheads with each shape by sestiere and by island respectively. These figures ignore the shape of the bottom of the wellhead. We found that the majority of wellheads have a square rim with a circular bottom.



	Sestiere	San Marco	Castello	Cannaregio	San Polo	Santa Croce	Dorsodoro	Giudecca
Hexagon	6	3	4	4	0	2	4	1
Octogon	8	10	10	7	6	3	10	0
Circle	1	13	4	14	7	3	5	0
Square	4	19	39	25	9	13	10	2

Figure 43: Wellhead Shape by *Sestiere*



	Murano	Burano	Torcello	Lido	Malamoca	S. Pietro in Volta	Portosecco	Pellestrina	Chioggia
Hexagon	0	0	1	0	2	0	0	0	0
Octogon	1	0	0	0	0	0	1	1	0
Circle	1	2	1	1	0	0	0	1	1
Square	4	0	4	0	1	1	0	2	1

Figure 44: Wellhead Shape by Island

5.2.4: Platform Shape

As with the shape of the wellhead, the platform of the wellhead also comes in a variety of shapes. These shapes include: square, circle, hexagon, and octagon. We found that in both Venice proper and the islands of the lagoon a square platform was the most common. We also found that approximately 91% of wellheads had platforms in Venice proper and approximately 96% of wellheads in all the islands had platforms.

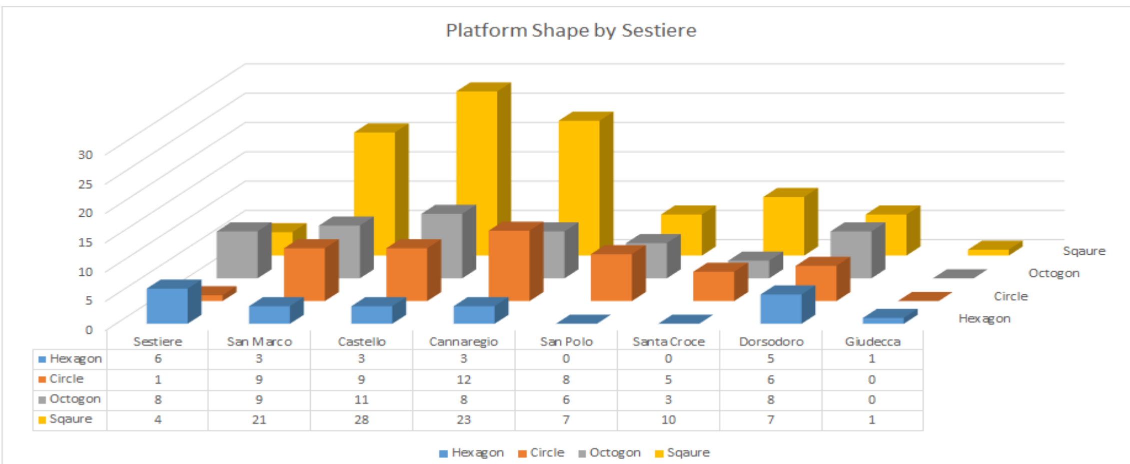


Figure 45: Platform Shape by *Sestiere*

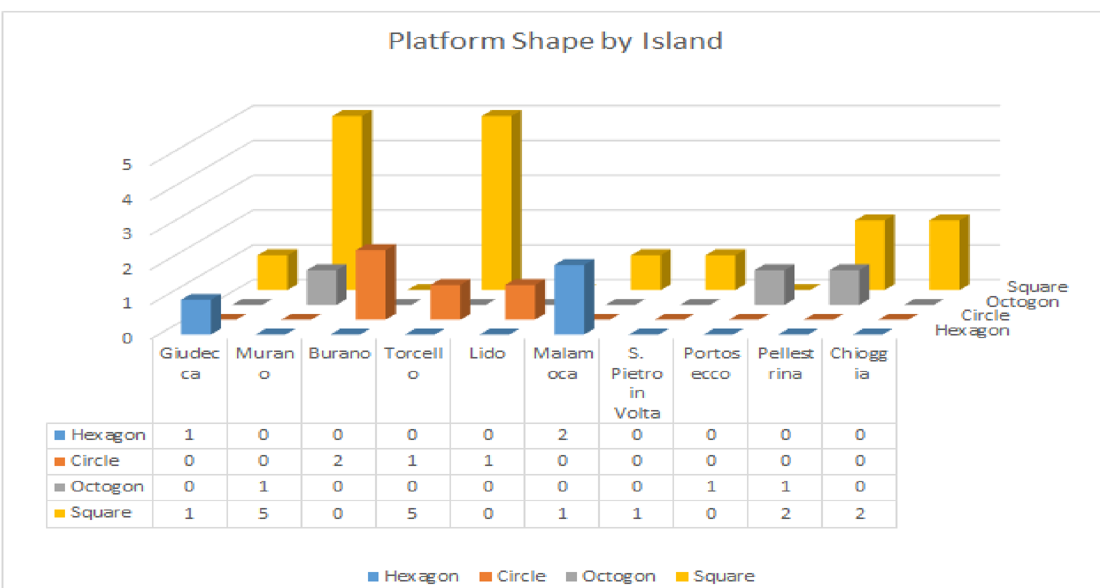


Figure 46: Platform Shape by Island

5.2.5: Measurements and Calculations

Our field surveys involved measuring the dimensions of the wellhead. This was used to calculate the approximate surface area of the wellhead, the platform, and the lid. We found that the average surface area of wellheads in Venice is 109,197 centimeters squared. We also found the largest surface area of a wellhead was 101,306 centimeters squared, while the smallest surface area was 13,245 centimeters squared. We hope that these calculations can be used in future restoration efforts.

5.2.6: Wellhead Material

There are four types of materials that wellheads in Venice are made out of. They are istrian stone, red verona marble, white verona marble, and aurisina. The wellhead seen in Figure 47, located in *Piazzetta dei Leoni* (next to the *Basillica de San Marco*), is made of both Istrian stone and red Verona marble.

Figure 47: Wellhead Made of Both Istrian Stone and Red Verona Marble

Of the four wellhead materials, Istrian stone is the most common material by far. Figure 48 represents the percentage of each material for all 258 wellheads. In this figure "other" represents Aurisina and mixed material wellheads.

Overall 76% of wellheads are made of Istrian stone and 70% of island wellheads are made of Istrian stone. We concluded that the availability and cost of material remained true for both Venice proper and the islands of the lagoon.

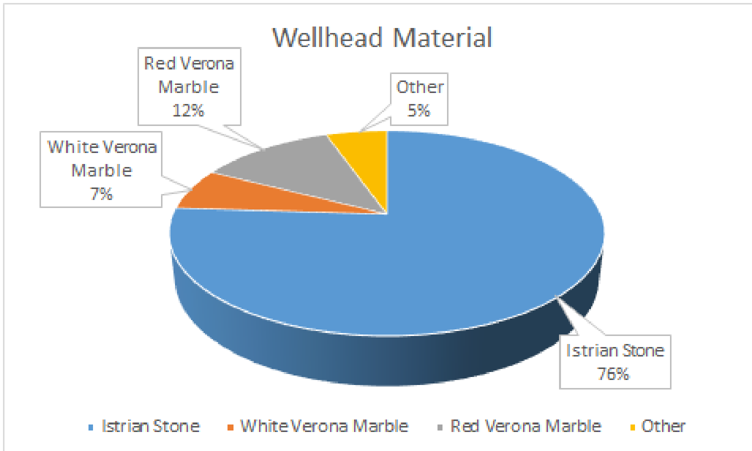


Figure 48: Percentages of Wellhead Material

5.2.7: Platform Material

The platforms of the wellheads consist of a variety of materials including: Istrian stone, red Verona marble, brick, and concrete. Typically, the material of the wellhead and the material of the platform were the same. We found that this was true for approximately 82% of all the wellheads in Venice. Differences between the platform material and wellhead material were most frequent on the island of *Torcello*. This was true for three of the six wellheads on *Torcello*. We also found that these three wellheads did not have a well underneath the wellhead. This led us to believe that many of the wellheads that had a different platform material than wellhead material were moved from their original location. Figure 49 represents a wellhead with a platform material differing from the wellhead material.

Figure 49: Wellhead with Different Platform Material

Overall we found that the distribution of materials for the platform was very similar to the distribution of materials for the wellheads. This was because most of the wellheads had the same material as their platform. Figure 50 represents the percentage of wellheads of each material. In this figure other represents brick and concrete.

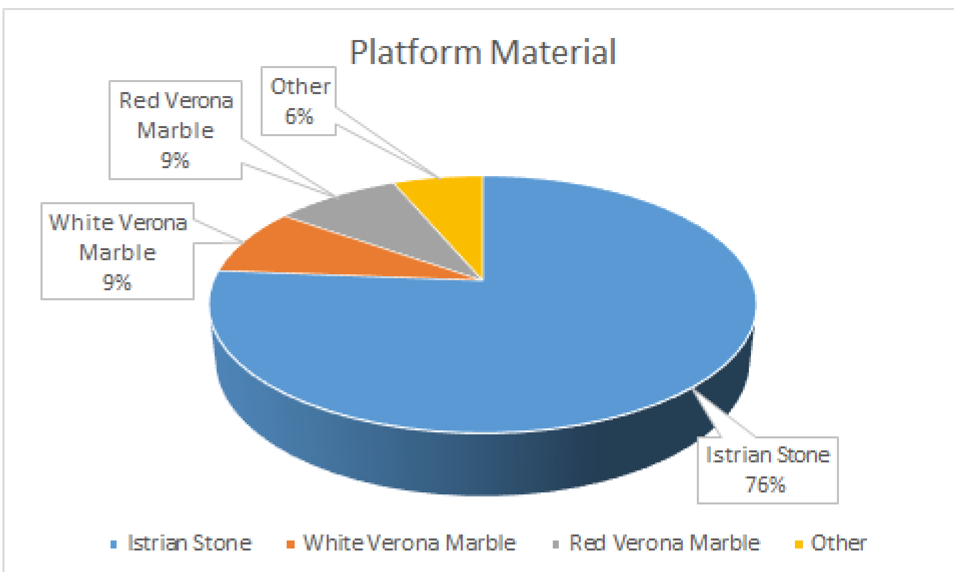


Figure 50: Percentages of Platform Material

5.2.8: Wellhead Lid

We found that approximately 90% of all the wellheads in Venice have some sort of lid. The lids have a variety of materials including: metal, concrete, flowers, dirt, wood, a tree, a statue, or stone. Figure 51 represents some of the various lid materials The vast majority of these lids are made out of metal and serve as a safety feature to keep people from falling into the well.

Figure 51: Examples of Lid Variety

The metal lids come in two types: flat or curved. Figure 52 represents the difference between a flat and curved metal lid.

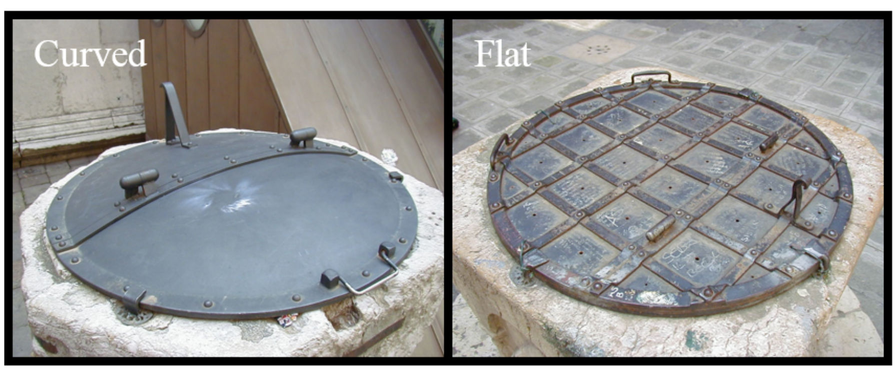


Figure 52: Examples of Metal Lid Shape

5.2.9: Wellhead Drains

All of the wells in Venice have been closed off or filled in. The only remnants left of the well's existence is the wellhead and the drains. Of all 258 wellheads in Venice, approximately 34% of them do not have drains. In Venice proper, approximately 33% of wellheads had no drains. However, on the islands, approximately 76% of the wellheads had no drains. We concluded that this was a result of many island wellheads being moved from their original location to their current location or constructions removing the drains.

Of the wellheads that still have drains, on average wellheads have 2 drains. Figure 53 represents the total number of wellheads with different number of drains. We measured the distance between drains of the wellheads on the islands of the lagoon. This data was not collected for the wells in Venice proper. We found the average distance between drains was 788 centimeters. We assume this average to remain true in Venice proper. We also calculated the average volume of a well, assuming the well is spherical. This value was calculated to be 32.5 cubic meters or 8586 gallons.

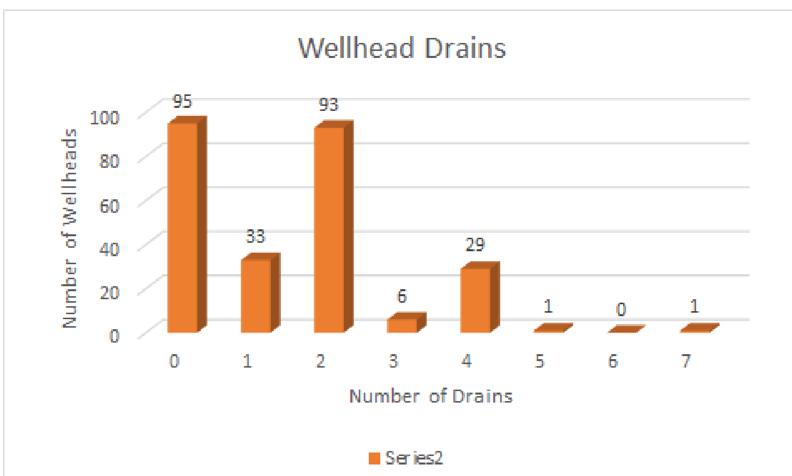


Figure 53: Wellhead Drains

5.2.10: Wellhead Decoration

Past VPC teams have recorded the presence of a crest or shield on the outside of a wellhead. The crests and shields often had a link to a Venetian family, were a symbol of the time period, or a symbol of Venice itself. We found that 76% of wellheads did not have either a crest or shield. Figure 54 represents the percentage of wellheads with crests, shields, or neither.

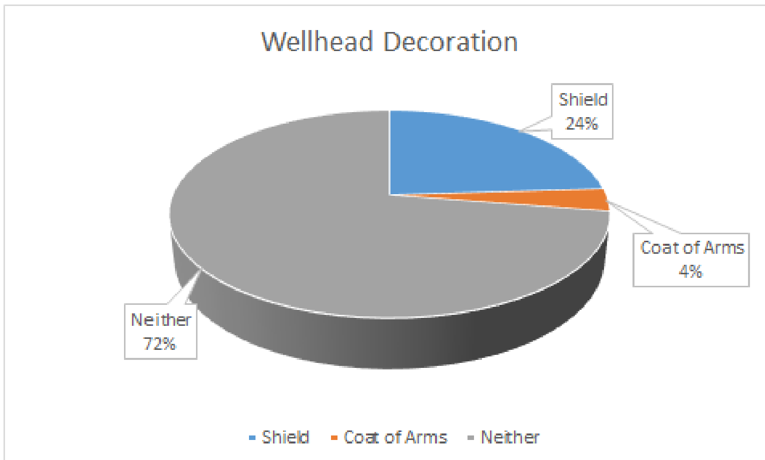


Figure 54: Percentages of Wellhead Decorations

5.2.11: Age of Wellhead

Wellheads have been a characteristic of Venice dating back to the 14th century. We have found wellheads that date back to before the 11th century. Figure 55 shows a wellhead was dated to the year 500 and carved from an early Roman column.

Figure 55: Wellhead Built in the Year 500 A.D.

We have found 9 wellheads that were made before the year 1300. We deduced that the majority of wellheads were created between the years of 1300 and 1400. Approximately 34% of the 258 wellheads were made during that century. Figure 56 represents the number of wellheads in each century.

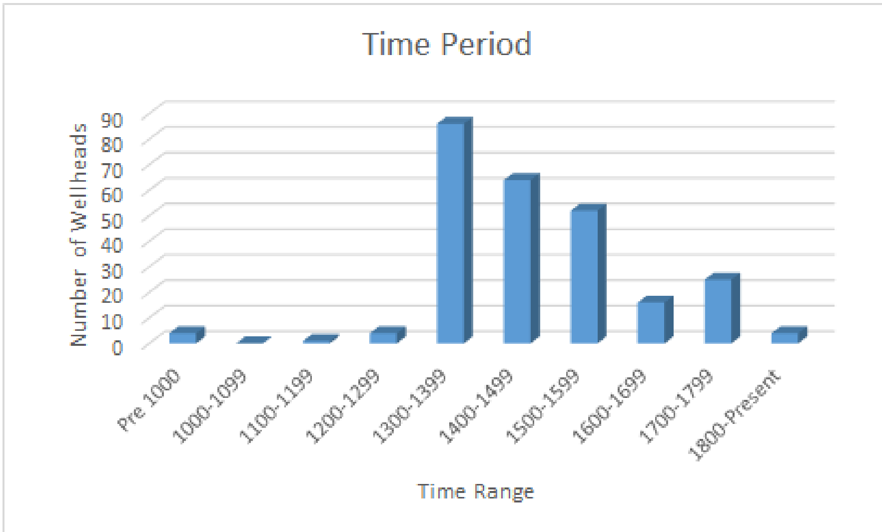


Figure 56: Number of Wellheads in Each Time Period

A summary of the data fields collected and analyzed for wellheads on Venice proper and the islands of the lagoon is depicted in Figure 57.

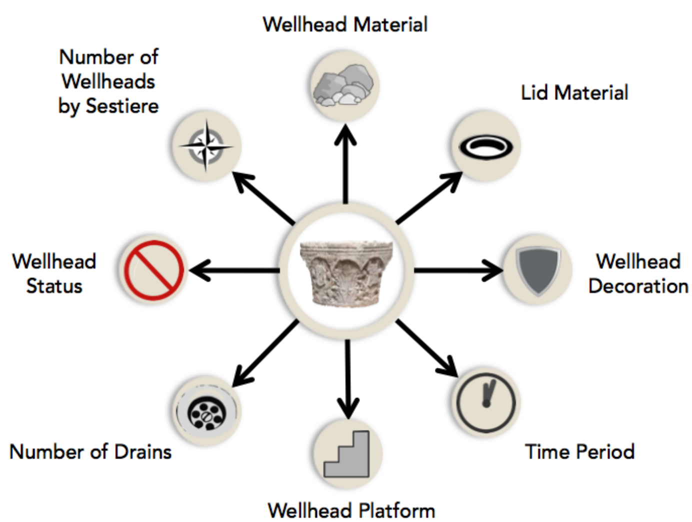


Figure 57: Infographic of Data Fields Collected and Organized

6: Conclusions and Recommendations

By the end of this project, we have completed certain goals and achieved certain deliverables. However, there is an opportunity to build more on the work we have done. This chapter describes what more could be done and summarizes the products of our work.

6.1: Conclusions and Recommendations for the Wellhead Data Catalogue

As one of our deliverables, our team collected and organized all of the outstanding data on wellheads including data on wellheads on the islands of the lagoon. This data was then published to the VPC website and to Venipedia. The wellheads in Venice, now considered public art, are in need of restoration. It is for this purpose that data has been collected, organized and published. However, we recommend organizing the data into its own page or tab on the VPC website for even quicker access where a restoration team could easily access data sets such as surface area, material of the wellhead, damages/condition rating of the wellhead as well as a detailed description of the damages on each, etc.

Even without an individual page for the wellhead data, the data that has been published by our team on Venipedia, and the VPC website is easily accessible. We hope that it will be very useful for future restoration efforts. It is our goal that this data will contribute to the betterment of Venice, as is the ultimate goal of the Venice Project Center.

6.2: Conclusions and Recommendations for UNESCO's Treasure Hunt App

The second deliverable of our project was to design the contextual design of a mobile app for the UNESCO children's treasure hunt in Venice. This treasure hunt is being organized as part of the Venice to Expo Initiative. Our design has been taken by UNESCO and their partners, Gruppo Alcuni and OKCS, to be produced into an operating mobile application that will be part of the treasure hunt event for the Venice to Expo part of the 2015 Milan Expo.

Although the app was created for the Venice to Expo events and exhibits for the 2015 Milan Expo, its use may outlive these events. Water sustainability will always be an important issue, and finding ways to teach awareness to children will always be necessary. The mobile application could be further developed or modified into a game, rather than a treasure hunt, that children can play when they visit Venice. In addition, it can be altered to include more 3D animations of the city of Venice to reflect the Pet Pals Run mobile application. If the mobile application is further developed into a game, it could even be played by children all over the world, not just in Venice. The app can show the city in a 3D cartoon version but still include the informational videos about the city, as well as the "Did you know?" facts about water sustainability all over the world.

