

# SOCIAL RETURN ON INVESTMENT REPORT

## HEADWATERS AT THE COMAL EDUCATION AND NATURE CENTER PROJECT

*Comal County, Texas*

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PRODUCED FOR AND FUNDED BY: HEADWATERS AT THE COMAL



July 2022



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Signed

Mr Ben Carpenter  
Chief Executive Officer  
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## 1.0 Executive Summary

This report contains a forecast of the economic, social, and environmental outcomes expected from the Phase II expansion of the Headwaters at the Comal Education Center in New Braunfels, Texas. New Braunfels is a city of over 90,000 residents in Comal County, slightly north of the San Antonio Metropolitan Area in Texas. A great amount of analysis was done prior to embarking on the development of the site and that work is not repeated or reproduced herein. We reference other work as appropriate to support our assumptions and conclusions, but this report is focused on determining the environmental, economic, and social benefits created as a result of planned work.

Ultimately, the long-term development of the site will encompass many phases covering a number of years. This specific report focuses on value created to date from Phase I relative to pre-Center conditions and predicts benefits to be created by the planned Phase II intended to commence in 2022. In large part, the phasing is for financing and planning purposes. For the purpose of this analysis and to determine baseline, the “project” is the center and pre-project conditions were the vacant maintenance facility and lot. Value created is based on a start year of the first year operating with a completed Phase II, defined as Year One. Future phases will be evaluated when appropriate and this report updated accordingly.

The 16-acre site is on land owned by New Braunfels Utilities (NBU) who utilized it as a maintenance yard since the 1940’s until 2004 but has since transferred operation to a newly created non-profit to create a legacy conservation project known as Headwaters at the Comal (Headwaters). The Headwaters project has been in operation since 2017 but is seeking funding to perform a Phase II expansion that will significantly improve the facilities and offerings. The Social Return on Investment (SROI) analysis presented by this report was commissioned by Headwaters in order to make a more comprehensive and compelling case for the funding request. In the short term, the intent is to demonstrate the wide range of value and benefits to be created for the community. Longer term, Headwaters will also utilize the SROI results to expand their communications and reporting.

The site is a very valuable and unique location because it is a combination of historical, cultural, economic, and environmental attributes. For example, the site’s name, Headwaters at the Comal, reflects its role as the source spring for the Comal River. The region is characterized by springs seeping from a very important aquifer. Evidence shows that this area was a focal point for people for at least 8000 years due to its value as a source of water. It still serves as a water source area in that NBU operates an active well field and pumping station for municipal water supply. However, there are other natural attributes in the area such as biodiversity and archaeological finds that make this an excellent location for education and interacting with the natural environment. This coupled with NBU’s commitment to make this a place of experiential learning and interaction with nature, makes Headwaters ideal. As noted on their website “The Comal River is the heart and soul of New Braunfels, that is why we are rejuvenating 16 acres at the headwaters of the Comal River where people can learn, have fun, and experience history and nature. We are strengthening the relationship between the community and nature by showcasing the significance of the Comal Springs.” The mission of the organization is to *“Strengthen the relationship between the community and nature by showcasing the significance of the Comal Springs. A premier education center inspiring hearts and minds on the importance of conservation to community.”*

It is important to point out that very significant analysis of the site was done in 2012 during the initial Master Planning. These studies included ecological, environmental, cultural, archaeological, and

economic components and involved onsite observation, research of published and site historical information, and stakeholder engagement. These works provided a wealth of information that was used by EcoMetrics to determine the assumptions to be used in the SROI analysis. We do not repeat all the detailed findings herein, but do reference that Master Plan, known as the Comal Springs Conservation Report (Lake/Flato et al, 2012) and it is incorporated by reference.

## 1.1 Social and Market Value Creation

The following major stakeholder groups will benefit from the Headwaters project:

- **The Environment**, due to improved soil formation, erosion control and water retention, water quality improvement (via natural treatment), support of pollinator populations, habitat creation and protection and the biologic control of invasive species.
- **Funder (includes NBU and donors)**, monetarily from enhanced reputation, improved marketing opportunities, and the market value of the carbon sequestered, the nitrogen intercepted, and the phosphorus intercepted
- **Community at large (includes adjacent residents and visitors to the Center)**, from enhanced marketing and outreach opportunities, enhanced reputation and well-being derived from tourism and volunteering, and sense of community pride. Other outcomes include storm flooding protection, air quality improvements, phosphorus and nitrogen retention, carbon sequestration, and cultural, historical and amenity value. In addition, the community benefits widely from enhanced physical and mental health as well as an increased property value.
- **Students visiting the site for educational purposes**, from the value of educational programs and opportunities at the site, and from the future value of educational opportunities such as field trips.
- **Researchers and Academia**, from improved earnings from research stipends for enhanced research opportunities in and around the project site.
- **Headwaters at the Comal Center**, increased visitors and activities at the center will generate visitor revenue and new sources of grants and donations.
- **Employees of the Center**, their employment (for both staff and interns), earnings from retail sales and additional training for interns that is expected to increase future job opportunities.

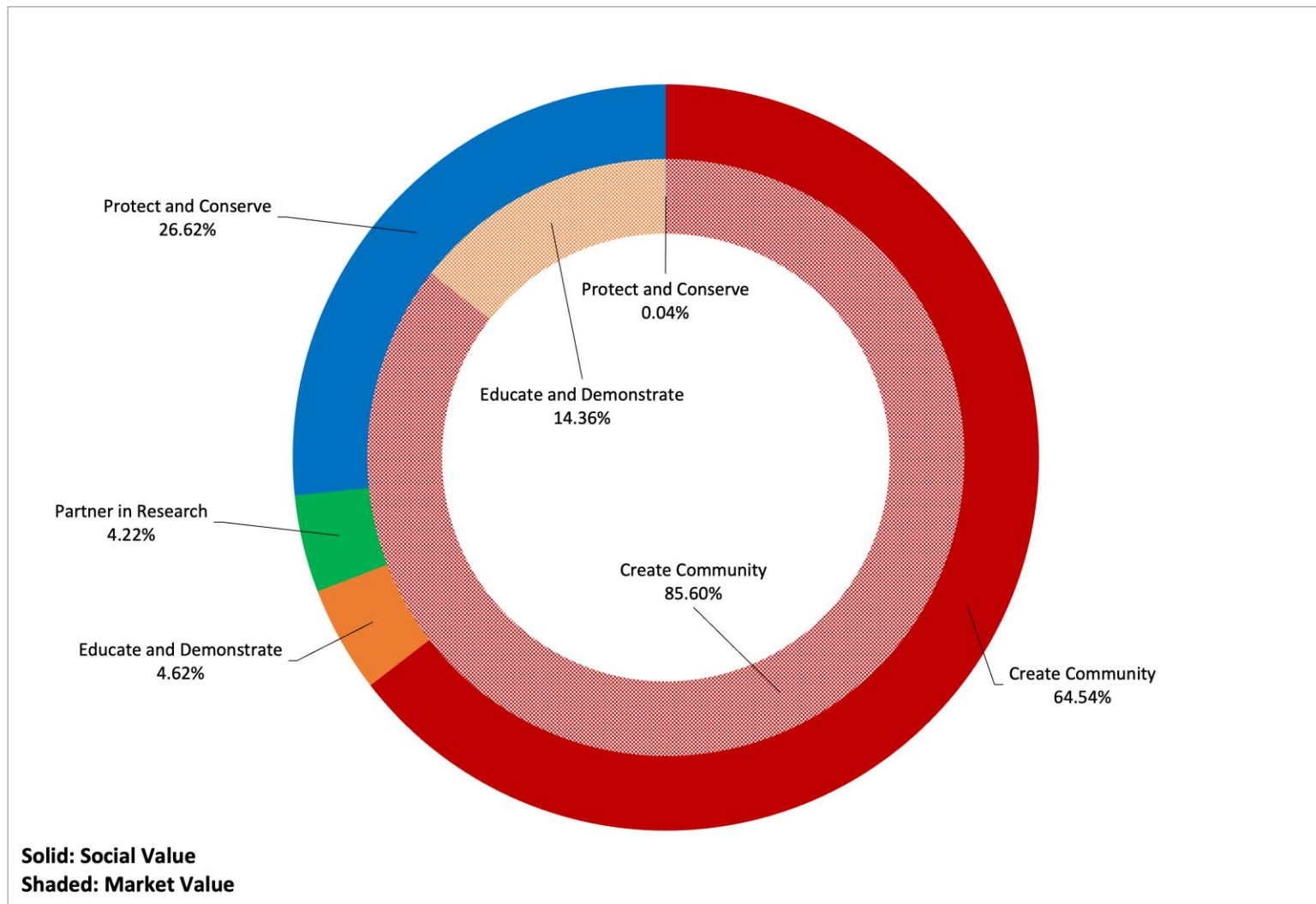
The SROI analysis of the anticipated outcomes for each stakeholder group shows a positive social return associated with the Headwaters project. An investment of \$27,838,056, which includes two main capital investments totaling \$16,000,000 creates approximately \$58,614,502 of net social impact over 25 years, resulting in an indicative SROI ratio of 2.11:1 (Table 1). In other words, the SROI analysis presents evidence that substantiates that for every dollar invested in Headwaters by Funders, \$2.11 is returned to community stakeholders in social value. Additionally, \$7,304,419 in direct market value is returned to Funders largely from the value of enhanced reputation, license to operate, and brand positivity, a direct market return of \$0.26 for every dollar invested (Table 1). In sum, with an initial investment of \$27,838,056 in financial capital, the community and funding stakeholders see a return of \$65,918,921 over 25 years (Table 2) for a total return on investment of 2.37:1. Figures 1 and 2 reflect the same information graphically. The Tables and Figures reflect value created sorted both by Stakeholder type and by the four pillars of the Center's mission and vision.

**Table 1: Return on Investment by Center Pillars**

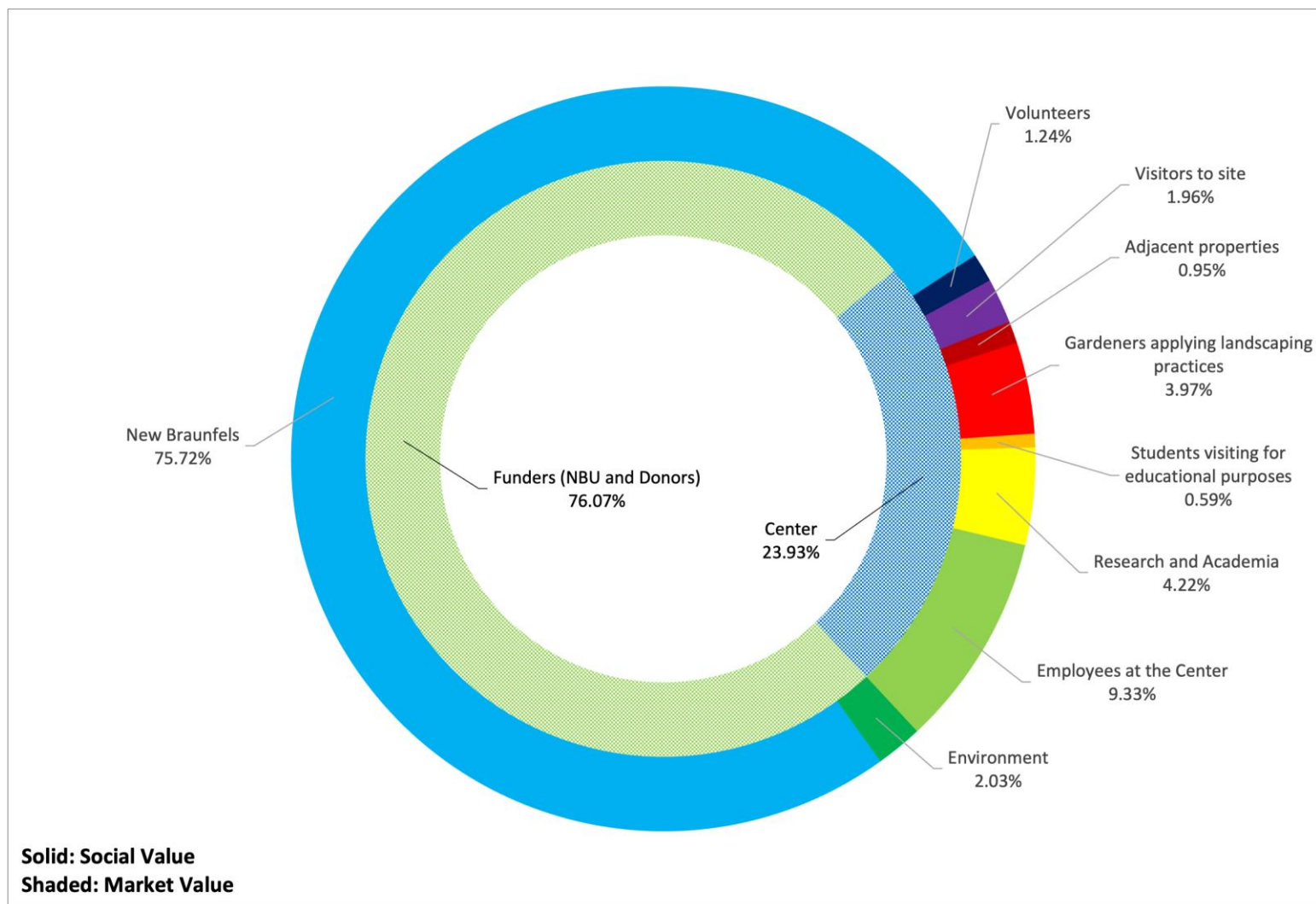
| Center Pillar   | Investment             | Market Value          | Social Value           |
|---|------------------------|-----------------------|------------------------|
| Create Community  |                        | \$5,398,435.00        | \$33,638,103.00        |
| Educate and Demonstrate   |                        | \$905,637.00          | \$4,432,322.00         |
| Partner in Research   |                        |                       | \$2,196,984.00         |
| Protect and Conserve  |                        | \$2,534.00            | \$13,874,827.00        |
| <b>Total Investment (Phase I and II)</b>  | <b>\$27,838,056.00</b> |                       |                        |
| Carryover from Phase I  |                        | <b>\$997,813.00</b>   | <b>\$6,646,649.00</b>  |
| <b>Total Present Value</b>  |                        | <b>\$7,304,419.00</b> | <b>\$58,614,502.00</b> |
| <b>Market and Social Return on Investment (dollar returned per dollar invested)</b> |                        | <b>0.26</b>           | <b>2.11</b>            |