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Appendices

Appendix A: Tables

Table 1: Wellhead Data Collection Criteria

Rizzi Number	Code Number given to each wellhead by Alberto Rizzi in his book "The Well-Heads Of Venice"
Date	The date the wellhead data was collected
Status	Determine whether the wellhead is Public, Private, Semi-Private (Inside building or property that is open to the public)
Sestiere/Island	Determine which Sestiere or Island the wellhead is located on
Time Period	Approximate time in which wellhead was built
Number of sides	Determine the number of sides that the wellhead has
Degree of North most side	The degree offset of the north most side of the wellhead
Circular Top	Determine whether the wellhead has a circular top (Yes or No)
Circular Bottom	Determine whether the wellhead has circular bottom (Yes or No)
Circumference of Base	Circumference of the base in centimeters
Rim Width/ Rim Circumference	The width of the top of the wellhead (if non-circular) or the circumference of the top of the wellhead (if circular)
Wellhead Material	The material of the wellhead
Height from base to rim	The height from base to rim of the wellhead in centimeters
Wellhead Lid	Determination if the wellhead has a lid (Yes or No)
Lid circumference/Opening Diameter	The circumference of the lid in centimeters or the diameter of the opening in the wellhead (if wellhead has no lid)
Number of drains	The number of drains around the wellhead
Drain to Drain	The measurement in centimeters from one drain to the other (if the wellhead has drains)
Platform material	The material of the platform

Number of steps of Platform	The number of steps of platform
Platform height	Height of the platform in centimeters
Wellhead Platform	Determine whether the wellhead has a platform (Yes or No)
Platform circular	Determine whether the platform is circular (Yes or No)
Number of Sides of Platform	The number of sides of the platform
Platform width/circumference	The platform width (if non circular) or circumference (if circular) in centimeters
Lid material	Material of lid
Lid Shape	Determine whether the lid is flat or is curved
Address	Address of the square of street that the wellhead is in
Crest or Shield	Determine whether there is a crest of shield on the wellhead
Latitude	Latitude of the wellhead
Longitude	Longitude of the wellhead

Table 2: Wellhead Damage Assessment

Damage Assessment	
Accretions 2	Paint Accumulations usually caused by graffiti that obscures the surface of the wellhead completely
Accretions 1	Paint accumulations that are sporadic as in the edge of spray paint marks or tiny spattering that still allows the wellhead surface to be seen under it
Structural Crack	Any cracks that is deep into, or all the way through, the wellhead wall; potentially causing severe structural damage
Surface Cracks	Minor cracks located on the outermost surface of the wall
Grime 2	Grime, dirt, and sulfur accumulations that are pervasive to the point of completely obscuring the wellhead surface
Grime 1	Grime, dirt, and sulfur accumulations that are light enough to still see the surface of the wellhead
Surface Damage 2	Heavy damage to the surface: includes pitting, chalking, and flaking

Surface Damage 1	Light dame to the surface: includes pitting, chalking, and flaking
Algae	Biological growth on the wellhead
Graffiti	Painted words or images on the surface of the wellhead

Table 3: Maximum and Minimum Damage Totals

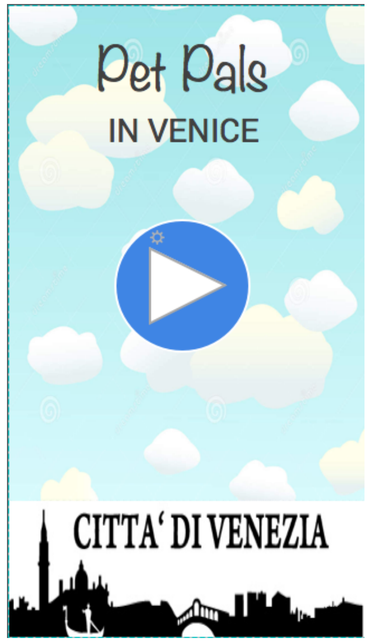
Scale	Min	Max
Acretion2	0	205
Accretion 1	0	70
Structural Cracks	0	82
Surface Crack	26	630
Grime 2	0	250
Grime 1	28	289
Surface Damage 2	8	101
Surface Damage 1	5	370
Algae	0	350
Graffiti	0	8

Table 4: Weighting of Categories

Category	**Weighting**
Acretion2	0.020
Accretion 1	0.020
Structural Cracks	0.350
Surface Crack	0.055
Grime 2	0.050
Grime 1	0.025
Surface Damage 2	0.350
Surface Damage 1	0.100
Algae	0.015
Graffiti	0.015

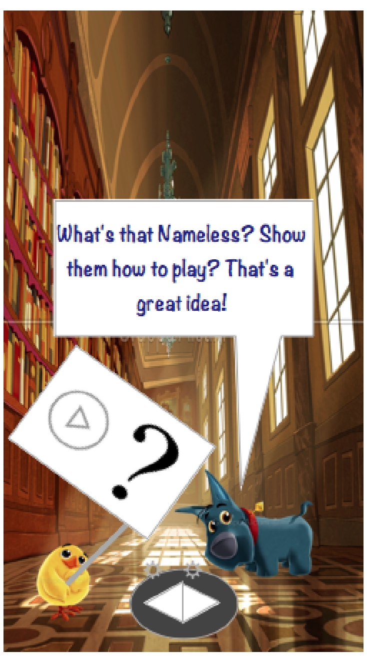
Appendix B: UNESCO Children's Treasure Hunt App Mockup

Screen 1: Welcome Screen

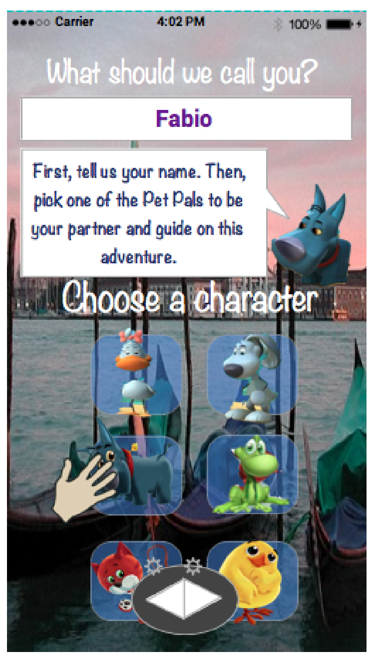


Screen 2: Play Screen

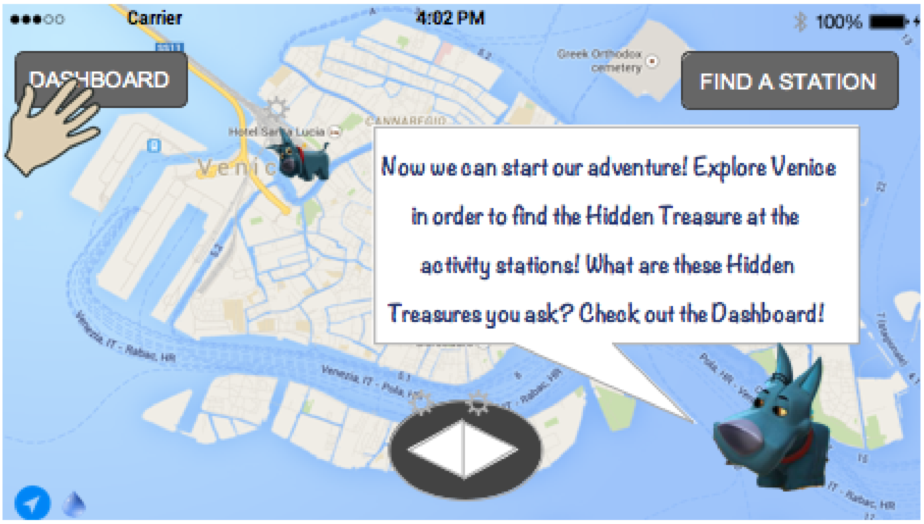
Screen 3: Tutorial A



Screen 4: Tutorial B



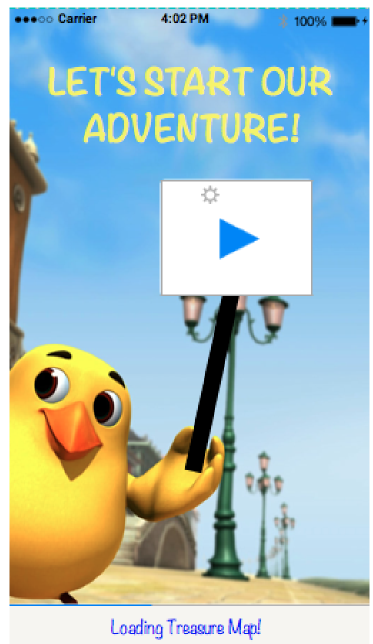
Screen 5: Tutorial C



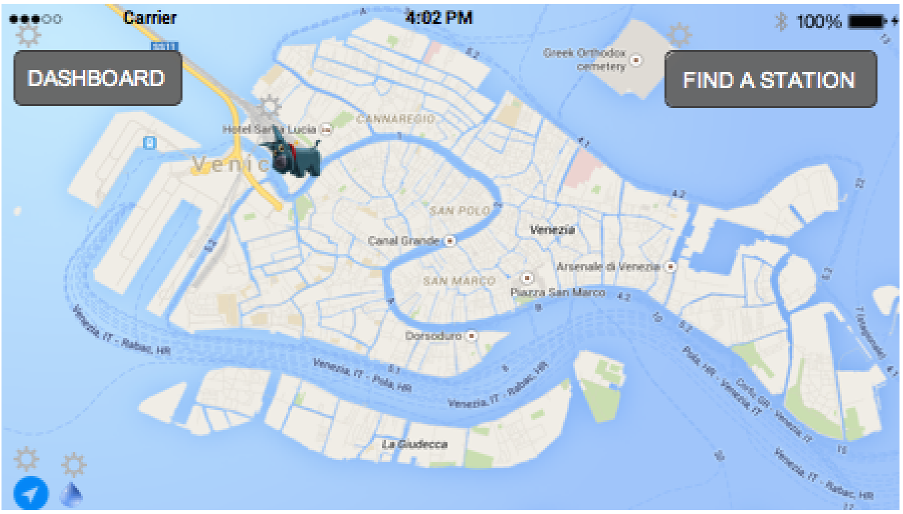
Screen 6: Tutorial D

Screen 7: Tutorial E

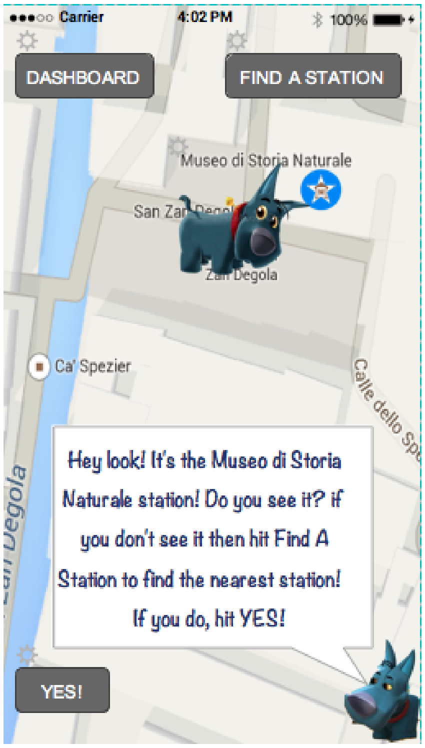
Screen 7: Choose a Character



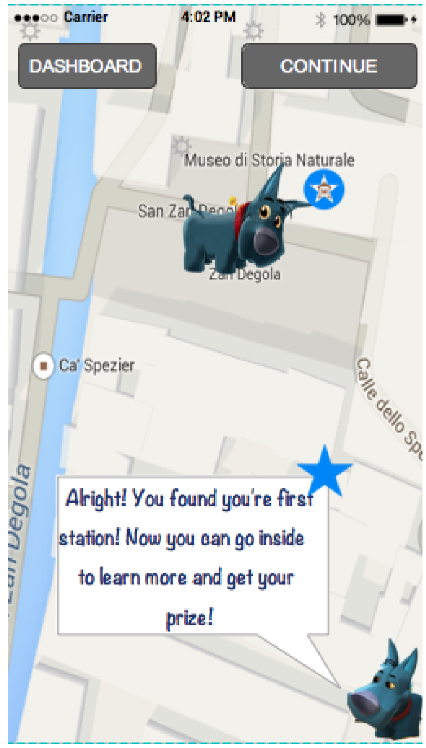
Screen 8: Loading Screening



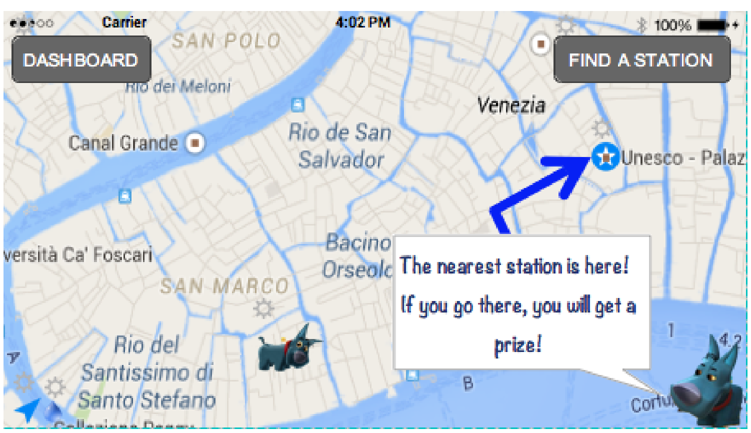
Screen 9: Main Full Map View



Screen 10: You've Found a Station

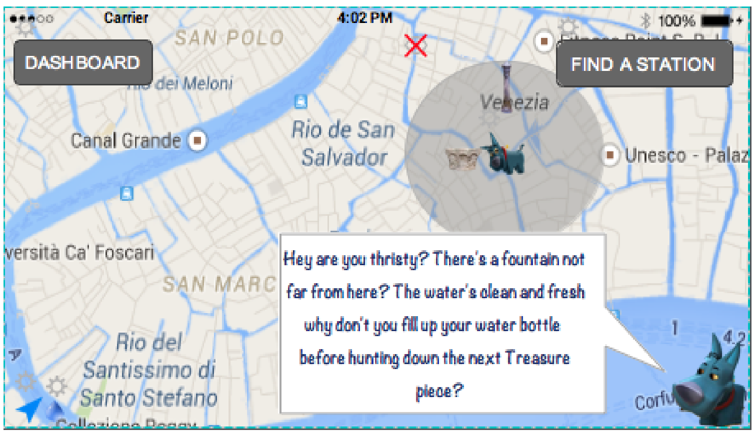


Screen 11: Go Inside the Station

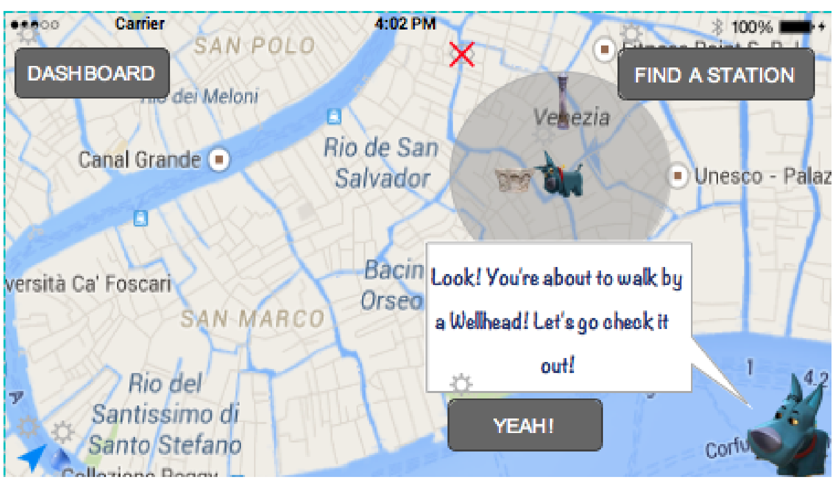


Screen 12: Find a Station

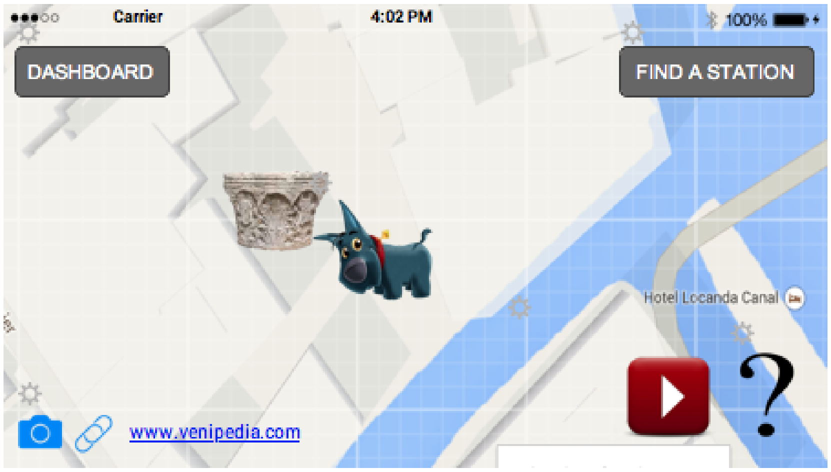
Screen 13: Congratulations



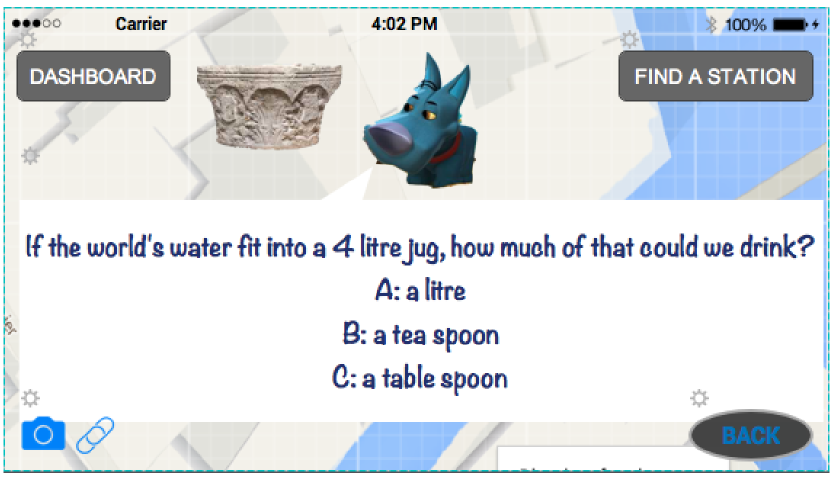
Screen 14: Are You Thirsty?



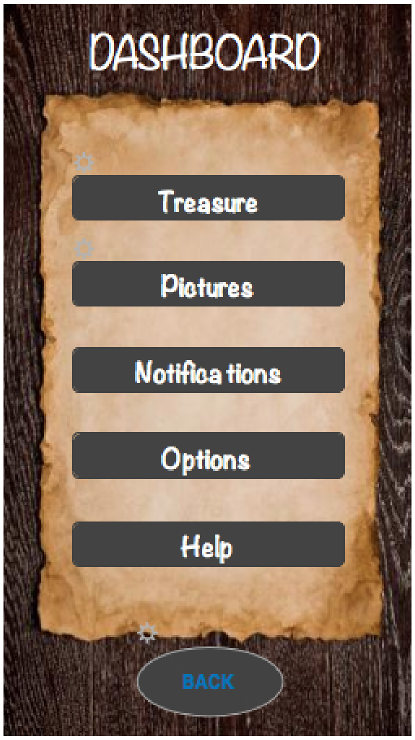
Screen 15: Finding Points of Interest



Screen 16: Icons Appear When Close To a Point of Interest

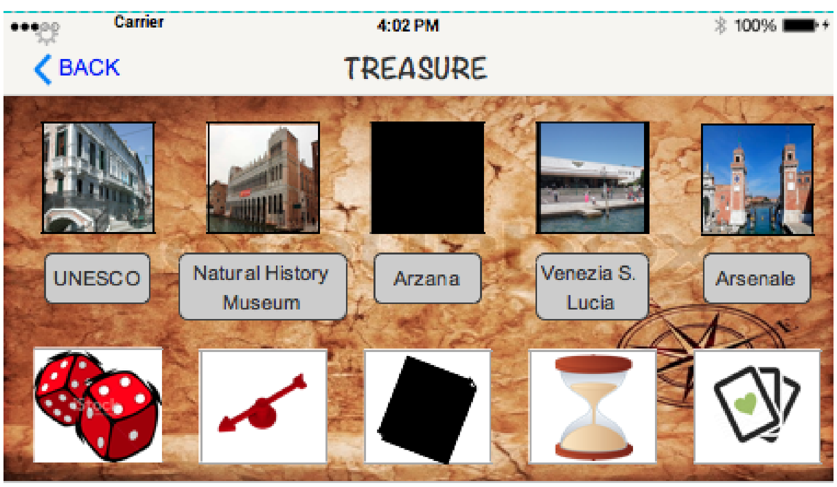


Screen 17: Question About Water That Corresponds to Board Game Questions



Screen 18: Dashboard

Screen 19: Pictures



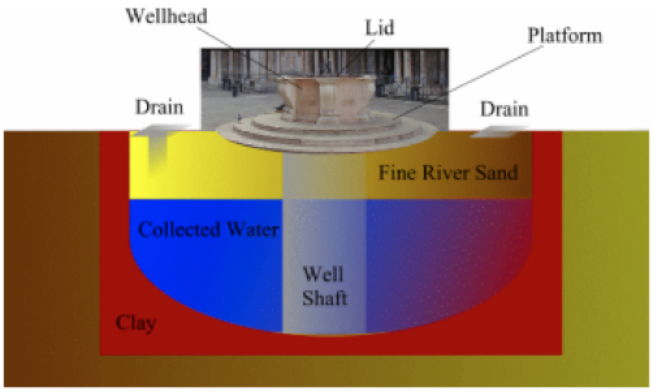
Screen 20: Treasure

Appendix C: Animation Storyboards

<u>Wellhead and Cistern:</u>

- Water flows down the drain, through the sand and into the clay basin.
- The well should be labeled as seen in diagram, but drawn like the drawing above then character pulls up bucket of water from the well

Images:



<u>Fountain:</u>

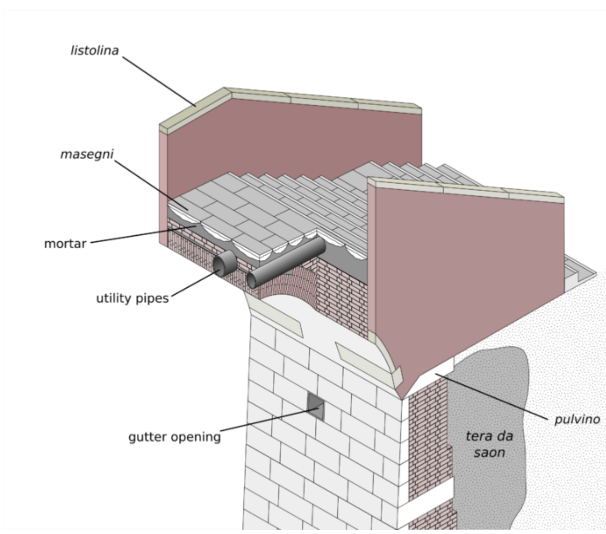
- Fountains in Venice serve as both public art and a source of drinking water.
- The water is piped in from deep wells on the mainland.
- Animation could show a tiny map of Venice with a pipe running from the mainlands to the fountain on Venice where the character is drinking water?

Images:

Bridges:

- They connect the series of islands that make up Venice
- They have electrical lines and utility pipes running through them to keep the city connected
- Foot bridges are the main way to get around Venice.
- Animation could simply show the character walking across a bridge and then cut the bridge in half to show the cross section as seen below.

Images:



Old Sewer System:

Dialogue:

- Sewage comes out of the *gatoli* into the canal and is washed away with the tide.
- There are also septic tanks and a treatment plant. this is the updated sewage system. Animation could show gatoli letting sewage into the canal and the tide washing it away, and then instead of gatoli a pipe leading to a tank and then the treatment plant where it comes out clean?

Images:


gatolo

Canals:

- Animation could just show the labeled layers of the canal wall as described below.

City Foundation:

- Animation should show the foundation of the city labeled as seen below, and then the water level could go down and the foundation starts to rot and crumble?

Images:

Rio Terra:

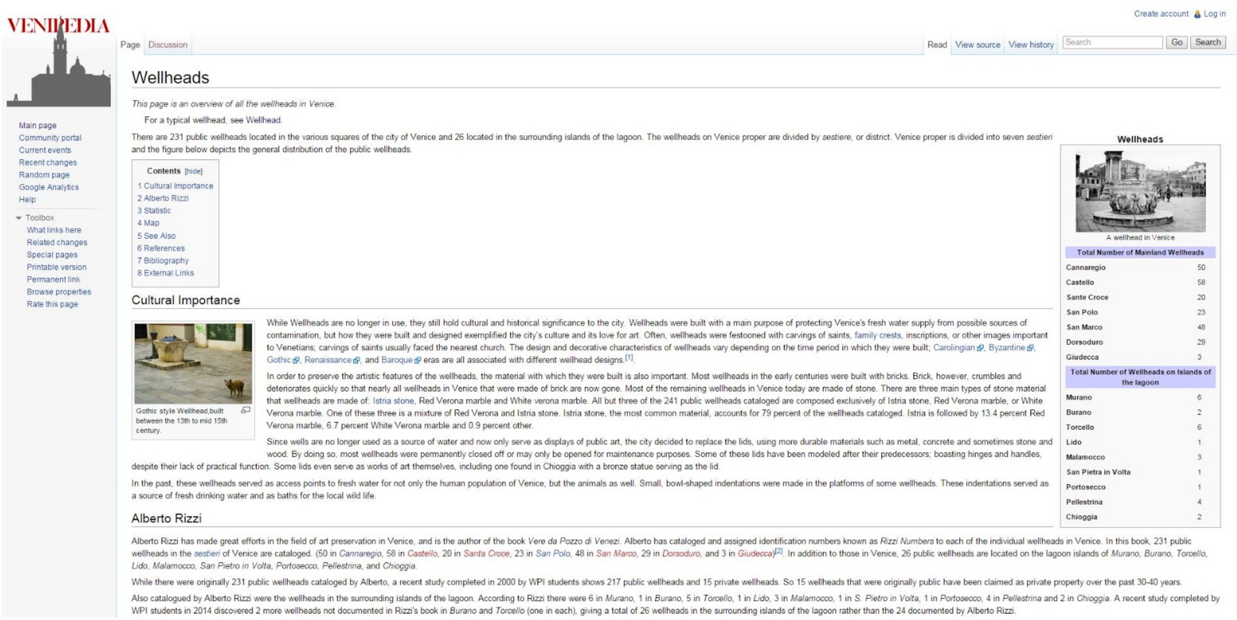
- Rio terra are filled in canals. Their street name usually includes the term “Rio Terra” so you know that street used to be a canal.

- The Animation could show the character walking into the opening of the street where it shows the name of the street “Rio Terra …”, and then it could show time going backwards to show the filling in of the canal and the canal it used to be. Could just be three panels, Panel1: street as it is now; Panel 2: canal being filled in(as seen in picture below); Panel 3: canal in the place of the street.

Image:

Appendix D: Venipedia Pages

'Wellheads' Venipedia Page



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Wellheads

This page is an overview of all the wellheads in Venice.

For a typical wellhead, see Wellhead.

There are 231 public wellheads located in the various squares of the city of Venice and 26 located in the surrounding islands of the lagoon. The wellheads on Venice proper are divided by *sestiere*, or district. Venice proper is divided into seven *sestieri* and the figure below depicts the general distribution of the public wellheads.

Contents [hide]

Cultural Importance

Gothic style Wellhead,built between the 13th to mid 15th century.

While Wellheads are no longer in use, they still hold cultural and historical significance to the city. Wellheads were built with a main purpose of protecting Venice's fresh water supply from possible sources of contamination, but how they were built and designed exemplified the city's culture and its love for art. Often, wellheads were festooned with carvings of saints, family crests, inscriptions, or other images important to Venetians; carvings of saints usually faced the nearest church. The design and decorative characteristics of wellheads vary depending on the time period in which they were built; Carolingian, Byzantine, Gothic, Renaissance, and Baroque eras are all associated with different wellhead designs.[1]

In order to preserve the artistic features of the wellheads, the material with which they were built is also important. Most wellheads in the early centuries were built with bricks. Brick, however, crumbles and deteriorates quickly so that nearly all wellheads in Venice that were made of brick are now gone. Most of the remaining wellheads in Venice today are made of stone. There are three main types of stone material that wellheads are made of: Istria stone, Red Verona marble and White verona marble. All but three of the 241 public wellheads cataloged are composed exclusively of Istria stone, Red Verona marble, or White Verona marble. One of these three is a mixture of Red Verona and Istria stone. Istria stone, the most common material, accounts for 79 percent of the wellheads cataloged. Istria is followed by 13.4 percent Red Verona marble, 6.7 percent White Verona marble and 0.9 percent other.

Since wells are no longer used as a source of water and now only serve as displays of public art, the city decided to replace the lids, using more durable materials such as metal, concrete and sometimes stone and wood. By doing so, most wellheads were permanently closed off or may only be opened for maintenance purposes. Some of these lids have been modeled after their predecessors; boasting hinges and handles, despite their lack of practical function. Some lids even serve as works of art themselves, including one found in Chioggia with a bronze statue serving as the lid.

In the past, these wellheads served as access points to fresh water for not only the human population of Venice, but the animals as well. Small, bowl-shaped indentations were made in the platforms of some wellheads. These indentations served as a source of fresh drinking water and as baths for the local wild life.

Wellheads

A wellhead in Venice

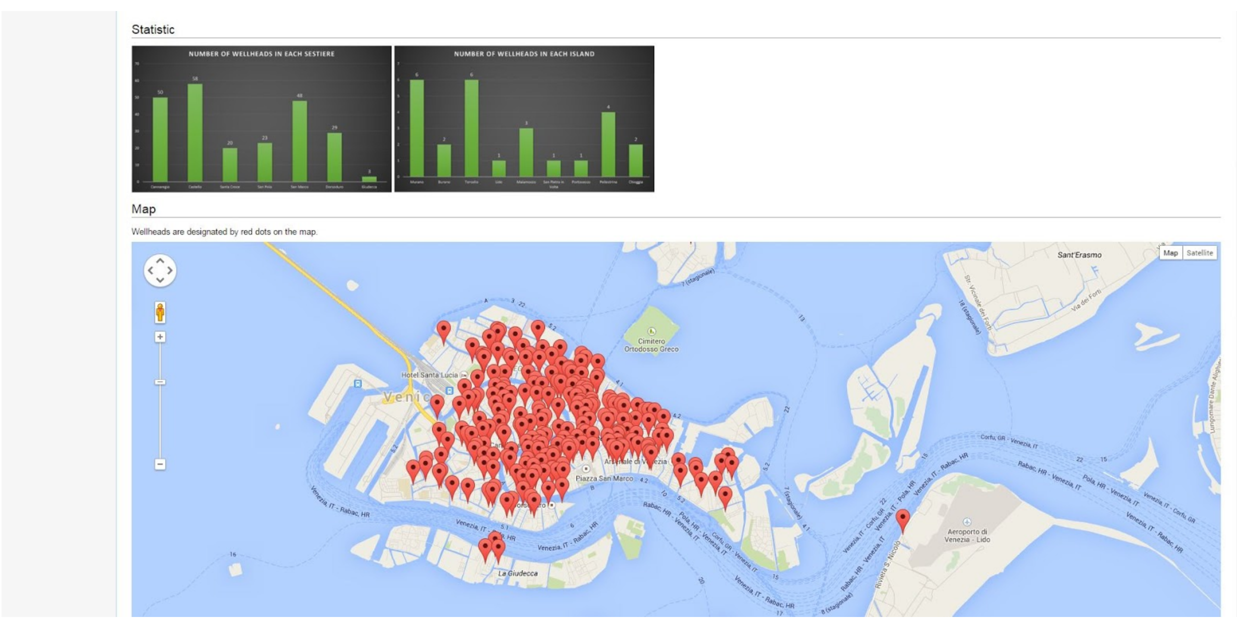
Total Number of Mainland Wellheads	
Cannaregio	50
Castello	58
Sante Croce	20
San Polo	23
San Marco	48
Dorsoduro	29
Giudecca	3
Total Number of Wellheads on Islands of the lagoon	
Murano	6
Burano	2
Torcello	6
Lido	1
Malamocco	3
San Pietra in Volta	1
Portosecco	1
Pellestrina	4
Chioggia	2

Alberto Rizzi

Alberto Rizzi has made great efforts in the field of art preservation in Venice, and is the author of the book *Vere da Pozzo di Venezi*. Alberto has cataloged and assigned identification numbers known as *Rizzi Numbers* to each of the individual wellheads in Venice. In this book, 231 public wellheads in the *sestieri* of Venice are cataloged. (50 in *Cannaregio*, 58 in *Castello*, 20 in *Santa Croce*, 23 in *San Polo*, 48 in *San Marco*, 29 in *Dorsoduro*, and 3 in *Giudecca*)[2]. In addition to those in Venice, 26 public wellheads are located on the lagoon islands of *Murano*, *Burano*, *Torcello*, *Lido*, *Malamocco*, *San Pietro in Volta*, *Portosecco*, *Pellestrina*, and *Chioggia*.

While there were originally 231 public wellheads cataloged by Alberto, a recent study completed in 2000 by WPI students shows 217 public wellheads and 15 private wellheads. So 15 wellheads that were originally public have been claimed as private property over the past 30-40 years.

Also catalogued by Alberto Rizzi were the wellheads in the surrounding islands of the lagoon. According to Rizzi there were 6 in *Murano*, 1 in *Burano*, 5 in *Torcello*, 1 in *Lido*, 3 in *Malamocco*, 1 in *S. Pietro in Volta*, 1 in *Portosecco*, 4 in *Pellestrina* and 2 in *Chioggia*. A recent study completed by WPI students in 2014 discovered 2 more wellheads not documented in Rizzi's book in *Burano* and *Torcello* (one in each), giving a total of 26 wellheads in the surrounding islands of the lagoon rather than the 24 documented by Alberto Rizzi.



Statistic

Map

Wellheads are designated by red dots on the map.

“Well” Venipedia Page

VENIPEDIA

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Well

This page contains information about a typical Venetian well.

For a list of wells, see Wells.

A well

Contents [hide]

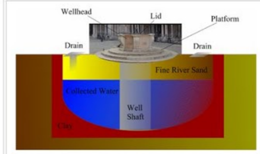

Diagram of a typical cistern below a wellhead.[1]

History

As a series of islands surrounded by a salt-water lagoon, Venice lacks natural sources of freshwater. As a result, Venice has found alternative ways to obtain freshwater for the city. As far back as the 6th century, Venetians built well systems to collect and filter rain to be stored as freshwater.

Structure

A typical well has an underground cistern, a well shaft, drains and a layer of fine river sand between the cistern and the pavement.

Well Shaft

While functioning as Venetians main water supply, the actual well shaft that extended from the wellhead to the cistern was made from bricks and lined with a layer of impermeable clay.

Cistern

The cisterns were made with large stones and then lined with impermeable clay that prevented the fresh water from leaking out and more importantly prevented salt water from leaking in and contaminating the water supply.

Drains

The drains were built in order to collect rain water. Typically there are two or four drain equally spread out around the wellhead. The image below shows a picture of a drain.

Current Water Supply

Venice is now supplied with water from the mainland, traveling underground through pipes from the commune Trebaseleghe which is filled by 120 artisan wells.

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Appendix E: Spreadsheets

Spreadsheet 1: “Did You Know?” Water Facts and Questions

Questions	Answer
What is the total water content of babies versus adults?	75% vs 60%
What percentage of fresh water is in the ground?	30%
How many people lack access to an improved water source? 780 million people	780 million people
What's the percentage of accessible freshwater found in the world?	Less than 1% of fresh water is accessible
How much of our planet is covered in water?	70%
What percentage of the human brain is water?	70%
At what temperature does water reach its highest density?	4 degrees Celsius
What is the chemical formula of water?	H2O
How long can the average person live without water?	A week
Water is the only liquid whose solid form is less dense than the liquid form.	True
Water regulates the Earth's temperature.	True
Africa has 34.5 times more people in need of clean water than all of the developed countries put together.	True
What percentage of the human body is made of up water?	66%
More people have a mobile phone than a toilet.	True
1 pound of chocolate requires 3,170 gallons of water.	True
The number of people in the world that don't have access to clean water is equivalent to 2.5 times the population of the USA.	True
Approximately 1 in 5 people around the world don't have access to an improved water source.	False
Approximately 1 in 9 people around the world don't have access to an improved water source.	True
Name 3 things that water can do.	keeping life on earth, generate electricity, putting out fire,...
How much water does a dripping tap waste in a year?	12,000 litres
What are the three forms of water?	Solid (ice), liquid (water), gas (steam)
How many gallons of water does it take to grow and process coffee beans for one cup of coffee?	37 gallons
One drip every second adds up to 5 gallons per day in a leaky faucet.	True
Does water shrink when it freezes?	No, it expands
Only 1% of the earth's water is available for drinking water.	True
By 2025 up to 1.8 billion people will face water scarcity.	True
In India, in the water infrastructure up to 40% leaks out.	True
Only about 50% of India's water resource demand goes to agriculture.	False
What percentage of India's water resource demand goes to agriculture?	80%
How many hours per day do most women in Kenya spend getting water for the family?	8 Hours
Between 2000 and 2009, more than 160,000 safe water devices have been installed in Bangladesh.	True
Half the world's schools do not have access to clean water, nor adequate sanitation.	True
On average, women in Africa and Asia have to walk 3.7 miles to collect water.	True
As little as one dollar can provide clean water for a child in the developing world for an entire year.	True

Did You Know?	Location
Did you know that the total water content of babies versus adults is 75% vs 60%?	Hospital
Did you know that 30% of fresh water is in the ground?	Park
Did you know that 780 million people lack access to an improved water source?	Fountain
Did you know that less than 1% of freshwater is accessible?	Fountain
Did you know that 70% of our planet is covered in water?	Canal
Did you know that 70% of the human brain is water?	Hospital
Did you know that at 4 degrees Celsius water reaches its highest density?	Canal
Did you know that the chemical formula of water is H2O?	Fountain
Did you know that the average person can live up to a week without water?	Fountain
Did you know that water is the only liquid whose solid form is less dense than the liquid form?	Wellhead
Did you know that water regulates the Earth's temperature?	Canal
Did you know that Africa has 34.5 times more people in need of clean water than all of the developed countries put together?	Wellhead
Did you know that 66% of the human body is made of up water?	Public Restroom
Did you know that more people have a mobile phone than a toilet?	Public Restroom
Did you know that 1 pound of chocolate requires 3,170 gallons of water?	
Did you know that the number of people in the world that don't have access to clean water is equivalent to 2.5 times the population of the USA?	Fountain
Did you know that approximately 1 in 9 people around the world don't have access to an improved water source?	Wellhead
Did you know that 12,000 liters of water drips from the tap per year?	Public Restroom
Did you know that the three forms of water are solid (ice), liquid (water), gas (steam)?	Restaurant
Did you know that it takes 37 gallons of water to grow and process coffee beans for one cup of coffee?	Coffee Shop
Did you know that one drip every second adds up to 5 gallons per day in a leaky faucet?	Fountain
Did you know that water expands when it freezes?	Market
Did you know that only 1% of the earth's water is available for drinking water?	Fountain
Did you know that by 2025 up to 1.8 billion people will face water scarcity?	Fountain
Did you know that in the water infrastructure in India, up to 40% leaks out?	Fountain
Did you know that only about 50% of India's water resource demand goes to agriculture?	Market
Did you know that 80% of India's water resource demand goes to agriculture?	Market
Did you know that most women in Kenya spend 8 hours per day getting water for the family?	Wellhead
Did you know that between 2000 and 2009, more than 160,000 safe water devices have been installed in Bangladesh?	Wellhead
Did you know that half the world's schools do not have access to clean water, nor adequate sanitation?	School
Did you know that on average, women in Africa and Asia have to walk 3.7 miles to collect water?	Wellhead
Did you know that as little as one dollar can provide clean water for a child in the developing world for an entire year?	ATM

Water Questions/Facts

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fx Questions

	A	B	C	D	E	F
1	Questions	Answer	Did You Know?	Location	Coordinates	
2	What is the total water content of babies versus adults?	75% vs 60%	Did you know that the total water content of babies versus adults is 75% vs 60%?	Hospital	45.440996, 12.343491	
3	What percentage of fresh water is in the ground?	30%	Did you know that 30% of fresh water is in the ground?	Park	45.426295, 12.360205	
4	How many people lack access to an improved water source? 780 million people	780 million people	Did you know that 780 million people lack access to an improved water source?	Fountain		
5	What's the percentage of accessible freshwater found in the world?	Less than 1% of fresh water is accessible	Did you know that less than 1% of freshwater is accessible?	Fountain		
6	How much of our planet is covered in water?	70%	Did you know that 70% of our planet is covered in water?	Canal		
7	What percentage of the human brain is water?	70%	Did you know that 70% of the human brain is water?	Hospital	45.440996, 12.343491	
8	At what temperature does water reach its highest density?	4 degrees Celsius	Did you know that at 4 degrees Celsius water reaches its highest density?	Canal		
9	What is the chemical formula of water?	H2O	Did you know that the chemical formula of water is H2O?	Fountain		
10	How long can the average person live without water?	A week	Did you know that the average person can live up to a week without water?	Fountain		
11	Water is the only liquid whose solid form is less dense than the liquid form.	True	Did you know that water is the only liquid whose solid form is less dense than the liquid form?	Wellhead		
12	Water regulates the Earth's temperature.	True	Did you know that water regulates the Earth's temperature?	Canal		
13	Africa has 34.5 times more people in need of clean water than all of the developed countries put together.	True	Did you know that Africa has 34.5 times more people in need of clean water than all of the developed countries put together?	Wellhead		
14	What percentage of the human body is made of up water?	66%	Did you know that 66% of the human body is made of up water?	Public Restroom		
15	More people have a mobile phone than a toilet.	True	Did you know that more people have a mobile phone than a toilet?	Public Restroom		
16	1 pound of chocolate requires 3,170 gallons of water.	True	Did you know that 1 pound of chocolate requires 3,170 gallons of water?			
17	The number of people in the world that don't have access to clean water is equivalent to 2.5 times the population of the USA.	True	Did you know that the number of people in the world that don't have access to clean water is equivalent to 2.5 times the population of the USA?	Fountain		
18	Approximately 1 in 5 people around the world don't have access to an improved water source.	False				
19	Approximately 1 in 9 people around the world don't have access to an improved water source.	True	Did you know that approximately 1 in 9 people around the world don't have access to an improved water source?	Wellhead		
20	Name 3 things that water can do.	keeping life on earth, generate electricity, putting out fire,...				
21	How much water does a dripping tap waste in a year?	12,000 litres	Did you know that 12,000 liters of water drips from the tap per year?	Public Restroom		
22	What are the three forms of water?	Solid (ice), liquid (water), gas (steam)	Did you know that the three forms of water are solid (ice), liquid (water), gas (steam)?	Restaurant		
23	How many gallons of water does it take to grow and process coffee beans for one cup of coffee?	37 gallons	Did you know that it takes 37 gallons of water to grow and process coffee beans for one cup of coffee?	Coffee Shop		
24	One drip every second adds up to 5 gallons per day in a leaky faucet.	True	Did you know that one drip every second adds up to 5 gallons per day in a leaky faucet?	Fountain		
25	Does water shrink when it freezes?	No, it expands	Did you know that water expands when it freezes?	Market		
26	Only 1% of the earth's water is available for drinking water.	True	Did you know that only 1% of the earth's water is available for drinking water?	Fountain		
27	By 2025 up to 1.8 billion people will face water scarcity.	True	Did you know that by 2025 up to 1.8 billion people will face water scarcity?	Fountain		
28	In India, in the water infrastructure up to 40% leaks out.	True	Did you know that in the water infrastructure in India, up to 40% leaks out?	Fountain		
29	Only about 50% of India's water resource demand goes to agriculture.	False	Did you know that only about 50% of India's water resource demand goes to agriculture?	Market		
30	What percentage of India's water resource demand goes to agriculture?	80%	Did you know that 80% of India's water resource demand goes to agriculture?	Market		
31	How many hours per day do most women in Kenya spend getting water for the family?	8 Hours	Did you know that most women in Kenya spend 8 hours per day getting water for the family?	Wellhead		
32	Between 2000 and 2009, more than 160,000 safe water devices have been installed in Bangladesh.	True	Did you know that between 2000 and 2009, more than 160,000 safe water devices have been installed in Bangladesh?	Wellhead		
33	Half the world's schools do not have access to clean water, nor adequate sanitation.	True	Did you know that half the world's schools do not have access to clean water, nor adequate sanitation?	School		
34	On average, women in Africa and Asia have to walk 3.7 miles to collect water.	True	Did you know that on average, women in Africa and Asia have to walk 3.7 miles to collect water?	Wellhead		
35	As little as one dollar can provide clean water for a child in the developing world for an entire year.	True	Did you know that as little as one dollar can provide clean water for a child in the developing world for an entire year?	ATM		
36	The human body needs at least 1 litre of water every day.	False				
37	How much water should you drink everyday?	At least 2 litres	Did you know that the average human should drink 2 liters of water per day?	Fountain		
38	What temperature does water start boiling?	100 degrees Celsius	Did you know that water starts boiling at 100 degrees Celsius?	Restaurant		
39	How much water does the human body lose per day?	3-4 liters	Did you know that the human body loses 3-4 liters per day?	Public Restroom		
40	Body water content is higher in women than in men.	False	Did you know that body water content is higher in adult men than in adult women?	Hospital	45.440996, 12.343491	
41	How much water can the human body lose during a three-hour flight?	1.5 liters	Did you know that the human body can lose about 1.5 liters of water during a 3-hour flight?			
42	How much water does the average toilet use?	Around 6 liters for a single flush	Did you know that the average toilet uses around 6 liters for a single flush?	Public Restroom		
43	Can you come up with a way to get clean water?	Open				
44	At what temperature does water freeze?	0 degrees Celsius	Did you know that water freezes at 0 degrees Celsius?	Market		
45	Where is most fresh water located?	90% in Antartica	Did you know that 90% of freshwater is located in Antartica?	Market		
46	What can you do to save water?	Open				