**Table 2: Social and Market Return on Investment Summary**

| Description                         | Value           |
|-------------------------------------|-----------------|
| Present Value of Total Social Value | \$58,614,502.00 |
| PV of Total Investment              | \$27,838,056.00 |
| Social Return on Investment         | 2.11            |
| PV of Total Market Value            | \$7,304,419.00  |
| Market Return on Investment         | 0.26            |
| PV Social + Market Value            | \$65,918,921.00 |



**Figure 1: Social and Market Value Generated by Center Pillar**



**Figure 2: The Benefit of Action by Stakeholder**

## 2.0 Social Return on Investment Background

### 2.1 Purpose of Social Return on Investment

This report presents a Social Return on Investment analysis for the Phase II expansion of the Headwaters at the Comal Education Center in New Braunfels, Texas. The 16-acre site is on land owned by New Braunfels Utilities (NBU) who utilized it as a maintenance yard but has since transferred operation to a newly created non-profit to create a legacy conservation project known as Headwaters at the Comal (Headwaters). The Headwaters project has been in operation since 2017 but is seeking funding to perform a Phase II expansion that will significantly improve the facilities and offerings.

A multi-phased master plan was created for the site to transition from the NBU maintenance yard to a multifaceted facility that includes natural open space, education-focused buildings, and other supporting features. The intent was to have the site demonstrate many environmental and cultural aspects of this natural feature, the Comal Springs. The first phase of work commenced in 2016, which included some initial enhancements of the area immediately along the spring and river, as well as converting some of the existing structures for offices and group events. But the showcase of phase I is the 4-acre restoration of a native grasses area along the river and spring. This has resulted in flood mitigation, enhanced habitat, water quality protection, and erosion control. Equally important, the site is open to the public and has already provided visitors and school groups with educational and recreational value. As part of the site development, a significant archaeological site was uncovered that represents settlement in the area around the springs dating back 8000 years. This has expanded the mission of the center to be not only about environmental aspects, but also local cultural and historical value.

Headwaters is located in New Braunfels, a city in Comal County, Texas. For the purpose of this analysis and to determine baseline, the “project” is the center and pre-project conditions were the vacant maintenance facility and lot. The analysis builds on results and benefits created to date during phase I (2017-2022), and predicts the additional environmental, economic, and social benefits to be created by Phase II over a 25-year time horizon (2023-2048).

The objective of this report is to use the SROI methodology for the following purposes:

- Identify and engage key stakeholders affected significantly by this project – Understand what each stakeholder wants changed (objectives), what they contribute (inputs), what activities they do (outputs) and what changes for them (outcomes, intended or unintended) as a result of their involvement;
- Measure and value the social impacts of this project – Understand the value created as a result of the changes experienced by each stakeholder group by using indicators to measure the outcomes and financial proxies to value the outcomes; and
- Create a forecast analysis to measure and evaluate the anticipated future impacts of site development – Articulate the key drivers of social value and identify what data are needed to best measure and evaluate the impacts of activities.

To fully measure and evaluate the impacts of the Headwaters project, this research incorporates scientific data on the objective social, environmental, and economic impacts of both the natural space as well as the impact of being an accessible education and recreation center into the SROI evaluation. These data are directly tied to the outcomes identified by the key stakeholders and used to quantify the social value of changes. The SROI methodology presents these social values in terms of financial equivalents, which

allows stakeholders across the board to evaluate the cost/benefit favorability or unfavorability of proposed projects and project alternatives. **Such valuation of outcomes will allow Headwaters and its partners such as NBU and other donors to understand the internalized financial benefits and externalized societal benefits of making investments in the site's development.**

This report provides a brief overview of the SROI methodology, the analysis approach, the objectives and activities of the Headwaters project, and the key findings and assumptions made when completing the analysis. Finally, this report includes a discussion of the SROI results and recommendations. The audience for this SROI report is Headwaters and NBU management, although Headwaters will also use findings of this study to communicate the impact of the project to donors and other local and regional stakeholders who may be affected by the site's development. **The data derived through this research will be used as baseline data to assess and monitor the social impacts of the project.**

## 2.2 Social Return on Investment Approach

SROI is a framework for measuring and accounting for the broad concept of social value, a measure of change that is relevant to people and organizations that experience it. This concept of value goes beyond what can be captured in pure, market-based financial terms, seeking to reduce inequality and environmental degradation and improve wellbeing by incorporating social, environmental, and economic costs and benefits into project valuation (SROI Network, 2012). For analytical purposes, SROI converts non-financial values into their financial equivalents, using both subjective and objective research to estimate those values. EcoMetrics LLC believes this is what makes SROI different from other forms of social-impact analysis, and therefore more valuable to funders and supporters.

There are two types of SROI analysis:

- Forecast, which is designed to understand and predict the desired impact and outcomes of a program or activity for significant stakeholders
- Evaluative, which is conducted retrospectively to validate a forecast or baseline SROI to understand if the impact sought was achieved

Forecast SROIs are especially useful in the planning stages of an activity. They can help show how investment can maximize social impact and are also useful for identifying what should be measured once the project is implemented (SROI Network, 2012).

SROI was developed from social accounting and cost-benefit analysis and is based on seven principles of social value (SROI Network, 2012):

1. Involve stakeholders – Inform what gets measured and how this is measured by involving stakeholders;
2. Understand what changes – Articulate how change is created and evaluate this through evidence gathered, recognizing positive and negative changes as well as those that are intended and unintended;
3. Value things that matter – Use financial proxies in order that the value of all outcomes can be recognized including those that are not traded in markets but are affected by activities;
4. Only include that which is material – Determine what information and evidence must be included in the accounts to give a true and fair picture, such that stakeholders can draw reasonable conclusions about impact;
5. Do not over-claim – Only claim the value that organizations are responsible for creating;

6. Be transparent – Demonstrate the basis on which the analysis may be considered accurate and honest, and show that it will be reported to and discussed with stakeholders; and
7. Verify the result – Ensure appropriate independent assurance.

The SROI process works by developing an understanding of the program being analyzed, how it meets its objectives, and how it works with its stakeholders. The SROI framework accounts for a broad concept of value and focuses on answering five key questions:

**Table 3: Key Questions Addressed by SROI Framework**

| Question                       | Definition   |
|--------------------------------|--|
| Who changes?                   | Taking account of all the people, organizations, and environments affected significantly                     |
| How do they change?            | Focusing on all the important positive and negative changes that take place, not just what was intended      |
| How do you know?               | Gathering evidence to go beyond individual opinion   |
| How much is you?               | Taking account of all the other influences that might have changed things for the better (or worse)          |
| How important are the changes? | Understanding the relative value of the outcomes to all the people, organizations, and environments affected |

SROI puts a value on the amount of change (impact) that takes place as a result of the program and looks at the returns to those who contribute to creating the change and others who benefit from it. It estimates a value for this change and compares this value to the investment required to achieve that impact, resulting in an SROI ratio. It takes standard measures of economic return a step further by placing a monetary value on social returns (Social Ventures Australia, 2011). The development of an impact map demonstrating the impact value chain for each stakeholder group is critical to this process. It links stakeholders' objectives to inputs (e.g., what has been invested), to outputs (e.g., number of acres preserved), through to the outcomes (e.g., increase in income through employment). The process then involves identifying indicators for the outcomes, so that we can measure if the outcome has been achieved. The next step is to use financial proxies to value the outcome.

It is then necessary to establish the amount of impact each outcome has had. Impact is defined in the SROI as an estimate of how much of the outcome would have happened without the project and the proportion of the outcome that can be isolated as being added by the activities being analyzed. A number of filters are utilized in the analysis to render additional validity and stability to the conversion of non-market social values into their financial equivalents. SROI uses four filters applied to each outcome to establish the impact of the activities:

- Deadweight – What would have happened anyway?
- Displacement – Were other outcomes displaced to create the outcome?
- Attribution – Who else contributed to the outcome?
- Drop-off – How much does the outcome drop-off each year?

Establishing impact is important as it reduces the risk of over-claiming and may also help identify any important stakeholders that may not have been included in the analysis.

## 2.3 SROI Research Approach for Headwaters Site

The comprehensive benefits of this project – which include social, economic, and environmental outcomes – were tracked, measured, and reported on, utilizing the EcoMetrics methodology. EcoMetrics incorporates the guiding principles of Social Value International’s (SVI) SROI Methodology. For the purpose of this analysis and to determine baseline, the “project” is the center and pre-project conditions were the vacant maintenance facility and lot. Value created is based on a start year of the first year operating with a completed Phase II, defined as Year One. Future phases will be evaluated when appropriate and this report updated accordingly.

The Headwaters project was analyzed using the initial capital investments of approximately \$8,000,000 for Phase I, a planned \$8,000,000 for Phase II, as well as anticipated annual investment and assessing the benefits over a 25-year time horizon with a 5% discount rate.

The forecast SROI analysis was undertaken in six stages. These stages and the activities completed in each of them are listed below:

1. Establish scope and identify stakeholders
  - a. Define boundaries and time scale for analysis
  - b. Define stakeholders
2. Map outcomes
  - a. Engage with stakeholders to develop an impact map that shows the relationship between objectives, inputs, outputs and outcomes
3. Evidence outcomes and giving them a value
  - a. Synthesize data from stakeholder interviews into an impact map
  - b. Identify relevant indicators and financial proxies to monetize the social outcomes, where possible
  - c. Define the investment, both direct cash investments and pro bono contributions from the relevant stakeholders
  - d. Conduct follow up interviews and share analysis with stakeholders to verify evidence where required
  - e. Test assumptions with key project team members and stakeholders
4. Establish impact
  - a. Determine those aspects of change that would have happened anyway or are a result of other factors
5. Calculate the SROI
  - a. Populate and use the EcoMetrics model to sum all the benefits, subtract any negatives and compare the result to the investment. This is also where the sensitivity of the results is tested.
6. Report, use and embed
  - a. Write a detailed report which describes the methodology, assumptions made, results and recommendations
  - b. Complete summaries of the SROI analysis
  - c. Report to stakeholders, communicate and use the results, and embed the SROI process in the organization

In addition, the SROI analysis will be used to provide a baseline indicator of whether the Headwaters project has and will create social value. **The primary purpose of the baseline SROI is to identify outcomes, guide forward planning and establish what needs to be monitored and measured to demonstrate success.**

It is important to point out that very significant analysis of the site was done in 2012 during the initial Master Planning. These studies included ecological, environmental, cultural, archaeological, and economic components and involved onsite observation, research of published and site historical information, and stakeholder engagement. These works provided a wealth of information that was used by EcoMetrics LLC to determine the assumptions to be used in the SROI analysis. We do not repeat all the detailed findings herein, but do reference that Master Plan, known as the Comal Springs Conservation Report (Lake/Flato et al, 2012) and it is incorporated by reference.