Spreadsheet 2: Wellhead Dimensions and Surface Area

Wellhead Dimension and Surface Area

rizzi	Sestiere/Island	Number of Sides	Circular Top	Circular Bottom	Circumference of Base	Rim Width/ Rim Corcumference	Height from Base to Rim
1	San Marco	1	Y	Y	674	674	93
2	San Marco		N	N	NULL	NULL	0
3	San Marco		N	N	NULL	NULL	0
4	San Marco	1	Y	Y	366	366	87
5	San Marco	1	Y	Y	277	277	90
6	San Marco	4	N	Y	254	95	86
7	San Marco	6	N	N	NULL	NULL	0
8	San Marco	4	N	Y	287	108	84
9	San Marco	4	N	N	NULL	NULL	0
10	San Marco	4	N	Y	243	89	79
11	San Marco	1	Y	Y	485	485	88
12	San Marco	1	Y	Y	210	210	69
13	San Marco	4	N	Y	315	126	77
14	San Marco	1	Y	Y	281	281	87
15	San Marco	6	N	Y	250	121	95
16	San Marco	4	N	Y	286	117	73
17	San Marco	NULL	N	N	NULL	NULL	0
18	San Marco	8	N	Y	289	115	89
19	San Marco	1	Y	Y	276	276	70
20	San Marco	1	Y	Y	265	265	76
21	San Marco	4	N	Y	268	105	81
22	San Marco	4	N	Y	233	110	73
23	San Marco	4	N	Y	295	114	83
24	San Marco	4	N	Y	235	96	84
25	San Marco	1	Y	Y	513	513	93
26	San Marco	6	N	N	672	205	88
27	San Marco	4	N	Y	274	97	87
28	San Marco	8	N	N	NULL	NULL	0
29	San Marco	1	Y	Y	484	484	88
30	San Marco	1	Y	Y	604	604	82
31	San Marco	4	N	N	NULL	NULL	0
32	San Marco	4	N	Y	273	111	78
33	San Marco	4	N	Y	297	113	83
34	San Marco	8	N	Y	271	108	82
35	San Marco	1	Y	Y	303	303	87
36	San Marco	8	N	N	325	119	77
37	San Marco	1	Y	Y	639	639	91
38	San Marco	4	N	Y	295	120	88
39	San Marco	8	N	Y	238	88	81
40	San Marco	8	N	Y	257	112	81
41	San Marco	8	N	Y	266	98	89
42	San Marco	4	N	Y	291	105	78
43	San Marco	8	N	Y	237	87	75

1 of 24

Wellhead Dimension and Surface Area

rizzi	Lid Circumference/ Opening Diameter	Platform Height	Platform Sides	Platform Width/ Circum.	Platform Radius	Platform Width	Platform Side 6	Platform Side 8
1	546	32	1	1548	246.37185	NULL	NULL	NULL
2	NULL	NULL		NULL	NULL	NULL	NULL	NULL
3	NULL	NULL		NULL	NULL	NULL	NULL	NULL
4	347	5	1	551	87.694374	NULL	NULL	NULL
5	221	13	8	190	NULL	NULL	NULL	78.707539
6	254	13	8	139	NULL	NULL	NULL	57.580779
7	NULL	NULL	6	NULL	NULL	NULL	NULL	NULL
8	250	4	4	98	NULL	98	NULL	NULL
9	NULL	NULL	4	NULL	NULL	NULL	NULL	NULL
10	237	8	8	128	NULL	NULL	NULL	53.024027
11	449	28	1	1000	159.15494	NULL	NULL	NULL
12	191	10	4	107	NULL	107	NULL	NULL
13	296	11	1	548	87.216909	NULL	NULL	NULL
14	218	10	4	159	NULL	159	NULL	NULL
15	300	22	6	107	NULL	NULL	61.776479	NULL
16	303	0	4	158	NULL	158	NULL	NULL
17	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
18	281	12	4	160	NULL	160	NULL	NULL
19	213	13	4	185	NULL	185	NULL	NULL
20	250	37	8	180	NULL	NULL	NULL	74.565037
21	60	NULL	NULL	NULL	NULL	NULL	NULL	NULL
22	51	NULL	NULL	NULL	NULL	NULL	NULL	NULL
23	290	13	4	128	NULL	128	NULL	NULL
24	239	18	5	141	NULL	NULL	NULL	NULL
25	467	10	1	740	117.77466	NULL	NULL	NULL
26	560	49	6	419	NULL	NULL	241.90976	NULL
27	77	15	4	154	NULL	154	NULL	NULL
28	NULL	NULL	4	NULL	NULL	NULL	NULL	NULL
29	423	31	1	1063	169.1817	NULL	NULL	NULL
30	496	33	1	1072	170.6141	NULL	NULL	NULL
31	NULL	NULL	4	NULL	NULL	NULL	NULL	NULL
32	265	14	4	140	NULL	140	NULL	NULL
33	289	13	4	158	NULL	158	NULL	NULL
34	290	18	8	194	NULL	NULL	NULL	80.36454
35	271	13	4	200	NULL	200	NULL	NULL
36	278	0	4	160	NULL	160	NULL	NULL
37	600	15	1	900	143.23945	NULL	NULL	NULL
38	281	12	4	160	NULL	160	NULL	NULL
39	50	4	4	90	NULL	90	NULL	NULL
40	246	16	8	137	NULL	NULL	NULL	56.752278
41	236	0	1	469	74.643668	NULL	NULL	NULL
42	268	5	8	155	NULL	NULL	NULL	64.208782
43	51	10	8	128	NULL	NULL	NULL	53.024027

Wellhead Dimension and Surface Area

rizzi	Rim Radius	Rim Width	Rim Side 6	Rim Side 8	Area of Top	Base Radius	Base Width	Base Side 6	Base Side 8	Area of Base	Lid Radius
1	107.27	NULL	NULL	NULL	36150.1	107.27	NULL	NULL	NULL	36150	86.8986
2	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
3	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
4	58.2507	NULL	NULL	NULL	10659.9	58.2507	NULL	NULL	NULL	10660	55.22677
5	44.0859	NULL	NULL	NULL	6105.9	44.0859	NULL	NULL	NULL	6105.9	35.17324
6	NULL	95	NULL	NULL	9025	40.4254	NULL	NULL	NULL	5134	40.42536
7	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
8	NULL	108	NULL	NULL	11664	45.6775	NULL	NULL	NULL	6554.7	39.78874
9	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
10	NULL	89	NULL	NULL	7921	38.6747	NULL	NULL	NULL	4699	37.71972
11	77.1901	NULL	NULL	NULL	18718.6	77.1901	NULL	NULL	NULL	18719	71.46057
12	33.4225	NULL	NULL	NULL	3509.37	33.4225	NULL	NULL	NULL	3509.4	30.39859
13	NULL	126	NULL	NULL	15876	50.1338	NULL	NULL	NULL	7896.1	47.10986
14	44.7225	NULL	NULL	NULL	6283.52	44.7225	NULL	NULL	NULL	6283.5	34.69578
15	NULL	NULL	69.859	NULL	12679.5	39.7887	NULL	NULL	NULL	4973.6	47.74648
16	NULL	117	NULL	NULL	13689	45.5183	NULL	NULL	NULL	6509.1	48.22395
17	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
18	NULL	NULL	NULL	47.64	10955.5	45.9958	NULL	NULL	NULL	6646.4	44.72254
19	43.9268	NULL	NULL	NULL	6061.89	43.9268	NULL	NULL	NULL	6061.9	33.9
20	42.1761	NULL	NULL	NULL	5588.33	42.1761	NULL	NULL	NULL	5588.3	39.78874
21	NULL	105	NULL	NULL	11025	42.6535	NULL	NULL	NULL	5715.6	NULL
22	NULL	110	NULL	NULL	12100	37.0831	NULL	NULL	NULL	4320.2	NULL
23	NULL	114	NULL	NULL	12996	46.9507	NULL	NULL	NULL	6925.2	46.15493
24	NULL	96	NULL	NULL	9216	37.4014	NULL	NULL	NULL	4394.7	38.03803
25	81.6465	NULL	NULL	NULL	20942.3	81.6465	NULL	NULL	NULL	20942	74.32536
26	NULL	NULL	118.36	NULL	36394.7	NULL	NULL	118.36	NULL	36395	89.12677
27	NULL	97	NULL	NULL	9409	43.6085	NULL	NULL	NULL	5974.4	NULL
28	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
29	77.031	NULL	NULL	NULL	18641.5	77.031	NULL	NULL	NULL	18642	67.32254
30	96.1296	NULL	NULL	NULL	29031.1	96.1296	NULL	NULL	NULL	29031	78.94085
31	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
32	NULL	111	NULL	NULL	12321	43.4493	NULL	NULL	NULL	5930.8	42.17606
33	NULL	113	NULL	NULL	12769	47.269	NULL	NULL	NULL	7019.4	45.99578
34	NULL	NULL	NULL	44.74	9662.42	43.131	NULL	NULL	NULL	5844.2	46.15493
35	48.2239	NULL	NULL	NULL	7305.93	48.2239	NULL	NULL	NULL	7305.9	43.13099
36	NULL	NULL	NULL	49.3	11730.9	NULL	NULL	NULL	49.296	11731	44.24507
37	101.7	NULL	NULL	NULL	32493.2	101.7	NULL	NULL	NULL	32493	95.49297
38	NULL	120	NULL	NULL	14400	46.9507	NULL	NULL	NULL	6925.2	44.72254
39	NULL	NULL	NULL	36.45	6415.1	37.8789	NULL	NULL	NULL	4507.6	NULL
40	NULL	NULL	NULL	46.4	10391.4	40.9028	NULL	NULL	NULL	5256	39.15212
41	NULL	NULL	NULL	40.6	7955.92	42.3352	NULL	NULL	NULL	5630.6	37.56057
42	NULL	105	NULL	NULL	11025	46.3141	NULL	NULL	NULL	6738.7	42.65352
43	NULL	NULL	NULL	36.04	6270.14	37.7197	NULL	NULL	NULL	4469.8	NULL

Wellhead Dimension and Surface Area

rizzi	Platform Surface Area	Lid Surface area	Area of Opening	Top Surface Area	Outside Surface Area	Total Surface Area	Total Surface Area (with Platform)
1	204077.7	23723.32	NULL	12426.82	62682	75108.818	279186.4959
2	NULL	NULL	NULL	NULL	NULL	NULL	NULL
3	NULL	NULL	NULL	NULL	NULL	NULL	NULL
4	16254.92	9581.844	NULL	1078.036	31842	32920.036	49174.95617
5	31984.81	3886.643	NULL	2219.257	24930	27149.257	59134.06405
6	16859.83	5134.02	NULL	3890.98	32680	36570.98	53430.8146
7	NULL	NULL	NULL	NULL	NULL	NULL	NULL
8	4617.283	4973.592	NULL	6690.408	36288	42978.408	47595.69127
9	NULL	NULL	NULL	NULL	NULL	NULL	NULL
10	12267.02	4469.787	NULL	3451.213	28124	31575.213	43842.23319
11	88858.86	16042.9	NULL	2675.713	42680	45355.713	134214.5737
12	12219.63	2903.066	NULL	606.3008	14490	15096.301	27315.93426
13	22029.36	6972.26	NULL	8903.74	38808	47711.74	69741.09865
14	25357.48	3781.84	NULL	2501.677	24447	26948.677	52306.16024
15	13096.03	7161.972	NULL	5517.505	39819.85	45337.354	58433.38164
16	18454.88	7305.928	NULL	6383.072	34164	40547.072	59001.95305
17	NULL	NULL	NULL	NULL	NULL	NULL	NULL
18	26633.61	6283.517	NULL	4672.03	33918.81	38590.837	65224.44746
19	37783.11	3610.35	NULL	2451.543	19320	21771.543	59554.64969
20	43322.98	4973.592	NULL	614.736	20140	20754.736	64077.71428
21	NULL	NULL	2827.433388	8197.567	34020	34020	34020
22	NULL	NULL	2042.820623	10057.18	32120	32120	32120
23	16114.77	6692.465	NULL	6303.535	37848	44151.535	60266.30518
24	25638.33	4545.545	NULL	4670.455	32256	36926.455	62564.78938
25	30034.3	17354.97	NULL	3587.352	47709	51296.352	81330.65223
26	186767	24955.5	NULL	11439.22	62492.39	73931.616	260698.6542
27	26981.64	NULL	4656.625711	4752.374	33756	38508.374	65490.01604
28	NULL	NULL	NULL	NULL	NULL	NULL	NULL
29	104231.6	14238.72	NULL	4402.783	42592	46994.783	151226.3585
30	97794.02	19577.33	NULL	9453.804	49528	58981.804	156775.8258
31	NULL	NULL	NULL	NULL	NULL	NULL	NULL
32	21509.17	5588.328	NULL	6732.672	34632	41364.672	62873.84268
33	26160.55	6646.39	NULL	6122.61	37516	43638.61	69799.16081
34	36905.79	6692.465	NULL	2969.955	29348.8	32318.753	69224.53857
35	43094.07	5844.249	NULL	1461.679	26361	27822.679	70916.75091
36	13869.07	6150.065	NULL	5580.861	30366.2	35947.058	49816.13187
37	45464.6	28647.89	NULL	3845.263	58149	61994.263	107458.8622
38	26354.77	6283.517	NULL	8116.483	42240	50356.483	76711.25381
39	5032.414	NULL	1963.495408	4451.609	23622.2	28073.813	33106.22666
40	17556.46	4815.71	NULL	5575.699	30064.62	35640.322	53196.77991
41	11873.36	4432.147	NULL	3523.776	28904.72	32428.498	44301.85478
42	15731.88	5715.572	NULL	5309.428	32760	38069.428	53801.3114
43	13344.59	NULL	2042.820623	4227.314	21623.86	25851.175	39195.76304

rizzi	Sestiere/Island	Number of Sides	Circular Top	Circular Bottom	Circumference of Base	Rim Width/ Rim Corcumference	Height from Base to Rim
44	San Marco	4	N	Y	266	105	89
45	San Marco	4	N	Y	236	86	82
46	San Marco	8	N	Y	218	86	63
47	San Marco	8	N	Y	294	102	85
48	San Marco	4	N	N	NULL	NULL	0
49	Castello	4	N	Y	296	132	83
50	Castello	4	N	Y	310	102	75
51	Castello	4	N	N	330	122	97
52	Castello	6	N	N	689	210	84
53	Castello	8	N	Y	281	102	81
54	Castello	4	N	N	321	123	92
55	Castello	8	N	Y	257	92	80
56	Castello	4	N	Y	264	115	79
57	Castello	4	N	Y	283	118	80
58	Castello	4	N	Y	372	162	88
59	Castello	4	N	Y	264	119	80
60	Castello	4	N	N	251	90	72
61	Castello	1	Y	Y	594	594	80
62	Castello	8	N	Y	283	105	84
63	Castello	4	N	Y	264	101	88
64	Castello	4	N	Y	301	105	80
65	Castello	4	N	N	247	95	80
66	Castello	6	N	N	519	186	86
67	Castello	4	N	Y	306	121	80
68	Castello	4	N	N	307	136	86
69	Castello	4	N	Y	314	136	84
70	Castello	4	N	Y	272	110	74
71	Castello	4	N	Y	292	104	84
72	Castello	4	N	Y	340	142	94
73	Castello	4	N	Y	331	125	88
74	Castello	4	N	N	328	94	79
75	Castello	8	N	N	497	188	90
76	Castello	8	N	N	617	180	82
77	Castello	8	N	Y	450	175	91
78	Castello	4	N	Y	294	103	84
79	Castello	8	N	Y	287	113	93
80	Castello	4	N	Y	285	115	93
81	Castello	4	N	Y	376	148	81
82	Castello	6	N	N	NULL	NULL	0
83	Castello	4	N	Y	266	98	90
84	Castello	4	N	N	352	91	76
85	Castello	4	N	Y	221	117	75
86	Castello	4	N	Y	280	130	81

Wellhead Dimension and Surface Area

rizzi	Lid Circumference/ Opening Diameter	Platform Height	Platform Sides	Platform Width/ Circum.	Platform Radius	Platform Width	Platform Side 6	Platform Side 8
44	257	7	4	149	NULL	149	NULL	NULL
45	180	5	4	97	NULL	97	NULL	NULL
46	219	18	4	51	NULL	51	NULL	NULL
47	233	15	8	188	NULL	NULL	NULL	77.879039
48	NULL	NULL	4	NULL	NULL	NULL	NULL	NULL
49	328	2	8	150	NULL	NULL	NULL	62.137531
50	0	NULL	NULL	NULL	NULL	NULL	NULL	NULL
51	90	NULL	NULL	NULL	NULL	NULL	NULL	NULL
52	574	5	6	263	NULL	NULL	151.84312	NULL
53	0	16	4	145	NULL	145	NULL	NULL
54	285	NULL	NULL	NULL	NULL	NULL	NULL	NULL
55	206	17	1	482	76.712683	NULL	NULL	NULL
56	289	4	8	149	NULL	NULL	NULL	61.723281
57	279	9	4	178	NULL	178	NULL	NULL
58	367	7	4	219	NULL	219	NULL	NULL
59	300	13	4	168	NULL	168	NULL	NULL
60	233	4	4	99	NULL	99	NULL	NULL
61	489	16	1	755	120.16198	NULL	NULL	NULL
62	271	10	1	577	91.832402	NULL	NULL	NULL
63	0	11	8	150	NULL	NULL	NULL	62.137531
64	288	15	4	133	NULL	133	NULL	NULL
65	234	11	4	134	NULL	134	NULL	NULL
66	489	19	6	270	NULL	NULL	155.88457	NULL
67	293	17	4	178	NULL	178	NULL	NULL
68	349	15	4	185	NULL	185	NULL	NULL
69	344	21	4	185	NULL	185	NULL	NULL
70	243	20	4	138	NULL	138	NULL	NULL
71	70	5	1	346	55.06761	NULL	NULL	NULL
72	356	12	4	155	NULL	155	NULL	NULL
73	295	11	4	138	NULL	138	NULL	NULL
74	211	5	4	118	NULL	118	NULL	NULL
75	451	30	8	292	NULL	NULL	NULL	120.96106
76	513	30	8	1138	NULL	NULL	NULL	471.41674
77	390	18	8	220	NULL	NULL	NULL	91.135046
78	210	19	4	152	NULL	152	NULL	NULL
79	230	0	8	147	NULL	NULL	NULL	60.89478
80	274	6	4	141	NULL	141	NULL	NULL
81	326	32	8	278	NULL	NULL	NULL	115.16156
82	NULL	NULL	4	NULL	NULL	NULL	NULL	NULL
83	239	17	8	145	NULL	NULL	NULL	60.06628
84	61	16	4	143	NULL	143	NULL	NULL
85	224	1	4	107	NULL	107	NULL	NULL
86	104	5	4	149	NULL	149	NULL	NULL

Wellhead Dimension and Surface Area

rizzi	Rim Radius	Rim Width	Rim Side 6	Rim Side 8	Area of Top	Base Radius	Base Width	Base Side 6	Base Side 8	Area of Base	Lid Radius
44	NULL	105	NULL	NULL	11025	42.3352	NULL	NULL	NULL	5630.6	40.90282
45	NULL	86	NULL	NULL	7396	37.5606	NULL	NULL	NULL	4432.1	28.64789
46	NULL	NULL	NULL	35.63	6126.82	34.6958	NULL	NULL	NULL	3781.8	34.85493
47	NULL	NULL	NULL	42.25	8618.64	46.7916	NULL	NULL	NULL	6878.4	37.0831
48	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
49	NULL	132	NULL	NULL	17424	47.1099	NULL	NULL	NULL	6972.3	52.20282
50	NULL	102	NULL	NULL	10404	49.338	NULL	NULL	NULL	7647.4	0
51	NULL	122	NULL	NULL	14884	NULL	122	NULL	NULL	14884	NULL
52	NULL	NULL	121.24	NULL	38191.7	NULL	NULL	121.24	NULL	38192	91.35494
53	NULL	NULL	NULL	42.25	8618.64	44.7225	NULL	NULL	NULL	6283.5	0
54	NULL	123	NULL	NULL	15129	NULL	123	NULL	NULL	15129	45.35916
55	NULL	NULL	NULL	38.11	7011.55	40.9028	NULL	NULL	NULL	5256	32.78592
56	NULL	115	NULL	NULL	13225	42.0169	NULL	NULL	NULL	5546.2	45.99578
57	NULL	118	NULL	NULL	13924	45.0408	NULL	NULL	NULL	6373.3	44.40423
58	NULL	162	NULL	NULL	26244	59.2056	NULL	NULL	NULL	11012	58.40986
59	NULL	119	NULL	NULL	14161	42.0169	NULL	NULL	NULL	5546.2	47.74648
60	NULL	90	NULL	NULL	8100	NULL	90	NULL	NULL	8100	37.0831
61	94.538	NULL	NULL	NULL	28077.8	94.538	NULL	NULL	NULL	28078	77.82677
62	NULL	NULL	NULL	43.5	9133.07	45.0408	NULL	NULL	NULL	6373.3	43.13099
63	NULL	101	NULL	NULL	10201	42.0169	NULL	NULL	NULL	5546.2	NULL
64	NULL	105	NULL	NULL	11025	47.9056	NULL	NULL	NULL	7209.8	45.83662
65	NULL	95	NULL	NULL	9025	NULL	95	NULL	NULL	9025	37.24226
66	NULL	NULL	107.39	NULL	29961	NULL	NULL	107.39	NULL	29961	77.82677
67	NULL	121	NULL	NULL	14641	48.7014	NULL	NULL	NULL	7451.3	46.6324
68	NULL	136	NULL	NULL	18496	NULL	136	NULL	NULL	18496	55.54508
69	NULL	136	NULL	NULL	18496	49.9747	NULL	NULL	NULL	7846	54.7493
70	NULL	110	NULL	NULL	12100	43.2901	NULL	NULL	NULL	5887.5	38.67465
71	NULL	104	NULL	NULL	10816	46.4732	NULL	NULL	NULL	6785.1	NULL
72	NULL	142	NULL	NULL	20164	54.1127	NULL	NULL	NULL	9199.2	56.65916
73	NULL	125	NULL	NULL	15625	52.6803	NULL	NULL	NULL	8718.6	46.95071
74	NULL	94	NULL	NULL	8836	NULL	94	NULL	NULL	8836	33.58169
75	NULL	NULL	NULL	77.88	29278.9	NULL	NULL	NULL	77.879	29279	71.77888
76	NULL	NULL	NULL	74.57	26840.1	NULL	NULL	NULL	74.565	26840	81.64649
77	NULL	NULL	NULL	72.49	25369.7	71.6197	NULL	NULL	NULL	16114	62.07043
78	NULL	103	NULL	NULL	10609	46.7916	NULL	NULL	NULL	6878.4	33.42254
79	NULL	NULL	NULL	46.81	10577.8	45.6775	NULL	NULL	NULL	6554.7	36.60564
80	NULL	115	NULL	NULL	13225	45.3592	NULL	NULL	NULL	6463.7	43.60845
81	NULL	148	NULL	NULL	21904	59.8423	NULL	NULL	NULL	11250	51.88451
82	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
83	NULL	98	NULL	NULL	9604	42.3352	NULL	NULL	NULL	5630.6	38.03803
84	NULL	91	NULL	NULL	8281	NULL	91	NULL	NULL	8281	NULL
85	NULL	117	NULL	NULL	13689	35.1732	NULL	NULL	NULL	3886.6	35.65071
86	NULL	130	NULL	NULL	16900	44.5634	NULL	NULL	NULL	6238.9	NULL

Wellhead Dimension and Surface Area

rizzi	Platform Surface Area	Lid Surface area	Area of Opening	Top Surface Area	Outside Surface Area	Total Surface Area	Total Surface Area (with Platform)
44	20742.42	5256.012	NULL	5768.988	37380	43148.988	63891.40401
45	6916.853	2578.31	NULL	4817.69	28208	33025.69	39942.54307
46	2491.16	3816.615	NULL	2310.207	17955.26	20265.468	22756.62859
47	31745.98	4320.181	NULL	4298.459	28732.39	33030.853	64776.8346
48	NULL	NULL	NULL	NULL	NULL	NULL	NULL
49	12660.87	8561.263	NULL	8862.737	43824	52686.737	65347.60528
50	NULL	0	NULL	10404	30600	41004	41004
51	NULL	NULL	6361.725124	8522.275	47336	55858.275	55858.27488
52	26265.68	26218.87	NULL	11972.85	61106.75	73079.606	99345.29025
53	24021.48	0	NULL	8618.64	27380.28	35998.922	60020.40491
54	NULL	6463.68	NULL	8665.32	45264	53929.32	53929.31987
55	21425.74	3376.95	NULL	3634.601	24391.05	28025.653	49451.39692
56	14820.15	6646.39	NULL	6578.61	36340	42918.61	57738.76013
57	31718.72	6194.39	NULL	7729.61	37760	45489.61	77208.32992
58	43080.75	10718.21	NULL	15525.79	57024	72549.79	115630.5411
59	31413.77	7161.972	NULL	6999.028	38080	45079.028	76492.7961
60	3285	4320.181	NULL	3779.819	25920	29699.819	32984.81865
61	29363.35	19028.64	NULL	9049.152	47520	56569.152	85932.50364
62	25890.37	5844.249	NULL	3288.825	29229.49	32518.32	58408.68778
63	18560.8	NULL	0	10201	35552	45753	64313.79851
64	18459.2	6600.474	NULL	4424.526	33600	38024.526	56483.7277
65	14827	4357.344	NULL	4667.656	30400	35067.656	49894.65597
66	50943.08	19028.64	NULL	10932.37	55411.77	66344.14	117287.2181
67	36336.68	6831.646	NULL	7809.354	38720	46529.354	82866.03752
68	26829	9692.616	NULL	8803.384	46784	55587.384	82416.38439
69	41918.98	9416.88	NULL	9079.12	45696	54775.12	96694.09994
70	24196.54	4698.97	NULL	7401.03	32560	39961.03	64157.57023
71	4471.603	NULL	3848.451001	6967.549	34944	41911.549	46383.15205
72	22265.84	10085.33	NULL	10078.67	53392	63470.67	85736.51386
73	16397.41	6925.229	NULL	8699.771	44000	52699.771	69097.18318
74	7448	3542.869	NULL	5293.131	29704	34997.131	42445.13139
75	70384.22	16186.14	NULL	13092.72	56072.91	69165.626	139549.8471
76	1159110	20942.32	NULL	5897.732	48914.66	54812.396	1213922.619
77	37103.41	12103.73	NULL	13265.92	52775.48	66041.394	103144.806
78	27777.64	3509.366	NULL	7099.634	34608	41707.634	69485.27517
79	11346.11	4209.648	NULL	6368.15	34826.84	41194.993	52541.10243
80	16801.32	5974.358	NULL	7250.642	42780	50030.642	66831.96162
81	82252.83	8457.175	NULL	13446.82	47952	61398.825	143651.6544
82	NULL	NULL	NULL	NULL	NULL	NULL	NULL
83	19955.47	4545.545	NULL	5058.455	35280	40338.455	60293.92776
84	21320	NULL	2922.466566	5358.533	27664	33022.533	54342.53343
85	7990.357	3992.879	NULL	9696.121	35100	44796.121	52786.4775
86	18942.13	NULL	8494.866535	8405.133	42120	50525.133	69467.2597

rizzi	Sestiere/Island	Number of Sides	Circular Top	Circular Bottom	Circumference of Base	Rim Width/ Rim Corcumference	Height from Base to Rim
87	Castello	4	N	Y	356	131	98
88	Castello	4	N	Y	329	125	94
89	Castello	4	N	Y	267	4	74
90	Castello	1	Y	Y	559	559	84
91	Castello	1	Y	Y	847	847	87
92	Castello	4	N	Y	263	263	87
93	Castello	4	N	Y	281	160	88
94	Castello	1	Y	Y	436	436	84
95	Castello	6	N	N	600	210	83
96	Castello	8	N	Y	321	97	93
97	Castello	4	N	Y	295	115	94
98	Castello	4	N	N	NULL	NULL	0
99	Castello	4	N	Y	302	118	92
100	Castello	4	N	N	300	105	81
101	Castello	4	N	Y	305	88	87
102	Castello	4	N	Y	211	139	67
103	Castello	8	N	N	389	143	86
104	Castello		N	N	NULL	NULL	0
105	Castello	8	N	N	445	266	94
106	Castello	4	N	N	328	139	85
107	Cannaregio	4	N	Y	354	195	88
108	Cannaregio	1	Y	Y	583	583	85
109	Cannaregio	1	Y	Y	296	296	85
110	Cannaregio	4	N	Y	315	289	84
111	Cannaregio	8	N	Y	324	141	90
112	Cannaregio	1	Y	Y	269	269	92
113	Cannaregio	1	Y	Y	293	293	85
114	Cannaregio	1	Y	Y	544	544	86
115	Cannaregio	6	N	N	481	186	87
116	Cannaregio	1	Y	Y	538	538	86
117	Cannaregio	8	N	Y	344	186	83
118	Cannaregio	4	N	Y	234	135	79
119	Cannaregio	1	Y	Y	420	420	82
120	Cannaregio	4	N	Y	339	106	90
121	Cannaregio	8	N	Y	275	126	73
122	Cannaregio	4	N	Y	284	146	87
123	Cannaregio	4	N	Y	386	139	93
124	Cannaregio	4	N	Y	361	164	97
125	Cannaregio	1	Y	Y	452	452	86
126	Cannaregio	4	N	Y	297	118	82
127	Cannaregio	4	N	Y	332	130	84
128	Cannaregio	4	N	Y	364	125	83
129	Cannaregio	4	N	Y	329	180	84

Wellhead Dimension and Surface Area

rizzi	Lid Circumference/ Opening Diameter	Platform Height	Platform Sides	Platform Width/ Circum.	Platform Radius	Platform Width	Platform Side 6	Platform Side 8
87	346	5	4	173	NULL	173	NULL	NULL
88	325	3	4	163	NULL	163	NULL	NULL
89	210	25	4	152	NULL	152	NULL	NULL
90	526	14	1	784	124.77748	NULL	NULL	NULL
91	790	2	1	1238	197.03382	NULL	NULL	NULL
92	260	13	4	142	NULL	142	NULL	NULL
93	140	5	1	396	63.025357	NULL	NULL	NULL
94	398	3	1	679	108.06621	NULL	NULL	NULL
95	477	21	6	235	NULL	NULL	135.67731	NULL
96	295	14	8	174	NULL	NULL	NULL	72.079536
97	242	6	4	159	NULL	159	NULL	NULL
98	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
99	259	11	4	128	NULL	128	NULL	NULL
100	296	NULL	NULL	NULL	NULL	NULL	NULL	NULL
101	252	14	4	132	NULL	132	NULL	NULL
102	113	3	8	132	NULL	NULL	NULL	54.681027
103	349	NULL	NULL	NULL	NULL	NULL	NULL	NULL
104	NULL	NULL		NULL	NULL	NULL	NULL	NULL
105	441	20	1	817	130.02959	NULL	NULL	NULL
106	270	7	4	173	NULL	173	NULL	NULL
107	318	5	4	166	NULL	166	NULL	NULL
108	554	19	1	824	131.14367	NULL	NULL	NULL
109	233	13	4	185	NULL	185	NULL	NULL
110	280	9	4	172	NULL	172	NULL	NULL
111	340	9	1	586	93.264797	NULL	NULL	NULL
112	210	8	1	587	93.423952	NULL	NULL	NULL
113	277	9	1	524	83.39719	NULL	NULL	NULL
114	503	9	1	661	105.20142	NULL	NULL	NULL
115	401	15	6	207	NULL	NULL	119.51151	NULL
116	454	31	1	1055	167.90846	NULL	NULL	NULL
117	395	12	8	205	NULL	NULL	NULL	84.921292
118	180	12	4	114	NULL	114	NULL	NULL
119	331	1	1	594	94.538036	NULL	NULL	NULL
120	267	21	4	168	NULL	168	NULL	NULL
121	245	NULL	NULL	NULL	NULL	NULL	NULL	NULL
122	270	NULL	NULL	NULL	NULL	NULL	NULL	NULL
123	411	15	4	201	NULL	201	NULL	NULL
124	332	7	4	193	NULL	193	NULL	NULL
125	408	20	1	691	109.97607	NULL	NULL	NULL
126	300	19	4	145	NULL	145	NULL	NULL
127	344	8	4	170	NULL	170	NULL	NULL
128	306	14	4	190	NULL	190	NULL	NULL
129	307	10	8	171	NULL	NULL	NULL	70.836785

Wellhead Dimension and Surface Area

rizzi	Rim Radius	Rim Width	Rim Side 6	Rim Side 8	Area of Top	Base Radius	Base Width	Base Side 6	Base Side 8	Area of Base	Lid Radius
87	NULL	131	NULL	NULL	17161	56.6592	NULL	NULL	NULL	10085	55.06761
88	NULL	125	NULL	NULL	15625	52.362	NULL	NULL	NULL	8613.5	51.72536
89	NULL	4	NULL	NULL	16	42.4944	NULL	NULL	NULL	5673	33.42254
90	88.9676	NULL	NULL	NULL	24866.4	88.9676	NULL	NULL	NULL	24866	83.7155
91	134.804	NULL	NULL	NULL	57089.6	134.804	NULL	NULL	NULL	57090	125.7324
92	NULL	263	NULL	NULL	69169	41.8578	NULL	NULL	NULL	5504.3	41.38029
93	NULL	160	NULL	NULL	25600	44.7225	NULL	NULL	NULL	6283.5	NULL
94	69.3916	NULL	NULL	NULL	15127.4	69.3916	NULL	NULL	NULL	15127	63.34367
95	NULL	NULL	121.24	NULL	38191.7	NULL	NULL	121.24	NULL	38192	75.91691
96	NULL	NULL	NULL	40.18	7794.39	51.0887	NULL	NULL	NULL	8199.7	46.95071
97	NULL	115	NULL	NULL	13225	46.9507	NULL	NULL	NULL	6925.2	38.5155
98	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
99	NULL	118	NULL	NULL	13924	48.0648	NULL	NULL	NULL	7257.8	41.22113
100	NULL	105	NULL	NULL	11025	NULL	105	NULL	NULL	11025	47.10986
101	NULL	88	NULL	NULL	7744	48.5423	NULL	NULL	NULL	7402.7	40.10705
102	NULL	139	NULL	NULL	19321	33.5817	NULL	NULL	NULL	3542.9	NULL
103	NULL	NULL	NULL	59.24	16939.9	NULL	NULL	NULL	59.238	16940	55.54508
104	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
105	NULL	NULL	NULL	110.2	58614	NULL	NULL	NULL	110.19	58614	70.18733
106	NULL	139	NULL	NULL	19321	NULL	139	NULL	NULL	19321	42.97183
107	NULL	195	NULL	NULL	38025	56.3408	NULL	NULL	NULL	9972.3	50.61127
108	92.7873	NULL	NULL	NULL	27047.5	92.7873	NULL	NULL	NULL	27048	88.17184
109	47.1099	NULL	NULL	NULL	6972.26	47.1099	NULL	NULL	NULL	6972.3	37.0831
110	NULL	289	NULL	NULL	83521	50.1338	NULL	NULL	NULL	7896.1	44.56338
111	NULL	NULL	NULL	58.41	16469.4	51.5662	NULL	NULL	NULL	8353.7	54.11268
112	42.8127	NULL	NULL	NULL	5758.31	42.8127	NULL	NULL	NULL	5758.3	33.42254
113	46.6324	NULL	NULL	NULL	6831.65	46.6324	NULL	NULL	NULL	6831.6	44.08592
114	86.5803	NULL	NULL	NULL	23549.8	86.5803	NULL	NULL	NULL	23550	80.05494
115	NULL	NULL	107.39	NULL	29961	NULL	NULL	107.39	NULL	29961	63.82113
116	85.6254	NULL	NULL	NULL	23033.2	85.6254	NULL	NULL	NULL	23033	72.25634
117	NULL	NULL	NULL	77.05	28659.2	54.7493	NULL	NULL	NULL	9416.9	62.8662
118	NULL	135	NULL	NULL	18225	37.2423	NULL	NULL	NULL	4357.3	28.64789
119	66.8451	NULL	NULL	NULL	14037.5	66.8451	NULL	NULL	NULL	14037	52.68029
120	NULL	106	NULL	NULL	11236	53.9535	NULL	NULL	NULL	9145.1	42.49437
121	NULL	NULL	NULL	52.2	13151.6	43.7676	NULL	NULL	NULL	6018	38.99296
122	NULL	146	NULL	NULL	21316	45.2	NULL	NULL	NULL	6418.4	42.97183
123	NULL	139	NULL	NULL	19321	61.4338	NULL	NULL	NULL	11857	65.41268
124	NULL	164	NULL	NULL	26896	57.4549	NULL	NULL	NULL	10371	52.83944
125	71.938	NULL	NULL	NULL	16258	71.938	NULL	NULL	NULL	16258	64.93522
126	NULL	118	NULL	NULL	13924	47.269	NULL	NULL	NULL	7019.4	47.74648
127	NULL	130	NULL	NULL	16900	52.8394	NULL	NULL	NULL	8771.3	54.7493
128	NULL	125	NULL	NULL	15625	57.9324	NULL	NULL	NULL	10544	48.70141
129	NULL	180	NULL	NULL	32400	52.362	NULL	NULL	NULL	8613.5	48.86057

Wellhead Dimension and Surface Area

rizzi	Platform Surface Area	Lid Surface area	Area of Opening	Top Surface Area	Outside Surface Area	Total Surface Area	Total Surface Area (with Platform)
87	23303.67	9526.697	NULL	7634.303	51352	58986.303	82289.97298
88	19911.45	8405.37	NULL	7219.63	47000	54219.63	74131.08447
89	32631	3509.366	NULL	-3493.366	1184	-2309.3665	30321.63514
90	35022.32	22017.18	NULL	2849.271	46956	49805.271	84827.59383
91	67350.34	49664.3	NULL	7425.294	73689	81114.294	148464.6343
92	22043.71	5379.437	NULL	63789.56	91524	155313.56	177357.2688
93	8175.504	NULL	15393.804	10206.2	56320	66526.196	74701.70004
94	23598.12	12605.39	NULL	2521.969	36624	39145.969	62744.08726
95	26729.87	18106.18	NULL	20085.54	60379.29	80464.829	107194.703
96	24953.71	6925.229	NULL	869.1557	29895.61	30764.765	55718.47093
97	22171.77	4660.375	NULL	8564.625	43240	51804.625	73976.3955
98	NULL	NULL	NULL	NULL	NULL	NULL	NULL
99	14758.22	5338.136	NULL	8585.864	43424	52009.864	66768.07992
100	NULL	6972.26	NULL	4052.74	34020	38072.74	38072.74025
101	17413.31	5053.488	NULL	2690.512	30624	33314.512	50727.81796
102	12203.46	NULL	10028.74915	9292.251	37252	46544.251	58747.71215
103	NULL	9692.616	NULL	7247.27	40755.59	48002.862	48002.86223
104	NULL	NULL	NULL	NULL	NULL	NULL	NULL
105	10843.05	15476.31	NULL	43137.74	82863.3	126001.03	136844.0781
106	15452	5801.198	NULL	13519.8	47260	60779.802	76231.80232
107	20903.67	8047.192	NULL	29977.81	68640	98617.808	119521.4773
108	42639.69	24423.6	NULL	2623.908	49555	52178.908	94818.59406
109	36872.74	4320.181	NULL	2652.078	25160	27812.078	64684.81865
110	27879.93	6238.874	NULL	77282.13	97104	174386.13	202266.0516
111	24246.86	9199.156	NULL	7270.2	42054.68	49324.881	73571.74219
112	26357.62	3509.366	NULL	2248.939	24748	26996.939	53354.5633
113	19734.42	6105.9	NULL	725.7465	24905	25630.747	45365.16401
114	17168.23	20133.82	NULL	3416.022	46784	50200.022	67368.25195
115	17903.34	12796.14	NULL	17164.88	56056.09	73220.97	91124.31338
116	98243.49	16402.19	NULL	6631.032	46268	52899.032	151142.5251
117	33548.94	12416.07	NULL	16243.14	51161.56	67404.697	100953.6356
118	14110.66	2578.31	NULL	15646.69	42660	58306.69	72417.34589
119	14634.33	8718.587	NULL	5318.879	34440	39758.879	54393.20939
120	33190.88	5672.998	NULL	5563.002	38160	43723.002	76913.87902
121	NULL	4776.638	NULL	8374.989	30482.19	38857.177	38857.17657
122	NULL	5801.198	NULL	15514.8	50808	66322.802	66322.80232
123	40604.28	13442.31	NULL	5878.694	51708	57586.694	98190.96898
124	32282.38	8771.347	NULL	18124.65	63632	81756.653	114039.0371
125	35558.73	13246.78	NULL	3011.212	38872	41883.212	77441.94647
126	25025.55	7161.972	NULL	6762.028	38704	45466.028	70491.57837
127	25568.65	9416.88	NULL	7483.12	43680	51163.12	76731.7731
128	36196.3	7451.316	NULL	8173.684	41500	49673.684	85869.9872
129	21276.55	7500.097	NULL	24899.9	60480	85379.903	106656.4505

Wellhead Dimension and Surface Area

rizzi	Sestiere/Island	Number of Sides	Circular Top	Circular Bottom	Circumference of Base	Rim Width/ Rim Corcumference	Height from Base to Rim
130	Cannaregio	6	N	N	533	181	89
131	Cannaregio	4	N	Y	293	117	88
132	Cannaregio	8	Y	Y	273	100	82
133	Cannaregio	1	Y	Y	256	256	74
134	Cannaregio	1	Y	Y	761	761	86
135	Cannaregio	4	N	Y	274	207	92
136	Cannaregio	1	Y	Y	615	615	86
137	Cannaregio	4	N	N	289	125	82
138	Cannaregio	1	N	N	NULL	NULL	0
139	Cannaregio	4	N	Y	320	136	74
140	Cannaregio	8	N	Y	326	247	87
141	Cannaregio	6	N	N	708	208	88
142	Cannaregio	4	N	Y	306	89	81
143	Cannaregio	6	N	Y	227	100	74
144	Cannaregio	4	N	Y	244	100	81
145	Cannaregio	1	Y	Y	252	252	85
146	Cannaregio	8	N	N	295	139	87
147	Cannaregio	4	N	N	NULL	NULL	0
148	Cannaregio	4	N	N	344	112	77
149	Cannaregio	4	N	Y	331	95	102
150	Cannaregio	4	N	Y	251	120	87
151	Cannaregio	4	N	Y	297	146	79
152	Cannaregio	4	N	Y	363	147	91
153	Cannaregio	4	N	Y	248	133	78
154	Cannaregio	1	Y	Y	397	397	84
155	Cannaregio	8	N	Y	325	134	76
156	Cannaregio	4	N	N	NULL	NULL	0
157	San Polo	8	N	N	400	198	84
158	San Polo	8	N	N	613	170	88
159	San Polo	NULL	N	N	NULL	NULL	0
160	San Polo	4	N	Y	354	178	88
161	San Polo	1	Y	Y	517	517	83
162	San Polo	4	N	Y	286	99	82
163	San Polo	4	N	Y	270	128	83
164	San Polo	4	N	Y	296	164	96
165	San Polo	1	Y	Y	453	453	85
166	San Polo	4	N	Y	305	343	84
167	San Polo	8	N	N	1013	1013	90
168	San Polo	8	N	Y	262	110	63
169	San Polo	1	Y	Y	299	299	83
170	San Polo	1	Y	Y	300	300	94
171	San Polo	1	Y	Y	701	701	91
172	San Polo	1	Y	Y	691	691	93