## 2.4 Challenges with Applying the SROI Methodology to Environmental Projects

Projects with environmental and nature-based solutions attributes are different than typical SROI-related projects. Benefits tend to focus on changes to the environment and natural ecosystems, which in turn have impact and provide benefits to, a variety of stakeholders. Applying the SROI methodology to environmental projects, however, poses unique challenges. The SROI methodology has historically been used by community organizations focused on social welfare programs which have a clearly defined period of investment and an associated commensurate period of benefits (Social Ventures Australia Consulting, 2011). With nature-based solution environmental projects, many of the benefits are often not readily or immediately apparent to stakeholders. For example, the assignment of carbon, nitrogen, and phosphorus offset credits provide direct benefits to the funders and partners. However, the environmental value of carbon, nitrogen, and phosphorus for other stakeholders and society at large are generally not identified as outcomes through stakeholder engagement.

To account for these more intangible assets, the environment is considered as a stakeholder, as though it were a person or an organization. The specific outcomes associated with the environment were derived from the scientific literature and research and interviews with government agency officials that are responsible for environmental factors. The results of this research can be considered outcomes that will accrue to various stakeholder groups in the future. However, environmental benefits also have ancillary benefits to other stakeholders and those are also noted and accounted for herein. For this project, the input of the government stakeholders helped define the benefits to be created for the environment.

## 2.5 Who Worked on the Report?

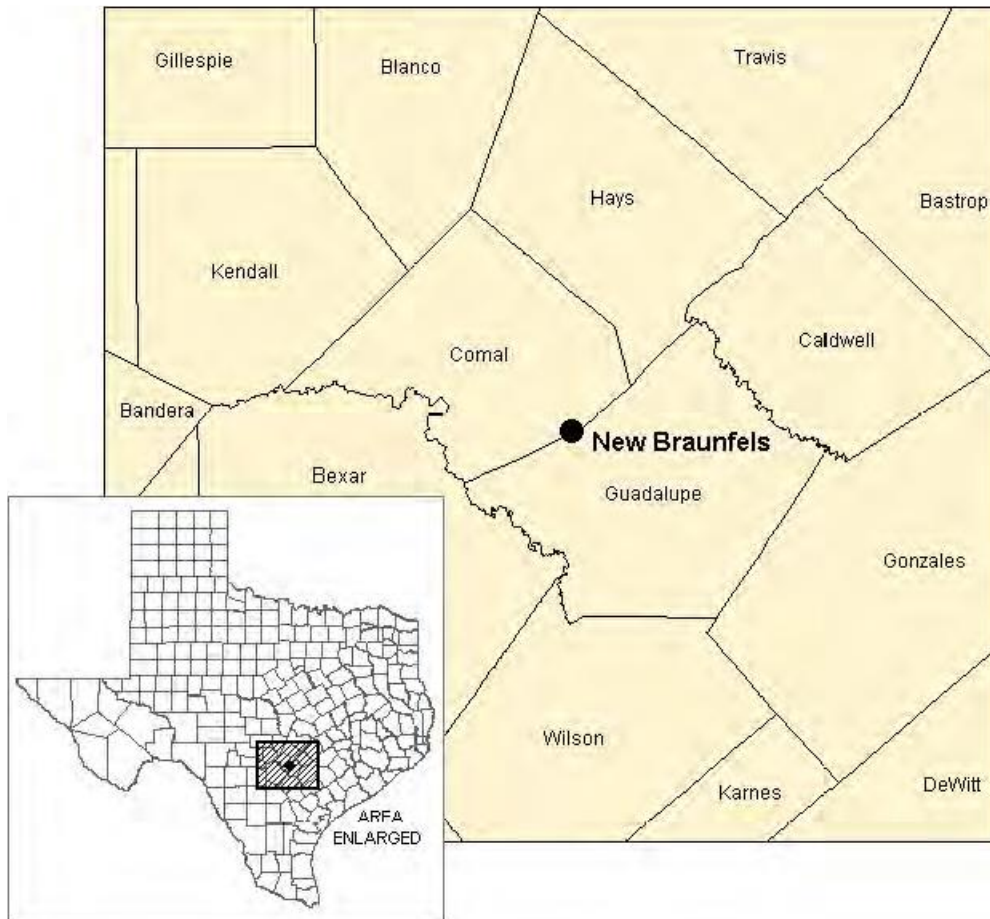
Names and qualifications of key team members are provided in the Appendix.

# 3.0 Project Background

## 3.1 Regional Demographics

This study assesses the social value of the Headwaters at the Comal education center, located in New Braunfels, Texas between San Antonio and Austin (Figure 3). According to the US Census Bureau, in 2019 New Braunfels had a population of approximately 90,200 people. In the nine-year period between

2010 and 2019, the city of New Braunfels saw a population increase of over 56%. In 2019, New Braunfels experienced a civilian workforce unemployment rate of 2.2%. At the same time, the city's per capita income was below the value for Comal County, and the United States, but above the value for the state of Texas. The city's per capita income change between 2010 and 2019, tabulated at an increase of 28.6%, is illustrative of a community experiencing growth (Table 4; U.S. Census Bureau, 2010, 2019).



**Figure 3: Project Location and Associated System Overview**

**Table 4: Regional Demographics for Project Area**

| Spatial Extent              | Population  |             |                          | Unemployment (Civilian, Age 16+) |      |                          | Per Capita Annual Income |             |                          |
|-----------------------------|-------------|-------------|--------------------------|----------------------------------|------|--------------------------|--------------------------|-------------|--------------------------|
|                             | 2010        | 2019        | Percent Change 2010-2019 | 2010                             | 2019 | Percent Change 2010-2019 | 2010                     | 2019        | Percent Change 2010-2019 |
| <b>New Braunfels, Texas</b> | 57,676      | 90,209      | 56.4%                    | 3.5%                             | 2.2% | -37.1%                   | \$25,975.00              | \$33,405.00 | 28.6%                    |
| <b>Comal County, Texas</b>  | 108,520     | 156,209     | 43.9%                    | 3.6%                             | 2.1% | -41.7%                   | \$31,862.00              | \$38,991.00 | 22.4%                    |
| <b>Texas (State)</b>        | 25,146,091  | 28,995,881  | 15.3%                    | 4.6%                             | 3.3% | -28.3%                   | \$24,870.00              | \$31,277.00 | 25.8%                    |
| <b>United States</b>        | 308,758,105 | 328,239,523 | 6.3%                     | 5.1%                             | 3.4% | -33.3%                   | \$27,334.00              | \$34,103.00 | 24.8%                    |

### 3.2 An Important Focal Point for Water

Fed by one of the largest systems of springs in the southwestern U.S., the Comal River is located entirely within the city limits of New Braunfels, Texas. The Comal Springs, in turn, are supplied by the Edwards Aquifer, a very important regional aquifer which underlies and serves multiple counties in south central Texas. Archeological research suggests that the area surrounding the Comal Springs has been utilized by humans for at least 8,000 years. Beginning in the 19th century, European settlers used the water from the springs to power various types of mills and for hydroelectric power. By the end of the 19th century, the area now known as Landa Park had become a popular area for recreation, and it remains so today.

In the early 20th century, the city of New Braunfels purchased three springs at the headwaters of the Comal River to supplement its existing water supply. Over the next few decades, the springs were capped, and various buildings were constructed on the property to facilitate the property's use by New Braunfels' Water Works, and later New Braunfels Utilities (NBU).

### 3.3 Project Partners

Headwaters at the Comal was founded in 2017 as a non-profit to create a legacy conservation and educational project at a former New Braunfels Utilities (NBU) maintenance yard. This yard was associated with a municipal water supply well field and pump station adjacent to the Comal Springs which feed the Comal River. NBU continues to remain operationally and financially engaged with the site and support the Headwaters staff. NBU has a variety of interests in this project, including direct stewardship and protection of a key water supply source in their system, as well as supporting their sustainability and stewardship legacy and goals. Because of these reasons, NBU is the most active partner supporting the Center.

Headwaters also benefits from a wide array of supporting partners that have been instrumental in getting the work to where it is now in 2022, and to position it to move forward with future phases. Partners include local residents who are donors, civic groups, local educators, technical and subject matter experts in a variety of topics. Headwaters has rapidly become a focal point for demonstrating many ideas and concepts that can help the community as a whole. In addition to providing financial support, these partners also play a key role in developing this study.

Headwaters essentially wants to serve as a place for visitors to come and experience the impact of the Comal Springs on the region and see first-hand the importance of environmental attributes in protecting key source water areas. The hope is that visitors and students can take what they learn here and apply it in their lives. This will result in even greater sustainability for the region than could be done by the 16-acre site alone. This can generate quantifiable social, environmental, and economic benefits to communities surrounding the project.

Coincident with the social value of the site and project, Headwaters has attracted many scientists and government agency partners because of its environmental significance. The site is a key source of water and the site's goal of protecting the spring itself, local wildlife, and biodiversity makes it a key location for environmental stewardship. The historical significance of the site has also attracted subject matter experts in archaeology and social sciences.

### 3.4 Project Description

Situated at the headwaters of the Comal River, during the NBU time, the site was dominated by impervious cover in the form of concrete, gravel parking lots, and buildings. It was used by NBU for many years for the purpose of managing their utilities on site and throughout the area. The property includes two wells, a ground water storage tank, a booster pump station, a building platform, and ten buildings; two of which are historic. Other unique elements on site include, a previously existing house foundation slab, and a grove of trees; all of which are situated on a small pervious area, which make up approximately 37% of the total site area. Adjacent to the site are the springs, which is home to many endangered species. The property is also located southeast of a retirement community and residential area above the escarpment, southwest of prime farmland, and northeast of the Heidelberg Lodges. It is approximately two miles from downtown New Braunfels. (Refer to Figure I-1) (Klingemann Report, Lake/Flato et al, 2017).

Phase I was focused on spring restoration and protection, including removing part of a concrete cap that had been put on the spring. Whereas this may seem counterproductive in terms of protection of the spring, it does help increase habitat for the endangered species in the area by providing access. The riparian work will help protect the spring and offset any risk introduced by partially removing the cap.

Other work included some stormwater runoff management features, and enhancement of the vegetated area along the river. Finally, some modifications were done to site structures to provide offices for the Headwaters team and a pavilion for group events. Even though the site opened to visitors and educational events, as well as renting the pavilion for some group events during Phase I, it is not yet fully configured for large operation. For example, there are no restroom facilities other than those in the office area. More importantly, Phase II will enhance site structures to serve as demonstration, interpretative, and education features. Additional renovations will make the site more conducive to rental for group events and

meetings, as well as support features such as parking and restroom facilities. Work will also continue on the long-term transition from impervious surface dominated to pervious surface dominated.

The project overall hopes to build on two main areas:

- Environmental and nature based – such as source water protection, stormwater runoff mitigation, habitat and biodiversity improvement and protection, and water quality impact protection. Because the site sits in the 100-year floodplain and is surrounded by urban and suburban development, flooding and poor-quality runoff is of real concern for source water protection. Biodiversity management is also critically important because the site has both threatened and endangered species which must be accommodated and protected, but also has harmful invasive species which must be controlled. Invasive species actually cause problems for the desired biodiversity and habitats. Because of these elements, combined with water quality and quantity protection, there is significant interest in this site from government agencies. The restoration work will restore ecosystems that become self-sustaining and self-correcting. This is more effective than static and isolated replacement which requires frequent and long-term maintenance. Finally, the restoration of the nature-based elements will in turn provide education and experiential opportunities.
- Socio-cultural – such as raising awareness of the springs to local history and culture, the importance to the local economy, and provide for experiential learning of sustainable attributes such that visitors can take what they learned to practice at home and at work. It was already known how important these spring areas are to Texas, especially the Comal Springs and River, but the archaeological discoveries made during Phase I site work accentuated the cultural and historical value of the site, which needs to be protected and preserved. These discoveries also serve as an important research and educational opportunity.