Wellhead Dimension and Surface Area

rizzi	Lid Circumference/ Opening Diameter	Platform Height	Platform Sides	Platform Width/ Circum.	Platform Radius	Platform Width	Platform Side 6	Platform Side 8
130	464	9	6	251	NULL	NULL	144.91492	NULL
131	245	19	4	155	NULL	155	NULL	NULL
132	265	17	8	164	NULL	NULL	NULL	67.937034
133	226	16	8	151	NULL	NULL	NULL	62.551781
134	628	34	1	1200	190.98593	NULL	NULL	NULL
135	226	11	4	153	NULL	153	NULL	NULL
136	540	38	1	1145	182.23241	NULL	NULL	NULL
137	312	NULL	NULL	NULL	NULL	NULL	NULL	NULL
138	NULL	NULL	1	NULL	NULL	NULL	NULL	NULL
139	280	NULL	NULL	NULL	NULL	NULL	NULL	NULL
140	336	7	8	184	NULL	NULL	NULL	76.222038
141	624	50	6	1430	NULL	NULL	825.61088	NULL
142	297	23	4	159	NULL	159	NULL	NULL
143	234	22	1	426	67.800006	NULL	NULL	NULL
144	241	14	4	127	NULL	127	NULL	NULL
145	226	15	8	143	NULL	NULL	NULL	59.23778
146	329	22	8	161	NULL	NULL	NULL	66.694283
147	NULL	NULL	4	NULL	NULL	NULL	NULL	NULL
148	225	20	4	131	NULL	131	NULL	NULL
149	271	14	4	168	NULL	168	NULL	NULL
150	223	17	4	126	NULL	126	NULL	NULL
151	299	0	4	140	NULL	140	NULL	NULL
152	358	33	4	236	NULL	236	NULL	NULL
153	210	11	4	116	NULL	116	NULL	NULL
154	329	12	8	194	NULL	NULL	NULL	80.36454
155	333	13	4	166	NULL	166	NULL	NULL
156	NULL	NULL	4	NULL	NULL	NULL	NULL	NULL
157	342	3	8	195	NULL	NULL	NULL	80.77879
158	443	7	1	834	132.73522	NULL	NULL	NULL
159	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
160	357	5	4	181	NULL	181	NULL	NULL
161	445	21	1	996	158.51832	NULL	NULL	NULL
162	286	13	4	151	NULL	151	NULL	NULL
163	216	17	4	149	NULL	149	NULL	NULL
164	311	1	4	180	NULL	180	NULL	NULL
165	393	11	1	690	109.81691	NULL	NULL	NULL
166	241	10	4	159	NULL	159	NULL	NULL
167	906	48	8	1766	NULL	NULL	NULL	731.56587
168	245	NULL	NULL	NULL	NULL	NULL	NULL	NULL
169	252	12	1	487	77.508457	NULL	NULL	NULL
170	281	24	1	719	114.4324	NULL	NULL	NULL
171	644	33	1	1184	188.43945	NULL	NULL	NULL
172	642	34	1	1308	208.17467	NULL	NULL	NULL

rizzi	Rim Radius	Rim Width	Rim Side 6	Rim Side 8	Area of Top	Base Radius	Base Width	Base Side 6	Base Side 8	Area of Base	Lid Radius
130	NULL	NULL	104.5	NULL	28371.9	NULL	NULL	104.5	NULL	28372	73.84789
131	NULL	117	NULL	NULL	13689	46.6324	NULL	NULL	NULL	6831.6	38.99296
132	NULL	NULL	NULL	41.43	8283.97	43.4493	NULL	NULL	NULL	5930.8	42.17606
133	40.7437	NULL	NULL	NULL	5215.19	40.7437	NULL	NULL	NULL	5215.2	35.96902
134	121.117	NULL	NULL	NULL	46085	121.117	NULL	NULL	NULL	46085	99.9493
135	NULL	207	NULL	NULL	42849	43.6085	NULL	NULL	NULL	5974.4	35.96902
136	97.8803	NULL	NULL	NULL	30098.2	97.8803	NULL	NULL	NULL	30098	85.94367
137	NULL	125	NULL	NULL	15625	NULL	125	NULL	NULL	15625	49.65634
138	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
139	NULL	136	NULL	NULL	18496	50.9296	NULL	NULL	NULL	8148.7	44.56338
140	NULL	NULL	NULL	102.3	50539.7	51.8845	NULL	NULL	NULL	8457.2	53.47606
141	NULL	NULL	120.09	NULL	37467.7	NULL	NULL	120.09	NULL	37468	99.31268
142	NULL	89	NULL	NULL	7921	48.7014	NULL	NULL	NULL	7451.3	47.26902
143	NULL	NULL	57.735	NULL	8660.25	36.1282	NULL	NULL	NULL	4100.5	37.24226
144	NULL	100	NULL	NULL	10000	38.8338	NULL	NULL	NULL	4737.7	38.35634
145	40.107	NULL	NULL	NULL	5053.49	40.107	NULL	NULL	NULL	5053.5	35.96902
146	NULL	NULL	NULL	57.58	16005.5	NULL	NULL	NULL	57.581	16005	52.36198
147	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
148	NULL	112	NULL	NULL	12544	NULL	112	NULL	NULL	12544	35.80986
149	NULL	95	NULL	NULL	9025	52.6803	NULL	NULL	NULL	8718.6	43.13099
150	NULL	120	NULL	NULL	14400	39.9479	NULL	NULL	NULL	5013.5	35.49155
151	NULL	146	NULL	NULL	21316	47.269	NULL	NULL	NULL	7019.4	47.58733
152	NULL	147	NULL	NULL	21609	57.7732	NULL	NULL	NULL	10486	56.97747
153	NULL	133	NULL	NULL	17689	39.4704	NULL	NULL	NULL	4894.3	33.42254
154	63.1845	NULL	NULL	NULL	12542.1	63.1845	NULL	NULL	NULL	12542	52.36198
155	NULL	NULL	NULL	55.51	14874.7	51.7254	NULL	NULL	NULL	8405.4	52.9986
156	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
157	NULL	NULL	NULL	82.02	32476.5	NULL	NULL	NULL	82.022	32476	54.43099
158	NULL	NULL	NULL	70.42	23940.7	NULL	NULL	NULL	70.423	23941	70.50564
159	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
160	NULL	178	NULL	NULL	31684	56.3408	NULL	NULL	NULL	9972.3	56.81831
161	82.2831	NULL	NULL	NULL	21270.2	82.2831	NULL	NULL	NULL	21270	70.82395
162	NULL	99	NULL	NULL	9801	45.5183	NULL	NULL	NULL	6509.1	45.51831
163	NULL	128	NULL	NULL	16384	42.9718	NULL	NULL	NULL	5801.2	34.37747
164	NULL	164	NULL	NULL	26896	47.1099	NULL	NULL	NULL	6972.3	49.49719
165	72.0972	NULL	NULL	NULL	16330	72.0972	NULL	NULL	NULL	16330	62.54789
166	NULL	343	NULL	NULL	117649	48.5423	NULL	NULL	NULL	7402.7	38.35634
167	NULL	NULL	NULL	419.6	850075	NULL	NULL	NULL	419.64	850075	144.1944
168	NULL	NULL	NULL	45.57	10023.6	41.6986	NULL	NULL	NULL	5462.5	38.99296
169	47.5873	NULL	NULL	NULL	7114.31	47.5873	NULL	NULL	NULL	7114.3	40.10705
170	47.7465	NULL	NULL	NULL	7161.97	47.7465	NULL	NULL	NULL	7162	44.72254
171	111.568	NULL	NULL	NULL	39104.4	111.568	NULL	NULL	NULL	39104	102.4958
172	109.976	NULL	NULL	NULL	37996.7	109.976	NULL	NULL	NULL	37997	102.1775

rizzi	Platform Surface Area	Lid Surface area	Area of Opening	Top Surface Area	Outside Surface Area	Total Surface Area	Total Surface Area (with Platform)
130	34014.01	17132.71	NULL	11239.15	55803.21	67042.36	101056.3736
131	28973.35	4776.638	NULL	8912.362	41184	50096.362	79069.71592
132	25589.17	5588.328	NULL	2695.64	27174.81	29870.453	55459.61997
133	21679.71	4064.499	NULL	1150.69	18944	20094.69	41774.40373
134	109306.6	31384.08	NULL	14700.9	65446	80146.903	189453.4775
135	24166.64	4064.499	NULL	38784.5	76176	114960.5	139127.1428
136	117739.9	23204.79	NULL	6893.398	52890	59783.398	177523.2639
137	NULL	7746.389	NULL	7878.611	41000	48878.611	48878.61061
138	NULL	NULL	NULL	NULL	NULL	NULL	NULL
139	NULL	6238.874	NULL	12257.13	40256	52513.126	52513.12623
140	23857.46	8983.978	NULL	41555.68	71214.58	112770.26	136627.7213
141	1981151	30985.56	NULL	6482.166	63406.92	69889.081	2051039.972
142	32457.68	7019.449	NULL	901.5508	28836	29737.551	62195.23469
143	19712.85	4357.344	NULL	4302.91	25634.35	29937.262	49650.11565
144	18503.28	4621.939	NULL	5378.061	32400	37778.061	56281.33653
145	18994.93	4064.499	NULL	988.9888	21420	22408.989	41403.92008
146	17205.61	8613.545	NULL	7391.909	40076.22	47468.131	64673.74338
147	NULL	NULL	NULL	NULL	NULL	NULL	NULL
148	15097	4028.609	NULL	8515.391	34496	43011.391	58108.3905
149	28913.41	5844.249	NULL	3180.751	38760	41940.751	70854.16355
150	19430.54	3957.308	NULL	10442.69	41760	52202.692	71633.23163
151	12580.55	7114.306	NULL	14201.69	46136	60337.694	72918.24528
152	76362.16	10198.97	NULL	11410.03	53508	64918.033	141280.1891
153	13665.67	3509.366	NULL	14179.63	41496	55675.634	69341.30069
154	26350.41	8613.545	NULL	3928.581	33348	37276.581	63626.99144
155	27782.63	8824.266	NULL	6050.426	33749.79	39800.219	67582.84853
156	NULL	NULL	NULL	NULL	NULL	NULL	NULL
157	962.0112	9307.699	NULL	23168.77	55118.48	78287.243	79249.25417
158	37247.92	15617	NULL	8323.667	49577.46	57901.132	95149.05337
159	NULL	NULL	NULL	NULL	NULL	NULL	NULL
160	26408.67	10142.07	NULL	21541.93	62656	84197.931	110606.6004
161	78587.94	15758.33	NULL	5511.854	42911	48422.854	127010.7962
162	24143.88	6509.119	NULL	3291.881	32472	35763.881	59907.76227
163	26531.8	3712.767	NULL	12671.23	42496	55167.233	81699.03581
164	26147.74	7696.813	NULL	19199.19	62976	82175.187	108322.9276
165	29146.82	12290.66	NULL	4039.352	38505	42544.352	71691.1733
166	24238.31	4621.939	NULL	113027.1	115248	228275.06	252513.3666
167	2014414	65320.05	NULL	784755	302137.5	1086892.6	3101306.154
168	NULL	4776.638	NULL	5246.963	22966.03	28212.995	28212.99462
169	17603	5053.488	NULL	2060.818	24817	26877.818	44480.8216
170	51232.48	6283.517	NULL	878.4557	28200	29078.456	80310.93254
171	111523.7	33003.64	NULL	6100.807	63791	69891.807	181415.5137
172	142621.5	32798.97	NULL	5197.762	64263	69460.762	212082.2623

Wellhead Dimension and Surface Area

rizzi	Sestiere/Island	Number of Sides	Circular Top	Circular Bottom	Circumference of Base	Rim Width/ Rim Corcumferenc e	Height from Base to Rim
173	San Polo	4	N	N	260	115	73
174	San Polo	4	N	Y	262	167	77
175	San Polo	8	N	N	524	239	84
176	San Polo	8	N	N	280	110	64
177	San Polo	1	Y	Y	676	676	87
178	San Polo	4	N	Y	256	102	83
179	San Polo	4	N	Y	239	100	81
180	Santa Croce	4	N	Y	274	105	77
181	Santa Croce	4	N	Y	NULL	155	84
182	Santa Croce	4	N	Y	381	106	105
183	Santa Croce	8	N	Y	295	96	81
184	Santa Croce	4	N	Y	221	135	59
185	Santa Croce	1	Y	Y	376	376	86
186	Santa Croce	1	Y	Y	376	376	83
187	Santa Croce	4	N	Y	244	190	71
188	Santa Croce	8	Y	Y	300	178	85
189	Santa Croce	8	N	N	276	99	85
190	Santa Croce	4	N	Y	249	119	63
191	Santa Croce	4	N	Y	283	117	88
192	Santa Croce	4	N	Y	282	117	90
193	Santa Croce	4	N	Y	289	146	78
194	Santa Croce	4	N	Y	351	90	87
195	Santa Croce	4	N	Y	258	123	74
196	Santa Croce	4	N	Y	300	128	88
197	Santa Croce	1	Y	Y	368	368	80
198	Santa Croce	4	N	Y	397	140	91
199	Santa Croce	6	N	Y	221	92	83
200	Santa Croce	6	N	Y	255	168	81
201	Dorsodoro	8	N	N	446	152	88
202	Dorsodoro	4	N	N	378	107	97
203	Dorsodoro	4	N	Y	280	149	70
204	Dorsodoro	8	N	Y	257	243	84
205	Dorsodoro	1	Y	Y	719	719	88
206	Dorsodoro	8	N	N	349	203	86
207	Dorsodoro	6	N	N	688	232	84
208	Dorsodoro	8	N	Y	345	130	76
209	Dorsodoro	4	N	Y	308	264	99
210	Dorsodoro	1	N	Y	775	775	87
211	Dorsodoro	8	N	Y	265	275	83
212	Dorsodoro	4	N	Y	279	168	87
213	Dorsodoro	1	Y	Y	451	451	87
214	Dorsodoro	1	Y	Y	543	543	84
215	Dorsodoro	4	N	Y	295	116	91

Wellhead Dimension and Surface Area

rizzi	Lid Circumference/ Opening Diameter	Platform Height	Platform Sides	Platform Width/ Circum.	Platform Radius	Platform Width	Platform Side 6	Platform Side 8
173	235	22	4	150	NULL	150	NULL	NULL
174	269	10	4	135	NULL	135	NULL	NULL
175	438	38	8	287	NULL	NULL	NULL	118.88981
176	247	15	8	142	NULL	NULL	NULL	58.823529
177	647	6	1	978	155.65353	NULL	NULL	NULL
178	254	20	8	160	NULL	NULL	NULL	66.280033
179	265	21	8	139	NULL	NULL	NULL	57.580779
180	250	9	4	152	NULL	152	NULL	NULL
181	NULL	6	4	119	NULL	NULL	NULL	NULL
182	270	15	4	208	NULL	208	NULL	NULL
183	242	17	4	150	NULL	150	NULL	NULL
184	230	11	1	383	60.956343	NULL	NULL	NULL
185	311	NULL	NULL	NULL	NULL	NULL	NULL	NULL
186	311	NULL	NULL	NULL	NULL	NULL	NULL	NULL
187	239	21	4	113	NULL	113	NULL	NULL
188	503	26	1	371	59.046484	NULL	NULL	NULL
189	277	13	8	122	NULL	NULL	NULL	50.538525
190	227	3	8	110	NULL	NULL	NULL	45.567523
191	289	0	1	386	61.433808	NULL	NULL	NULL
192	278	15	4	170	NULL	170	NULL	NULL
193	279	18	4	100	NULL	100	NULL	NULL
194	290	18	4	165	NULL	165	NULL	NULL
195	214	16	8	136	NULL	NULL	NULL	56.338028
196	303	11	4	179	NULL	179	NULL	NULL
197	331	11	1	522	83.07888	NULL	NULL	NULL
198	396	3	1	697	110.931	NULL	NULL	NULL
199	182	NULL	NULL	NULL	NULL	NULL	NULL	NULL
200	220	9	4	143	NULL	143	NULL	NULL
201	439	16	4	202	NULL	202	NULL	NULL
202	314	14	4	209	NULL	209	NULL	NULL
203	254	NULL	NULL	NULL	NULL	NULL	NULL	NULL
204	273	6	8	183	NULL	NULL	NULL	75.807788
205	673	25	1	1185	188.59861	NULL	NULL	NULL
206	243	11	4	173	NULL	173	NULL	NULL
207	547	16	6	943	NULL	NULL	544.4413	NULL
208	322	26	8	575	NULL	NULL	NULL	238.19387
209	334	13	6	155	NULL	NULL	89.489292	NULL
210	739	12	1	1050	167.11269	NULL	NULL	NULL
211	231	8	8	130	NULL	NULL	NULL	53.852527
212	289	NULL	NULL	NULL	NULL	NULL	NULL	NULL
213	403	17	1	661	105.20142	NULL	NULL	NULL
214	500	15	1	812	129.23381	NULL	NULL	NULL
215	320	14	4	89	NULL	89	NULL	NULL

Wellhead Dimension and Surface Area

rizzi	Rim Radius	Rim Width	Rim Side 6	Rim Side 8	Area of Top	Base Radius	Base Width	Base Side 6	Base Side 8	Area of Base	Lid Radius
173	NULL	115	NULL	NULL	13225	NULL	115	NULL	NULL	13225	37.40141
174	NULL	167	NULL	NULL	27889	41.6986	NULL	NULL	NULL	5462.5	42.81268
175	NULL	NULL	NULL	99.01	47318.9	NULL	NULL	NULL	99.006	47319	69.70987
176	NULL	NULL	NULL	45.57	10023.6	NULL	NULL	NULL	45.568	10024	39.31127
177	107.589	NULL	NULL	NULL	36365	107.589	NULL	NULL	NULL	36365	102.9732
178	NULL	102	NULL	NULL	10404	40.7437	NULL	NULL	NULL	5215.2	40.42536
179	NULL	100	NULL	NULL	10000	38.038	NULL	NULL	NULL	4545.5	42.17606
180	NULL	105	NULL	NULL	11025	43.6085	NULL	NULL	NULL	5974.4	39.78874
181	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
182	NULL	106	NULL	NULL	11236	60.638	NULL	NULL	NULL	11552	42.97183
183	NULL	NULL	NULL	39.77	7634.5	46.9507	NULL	NULL	NULL	6925.2	38.5155
184	NULL	135	NULL	NULL	18225	35.1732	NULL	NULL	NULL	3886.6	36.60564
185	59.8423	NULL	NULL	NULL	11250.3	59.8423	NULL	NULL	NULL	11250	49.49719
186	59.8423	NULL	NULL	NULL	11250.3	59.8423	NULL	NULL	NULL	11250	49.49719
187	NULL	190	NULL	NULL	36100	38.8338	NULL	NULL	NULL	4737.7	38.03803
188	NULL	NULL	NULL	73.74	26246.9	47.7465	NULL	NULL	NULL	7162	80.05494
189	NULL	NULL	NULL	41.01	8119.12	NULL	NULL	NULL	41.011	8119.1	44.08592
190	NULL	119	NULL	NULL	14161	39.6296	NULL	NULL	NULL	4933.9	36.12817
191	NULL	117	NULL	NULL	13689	45.0408	NULL	NULL	NULL	6373.3	45.99578
192	NULL	117	NULL	NULL	13689	44.8817	NULL	NULL	NULL	6328.3	44.24507
193	NULL	146	NULL	NULL	21316	45.9958	NULL	NULL	NULL	6646.4	44.40423
194	NULL	90	NULL	NULL	8100	55.8634	NULL	NULL	NULL	9804	46.15493
195	NULL	123	NULL	NULL	15129	41.062	NULL	NULL	NULL	5297	34.05916
196	NULL	128	NULL	NULL	16384	47.7465	NULL	NULL	NULL	7162	48.22395
197	58.569	NULL	NULL	NULL	10776.7	58.569	NULL	NULL	NULL	10777	52.68029
198	NULL	140	NULL	NULL	19600	63.1845	NULL	NULL	NULL	12542	63.02536
199	NULL	NULL	53.116	NULL	7330.04	35.1732	NULL	NULL	NULL	3886.6	28.9662
200	NULL	NULL	96.995	NULL	24442.7	40.5845	NULL	NULL	NULL	5174.5	35.01409
201	NULL	NULL	NULL	62.97	19139.3	NULL	NULL	NULL	62.966	19139	69.86902
202	NULL	107	NULL	NULL	11449	NULL	107	NULL	NULL	11449	49.97465
203	NULL	149	NULL	NULL	22201	44.5634	NULL	NULL	NULL	6238.9	40.42536
204	NULL	NULL	NULL	100.7	48916	40.9028	NULL	NULL	NULL	5256	43.4493
205	114.432	NULL	NULL	NULL	41138.4	114.432	NULL	NULL	NULL	41138	107.1113
206	NULL	NULL	NULL	84.09	34137.4	NULL	NULL	NULL	84.093	34137	38.67465
207	NULL	NULL	133.95	NULL	46613	NULL	NULL	133.95	NULL	46613	87.05775
208	NULL	NULL	NULL	53.85	13999.9	54.9085	NULL	NULL	NULL	9471.7	51.24789
209	NULL	264	NULL	NULL	69696	49.0197	NULL	NULL	NULL	7549	53.15775
210	123.345	NULL	NULL	NULL	47796.2	123.345	NULL	NULL	NULL	47796	117.6155
211	NULL	NULL	NULL	113.9	62647.5	42.1761	NULL	NULL	NULL	5588.3	NULL
212	NULL	168	NULL	NULL	28224	44.4042	NULL	NULL	NULL	6194.4	45.99578
213	71.7789	NULL	NULL	NULL	16186.1	71.7789	NULL	NULL	NULL	16186	64.13944
214	86.4211	NULL	NULL	NULL	23463.3	86.4211	NULL	NULL	NULL	23463	79.57747
215	NULL	116	NULL	NULL	13456	46.9507	NULL	NULL	NULL	6925.2	50.92958

Wellhead Dimension and Surface Area

rizzi	Platform Surface Area	Lid Surface area	Area of Opening	Top Surface Area	Outside Surface Area	Total Surface Area	Total Surface Area (with Platform)
173	22475	4394.666	NULL	8830.334	33580	42410.334	64885.33413
174	18162.48	5758.305	NULL	22130.69	51436	73566.695	91729.17862
175	57057.86	15266.46	NULL	32052.39	66531.9	98584.288	155642.1521
176	13739.02	4854.942	NULL	5168.659	23330.57	28499.231	42238.24562
177	45617.58	33311.85	NULL	3053.149	58812	61865.149	107482.7325
178	26596.57	5134.02	NULL	5269.98	33864	39133.98	65730.55318
179	21133.48	5588.328	NULL	4411.672	32400	36811.672	57945.15206
180	22601.64	4973.592	NULL	6051.408	32340	38391.408	60993.04977
181	NULL	NULL	NULL	NULL	NULL	NULL	NULL
182	44192.45	5801.198	NULL	5434.802	44520	49954.802	94147.25698
183	25774.77	4660.375	NULL	2974.13	25769.68	28743.806	54518.57697
184	11999.5	4209.648	NULL	14015.35	31860	45875.352	57874.84819
185	NULL	7696.813	NULL	3553.532	32336	35889.532	35889.53199
186	NULL	7696.813	NULL	3553.532	31208	34761.532	34761.53199
187	17523.28	4545.545	NULL	31554.46	53960	85514.455	103037.7309
188	13437.15	20133.82	NULL	6113.107	50140.85	56253.952	69691.10202
189	9466.747	6105.9	NULL	2013.217	27887.32	29900.541	39367.28822
190	6183.339	4100.548	NULL	10060.45	29988	40048.452	46231.79107
191	5483.445	6646.39	NULL	7042.61	41184	48226.61	53710.05483
192	32771.68	6150.065	NULL	7538.935	42120	49658.935	82430.61584
193	10553.61	6194.39	NULL	15121.61	45552	60673.61	71227.22004
194	29300.98	6692.465	NULL	1407.535	31320	32727.535	62028.51057
195	17236.3	3644.33	NULL	11484.67	36408	47892.67	65128.96948
196	32755.03	7305.928	NULL	9078.072	45056	54134.072	86889.09948
197	16648.89	8718.587	NULL	2058.112	29440	31498.112	48147.0004
198	28208.33	12479.02	NULL	7120.979	50960	58080.979	86289.30538
199	NULL	2635.924	NULL	4694.115	26451.88	31145.995	31145.99478
200	20422.47	3851.55	NULL	20591.15	47139.49	67730.646	88153.12107
201	34592.72	15336.25	NULL	3803.029	44328.09	48131.115	82723.83627
202	43936	7846.02	NULL	3602.98	41516	45118.98	89054.97962
203	NULL	5134.02	NULL	17066.98	41720	58786.98	58786.97985
204	26124.94	5930.829	NULL	42985.17	67645.4	110630.57	136755.5138
205	100231.2	36042.94	NULL	5095.505	63272	68367.505	168598.7304
206	3403.598	4698.97	NULL	29438.43	57855.84	87294.273	90697.87081
207	775765.6	23810.3	NULL	22802.66	67508.41	90311.068	866076.7061
208	313961.3	8250.911	NULL	5748.995	32742.34	38491.331	352452.6281
209	20237.39	8877.344	NULL	60818.66	104544	165362.66	185600.0434
210	52537.94	43458.93	NULL	4337.291	67425	71762.291	124300.234
211	11858.14	NULL	41909.6314	20737.87	75642.09	96379.962	108238.101
212	NULL	6646.39	NULL	21577.61	58464	80041.61	80041.61
213	29819.93	12924.1	NULL	3262.04	39237	42499.04	72318.97087
214	41185.59	19894.37	NULL	3568.97	45612	49180.97	90366.56051
215	5979.771	8148.733	NULL	5307.267	42224	47531.267	53511.03745

Wellhead Dimension and Surface Area

rizzi	Sestiere/Island	Number of Sides	Circular Top	Circular Bottom	Circumference of Base	Rim Width/ Rim Corcumference	Height from Base to Rim
216	Dorsodoro	4	N	Y	275	136	93
217	Dorsodoro	8	N	N	495	194	81
218	Dorsodoro	6	N	N	661	194	83
219	Dorsodoro	8	N	Y	269	126	89
220	Dorsodoro	8	Y	Y	307	260	89
221	Dorsodoro	1	Y	Y	780	780	87
222	Dorsodoro	6	N	N	666	206	84
223	Dorsodoro	6	N	N	673	170	86
224	Dorsodoro	4	N	Y	295	79	76
225	Dorsodoro	4	N	Y	237	169	64
226	Dorsodoro	8	N	N	161	251	92
227	Dorsodoro	8	N	Y	251	106	74
228	Dorsodoro	4	N	Y	254	100	76
229	Dorsodoro	4	N	Y	287	110	83
230	Giudecca	4	N	N	285	92	66
231	Giudecca	4	N	Y	220	187	57
232	Giudecca	6	N	Y	560	193.6957872	87
233	Murano	4	N	Y	283	97	82
234	Murano	4	N	Y	295	110	82
235	Murano	8	N	Y	397	131	89
236	Murano	1	Y	Y	283	289	63
237	Murano	4	N	Y	410	130	85
238	Murano	4	N	Y	353	92	77
239	Burano	1	Y	Y	692	692	83
240	Torcello	4	N	Y	276	138	85
241	Torcello	1	Y	Y	254	254	80
242	Torcello	4	N	Y	334	137	78
243	Torcello	4	N	N	NULL	90	84
244	Torcello	4	N	Y	272	118	91
245	Lido	1	Y	Y	536	536	78
246	Malamoca	4	N	Y	332	123	93
247	Malamoca	6	N	N	138	138	81
248	Malamoca	6	N	N	130	130	79
249	S. Pietro in Volta	4	N	Y	295	113	87
250	Portosecco	4	N	Y	227	76	67
251	Pellestrina	1	Y	Y	285	320	87
252	Pellestrina	4	N	Y	287	96	71
253	Pellestrina	4	N	Y	286	97	73
254	Pellestrina	4	N	Y	263	90	66
255	Chioggia	1	Y	Y	240	240	40
256	Chioggia	4	N	Y	268	108	74
?	Torcello	6	N	Y	206	74	59
?	Burano	1	Y	Y	535		80

Wellhead Dimension and Surface Area

rizzi	Lid Circumference/ Opening Diameter	Platform Height	Platform Sides	Platform Width/ Circum.	Platform Radius	Platform Width	Platform Side 6	Platform Side 8
216	293	19	4	165	NULL	165	NULL	NULL
217	434	NULL	NULL	NULL	NULL	NULL	NULL	NULL
218	515	15	6	273	NULL	NULL	157.61662	NULL
219	279	4	8	156	NULL	NULL	NULL	64.623032
220	290	6	8	154	NULL	NULL	NULL	63.794532
221	721	12	1	1027	163.45213	NULL	NULL	NULL
222	511	5	6	310	NULL	NULL	178.97858	NULL
223	546	3	6	348	NULL	NULL	200.91789	NULL
224	258	20	8	155	NULL	NULL	NULL	64.208782
225	192	11	4	80	NULL	80	NULL	NULL
226	386	10	8	237	NULL	NULL	NULL	98.177299
227	243	2	8	172	NULL	NULL	NULL	71.251036
228	258	3	1	463	73.688739	NULL	NULL	NULL
229	249	14	4	110	NULL	110	NULL	NULL
230	259	9	4	162	NULL	162	NULL	NULL
231	255	NULL	NULL	NULL	NULL	NULL	NULL	NULL
232	464	7	6	235	NULL	NULL	135.67731	NULL
233	251	28	4	153	NULL	153	NULL	NULL
234	321	25	4	174	NULL	174	NULL	NULL
235	361	51	8	296	NULL	NULL	NULL	122.61806
236	258	15	4	133	NULL	133	NULL	NULL
237	328	15	4	192	NULL	192	NULL	NULL
238	251	4	4	148	NULL	148	NULL	NULL
239	629	14	1	974	155.01691	NULL	NULL	NULL
240	260	22	1	397	63.184512	NULL	NULL	NULL
241	68	13	4	109	NULL	109	NULL	NULL
242	308	4	4	163	NULL	163	NULL	NULL
243	80	6	4	137	NULL	137	NULL	NULL
244	286	69	4	165	NULL	165	NULL	NULL
245	459	15	1	674	107.27043	NULL	NULL	NULL
246	325	15	4	173	NULL	173	NULL	NULL
247	385	14	6	215	NULL	NULL	124.13031	NULL
248	352	15	6	193	NULL	NULL	111.4286	NULL
249	296	19	4	135	NULL	135	NULL	NULL
250	93	11	8	170	NULL	NULL	NULL	70.422535
251	281	14	8	140	NULL	NULL	NULL	57.995029
252	268	4	4	134	NULL	134	NULL	NULL
253	257	14	4	145	NULL	145	NULL	NULL
254	236	NULL	NULL	NULL	NULL	NULL	NULL	NULL
255	59	20	4	130	NULL	130	NULL	NULL
256	278	30	4	210	NULL	210	NULL	NULL
?	59	13	4	117	NULL	117	NULL	NULL
?	473	10	1	762	121.27607	NULL	NULL	NULL

Wellhead Dimension and Surface Area

rizzi	Rim Radius	Rim Width	Rim Side 6	Rim Side 8	Area of Top	Base Radius	Base Width	Base Side 6	Base Side 8	Area of Base	Lid Radius
216	NULL	136	NULL	NULL	18496	43.7676	NULL	NULL	NULL	6018	46.6324
217	NULL	NULL	NULL	80.36	31177.5	NULL	NULL	NULL	80.365	31178	69.07325
218	NULL	NULL	112.01	NULL	32593.7	NULL	NULL	112.01	NULL	32594	81.9648
219	NULL	NULL	NULL	52.2	13151.6	42.8127	NULL	NULL	NULL	5758.3	44.40423
220	NULL	NULL	NULL	107.7	55999.6	48.8606	NULL	NULL	NULL	7500.1	46.15493
221	124.141	NULL	NULL	NULL	48414.9	124.141	NULL	NULL	NULL	48415	114.7507
222	NULL	NULL	118.93	NULL	36750.7	NULL	NULL	118.93	NULL	36751	81.32818
223	NULL	NULL	98.15	NULL	25028.1	NULL	NULL	98.15	NULL	25028	86.8986
224	NULL	79	NULL	NULL	6241	46.9507	NULL	NULL	NULL	6925.2	41.06198
225	NULL	169	NULL	NULL	28561	37.7197	NULL	NULL	NULL	4469.8	30.55775
226	NULL	NULL	NULL	104	52189.8	NULL	NULL	NULL	103.98	52190	61.43381
227	NULL	NULL	NULL	43.91	9307.87	39.9479	NULL	NULL	NULL	5013.5	38.67465
228	NULL	100	NULL	NULL	10000	40.4254	NULL	NULL	NULL	5134	41.06198
229	NULL	110	NULL	NULL	12100	45.6775	NULL	NULL	NULL	6554.7	39.62958
230	NULL	92	NULL	NULL	8464	NULL	92	NULL	NULL	8464	41.22113
231	NULL	187	NULL	NULL	34969	35.0141	NULL	NULL	NULL	3851.5	40.58451
232	NULL	NULL	111.83	NULL	32491.6	89.1268	NULL	NULL	NULL	24955	73.84789
233	NULL	97	NULL	NULL	9409	45.0408	NULL	NULL	NULL	6373.3	39.94789
234	NULL	110	NULL	NULL	12100	46.9507	NULL	NULL	NULL	6925.2	51.08874
235	NULL	NULL	NULL	54.27	14216.1	63.1845	NULL	NULL	NULL	12542	57.45493
236	45.9958	NULL	NULL	NULL	6646.39	45.0408	NULL	NULL	NULL	6373.3	41.06198
237	NULL	130	NULL	NULL	16900	65.2535	NULL	NULL	NULL	13377	52.20282
238	NULL	92	NULL	NULL	8464	56.1817	NULL	NULL	NULL	9916.1	39.94789
239	110.135	NULL	NULL	NULL	38106.8	110.135	NULL	NULL	NULL	38107	100.1085
240	NULL	138	NULL	NULL	19044	43.9268	NULL	NULL	NULL	6061.9	41.38029
241	40.4254	NULL	NULL	NULL	5134.02	40.4254	NULL	NULL	NULL	5134	NULL
242	NULL	137	NULL	NULL	18769	53.1578	NULL	NULL	NULL	8877.3	49.01972
243	NULL	90	NULL	NULL	8100	NULL	90	NULL	NULL	8100	NULL
244	NULL	118	NULL	NULL	13924	43.2901	NULL	NULL	NULL	5887.5	45.51831
245	85.307	NULL	NULL	NULL	22862.3	85.307	NULL	NULL	NULL	22862	73.05212
246	NULL	123	NULL	NULL	15129	52.8394	NULL	NULL	NULL	8771.3	51.72536
247	NULL	NULL	79.674	NULL	16492.6	NULL	NULL	79.674	NULL	16493	61.27465
248	NULL	NULL	75.056	NULL	14635.8	NULL	NULL	75.056	NULL	14636	56.02254
249	NULL	113	NULL	NULL	12769	46.9507	NULL	NULL	NULL	6925.2	47.10986
250	NULL	76	NULL	NULL	5776	36.1282	NULL	NULL	NULL	4100.5	14.80141
251	50.9296	NULL	NULL	NULL	8148.73	45.3592	NULL	NULL	NULL	6463.7	44.72254
252	NULL	96	NULL	NULL	9216	45.6775	NULL	NULL	NULL	6554.7	42.65352
253	NULL	97	NULL	NULL	9409	45.5183	NULL	NULL	NULL	6509.1	40.90282
254	NULL	90	NULL	NULL	8100	41.8578	NULL	NULL	NULL	5504.3	37.56057
255	38.1972	NULL	NULL	NULL	4583.66	38.1972	NULL	NULL	NULL	4583.7	NULL
256	NULL	108	NULL	NULL	11664	42.6535	NULL	NULL	NULL	5715.6	44.24507
?	NULL	NULL	42.724	NULL	4742.36	32.7859	NULL	NULL	NULL	3376.9	NULL
?	0	NULL	NULL	NULL	0	85.1479	NULL	NULL	NULL	22777	75.28029

Wellhead Dimension and Surface Area

rizzi	Platform Surface Area	Lid Surface area	Area of Opening	Top Surface Area	Outside Surface Area	Total Surface Area	Total Surface Area (with Platform)
216	33746.95	6831.646	NULL	11664.35	50592	62256.354	96003.30736
217	NULL	14988.89	NULL	16188.65	52076.22	68264.868	68264.86849
218	46135.77	21105.93	NULL	11487.8	55778.96	67266.761	113402.5327
219	16469.5	6194.39	NULL	6957.237	37163.21	44120.452	60589.94698
220	15208.3	6692.465	NULL	49307.16	76686	125993.15	141201.4525
221	47841.73	41367.63	NULL	7047.301	67860	74907.301	122749.0346
222	51843.74	20779.35	NULL	15971.31	59942.81	75914.119	127757.8642
223	83467.53	23723.32	NULL	1304.817	50645.17	51949.982	135417.5107
224	23250.41	5296.995	NULL	944.0052	24016	24960.005	48210.41316
225	5450.213	2933.544	NULL	25627.46	43264	68891.456	74341.66909
226	2194.577	11856.72	NULL	40333.1	76526.93	116860.03	119054.6032
227	20633.85	4698.97	NULL	4608.896	25995.03	30603.925	51237.77115
228	13313.92	5296.995	NULL	4703.005	30400	35103.005	48416.92803
229	11705.28	4933.883	NULL	7166.117	36520	43686.117	55391.40043
230	23612	5338.136	NULL	3125.864	24288	27413.864	51025.86363
231	NULL	5174.525	NULL	29794.47	42636	72430.475	72430.47491
232	28569.21	17132.71	NULL	15358.88	58375.42	73734.304	102303.5094
233	34171.72	5013.46	NULL	4395.54	31816	36211.54	70383.2596
234	40750.77	8199.742	NULL	3900.258	36080	39980.258	80731.02829
235	110066.9	10370.62	NULL	3845.501	38637.95	42483.447	152550.3009
236	19295.72	5296.995	NULL	1349.395	18207	19556.395	38852.11507
237	35007.03	8561.263	NULL	8338.737	44200	52538.737	87545.76433
238	14355.93	5013.46	NULL	3450.54	28336	31786.54	46142.47056
239	51022.45	31484.11	NULL	6622.676	57436	64058.676	115081.127
240	15214.23	5379.437	NULL	13664.56	46920	60584.563	75798.79516
241	12414.98	NULL	3631.681108	1502.339	20320	21822.339	34237.31889
242	20299.66	7549.037	NULL	11219.96	42744	53963.963	74263.61832
243	13957	NULL	5026.548246	3073.452	30240	33313.452	47270.45175
244	66877.54	6509.119	NULL	7414.881	42952	50366.881	117244.4215
245	23397.85	16765.46	NULL	6096.828	41808	47904.828	71302.67418
246	31537.65	8405.37	NULL	6723.63	45756	52479.63	84017.28234
247	33966.38	11795.37	NULL	4697.217	38721.73	43418.945	77385.32729
248	27651.33	9859.967	NULL	4775.862	35576.32	40352.186	68003.51099
249	21559.77	6972.26	NULL	5796.74	39324	45120.74	66680.51079
250	26037.3	688.2656	NULL	5087.734	20368	25455.734	51493.03655
251	16268.34	6283.517	NULL	1865.216	27840	29705.216	45973.55609
252	13545.28	5715.572	NULL	3500.428	27264	30764.428	44309.71093
253	22635.88	5256.012	NULL	4152.988	28324	32476.988	55112.86872
254	NULL	4432.147	NULL	3667.853	23760	27427.853	27427.85314
255	22716.34	NULL	2733.971007	1849.691	9600	11449.691	34166.02899
256	63584.43	6150.065	NULL	5513.935	31968	37481.935	101066.3624
?	16396.05	NULL	2733.971007	2008.384	15124.27	17132.652	33528.70217
?	31049.12	17803.79	NULL	-17803.79	0	-17803.788	13245.33146

Spreadsheet 3: Wellhead Conditions

Wellhead Conditions

Rizzi	Accretion 2 Total	Accretion 1 Total	Structural Crack Total	Surface Crack Total	Grime 2 Total	Grime 1 Total	Surface Damage 2 Total	Surface Damage 1 Total	Algae Total	Graffiti Total	Accretion 2 Scaled
1	0	0	15	220	10	45	40	120	30	0	0
2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	0	0	10	145	0	75	10	5	9	0	0
5	3	1	10	630	20	37	23	370	0	0	0
6	10	3	40	178	5	42	10	120	0	1	1
7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8	0	1	0	105	85	190	20	58	1	0	0
9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	0	1	2	80	0	67	14	29	3	0	0
11	5	12	32	110	90	105	60	85	3	1	0
12	1	32	8	68	1	139	91	72	0	0	0
13	15	7	0	250	30	70	13	47	0	2	1
14	11	7	0	38	21	99	28	240	0	0	1
15	26	14	46	275	5	174	97	300	12	1	2
16	5	11	9	57	10	140	43	50	0	0	0
17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	0	12	0	175	1	63	53	57	0	0	0
19	0	0	0	625	49	58	40	40	1	0	0
20	2	13	53	340	0	195	17	170	1	0	0
21	0	3	30	85	18	45	50	50	0	0	0
22	5	3	37	210	25	34	36	200	0	0	0
23	0	0	15	130	30	28	19	118	10	0	0
24	0	0	35	80	105	70	8	6	0	0	0
25	0	15	0	26	24	45	29	33	0	1	0
26	0	17	10	250	14	131	32	140	0	1	0
27	4	0	10	40	28	115	29	60	40	2	0
28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
29	3	43	25	190	26	86	43	92	1	3	0
30	17	6	22	130	16	140	35	95	1	2	1
31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32	5	0	0	95	28	60	15	70	0	0	0
33	70	0	0	260	37	90	21	113	30	1	5
34	4	4	5	135	3	110	29	118	0	3	0
35	0	0	0	380	0	180	24	29	0	0	0
36	0	0	40	58	52	289	21	70	220	0	0
37	4	1	0	70	17	60	34	26	6	2	0
38	40	0	0	240	1	65	18	95	0	1	3
39	5	2	11	24	25	35	12	47	40	0	0
40	12	3	10	58	123	110	29	155	350	0	1
41	0	0	0	27	23	82	20	298	195	0	0
42	2	10	0	40	14	65	8	16	0	2	0
43	0	1	18	73	230	48	29	106	0	0	0

Wellhead Conditions

Rizzi	Accretion 1 Scaled	Structural Cracks Scaled	Surface Cracks Scaled	Grime 2 Scaled	Grime 1 Scaled	Surface Damage 2 Scaled	Surface Damage 1 Scaled	Algae Scaled	Graffiti Scaled	Overall Rating
1	0	3	5	1	2	6	5	1	0	39
2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	0	2	3	0	4	1	0	0	0	15
5	0	2	15	1	2	3	15	0	0	43
6	1	7	4	0	2	1	5	0	2	39
7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8	0	0	3	5	10	3	2	0	0	19
9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	0	0	2	0	3	2	1	0	0	12
11	3	6	3	5	5	9	3	0	2	62
12	7	1	2	0	7	14	3	0	0	59
13	2	0	6	2	4	2	2	0	4	15
14	2	0	1	1	5	4	10	0	0	27
15	3	8	7	0	9	14	12	1	2	99
16	2	2	1	1	7	6	2	0	0	34
17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	3	0	4	0	3	8	2	0	0	34
19	0	0	15	3	3	6	2	0	0	33
20	3	10	8	0	10	3	7	0	0	57
21	1	5	2	1	2	7	2	0	0	50
22	1	7	5	2	2	5	8	0	0	55
23	0	3	3	2	1	3	5	0	0	27
24	0	6	2	6	4	1	0	0	0	32
25	3	0	1	1	2	4	1	0	2	19
26	4	2	6	1	7	5	6	0	2	35
27	0	2	1	2	6	4	2	2	4	28
28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
29	9	5	5	2	4	6	4	0	6	49
30	1	4	3	1	7	5	4	0	4	41
31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32	0	0	2	2	3	2	3	0	0	14
33	0	0	6	2	5	3	5	1	2	23
34	1	1	3	0	6	4	5	0	6	27
35	0	0	9	0	9	4	1	0	0	21
36	0	7	1	3	15	3	3	9	0	47
37	0	0	2	1	3	5	1	0	4	22
38	0	0	6	0	3	3	4	0	2	18
39	0	2	1	2	2	2	2	2	0	17
40	1	2	1	7	6	4	6	15	0	36
41	0	0	1	1	4	3	12	8	0	26
42	2	0	1	1	3	1	1	0	4	8
43	0	3	2	14	2	4	4	0	0	39

Rizzi	Accretion 2 Total	Accretion 1 Total	Structural Crack Total	Surface Crack Total	Grime 2 Total	Grime 1 Total	Surface Damage 2 Total	Surface Damage 1 Total	Algae Total	Graffiti Total	Accretion 2 Scaled
44	1	0	4	45	1	17	11	50	10	0	0
45	0	2	75	80	60	30	19	90	18	0	0
46	0	1	2	125	6	70	22	20	7	0	0
47	4	19	55	280	0	120	31	37	0	2	0
48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
49	15	0	15	48	10	35	22	65	0	0	1
50	0	0	3	23	22	47	12	12	0	0	0
51	3	0	0	5	0	60	8	30	60	0	0
52	6	12	10	90	43	60	15	43	3	3	0
53	6	5	30	170	21	29	22	40	11	0	0
54	35	32	25	30	10	95	14	23	0	0	3
55	33	7	40	60	100	62	66	27	41	0	2
56	0	0	0	160	0	35	13	24	0	0	0
57	0	0	10	105	3	22	17	45	0	0	0
58	10	1	0	85	95	30	9	17	10	1	1
59	0	2	0	37	32	47	22	13	15	0	0
60	0	2	20	50	55	30	55	25	0	0	0
61	0	28	0	35	62	65	22	27	0	0	0
62	13	5	7	55	60	45	29	0	0	0	1
63	72	20	0	20	20	65	10	30	0	0	5
64	205	9	0	10	8	30	8	36	0	0	15
65	0	9	0	24	3	23	27	21	0	2	0
66	2	0	10	180	3	38	62	50	0	1	0
67	0	0	0	210	18	53	3	45	0	0	0
68	0	25	0	21	35	37	8	20	0	0	0
69	0	6	0	19	1	14	23	12	0	0	0
70	1	4	0	85	4	50	17	25	0	0	0
71	0	9	0	115	57	37	23	15	65	0	0
72	0	0	0	125	19	35	10	22	5	0	0
73	0	1	0	55	35	60	9	21	0	0	0
74	0	2	0	35	28	20	16	13	0	0	0
75	0	0	0	140	72	75	28	58	0	0	0
76	4	1	0	112	59	64	22	136	0	0	0
77	0	9	5	335	16	82	14	84	0	0	0
78	23	8	0	66	13	30	7	165	0	0	2
79	10	10	19	102	180	140	6	70	64	7	1
80	1	2	0	58	15	58	16	48	0	0	0
81	2	0	0	33	5	10	13	14	0	0	0
82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
83	0	0	0	33	18	35	10	33	0	0	0
84	0	0	2	0	10	5	2	12	0	0	0
85	2	0	7	37	15	25	41	40	61	0	0
86	20	13	0	80	5	50	26	28	0	0	1