### 3.5 Ecological Overview

The site is interesting in that it naturally consists of riparian areas along the river but upland area for the remainder of the site. A long history as the NBU yard makes it commercial industrial rather than natural, and over the years the area has been ecologically degraded in terms of runoff impact, soil stability, and biodiversity. It is the importance of the springs as a water source that makes the area so important, and the goal of the Center is in part to return conditions back to the more natural and protective state. This also makes the site unique, even though there are other, less critical but important springs in the general area.

The Comal Springs/River system is the largest spring system in Texas and is in one of the fastest growing counties in the state of Texas. The general area of New Braunfels and the immediate region is of national importance because of the Edwards Aquifer, which is one of the most important aquifers in Texas and ranks nationally as a source of drinking water for very large and populated areas. The geology of the area makes it uniquely sensitive in that the aquifer outcrops in the area and therefore recharge is important. Secondly, the geology is characterized by karst limestone features, which means that degradation of surface waters can easily infiltrate deeper levels and contaminate subsurface supplies. Springs are hydro-geologically important as they represent surficial discharges of subsurface aquifers. The presence and

history of the NBU water supply installation at this location is evidence of the importance. In other words, the Comal Springs represent a visible and tangible link between surface water and groundwater.

Also highlighting the significance of the site is its rich archeological history. The proximity to water access has been utilized long before NBU and is evident by the wealth of archeological artifacts that have been discovered, identified, and preserved as part of the initial site investigations.

The general natural biodiversity in the area is quite rich and has been studied by various experts in the field. The diversity in the naturally occurring soils has also contributed to diverse grass species identified onsite. However, the overall health of the ecoregion has been identified as “poor to moderate”, as a result of prior site development. A number of threatened and endangered, as well as invasive, species have been highlighted to be of concern. This includes various plants, beetles, turtles, and other aquatic ecosystem species.

Figure 4 is an aerial photograph of the site in 2019. The NBU water supply operation is clearly visible in the upper left quadrant, as is the smaller, circular spring cap. The heavily developed nature of the site is evident as paved areas and buildings.



**Figure 4: Site Aerial Photograph from 2019**

## 4.0 Stakeholder Engagement Methodology

### 4.1 Meetings and Field Visits

The stakeholder engagement phase of the analysis occurred in October and November 2021 and consisted of a combination of in-person interviews via group sessions, one-on-one onsite interviews, telephone interviews, and emailed survey questionnaires as described in the sections below (Table 5). Because this analysis was a predictive study of the expected impact of Phase II, there are some outcomes anticipated that did not have a direct stakeholder to interview at this time. Hence, the outcomes for those stakeholder groups were based on input from other stakeholder groups, discussions with Center staff, and EcoMetrics LLC's research and expertise.

**Table 5: Dates of Fieldwork Activities and Present Parties**

| Date                  | Meeting Type   | Location                          | Parties Present  |
|-----------------------|--|-----------------------------------|--|
| 10/25/2021-10/27/2021 | In person meetings with different stakeholder groups | New Braunfels, TX                 | EcoMetrics LLC, Center staff, educators, volunteers, government (Federal, State, and Local), and a variety of community stakeholders |
| 11/5/2021             | Phone interview                                      | phone                             | Edwin Pinero (EcoMetrics LLC), Nancy Pappas (Headwaters) and Atanacio Campos (former NBU Board Member)                               |
| 11/16/2021-12/2/2021  | Ranking Exercise                                     | Google Form survey sent via email | Sent to 34 stakeholders who participated in the on-site interviews, with 16 responses  |

### 4.2 Outreach Strategies

Before outreach began, the Managing Director at the Headwaters at the Comal, provided access to a library of resources regarding studies, master plans and stakeholder directories of the Headwaters at the Comal, providing the EcoMetrics team with significant background information to help build out our initial conceptualization of stakeholder groups. Following initial meetings and a review of stakeholder groups, EcoMetrics LLC and the Headwaters team compiled a list of stakeholders, individuals, and organizations to meet with while Ed Pinero of EcoMetrics LLC was visiting New Braunfels. With time and travel restrictions due to Covid, EcoMetrics LLC team members listened in to the stakeholder meetings via zoom and zoom recordings to take notes and record responses. EcoMetrics LLC, with the help of the Headwaters team, was able to schedule eight meetings over two days, representing all eleven of the stakeholder groups, totaling 35 individuals. Some of these 35 individuals spoke from several stakeholder perspectives and actually represented 44 views.

Collectively, groupings included:

- Archaeological consultant
- Architect and design
- Campaign Committee
- City of New Braunfels staff

- Comal County Historical Commission
- Educators and volunteers including New Braunfels Independent School District
- Headwaters at the Comal Board of Directors
- Center full time staff
- Center part time staff
- Center Technical Committee
- New Braunfels Utilities Conservation and Customer Corporate Group

In addition, we also consulted the stakeholder engagement work done before by others, and as noted in Section 1.0 and 2.3 for example. Although not done under the auspices of EcoMetrics, this work by Lake/Flato appeared to be comprehensive and provide stakeholder feedback and insight very consistent with what we would ask. Hence, information on expected impact and benefits of the center noted in this earlier study were used to inform the EcoMetrics outcomes list. During the 2011-12 study by Lake/Flato Architects, two stakeholder meetings were held and included representation from stakeholder groups such as:

- NB Parks & Recreation;
- New Braunfels Conservation Society
- Comal Water Recreational District #4;
- New Braunfels Chamber;
- Eden Hill (senior citizen community adjacent to the site);
- Heidelberg Lodges;
- New Braunfels property owners
- Economic Development Foundation
- Comal County Historical Commission;
- Parks & Recreation Foundation.

Section 4.3 provides detail of how the 35 individuals of this EcoMetrics analysis were distributed across the defined stakeholder groups, however there is significant overlap. As a follow up to these interviews, participants were sent a brief ranking exercise survey via email to record value rating responses assessing the current and future value of the Headwaters at the Comal site.

During each of these qualitative research sessions, EcoMetrics inquired into the current and past use of the Headwaters at the Comal site; the environmental/ecological footprint of the site; the historical significance of the site; the amount of activity that will occur at the Center and site and what kind of residual impacts the project might bring to the area; how the projects fits into an existing landscape of environmental management; and the significance of the project site to the watershed, the region and the county. The specifics of what was asked in the interviews is provided in Appendix II.

#### 4.3 Meetings in New Braunfels

From October 25-27, 2021, eight interviews were conducted in New Braunfels by EcoMetrics LLC, with colleagues listening in via Zoom. These sessions were also recorded for additional notetaking and data mining. The goal of these three days of meetings was to bring all relevant project experts and stakeholders together to accelerate a collaborative process to better understand the historical land use of the project site and its ecological significance and begin to identify the environmental, social and economic value created

by the project. In total 35 stakeholders representing 44 perspectives took part in these interviews, in addition to two representatives from EcoMetrics who facilitated the discussions (Appendices I and III).

The engagement process allowed the research team to solicit and gather stakeholder input on the uses and value of the project, as well as the perceived and desired goals, impacts, and outcomes of different stakeholder groups.

Facilitators spoke with stakeholders specifically about how the site impacts them personally and as a member of a specific stakeholder group, to anticipate changes that might occur regardless of the project. These questions allowed researchers to determine what other factors might contribute to the forecasted changes (i.e., deadweight and attribution).

#### 4.4 Ranking Exercise Survey

A few weeks after the in-person group interviews in New Braunfels, the EcoMetrics team sent participants a follow up Google Form survey, asking individuals to identify their stakeholder role, and rank their personal valuation of current and future value of the economic, cultural, educational, ecological and community value and impact of the site, before the project and after the project has been completed.

Of the 34 who were sent the survey, 16 responded, representing a reasonable cross-section of project stakeholders (Appendix II).

#### 4.5 Ongoing Engagement

As the project progressed, and as depicted in Figure EcoMetrics LLC engaged with subsets of the stakeholders to verify and validate conclusions, inputs, and assumptions. For example, early versions of the valuation calculations were shared with the Center Director, who then consulted with the Board of Directors and Technical Committee and provided questions, comments, and other inputs on our valuation approach. The first draft of the full report was shared with the Center staff, Board of Directors, and some key members of the Campaign Committee to review, comments, and approve the content. Once the provisional final of the report was developed, it was shared with the Center Director for final approval and authorization to issue to SVI for assurance review. The report was also shared with the Economic Development Council prior to the presentation requesting Phase II funding. Note that a representative from EDC was one of the original stakeholders engaged.



**Figure 5. Timeline of Stakeholder Engagement Process**

#### 4.6 Summary of Engagement

A summary of engagement is as follows, sorted by stakeholder type:

##### **Environment**

**Number of stakeholders directly engaged: 6**

The environment is perceived as a stakeholder as ecosystems can benefit from nature-based projects. However, in order to engage the environment, proxy representatives must be engaged who can speak to the benefits the environment will realize. Representatives of local, state, and Federal government operating in New Braunfels, Center staff, and local stakeholders were interviewed to represent the environment. In addition, team members conducted research to ascertain baseline and anticipated project impacts to the environment.

##### **Funder (includes NBU and donors)**

**Number of stakeholders directly engaged: 11 including members from the Campaign Committee**

**Method of engagement: Stakeholder group interview and follow up ranking exercise sent via email to several interviewees**

The actual number of funders for Phase II is not known as the center has an ongoing process to encourage donations and other types of financial support. The group interviewed represents the primary, and major donors to date, including the entire Campaign Committee, and it was concluded that they represent a reasonable cross section of views of those who contribute funds. Representatives from the two most significant funders, NBU, and the Economic Development Council (EDC) from whom the grant is being requested using this study, were both interviewed. Therefore, although a small percentage of all possible

funders, the group interviewed represents the overwhelming majority of anticipated funding needed for Phase II. NBU is the actual owner of the site and has provided it for the Center. NBU still has a presence onsite and operates an active water supply source. NBU also funds the day-to-day operation of the Center to make up any gap between costs and income from other sources.

### **Community at large (includes adjacent residents and visitors to the Center)**

**Number of stakeholders directly engaged: 16**

**Method of engagement: Stakeholder group interview and follow up ranking exercise sent via email**

This is a difficult group to assess in that the Comal Springs has wide-reaching implications and many of the benefits impact specific community members in a variety of ways, including indirectly. For example, the center's presence may increase tourism in the area, but businesses in the community that would benefit from increased visitors may not know to attribute that to the center. For this predictive study, and to account for the indirect nature of how this center will affect the community at large, interviews were targeted to representatives of the community who would have enough working knowledge to speak to how the center would impact them. For example, the 14 stakeholders interviewed included those who visit the center, those who live near the site and would be affected by its presence, directly or indirectly, and those who would recognize a benefit for any other reason and could reasonably attribute it to the site. For practical reasons, especially at this early predictive stage, this analysis did not do widespread, community-at-large surveys. As a result, the absolute number of interviewees is a very small percentage of the regional population, yet they are some of the most representative of the community at large.

### **Students visiting the site for educational purposes**

**Number of stakeholders directly engaged: 2**

**Method of engagement: Stakeholder interview and follow up ranking exercise sent via email.**

Actual students were not interviewed but will likely be in future updated assessments. The site needs to complete Phase II to be fully operational before students are onsite for specific visits and activities (as compared to school year-long attendance). The one educator noted works for the local school district and is a teacher. However, a number of other interviewees in other stakeholder categories are also educators in some form. Therefore, this note of one stakeholder in this category is under-representative and there was a much stronger input to address benefits to students visiting the site. The Center in its current configuration has hosted students but they were not available for interview at this stage.

### **Researchers and Academia**

**Number of stakeholders directly engaged: 3**

**Method of engagement: Stakeholder group interview and follow up ranking exercise sent via email**

The benefits associated with this stakeholder group are anticipated and will be realized mainly in Phase II. The two stakeholders noted herein, as well as input from Center staff, provided insight into the plans for research capabilities of the site and project, and what that can mean to this stakeholder group.

This site is very unique in terms of environmental and historical/cultural attributes. Hence, this category of research focuses on those unique attribute of the site, and where equivalent research could not be done elsewhere. Once it becomes more well-known what is available at the site, and easier access provided, more research opportunities will be identified and will expand the list of potential stakeholders in this group.

### **Headwaters at the Comal Center**

**Number of stakeholders directly engaged: 4**

**Method of engagement: Stakeholder group interview and follow up ranking exercise sent via email**

This category represents those connected to the Center and who are directly impacted by the creation and success of Phase II. The current Director of the Center, for example, is in this category. The Headwaters at the Comal is a separate non-profit organization that operates the Center as facilitated by NBU. Therefore, the Center itself is a stakeholder who will benefit in order to fulfill its mission.

Gardeners applying landscape practices is an anticipated stakeholder group that will come into existence once Phase II is in place. Discussion with Center staff indicated that this role is a likely outcome of users of intended future programs. They are included as a future stakeholder although there were no representatives to interview at this stage and are not included in the 5 listed.

### **Those Employed by the Center**

**Number of stakeholders directly engaged: 2 including an intern and a part-time educational program manager**

**Method of engagement: One-on-one interview**

This sub-category of stakeholder is separate from the previous category in that these two individuals are paid part-time staff. There are two persons in this group, and a predicted third would be added when Phase II is complete. However, the Center's ongoing viability is dependent on moving to Phase II and even though these two are already employed, their continued employment depends on Phase II, hence they are still included as stakeholders.

## **5.0 Theory of Change**

A theory of change describes and summarizes the objectives, inputs, outputs, and outcomes of programs and activities on different stakeholder groups (Social Ventures Australia, 2011). It is additionally a pathway linking the activities of these programs and activities to short-term, medium-term, and long-term outcomes experienced by these stakeholder groups (Ireland, 2013). The theory of change described here delineates how varying stakeholder groups experience and perceive material change resulting from the inputs of the Headwaters project. The logic flow for the Theory of Change is illustrated in Table 6.

Collected data was carefully analyzed to determine the changes experienced by stakeholder groups and their interrelations. As previously described, the input costs for labor, time, land, and money are accounted for within the inputs provided by Funders. This input culminates in the central input of the project: a multi-use educational center with a focus on local environmental, historical, and cultural features focused on the Comal Springs. As such, the theory of change for each stakeholder group other than Funders is derived from the relationship between the operation of the Center and the respective outcome for each stakeholder group.

The results of the qualitative portion of this research revealed that there were differences in the ways that groups of people potentially impacted by the project were able to engage with the project. The development of the theory of change highlights these differences and identifies those outcomes unique to each stakeholder group. Based on observation, past experience, and initial data gathering, relevant stakeholder groups were identified as acknowledged in this report.

**Table 6: SROI Mapping Stages 1 and 2 – The Stakeholders, Inputs, and Outputs**

| Stakeholders   | Stakeholder Subgroup (if applicable) | Intended/unintended changes   | Materiality of changes to stakeholder group   | Inputs  | Value   | Outputs  |
|--|--------------------------------------|---|---|---|---|--|
| Environment<br>The environment is perceived as a stakeholder |                                      | Positive changes to various environmental parameters especially water and habitat   | Improved environmental conditions benefit stakeholders such as flood reduction and recreational opportunities | Natural                                       | Restored areas, biodiversity                    | Enhanced environmental conditions                            |
| Project Funders  | NBU and Donors                       | Funding to operate and expand the Center  | Enhanced reputation for supporting the development and operation of the center for the community              | Funding, moral support, in-kind contributions | \$27,838,056.00                                 | Positive return on investment                                |
|  | NBU only                             | Enhanced reputation with rate payers, conservation legacy use of their property   | As above for funders  | As above for funders                          | Portion of above                                | More positive perception by rate payers                      |
| Community at Large   | New Braunfels                        | The Center will provide a place to learn, recreate, and participate in a regionally important feature.  | The organization is tasked with assuring that operations are ecologically sustainable                         | Support and participation                     | Financial, economic, social                     | Multiple benefits to community reflected in various outcomes |
|  | Visitors to the site                 | Visitors will have a place to experience various natural features and learn about the Comal Springs from an environmental, social, and cultural perspective | Improved opportunities for education, recreation, and enjoyment   | Admission Fee, participation                  | Collected fees, opportunity to spread knowledge | The experience   |
|  | Volunteers                           | An opportunity for interested parties to directly engage in the   | Improved opportunities  | Time and labor                                | Offsets costs of paying more staff              | Learning experience and sense of satisfaction. The           |

|  |   |  |  |   |                                    |   |
|--|---|--|--|---|------------------------------------|---|
|  |   | project, provide in-kind support   |  |   |                                    | Center gets in-kind labor support   |
|  | Adjacent properties                     | More attractive environs, less flooding, improved ambiance                                     | Better area, enhances quality of life  | Support for development of the Center                           | Could be financial as a donor      | A more aesthetically pleasing environment with features that minimize prior issues such as uncontrolled stormwater runoff |
| Employees at the Center                  | Staff                                   | Provide employment   | Earning opportunity  | Human capital (time and labor)                                  | Worker time is valued as salary    | Income  |
|  | Interns                                 | Provide employment and hands on learning   | Earning opportunity  | Human capital (time and labor)                                  | Worker time is valued as salary    | Income  |
|  | Retail Sales                            | Provide employment   | Earning opportunity  | Human capital (time and labor)                                  | Worker time is valued as salary    | Income  |
| Research and Academia                    | University-level and other institutions | Opportunity to do research in a number of fields relative to the unique nature of the site     | Tangible resource to conduct necessary research  | Financial as grants and stipends, and researcher time and labor | Dollar value of grants             | Earning potential for researchers and income for the Center   |
|  | Citizen scientists                      | Opportunity for general public to contribute to body of data for science                       | Learning opportunity for the data collector and in-kind labor for research community   | Time and labor  | Offsets costs of paying more staff | Data is collected at low to no cost, learning opportunity for general public  |
| Gardeners Applying Landscaping Practices |   | Visitors learn more sustainable practices that they can apply in their homes                   | Cost savings and quality of life improvements to those applying best practices at home (lower water use, less fertilizer, carbon emission reduction) | Time and labor by those applying practices                      | Cost savings to users              | More sustainable gardening, with less water use, less fertilizer, less carbon emissions                                   |
| Government (local, state, Federal)       |   | Different agencies have varying expectations and can include water quality improvement, source | The Center provides an opportunity for the agencies to accomplish their respective missions  | Technical support and public trust, credibility                 | In kind                            | Contributing towards agency missions  |

|  |                            |   |  |  |           |   |
|--|----------------------------|---|--|--|-----------|---|
|  |                            | water protection, cultural site protection, and others  |  |  |           |   |
| Students Visiting for Educational Purposes | Local schools and students | Providing an experiential learning experience covering a multitude of topics  | The experience will help students better understand the concepts and apply them in life and career | Student and educator time                  | In kind   | More well-rounded students, especially with STEM topics. Students gain more appreciation during formative years |
| Center                                     | Operations                 | Being able to effectively operate the center in line with its mission   | A functioning Center that encourages ongoing support by other stakeholders                         | Center resources (human, financial, other) | Varies    | Functioning and successful Center over a long term  |
|  | Support consultants        | Opportunity to leverage the skills of others (architects, environmental scientists, archaeologists, historians, etc.) | Business opportunity for consultants builds experience.  | Intellectual capital, time and labor       | Expertise | Experience for consultants to apply again elsewhere, income from billings                                       |

**\*Key, Description of columns:**

Stakeholder: Who do we have an effect on? Who has an effect on us?

Stakeholder Subgroup: Can the stakeholder group be broken down into easily quantifiable subgroups?

Intended/unintended changes: What do you think will change for them?

Materiality to subgroup: Relevance/significance of change to stakeholder groups. Consistent with materiality

Inputs: What?: What do they invest?

Value: What is the value of the inputs by description or in currency?

Outputs: What changes as a result of the inputs?

## 6.0 Analysis of outcomes

### 6.1 Stakeholders Outcome Identification and Justification

A stakeholder engagement element was conducted as part of the EcoMetrics analysis of the project. This element involved identifying the relevant and applicable stakeholder types and groups, selecting individuals representing one or more of these groups, conducting interviews, and analyzing responses to inform the identification, quantification, and valuation of the expected co-benefits. Subgroups were identified through the process of classifying materially different outcomes from gathered qualitative data and representative stakeholders. The EcoMetrics team conducted 24 interviews with 35 individuals representing over a dozen stakeholder groups. For each interview, there was a lead interviewer, another team member listening, and discussions were recorded to allow the team to review responses during results analysis. The interviews were mostly conducted in group discussion sessions in person, but there were also a few one-on-one interviews in person, and one telephone interview.

EcoMetrics uses a set of questions designed to learn from stakeholders how they perceive the change from prior or current conditions and what they expect from the project (Appendix III). This questioning is intended to learn what impacts are expected from the project and what they mean to the specific stakeholder. Where possible, and if the stakeholder was willing and able, we asked for a cursory ranking of impacts using a 1 to 5 rating system. Although not a rigorous statistical analysis, this did provide a sense of which outcomes were considered more important or impactful than others. To be able to compare results, interview results were entered into an Excel spreadsheet to allow quantitative analysis.

Stakeholder groups include:

- The environment (with government agencies acting as a stakeholder proxy)
- Funders (NBU and other donors)
- The Community at large, subdivided into subgroups such as New Braunfels, volunteers, visitors to the Center, adjacent property owners
- Employees of the Center (Staff, Interns, and anticipated Retail Sales)
- The Center itself as an organization
- Research and academia
- Students visiting for educational purposes
- Gardeners applying landscaping practices (see Section 4.6)

Whereas these groups represent the scope of stakeholders, actual members for some of these were not interviewed at this time because they will not be involved until Phase II is underway, for example research and academia and gardeners. For these anticipated stakeholder groups, input from others, such as Center staff, was used as a proxy to inform likely benefits that would affect these future stakeholders.

### 6.2 Outcomes Identified by Stakeholders

#### Environment

- Multiple impacts were noted related to improved soil formation and stability, erosion control and stormwater retention, water quality protection and improvement (via natural treatment), habitat creation such as support of pollinator populations, and the biologic control of invasive species.

It was clear from stakeholder interviews that the environment will benefit from the Headwaters project in a number of ways. The transition from a predominantly paved industrial-type yard to one with more natural features would lead to improvement of the environmental condition. The main points raised included the impact to water quantity and quality as the banks along the spring are restored to native grasses. Species habitat was also noted as important.

When NBU vacated the site, there was interest from business/apartment developers to convert the site to residential use, but it was ultimately determined it would be converted into a type of nature preserve. One key important action conducted in Phase I was to partially uncap the main spring discharge point and convert some of the asphalt cover to a natural landscape. The project will continue to integrate the waters and the habitat in their natural state and developed areas where residents can engage and learn about the ecology of the region.

Situated on the banks of the Comal Springs and Blieders Creek, the Headwaters site represents the outermost habitat for species living in the Comal Springs ecosystem and is a potential refuge for native and migratory species. Headwaters is also the first line of defense for the sensitive Comal Springs species and habitats, acting as a natural buffer against some of the polluted stormwater drained by Blieders Creek from its extensive watershed miles away.

When the site was all asphalt, nuisance stormwater and poor water quality due to contaminant runoff was a major issue as indicated in the Lake/Flato study in 2011-12 and discussion with the Center Director. The design of the project, using existing structures and lowering disturbance of the area, improve the water quality in the region. The amount of silt and sedimentation that flowed into the waterways has already been significantly reduced as the area's native habitat is being restored. The heavy rains no longer sweep silt and sediment from asphalt into the watershed, but rather the unique diversity of native grasses and plants naturally treat the water, trapping sediments and pollutants, while supporting biodiversity.

As proof of the ecological changes to the site, the builders noticed that during construction, new birds came to nest in newly restored areas.