Wellhead Conditions

Rizzi	Accretion 1 Scaled	Structural Cracks Scaled	Surface Cracks Scaled	Grime 2 Scaled	Grime 1 Scaled	Surface Damage 2 Scaled	Surface Damage 1 Scaled	Algae Scaled	Graffiti Scaled	Overall Rating
44	0	1	1	0	1	2	2	0	0	11
45	0	14	2	4	2	3	4	1	0	65
46	0	0	3	0	4	3	1	0	0	16
47	4	10	7	0	6	5	2	0	4	59
48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
49	0	3	1	1	2	3	3	0	0	25
50	0	1	1	1	2	2	0	0	0	10
51	0	0	0	0	3	1	1	3	0	7
52	3	2	2	3	3	2	2	0	6	21
53	1	5	4	1	2	3	2	0	0	36
54	7	5	1	1	5	2	1	0	0	28
55	2	7	1	6	3	10	1	2	0	67
56	0	0	4	0	2	2	1	0	0	10
57	0	2	3	0	1	3	2	0	0	19
58	0	0	2	6	2	1	1	0	2	10
59	0	0	1	2	2	3	1	1	0	14
60	0	4	1	3	2	8	1	0	0	45
61	6	0	1	4	3	3	1	0	0	17
62	1	1	1	4	2	4	0	0	0	23
63	4	0	0	1	3	1	1	0	0	10
64	2	0	0	0	2	1	1	0	0	10
65	2	0	1	0	1	4	1	0	4	17
66	0	2	4	0	2	9	2	0	2	44
67	0	0	5	1	3	0	2	0	0	7
68	5	0	1	2	2	1	1	0	0	8
69	1	0	0	0	1	3	0	0	0	13
70	1	0	2	0	3	3	1	0	0	12
71	2	0	3	3	2	3	1	3	0	17
72	0	0	3	1	2	1	1	0	0	9
73	0	0	1	2	3	1	1	0	0	8
74	0	0	1	2	1	2	1	0	0	10
75	0	0	3	4	4	4	2	0	0	22
76	0	0	3	4	3	3	6	0	0	21
77	2	1	8	1	4	2	3	0	0	20
78	2	0	2	1	2	1	7	0	0	13
79	2	3	2	11	7	1	3	3	13	30
80	0	0	1	1	3	2	2	0	0	12
81	0	0	1	0	1	2	1	0	0	8
82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
83	0	0	1	1	2	1	1	0	0	8
84	0	0	0	1	0	0	0	0	0	3
85	0	1	1	1	1	6	2	3	0	29
86	3	0	2	0	3	4	1	0	0	17

Rizzi	Accretion 2 Total	Accretion 1 Total	Structural Crack Total	Surface Crack Total	Grime 2 Total	Grime 1 Total	Surface Damage 2 Total	Surface Damage 1 Total	Algae Total	Graffiti Total	Accretion 2 Scaled
87	15	1	0	280	10	55	17	38	0	1	1
88	0	3	0	95	14	60	16	22	0	0	0
89	0	6	4	31	20	32	3	10	22	0	0
90	0	8	28	66	22	65	33	84	0	0	0
91	59	38	8	55	157	46	33	138	0	8	4
92	5	2	0	22	70	40	11	46	0	0	0
93	35	1	0	21	4	18	18	34	6	0	3
94	0	0	0	55	22	45	50	85	0	0	0
95	59	25	0	150	18	39	34	85	0	4	4
96	4	2	0	74	78	175	10	68	0	0	0
97	11	0	2	75	39	50	6	43	0	1	1
98	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
99	13	0	0	45	17	55	15	15	37	0	1
100	7	0	0	35	25	55	47	14	0	0	1
101	1	0	35	70	45	85	21	12	48	0	0
102	0	0	10	13	40	62	13	20	30	0	0
103	0	14	0	102	58	80	47	29	0	0	0
104	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
105	0	0	0	80	49	97	35	52	0	0	0
106	0	4	0	85	35	35	14	22	0	0	0
107	6	1	0	24	20	50	7	33	0	1	0
108	27	25	0	57	15	66	20	82	12	2	2
109	12	5	0	182	2	40	19	121	0	2	1
110	2	2	0	33	2	30	9	57	0	1	0
111	4	0	0	36	26	69	18	102	25	0	0
112	5	0	2	130	28	24	13	37	0	1	0
113	0	0	0	30	41	20	7	24	0	0	0
114	1	0	4	60	10	35	17	97	45	0	0
115	0	0	5	48	0	21	40	110	0	0	0
116	0	0	1	25	83	48	8	55	0	0	0
117	0	0	11	70	16	27	16	66	0	0	0
118	6	0	1	175	40	25	8	110	0	1	0
119	0	0	0	25	50	20	0	225	0	0	0
120	0	0	0	35	10	17	9	60	0	0	0
121	95	70	0	44	32	50	21	27	0	4	7
122	15	4	0	23	2	30	28	23	0	0	1
123	0	1	0	19	7	20	4	25	0	0	0
124	9	0	0	30	45	45	55	152	0	0	1
125	12	0	35	60	120	55	38	208	0	0	1
126	12	0	20	16	6	8	24	52	0	0	1
127	0	6	25	40	3	25	14	105	3	0	0
128	23	13	0	48	12	10	27	33	0	3	2
129	0	0	0	35	80	60	11	53	0	0	0

Rizzi	Accretion 1 Scaled	Structural Cracks Scaled	Surface Cracks Scaled	Grime 2 Scaled	Grime 1 Scaled	Surface Damage 2 Scaled	Surface Damage 1 Scaled	Algae Scaled	Graffiti Scaled	Overall Rating
87	0	0	7	1	3	3	2	0	2	16
88	1	0	2	1	3	2	1	0	0	12
89	1	1	1	1	2	0	0	1	0	6
90	2	5	2	1	3	5	3	0	0	41
91	8	1	1	9	2	5	6	0	15	39
92	0	0	1	4	2	2	2	0	0	11
93	0	0	1	0	1	3	1	0	0	12
94	0	0	1	1	2	7	3	0	0	31
95	5	0	4	1	2	5	3	0	8	27
96	0	0	2	5	9	1	3	0	0	14
97	0	0	2	2	3	1	2	0	2	9
98	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
99	0	0	1	1	3	2	1	2	0	11
100	0	0	1	2	3	7	1	0	0	27
101	0	6	2	3	4	3	0	2	0	38
102	0	2	0	2	3	2	1	1	0	16
103	3	0	2	3	4	7	1	0	0	30
104	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
105	0	0	2	3	5	5	2	0	0	24
106	1	0	2	2	2	2	1	0	0	11
107	0	0	1	1	3	1	1	0	2	7
108	5	0	1	1	3	3	3	1	4	18
109	1	0	4	0	2	3	5	0	4	19
110	0	0	1	0	2	1	2	0	2	8
111	0	0	1	2	4	3	4	1	0	16
112	0	0	3	2	1	2	2	0	2	13
113	0	0	1	2	1	1	1	0	0	6
114	0	1	1	1	2	3	4	2	0	17
115	0	1	1	0	1	6	4	0	0	29
116	0	0	1	5	2	1	2	0	0	10
117	0	2	2	1	1	2	3	0	0	20
118	0	0	4	2	1	1	4	0	2	13
119	0	0	1	3	1	0	9	0	0	11
120	0	0	1	1	1	1	2	0	0	8
121	15	0	1	2	3	3	1	0	8	20
122	1	0	1	0	2	4	1	0	0	17
123	0	0	0	0	1	1	1	0	0	4
124	0	0	1	3	2	8	6	0	0	37
125	0	6	1	7	3	6	8	0	0	56
126	0	4	0	0	0	4	2	0	0	28
127	1	5	1	0	1	2	4	0	0	29
128	3	0	1	1	1	4	1	0	6	18
129	0	0	1	5	3	2	2	0	0	12

Wellhead Conditions

Rizzi	Accretion 2 Total	Accretion 1 Total	Structural Crack Total	Surface Crack Total	Grime 2 Total	Grime 1 Total	Surface Damage 2 Total	Surface Damage 1 Total	Algae Total	Graffiti Total	Accretion 2 Scaled
130	11	0	3	155	100	90	18	158	10	1	1
131	11	12	8	55	25	15	12	180	0	1	1
132	0	3	0	65	5	80	18	27	0	0	0
133	0	0	0	37	14	56	15	23	0	0	0
134	1	7	0	62	20	52	10	21	0	0	0
135	8	10	50	20	35	50	15	28	75	0	1
136	35	16	0	43	25	60	10	26	0	1	3
137	0	1	0	17	17	40	14	20	0	0	0
138	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
139	0	0	0	10	45	45	6	7	10	0	0
140	4	8	20	17	28	82	0	30	7	0	0
141	10	5	5	225	65	45	24	31	3	0	1
142	0	9	0	33	2	25	2	3	0	0	0
143	0	6	0	70	17	70	9	15	30	0	0
144	0	0	0	55	0	45	13	2	5	0	0
145	0	0	0	41	5	145	11	40	46	0	0
146	0	5	20	45	13	135	10	25	0	0	0
147	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
148	0	0	0	37	0	14	30	13	0	0	0
149	10	0	0	65	10	55	10	10	10	1	1
150	0	0	0	50	47	35	10	14	40	0	0
151	0	0	0	30	110	10	7	11	0	0	0
152	3	0	0	100	85	35	16	35	0	0	0
153	0	0	0	0	12	70	12	20	15	0	0
154	0	0	0	60	57	80	1	36	20	0	0
155	20	3	0	14	10	30	9	5	7	0	1
156	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
157	0	5	0	152	58	149	19	130	0	0	0
158	22	12	0	170	40	72	48	22	0	4	2
159	5	0	0	35	5	5	15	3	0	1	0
160	3	10	3	35	35	35	6	28	0	1	0
161	0	1	0	21	114	40	14	20	0	0	0
162	7	20	0	235	16	95	12	59	15	0	1
163	2	3	25	98	63	57	22	90	3	0	0
164	0	0	20	40	6	75	16	65	4	0	0
165	1	2	0	22	52	67	28	43	2	0	0
166	0	1	6	88	37	55	15	23	11	0	0
167	32	28	7	84	28	97	8	42	0	5	2
168	20	2	20	30	36	70	15	31	60	1	1
169	0	0	2	195	15	80	12	43	33	0	0
170	0	1	0	145	16	40	3	65	2	1	0
171	10	6	52	167	42	64	42	44	0	1	1
172	0	9	15	80	51	65	25	55	0	2	0

Wellhead Conditions

Rizzi	Accretion 1 Scaled	Structural Cracks Scaled	Surface Cracks Scaled	Grime 2 Scaled	Grime 1 Scaled	Surface Damage 2 Scaled	Surface Damage 1 Scaled	Algae Scaled	Graffiti Scaled	Overall Rating
130	0	1	4	6	5	3	6	0	2	24
131	3	1	1	2	1	2	7	0	2	21
132	1	0	2	0	4	3	1	0	0	13
133	0	0	1	1	3	2	1	0	0	10
134	2	0	1	1	3	1	1	0	0	8
135	2	9	0	2	3	2	1	3	0	44
136	3	0	1	2	3	1	1	0	2	10
137	0	0	0	1	2	2	1	0	0	9
138	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
139	0	0	0	3	2	1	0	0	0	6
140	2	4	0	2	4	0	1	0	0	17
141	1	1	5	4	2	4	1	0	0	23
142	2	0	1	0	1	0	0	0	0	2
143	1	0	2	1	4	1	1	1	0	8
144	0	0	1	0	2	2	0	0	0	8
145	0	0	1	0	8	2	2	2	0	10
146	1	4	1	1	7	1	1	0	0	22
147	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
148	0	0	1	0	1	4	1	0	0	17
149	0	0	2	1	3	1	0	0	2	8
150	0	0	1	3	2	1	1	2	0	9
151	0	0	1	7	1	1	0	0	0	8
152	0	0	2	5	2	2	1	0	0	14
153	0	0	0	1	4	2	1	1	0	8
154	0	0	1	3	4	0	1	1	0	6
155	1	0	0	1	2	1	0	0	0	6
156	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
157	1	0	4	3	8	3	5	0	0	21
158	3	0	4	2	4	7	1	0	8	32
159	0	0	1	0	0	2	0	0	2	9
160	2	1	1	2	2	1	1	0	2	9
161	0	0	1	7	2	2	1	0	0	12
162	4	0	6	1	5	2	2	1	0	14
163	1	5	2	4	3	3	4	0	0	35
164	0	4	1	0	4	2	3	0	0	25
165	0	0	1	3	3	4	2	0	0	19
166	0	1	2	2	3	2	1	0	0	16
167	6	1	2	2	5	1	2	0	9	17
168	0	4	1	2	4	2	1	3	2	25
169	0	0	5	1	4	2	2	1	0	14
170	0	0	3	1	2	0	3	0	2	7
171	1	10	4	3	3	6	2	0	2	62
172	2	3	2	3	3	4	2	0	4	29

Rizzi	Accretion 2 Total	Accretion 1 Total	Structural Crack Total	Surface Crack Total	Grime 2 Total	Grime 1 Total	Surface Damage 2 Total	Surface Damage 1 Total	Algae Total	Graffiti Total	Accretion 2 Scaled
173	1	1	5	150	20	65	16	65	0	0	0
174	0	2	0	120	20	55	13	40	3	1	0
175	3	10	0	127	35	70	49	35	0	3	0
176	0	0	0	253	0	132	33	180	32	0	0
177	3	4	10	130	30	95	37	43	10	2	0
178	15	0	5	100	26	120	29	65	0	1	1
179	1	6	0	45	10	50	25	28	0	1	0
180	0	15	35	28	14	39	25	65	9	1	0
181	0	0	60	75	3	15	3	35	0	0	0
182	0	0	10	95	6	26	16	56	0	0	0
183	1	0	1	85	5	50	7	50	0	0	0
184	2	0	8	58	3	20	14	21	0	0	0
185	2	5	0	67	3	80	21	22	0	0	0
186	1	3	0	25	10	70	22	25	10	1	0
187	32	7	15	100	37	40	26	29	15	0	2
188	29	6	15	145	13	70	14	53	4	3	2
189	13	2	20	67	7	40	25	27	0	1	1
190	11	7	10	66	14	50	18	54	0	0	1
191	0	2	0	65	4	40	13	18	0	1	0
192	1	2	0	42	43	55	12	96	0	1	0
193	0	0	6	56	33	34	13	54	1	0	0
194	5	2	7	42	13	32	17	40	0	2	0
195	8	1	50	12	3	95	8	25	135	1	1
196	20	0	45	42	14	97	101	25	45	0	1
197	2	0	5	70	2	65	27	39	1	0	0
198	0	0	0	100	55	77	25	34	0	0	0
199	6	3	0	58	152	166	13	25	28	0	0
200	10	5	23	90	55	110	33	51	13	0	1
201	0	0	0	315	5	142	6	28	12	0	0
202	0	0	5	110	15	65	0	10	7	0	0
203	20	0	0	40	15	30	3	13	20	1	1
204	37	54	0	85	82	90	13	54	35	0	3
205	9	0	10	190	35	80	15	34	20	0	1
206	7	15	27	130	63	65	13	32	5	0	1
207	15	10	3	210	65	50	20	42	15	1	1
208	5	13	0	115	2	37	20	37	0	0	0
209	0	0	15	40	10	25	7	19	3	0	0
210	0	1	0	40	5	35	11	35	0	0	0
211	0	3	2	56	11	65	29	26	90	0	0
212	0	7	35	70	12	30	14	45	3	0	0
213	0	5	5	95	65	75	10	30	0	0	0
214	13	5	0	53	23	19	28	117	0	0	1
215	20	5	6	24	26	15	21	28	0	0	1

Rizzi	Accretion 1 Scaled	Structural Cracks Scaled	Surface Cracks Scaled	Grime 2 Scaled	Grime 1 Scaled	Surface Damage 2 Scaled	Surface Damage 1 Scaled	Algae Scaled	Graffiti Scaled	Overall Rating
173	0	1	4	1	3	2	3	0	0	18
174	0	0	3	1	3	2	2	0	2	12
175	2	0	3	2	4	7	1	0	6	32
176	0	0	6	0	7	5	7	1	0	30
177	1	2	3	2	5	5	2	0	4	32
178	0	1	2	2	6	4	3	0	2	25
179	1	0	1	1	3	4	1	0	2	16
180	3	6	1	1	2	4	3	0	2	40
181	0	11	2	0	1	0	1	0	0	43
182	0	2	2	0	1	2	2	0	0	19
183	0	0	2	0	3	1	2	0	0	8
184	0	1	1	0	1	2	1	0	0	14
185	1	0	2	0	4	3	1	0	0	14
186	1	0	1	1	4	3	1	0	2	14
187	2	3	2	2	2	4	1	1	0	28
188	1	3	3	1	4	2	2	0	6	24
189	0	4	2	0	2	4	1	0	2	29
190	2	2	2	1	3	3	2	0	0	20
191	0	0	2	0	2	2	1	0	2	9
192	0	0	1	3	3	2	4	0	2	13
193	0	1	1	2	2	2	2	0	0	15
194	0	1	1	1	2	3	2	0	4	17
195	0	9	0	0	5	1	1	6	2	40
196	0	8	1	1	5	15	1	2	0	85
197	0	1	2	0	3	4	2	0	0	21
198	0	0	2	3	4	4	1	0	0	18
199	1	0	1	9	9	2	1	1	0	16
200	1	4	2	3	6	5	2	1	0	39
201	0	0	8	0	7	1	1	1	0	10
202	0	1	3	1	3	0	0	0	0	6
203	0	0	1	1	2	0	1	1	2	4
204	12	0	2	5	5	2	2	2	0	17
205	0	2	5	2	4	2	1	1	0	20
206	3	5	3	4	3	2	1	0	0	31
207	2	1	5	4	3	3	2	1	2	20
208	3	0	3	0	2	3	2	0	0	15
209	0	3	1	1	1	1	1	0	0	15
210	0	0	1	0	2	2	1	0	0	8
211	1	0	1	1	3	4	1	4	0	20
212	2	6	2	1	2	2	2	0	0	33
213	1	1	2	4	4	1	1	0	0	14
214	1	0	1	1	1	4	5	0	0	21
215	1	1	1	2	1	3	1	0	0	18

Wellhead Conditions

Rizzi	Accretion 2 Total	Accretion 1 Total	Structural Crack Total	Surface Crack Total	Grime 2 Total	Grime 1 Total	Surface Damage 2 Total	Surface Damage 1 Total	Algae Total	Graffiti Total	Accretion 2 Scaled
216	65	10	11	13	90	41	25	19	0	2	5
217	3	2	3	56	69	65	29	34	0	0	0
218	13	22	0	22	3	14	44	42	0	2	1
219	15	29	30	41	250	74	34	69	0	0	1
220	12	1	82	103	46	32	25	110	0	0	1
221	5	3	0	65	60	85	25	41	0	0	0
222	1	6	10	47	13	80	6	90	0	0	0
223	65	31	0	23	0	25	18	113	0	2	5
224	65	25	15	63	15	10	24	123	0	2	5
225	40	12	20	53	3	9	12	95	0	1	3
226	0	1	77	80	4	33	25	130	0	0	0
227	110	45	5	125	63	66	58	70	0	2	8
228	6	0	0	95	37	35	17	100	0	0	0
229	2	7	0	165	0	8	14	55	0	0	0
230	1	0	0	50	3	23	12	16	0	0	0
231	0	0	25	95	30	70	5	65	0	0	0
232	4	8	25	95	16	40	36	60	2	0	0
233	2	0	2	12	0	0	10	25	0	0	0
234	0	0	2	0	10	5	2	12	0	0	0
235	0	0	2	63	3	22	13	18	0	0	0
236	3	1	4	125	13	31	0	5	0	0	0
237	0	0	3	180	18	27	1	5	0	0	0
238	1	0	5	80	65	150	2	5	0	0	0
239	0	0	0	65	30	25	0	9	0	0	0
240	0	0	1	5	45	250	0	4	0	0	0
241	41	33	2	0	80	95	2	0	40	0	3
242	0	0	1	70	35	90	2	9	20	0	0
243	0	0	0	8	32	85	1	6	20	0	0
244	30	5	1	10	35	110	0	0	0	0	2
245	0	0	2	23	20	40	1	6	15	0	0
246	0	0	0	55	6	35	0	10	0	0	0
247	1	0	4	70	0	55	2	14	0	0	0
248	0	0	8	33	24	50	5	14	0	0	0
249	0	0	1	20	9	25	0	7	10	0	0
250	0	0	3	13	17	40	0	4	5	0	0
251	0	0	4	4	15	25	25	40	15	0	0
252	0	0	0	16	2	45	0	18	10	0	0
253	0	0	1	5	10	110	0	20	0	0	0
254	1	0	2	65	0	40	15	45	0	0	0
255	0	0	4	16	20	20	130	130	0	0	0
256	0	0	4	14	0	25	25	30	0	0	0
? (Tor	0	0	0	26	75	195	0	60	0	0	0
? (Bur	16	0	0	45	25	65	0	20		0	1

Rizzi	Accretion 1 Scaled	Structural Cracks Scaled	Surface Cracks Scaled	Grime 2 Scaled	Grime 1 Scaled	Surface Damage 2 Scaled	Surface Damage 1 Scaled	Algae Scaled	Graffiti Scaled	Overall Rating
216	2	2	0	5	2	4	1	0	4	26
217	0	1	1	4	3	4	1	0	0	22
218	5	0	1	0	1	7	2	0	4	27
219	6	5	1	15	4	5	3	0	0	50
220	0	15	2	3	2	4	4	0	0	73
221	1	0	2	4	4	4	2	0	0	19
222	1	2	1	1	4	1	4	0	0	15
223	7	0	1	0	1	3	5	0	4	17
224	5	3	2	1	1	4	5	0	4	31
225	3	4	1	0	0	2	4	0	2	25
226	0	14	2	0	2	4	5	0	0	69
227	10	1	3	4	3	9	3	0	4	45
228	0	0	2	2	2	3	4	0	0	16
229	2	0	4	0	0	2	2	0	0	12
230	0	0	1	0	1	2	1	0	0	8
231	0	5	2	2	4	1	3	0	0	24
232	2	5	2	1	2	5	2	0	0	40
233	0	0	0	0	0	1	1	0	0	8
234	0	0	0	1	0	0	0	0	0	3
235	0	0	2	0	1	2	1	0	0	10
236	0	1	3	1	2	0	0	0	0	5
237	0	1	4	1	1	0	0	0	0	6
238	0	1	2	4	8	0	0	0	0	9
239	0	0	2	2	1	0	0	0	0	2
240	0	0	0	3	13	0	0	0	0	5
241	7	0	0	5	5	0	0	2	0	8
242	0	0	2	2	5	0	0	1	0	5
243	0	0	0	2	4	0	0	1	0	3
244	1	0	0	2	6	0	0	0	0	4
245	0	0	1	1	2	0	0	1	0	4
246	0	0	1	0	2	0	0	0	0	2
247	0	1	2	0	3	0	1	0	0	6
248	0	1	1	1	3	1	1	0	0	10
249	0	0	0	1	1	0	0	0	0	2
250	0	1	0	1	2	0	0	0	0	3
251	0	1	0	1	1	4	2	1	0	18
252	0	0	0	0	2	0	1	0	0	2
253	0	0	0	1	6	0	1	0	0	3
254	0	0	2	0	2	2	2	0	0	12
255	0	1	0	1	1	19	5	0	0	76
256	0	1	0	0	1	4	1	0	0	17
? (Tor	0	0	1	5	10	0	2	0	0	8
? (Bur	0	0	1	2	3	0	1	0	0	3