#### **Funder (includes NBU and donors)**

- Funders and donors will benefit from improved reputation and “License to Operate”.
  - This is especially important for NBU, which is the local water, wastewater and electric utility and depends on positive engagement with ratepayers to justify operations and costs. The tremendous, sustained growth in the region requires significant investment of resources to secure additional water supplies and develop necessary infrastructure, resulting in large part to NBU's capital program growing dramatically from \$75M to an excess of \$700M. To eliminate and/or delay additional costly water purchases and expanded infrastructure, as well as to preserve local springs and other scarce water resources, a significant shift must be made in how regional water is managed. NBU is meeting this challenge by adopting a One Water, or integrated water management, approach that requires a redoubling of water conservation efforts and implementation of innovative solutions that will stretch the community's existing water supply. In addition to adjusting internal water planning and projects to achieve aligned goals, NBU is partnering with regional agencies that also play an important role in the community's water management to advance a joint water management strategy plan. The Headwaters plays an important role in the success of these efforts. The site and buildings will showcase innovative conservation and water management concepts, some of which

cannot be found anywhere else in the region. Additionally, the Headwaters will serve as a community demonstration, education, and research conduit for water resource innovation strategies for the region. Furthermore, NBU still operates water wells and a pump and distribution facility at the site and has a material interest in the continued protection of the water supply associated with the spring and local aquifer.

Although not anticipated to be significant at present, those with ownership interest in the site can generate revenue via transacting the carbon sequestered, and the nitrogen and phosphorus intercepted using credits trading market mechanisms that may be developed in Texas in the future.

**Community at large (includes adjacent residents, volunteers, the general New Braunfels community, and visitors to the Center)**

- From enhanced marketing and outreach opportunities, enhanced reputation and well-being derived from visiting the Center, and a general sense of community pride. Other outcomes include area-wide storm flooding protection, air quality improvements, nutrient retention, and cultural and amenity value. These enhanced marketing and outreach opportunities are not to promote the center but instead to promote the general region as a result of the presence of the center. In other words, because of the presence of the center, local tourism efforts have more to show as a draw to the area.

Overall, the stakeholders in this broad group were very positive about the impacts of the project. They recognize the importance of the Comal Springs to the local water supply, its role in defining the character and value of the region, and the unique opportunity it presents. None of the stakeholders noted any negative impact. The main point of caution noted was that they did not want it to become an overly commercialized tourist attraction, instead they prefer it be seen more as a place to experience and learn. The second note of desired improvement is for it to have more “curb appeal” and awareness. In general, this stakeholder group felt that the site needs to be more well-known. But the consensus was that this proposed use is the best path forward considering the other options that could have been realized once NBU vacated the site.

A key point raised was that most of the land in Texas is privately owned and having public access to such as site is a rare opportunity for direct contact with nature and history. NBU’s willingness to open the site to public use was perceived as very positive.

This area of Texas is very dependent on the regional aquifer for water supply, and its management and protection are paramount. Coincident with the water supply aspect, the springs in this region are of exceptional quality and importance. For example, the Comal Spring system is one of the largest in the United States. New Braunfels is one of the fastest growing cities in the nation, placing significant strain on resources. Specifically, residents already have a very high water use per capita and future growth will further constrain existing supplies. The Headwaters project inspires those who migrate to the area to become aware of the environmental balance needed to support the population in the area, and in turn will motivate new residents to adopt a mentality of environmental stewardship and sustainability. This is based on the concept of applied learning, and the assumption that if people learn the value of something, and learn how they can do it, they will transfer the concept to other aspects of their lives. The proxy used for this category is the idea of gardeners replicating practices at home, and residents in general being more water use efficient.

Those who visit the project contribute to the local economy- by eating locally and spending money in nearby shops. This domino effect means more jobs, inspired youth, and the possibility to attract national attention with the project.

Visitors appreciate the opportunity to come and bring their families to something new and interesting. It was characterized as a “jewel of the city.” Tourism in the area and around the local river system is already a beneficial amenity and economic engine for the community, but the unique community value of the site was under-utilized and somewhat neglected before this project. Because the site is small relative to other attractions in the area, the increased tourists specifically stemming from the Center is relatively small. To avoid overclaiming, per person tourism-related value creation was based on visitors to the site.

The Headwaters site gives people hands-on learning opportunities, such as the planned “Living Building” and the nature walk through the restored area, to demonstrate changing perspectives on natural beauty and sustainable gardening, as a new way of living. The Center will also offer a number of sessions, classes, exhibits, and workshops to learn about these concepts. Stakeholders believe the place can inspire others to create change and pass their learnings along everywhere they go. This scalability and replicability were noted as a very important aspect. Whereas the site itself is relatively small, its ability to impact others to apply sustainable principles is the true long-term value.

Volunteering opportunities are a highlight, as well as other community education opportunities. People from everywhere and every age, even community members are curious. Volunteers are motivated by future generations and working locally and for their community. This initiative offers a more comprehensive understanding of the entire water system.

### **Students visiting the site for educational purposes**

- From the value of educational programs and opportunities at the site, and from the future value of educational opportunities.

A nearly unanimous opinion of all stakeholders was that this site will provide a rare and excellent opportunity for experiential learning for school-aged children. Opportunities to provide hands-on exposure to environmental and natural aspects are rare, and local educators and schools are always looking for opportunities. A benefit universally noted by stakeholders was the ability to use this site for both passive and active learning on many topics. Those who spoke from the educational perspective noted that there is growing pride in the participation in projects like this, especially in what it means for increased opportunities for local children. Students can learn firsthand what biologists, environmental scientists, historians, and archeologists do, discovering new career paths.

Field trips are less frequent in school systems because of low funding, especially for transportation, and education is becoming more focused on testing rather than experiences. The Center can offer discounted admission rates and other options to offset the school’s cost of transport. In addition, the Center’s location is proximal to the community and reduces transportation costs and complexities. The project envisions Saturday programs and school field trips, driven by volunteer-led curricula, utilizing the knowledge of subject matter experts.

The project provides cultural continuity for the community, enabling people to better understand their past and how it relates to the present. It makes visitors more sensitive to the past artifacts by linking people of the past and present.

Headwaters surveyed participants of the Summer Camp Program. Respondents were asked to rate one statement as Excellent to Poor, and five statements as strongly agree, agree, neutral, disagree, and strongly disagree. The inquiries were:

- How would you rate your child/student's experience at Headwaters?
- The program my child/students participated in was educational.
- The program my child/students participated in was entertaining.
- This program positively changed my child's/students' attitude toward science, the environment, and/or conservation.
- This program helped prepare my child/students for future science classes.

For the excellent to poor question on rating the experience, all were excellent or very good, with the majority as excellent. For the remaining questions rated strongly agree to strongly disagree, most were either strongly agree or agree, with only a few neutral, and the majority as strongly agree. There were no "negative" ratings for any question which is indicative of a very positive experience by site users for educational purposes.

### **Researchers and Academia**

- From earnings from research stipends for enhanced research opportunities in and around the project site.

Culturally, the Headwaters site is home to several historical and archeological features that help tell the story of New Braunfels and the broader region. Archaeological findings provided a unique hands-on setting to directly study the scientific, cultural, and historical aspects of the region.

In addition to an archeological focus, biodiversity cataloging such as the i-naturalist online program for logging observations can offer research communities many data points for their studies. Other noted benefits include opportunity to study endangered species that inhabit the area. As noted for the Community at large stakeholder group, given the fact that so much of Texas is under private land ownership, having this kind of site accessible to the public will provide an excellent opportunity for learning.

### **Headwaters at the Comal Center**

- Increased visitors and activities at the center will generate revenue via entry fees, rental fees, and other fees for service offerings. The more aware the public becomes of the site and its value, the more it will create new sources of grants and donations.

An increase of visitors and use of the center will enhance retail sales and earnings, providing additional financial income to support the Center. Interviews with those employed by the Center noted that New Braunfels' reputation as a unique "crown jewel" in Texas will only be enhanced by the Headwaters at the Comal facility and its proposed activities, attracting visitors, business and earnings to the Center, its employees and surrounding amenities. Long term, the project is expected to result in an increase in local tourism, which will likely further result in benefit to the Center and local businesses.

### **Those Employed by the Center**

- Their employment (for both staff and interns), earnings from retail sales and additional training for interns that is expected to increase future job opportunities.

Those employed by the Headwaters at the Comal center will benefit directly from their employment and/or internship via salary, stipends, or other employment benefits. It is expected that those who work as

interns at the Headwaters at the Comal Center will benefit from an increased likelihood of being hired for future job opportunities due to the training and experience they will receive at the Center. The cross-section of value the Headwaters provide as a unique ecological resource for the watershed, an educational tool, a recreational site, and location of historical significance to the region will provide unique training opportunities for the staff and interns of the Center, enhancing future career opportunities at the Center or elsewhere. An increase of visitors and use of the center will enhance retail sales and earnings, providing additional financial income to support the center and its staff and interns.

As this project is only now beginning with Phase II, more detailed information on who specifically will benefit in this stakeholder category will become clearer over time.

**Table 7: Stakeholder Identified Outcomes and Supporting Statements**

| Outcomes  | Statements from Stakeholder Affirming Outcomes  |
|---|---|
| <ul style="list-style-type: none"> <li>• Soil formation</li> <li>• Soil stabilization</li> <li>• Water quality- natural treatment</li> <li>• Refuge habitat creation</li> </ul>   | <ul style="list-style-type: none"> <li>• Can use this place as a watershed model, looking at natural settings to help with water quality, etc., slowing down runoff.</li> <li>• “Can be a crown jewel of what we need to do to protect a resource”</li> <li>• “Water is a precious resource, need to protect the springs”</li> </ul>  |
| <ul style="list-style-type: none"> <li>• Enhanced reputation</li> <li>• Enhanced marketing opportunities</li> </ul>   | <ul style="list-style-type: none"> <li>• Once complete, this site will be an inspiration, providing an opportunity for problem solving, with transferability and replicability.</li> <li>• This project is just more than one thing, it brings community pride, connects people, demonstrates how landscapes can look when water is saved, providing something for the future</li> <li>• Headwaters at the Comal is very multi-dimensional; water, native plants, conservation practices, wildlife, water stewardship – this is an inspirational story when a community can come together to transform a parking lot to something like this.</li> <li>• “A place like this makes a visitor more empathic to other stakeholders”</li> </ul>  |
| <ul style="list-style-type: none"> <li>• Wellbeing derived from tourism</li> <li>• Sense of community pride</li> <li>• Storm flooding protection</li> <li>• Phosphorus retention</li> <li>• Nitrogen retention</li> <li>• Cultural value (includes archaeological value)</li> <li>• Social cost of carbon gained</li> </ul> | <ul style="list-style-type: none"> <li>• “I see this project as a bridge between natives and newcomers”</li> <li>• This project has created a deep sense of community pride, a sense of pride in investing and participating in a transformational project like this.”</li> <li>• Rare opportunity for public ownership and access of such an important site</li> <li>• This project will help increase local economic development</li> <li>• New Braunfels has always been cutting edge, NBU is thinking ahead</li> <li>• “This provided an opportunity to connect with cultures over time, demonstrating the linkage to our past.”</li> <li>• Can use this place as a watershed model, looking at the natural settings to help with water quality, slowing down run off, etc.</li> <li>• “We need water and must protect it.”</li> <li>• This site was important to local water supply downriver. Downriver is currently so polluted and overused, this is the cleanest water, and hence its biggest benefit.</li> <li>• “There are limited opportunities to protect resources, the Headwaters at the Comal site is a big deal, and we have an ethical and moral obligation to protect it.”</li> <li>• Stabilizing around the spring was very helpful erosion control and run off control. It helped nearby neighborhoods</li> <li>• Site has many physical remnants that are part of the identity of the city</li> <li>• Archeological remains were found at the site from a settlement that dates back at least 8,000 years. This site and project are part of the story of how people came to America</li> <li>• The Headwaters at the Comal can show how environmental aspects impacted society and still does</li> </ul> |

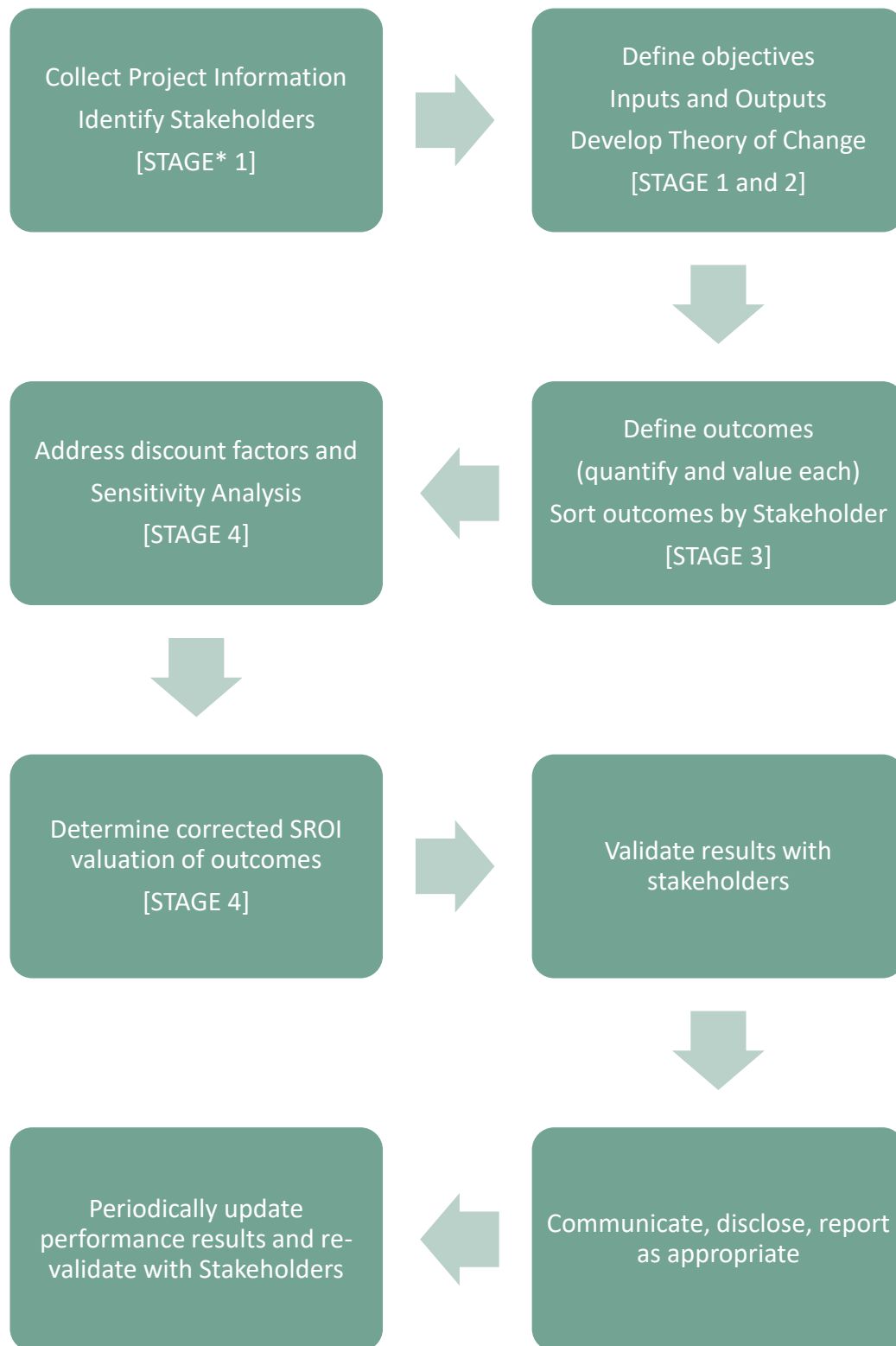
|   |  |
|---|--|
|   | <ul style="list-style-type: none"> <li>Part of the mitigation plan after the discovery of cultural artifacts was to allow work to continue, but protect the artifacts while allowing research and access</li> </ul>  |
| <ul style="list-style-type: none"> <li>Educational programs and opportunities</li> <li>Educational value to future opportunities</li> </ul> | <ul style="list-style-type: none"> <li>Site is an intersection of learning, innovation, ideas, “place of possibilities”, a hub of ideas</li> <li>“This is a place where science is happening all the time.”</li> <li>Education is a major aspect of this project – the ability to raise awareness especially around native plants and water conservation, watershed education, environmental and land conservation</li> <li>This project will inspire and drive kids to appreciate environmental education and to encourage volunteerism</li> <li>“Kids seeing active science and engaging in it will lead to enhanced community pride now and for the next generation.”</li> <li>This place has great educational value, it is a place to help spread the word and promote future stewardship of resources</li> </ul> |
| <ul style="list-style-type: none"> <li>Visitor revenue</li> <li>Grants and donations</li> </ul>   | <ul style="list-style-type: none"> <li>“Concept is proven, now need to scale it up”</li> <li>Rare opportunity for public ownership and access of such an important site</li> <li>Headwaters can be a retreat learning center, and will help economic development and community development for New Braunfels</li> </ul>  |
| <ul style="list-style-type: none"> <li>Enhanced future opportunities from being an intern</li> </ul>  | <ul style="list-style-type: none"> <li>“Headwaters is very multi-dimensional - getting connected with people from other professions, water, native plants, conservation practices, wildlife, and an inspirational story creating community pride.”</li> <li>“A place like this makes a visitor more empathetic to other stakeholders”</li> <li>“The center is good for social and emotional wellness, as well as career opportunities by knowing those in other professions.”</li> </ul>   |

## 7.0 SROI Mapping

### 7.1 Introduction to SROI Mapping

As noted in Section 2.2, the SROI approach is one that starts with input information and feedback from stakeholders and ends with a compilation of quantified and valued outcomes. The process is illustrated and documented in an SROI Map. For this report, we have integrated the SROI Map into a series of progressive tables that start with basic inputs and progress to a table that gives final, corrected and adjusted values for each outcome identified.

In EcoMetrics, we divided the SROI Map into four stages, and sections 7.2, 7.3, 7.4, and 7.6 reflect these stages. Each section includes a table that contains the relevant data from the subject stages. Section 7.5 is devoted to explaining the various SROI corrections that must be applied to initial outcome values in order to get a more accurate and truer picture of value created by the project. Figure 5 is a conceptual flow diagram illustrating the SROI Mapping process.



**Figure 5: Conceptual SROI Mapping Flow Diagram**

**\*STAGE numbers refer to SVI SROI Mapping and noted in report tables 7, 8, 9, and 12**

## 7.2 Inputs and Outputs – SROI Map Stages 1 and 2

There are two basic types of inputs for the Headwaters project. There is direct financial input from donors and funders either as capital sums or as ongoing operational financial support. For example, NBU currently supports the salaries of Center staff. There are also in-kind inputs such as volunteer hours. Table 7 reflects Stages 1 and 2 as defined above in Section 7.1 and represent the specific stakeholder types, and how they relate to inputs and expected outputs. These outputs lead to the impacts, which include benefits, to be attributed to the stakeholders.

## 7.3 Outputs and Outcomes – SROI Map Stage 2 (Continued)

Once we know the outputs, we can determine what changes as informed by research, direct observation, and stakeholder input. These are the outcomes. Table 8 builds on table 7 by identifying the outcomes sorted by the stakeholder they benefit. Specifics on how these outcomes are defined and valued are explained in Table 10. As noted above, this project is in the transition stage from Phase I to Phase II. This analysis is focused on anticipated benefits of Phase II building on how Phase I has been evolving. There are anticipated features that are not yet in place, and therefore some outcomes are extrapolated from current information. For example, income from Retail Sales personnel or saving realized by gardeners applying learned landscaping practices are anticipated when Phase II is underway. Other outcomes are building on features of Phase I and are better known, for example soil stabilization and educational value. Even for outcomes that are building on Phase I, totals presented in Section 7 of this report are for Phase II only. In any case, actual or extrapolated, all outcome types and values are supported by stakeholder input and researched information.

**Table 8: SROI Mapping Stage 2 Cont. – Identifying Outcomes by Stakeholder**

| Stakeholders             | Outcome                                       |
|--------------------------|---|
| Environment              | Soil Formation                                |
|                          | Soil Stabilization                            |
|                          | Pollinator Populations support                |
|                          | Water Quality- Natural Treatment              |
|                          | Refuge Habitat creation                       |
|                          | Biological Control- Invasive Species          |
| Funders (NBU and Donors) | Enhanced Reputation                           |
|                          | Market value of Carbon Credits                |
|                          | Market value of Nitrogen Credits              |
|                          | Market Value of Phosphorus Credits            |
| Community at Large       | Enhanced Marketing and Outreach Opportunities |
|                          | Sense of Accomplishment by Volunteering       |
|                          | Sense of Community Pride                      |

|  |  |
|--|--|
|  | Storm Flooding Protection                      |
|  | Air Quality                                    |
|  | Phosphorus Retention- Social Value             |
|  | Nitrogen Retention- Social Value               |
|  | Cultural Value (including archaeology)         |
|  | Amenity Value                                  |
|  | Carbon sequestration- Social Value             |
|  | General Recreation                             |
|  | Valuing the Water Resource                     |
|  | Archaeological Asset Protection                |
|  | Master Naturalist Program                      |
|  | Mental Health                                  |
|  | Physical Health                                |
|  | Real estate value added                        |
| Gardeners Applying Landscaping Practices   | Gardener Water Savings                         |
|  | Gardener Fertilizer Savings                    |
|  | Gardener Carbon- Social Value                  |
| Students Visiting for Educational Purposes | Educational Value Towards Future Opportunities |
|  | Field Trip Educational Value                   |
| Researchers and Academia                   | Earnings from Research Stipends                |
|  | Value of Citizen Science                       |
| Center                                     | Visitor Fees Revenue                           |
|  | Grants and Donations Income                    |
| Employees at the Center                    | Earnings- Staff                                |
|  | Earnings- Interns                              |
|  | Earnings- Retail Sales                         |
|  | Enhanced Earning Potential for Interns         |

## 7.4 Valuing Outcomes – SROI Map Stage 3

For attaching values to outcomes, our goal was to use as much as we could ascertain from the stakeholder engagement. However, the nature of this project and the stakeholders meant that whereas outcomes and benefits were noted, the expertise or data was not available to stakeholders for them to give a quantity. Therefore, our second approach was to find the most up to date peer-reviewed materials to use for the

calculation of financial proxies across outcomes (Tables 9 and 10). Where possible, we looked for the most regionally specific calculations beginning from the local area to the broader community, to the local region, to the state and regional level, and finally, where there was no regionally specific information, to the U.S. national level. Peer-reviewed figures from federal and state agencies were prioritized, depending on dates they were produced. Where these criteria could not be met for peer-reviewed proxies, recent international reports were used to make calculations, particularly for some of the more intangible values of well-being and sense of pride and accomplishment. Many of these values were drawn from data sources that have met the standard of social value as established by SVI and priority was given to projects that have been assured by this organization. The values were then adjusted by EcoMetrics LLC to reflect the circumstances of the Headwaters project and the social conditions of New Braunfels and Texas. Specific details on how the references were used to determine the financial proxies are reflected in Table 10. Actual dollar amounts are not noted for some of the quantification proxies for the outcomes in Table 9 because there is not always a single value used for the entire 25 years. A base value was used to start, but that value is corrected for changes in conditions over time, as well as being discounted 5%. Because these values are Net Present Value, it is not accurate, and would actually be misleading, to simply take an average (total outcome value divided by years of duration).

A total value is provided for each outcome which is based on the quantity of the outcome times the value per unit quantity and projected out for 25 years as Net Present Value with 5% discount rate.

Outcomes of the Headwaters project were determined by first analyzing collected information from the qualitative phase of research (see description in section 3 "Research Methodologies"). Collected stakeholder input information was quantitatively analyzed to determine frequencies, differences, and similarities of outcomes identified by participants across stakeholder categories. Only outcomes identified by stakeholder groups during the qualitative research phase were included. Once outcomes were identified by stakeholder group, third-party (secondary source) literatures were consulted to validate research findings within broader third-party literature and other relevant studies. Quantities for the Environment stakeholder were based primarily on the nature of the four acres of restored open space by examining the various attributes of these native grasses and plants. Secondly, environmental benefits are created from removing part of the Spring concrete cap and other protective measures of the surface water. We derived quantities of visitors to the site, both tourists and education visitors, from qualitative research, input from site staff, and projections based on Phase I data collected by Center staff. Quantities of outcomes for all other stakeholder groups were derived from third-party literature and stakeholder input as defined elsewhere in this report. Duration of outcomes for valuation purposes was set as a 25-year outlook as requested the Center Director. The EcoMetrics methodology incorporated these various inputs to determine the value of outcomes which were shared with and validated by relevant stakeholders as described in Section 4.5.

**Table 9: SROI Mapping Stage 3 – Valuing the Outcomes**

| Stakeholder Group               | Outcome   | Indicator  | Source                               | Quantity of indicator unit                     | Duration in Years | Outcomes Start Year | Value of Outcome in Currency |
|---------------------------------|---|--|--------------------------------------|--|-------------------|---------------------|------------------------------|
| <b>Environment</b>              | Soil Formation  | improved soil/acre/year  | Assumptions Table and Citations list | 4 open space acres                             | 25                | 1                   | \$181.13                     |
|                                 | Soil Stabilization  | tons of soil/acre/year   | Assumptions Table and Citations list | 4 open space acres                             | 25                | 1                   | \$17,896.72                  |
|                                 | Support of Pollinator Populations   | value of pollinator habitat created per acre per year          | Assumptions Table and Citations list | 4 open space acres                             | 25                | 1                   | \$3,644.70                   |
|                                 | Water Quality Treatment Equivalent  | retention of pollutants per acre                               | Assumptions Table and Citations list | 4 open space acres                             | 25                | 1                   | \$7,124.34                   |
|                                 | Refuge Habitat creation   | value of habitat preservation per acre                         | Assumptions Table and Citations list | 4 open space acres                             | 25                | 1                   | \$1,059.89                   |
|                                 | Biological Control- invasive species control  | healthy regulation of plant and wildlife populations by acres. | Assumptions Table and Citations list | paid hours of invasive management (\$500/acre) | 25                | 1                   | \$1,026,388.23               |
| <b>Funders (NBU and Donors)</b> | Social license to operate in the region (effects to reputation; positive impact on communities) | Dollar value of enhanced reputation                            | Assumptions Table and Citations list | total investment                               | 1                 | 1                   | \$6,392,902.92               |

|                           |   |  |                                      |                    |    |   |                 |
|---------------------------|---|--|--------------------------------------|--------------------|----|---|-----------------|
|                           | Market Value of Carbon Reduction - Open Space | Carbon Price Forecast (\$/t CO <sub>2</sub> -e) Average Sequestered (t CO <sub>2</sub> -e/acre/year) | Assumptions Table and Citations list | 4 open space acres | 25 | 1 | \$2,183.29      |
|                           | Nitrogen Offset Credit                        | Value of the nitrogen offset portion of a water quality credit that includes both N and P offsets.   | Assumptions Table and Citations list | 4 open space acres | 25 | 1 | \$256.25        |
|                           | Phosphorus Credit                             | Value of the phosphorus offset portion of a water quality credit that includes both N and P offsets. | Assumptions Table and Citations list | 4 open space acres | 25 | 1 | \$94.84         |
| <b>Community at Large</b> | Increased Marketing Opportunities             | Estimated advertising value of positive press coverage   | Assumptions Table and Citations list | \$15,000           | 25 | 1 | \$211,409.17    |
|                           | Sense of Accomplishment                       | sense of wellbeing from volunteers participating in project  | Assumptions Table and Citations list | 5 volunteers       | 25 | 1 | \$1,278,306.17  |
|                           | Increased sense of community pride            | Increased pride because of an improved perception of the area (\$/year/resident)                     | Assumptions Table and Citations list | 90209 residents    | 25 | 1 | \$27,169,100.22 |
|                           | Storm Protection and Flood Control            | value of storm protection per acre   | Assumptions Table and Citations list | 4 open space acres | 25 | 1 | \$16,065.22     |
|                           | Air Quality                                   | air quality improvement per acre per year  | Assumptions Table and Citations list | 4 open space acres | 25 | 1 | \$6,943.21      |

|  |                                     |  |                                      |                     |    |   |                 |
|--|-------------------------------------|--|--------------------------------------|---------------------|----|---|-----------------|
|  | Phosphorus Retention                | kg phosphorus retained per acre per year               | Assumptions Table and Citations list | 4 open space acres  | 25 | 1 | \$4,937.98      |
|  | Nitrogen Mitigation                 | kg nitrogen retained per acre per year                 | Assumptions Table and Citations list | 4 open space acres  | 25 | 1 | \$2,569.59      |
|  | Cultural Value                      | Value of the cultural and historical perspective       | Assumptions Table and Citations list | 16 total site acres | 25 | 1 | \$2,656.53      |
|  | Amenity Value                       | value per visitor per year                             | Assumptions Table and Citations list | 5000 visitors       | 25 | 1 | \$1,424,868.37  |
|  | Social Cost of Carbon - Open Space  | Tons of carbon sequestered per acre per year           | Assumptions Table and Citations list | 4 open space acres  | 25 | 1 | \$3,079.16      |
|  | General Recreation Consumer Surplus | value per visitor per year                             | Assumptions Table and Citations list | 5000 visitors       | 25 | 1 | \$1,021,860.05  |
|  | Valuing Water Protection            | value of water quality protection per household        | Assumptions Table and Citations list | 28835 households    | 25 | 1 | \$25,569,873.32 |
|  | Archaeological Asset Protection     | value of historical artifacts protection per household | Assumptions Table and Citations list | 28835 households    | 25 | 1 | \$7,921,256.83  |

|   |                                |   |                                      |                |    |   |                |
|---|--------------------------------|---|--------------------------------------|----------------|----|---|----------------|
|   | Master Naturalist              | value of training per volunteer                               | Assumptions Table and Citations list | 5 volunteers   | 25 | 1 | \$11,320.46    |
|   | Mental Health                  | value of mental health per visitor                            | Assumptions Table and Citations list | 5000 visitors  | 25 | 1 | \$188,674.31   |
|   | Physical Health                | value of mental health per member                             | Assumptions Table and Citations list | 100 members    | 25 | 1 | \$4,623,275.22 |
|   | Real Estate Value Added        | dollars per property  | Assumptions Table and Citations list | 250 properties | 1  | 1 | \$478,750      |
| <b>Gardeners applying landscaping practices</b>   | Gardener Water Savings         | gallons of water value saved                                  | Assumptions Table and Citations list | 500 gardeners  | 25 | 1 | \$3,694,997.63 |
|   | Gardener Fertilizer Savings    | dollars of fertilizer not used                                | Assumptions Table and Citations list | 500 gardeners  | 25 | 1 | \$339,613.75   |
|   | Gardener Carbon - Social Value | social cost of carbon per ton of carbon reduced               | Assumptions Table and Citations list | 500 gardeners  | 25 | 1 | \$100,072.85   |
| <b>Students visiting for educational purposes</b> | Educational Value              | Number of visitors visiting the site for educational purposes | Assumptions Table and Citations list | 1500 visitors  | 25 | 1 | \$136,071.91   |

|                                |   |  |                                      |               |    |   |                |
|--------------------------------|---|--|--------------------------------------|---------------|----|---|----------------|
|                                | Field Trip Educational Value                      | Number of students visiting the site for field trips           | Assumptions Table and Citations list | 1500 students | 25 | 1 | \$206,485.16   |
| <b>Research and Academia</b>   | Earnings from Research stipends                   | value of research tuitions to study onsite                     | Assumptions Table and Citations list | 2 stipends    | 25 | 1 | \$2,173,528.02 |
|                                | Citizen Science                                   | value of data collection hours                                 | Assumptions Table and Citations list | 129.5 hours   | 25 | 1 | \$23,455.99    |
| <b>Center</b>                  | Revenue to Center from visitors to site           | Entry fee per person   | Assumptions Table and Citations list | 5000 visitors | 25 | 1 | \$603,757.78   |
|                                | Grants and Donations                              | dollar value acquired  | Assumptions Table and Citations list | \$60,000      | 25 | 1 | \$905,636.67   |
| <b>Employees at the Center</b> | Earnings from Direct – Staff Jobs Created         | Jobs created (direct); number of working hours per year; wages | Assumptions Table and Citations list | 2 employees   | 25 | 1 | \$3,290,866.32 |
|                                | Earnings from Direct - Other- Intern Jobs Created | Jobs created, number of working hours per year; wages          | Assumptions Table and Citations list | 1 intern      | 25 | 1 | \$1,077,176.34 |
|                                | Earnings from Direct - Retail Sales Jobs Created  | Jobs created (direct); number of working hours per year; wages | Assumptions Table and Citations list | 1 employee    | 25 | 1 | \$470,931.07   |

|  |  |   |                                      |          |    |   |             |
|--|--|---|--------------------------------------|----------|----|---|-------------|
|  | Enhanced future employment opportunities for interns | Improved employability because of improved skills and increased work experience | Assumptions Table and Citations list | 1 intern | 25 | 1 | \$31,425.59 |
|--|--|---|--------------------------------------|----------|----|---|-------------|

**Key- Description of column headers:**

Description: How would the stakeholder describe the changes? Note this is a forecast model.

Indicator: How would you measure it?

Source: Where did you get the information from? See citations.

Duration: How long does it last after end of activity? Numbers are in years.

Outcomes Start Year: Does it start in period of activity (1) or in period after (2). How are these periods defined?

Financial Proxy: What proxy would you use to value the change? Note that Actual financial proxy is a value that changes per year due to discounting and changing conditions, see Table 10.

Value in currency: What is the value of the change? (Not corrected for discount factors.)

Materiality (Mat.): Is this a material outcome, in terms of quantity, duration, value, and causality?

Source relative to materiality: Where did you get the information from?

**Table 10: SROI Mapping Stage 3 – Valuing the Outcomes – Detail on Proxy Determination**

| Stakeholder | Outcome                         | Financial Proxy   | Financial Proxy Source | Further Detail on How Proxy Determined and Used  | Equation Details  |
|-------------|---------------------------------|-------------------|------------------------|--|---|
| Environment | Soil Formation                  | \$3/acre/year     | 1                      | Refers to weathering of rock and accumulation of organic material. The equation multiplies the proxy by the acreage of the site and over time.   | (Number of acres x number of years x dollars per acre = value of soil formation (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate   |
|             | Soil Stabilization              | \$1.94/ton        | 2                      | Vegetation helps stabilize soils and prevent erosion. The costs associated with erosion include reduced soil productivity, damaged roads and structures, filled ditches and reservoirs, reduced water quality and harm to fish populations. This value is based on erosion rates for high construction zones, given that New Braunfels is experiencing high levels of development and is prone to frequent flash flooding. | (Tons of soil stabilized per acre x number of acres x number of years x dollars per ton = value of soil stabilized (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate        |
|             | Pollinator Populations Support  | \$25/hectare/year | 3                      | populations, based on the pollination value of grass dominant regions. The equation multiplies the proxy by the acreage of the site and over time."  | (Number of acres (converted from hectares) x number of years x dollars per acre = value of pollinators population support (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate |
|             | Water Quality-Natural Treatment | \$118/acre/year   | 1                      | Reference midpoint of \$11-\$225; refers to an ecosystem's recovery of mobile nutrients and removal or breakdown of excess nutrients and compounds/detoxification. The equation multiplies the proxy by the acreage of the site and over time.   | (Number of acres x number of years x dollars per acre = value of water quality (value is calculated for each year then aggregated over 25 years for NPV))- minus 5% discount rate   |
|             | Refuge Habitat Creation         | \$18.74/acre/year | 4                      | Providing habitat for plants and animals and their full diversity. High range per acre estimates for Lakes/River regions is used. The equation multiplies the proxy by the acreage of the site and over time.  | (Number of acres x number of years x dollars per acre = value of refuge habitat creation (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                                  |

|                          |   |                              |    |   |  |
|--------------------------|---|------------------------------|----|---|--|
| Funders (NBU and Donors) | Enhanced Reputation                           | 0.26                         | 6  | Multiplied by NBU for operating expenses annually (461,000). 26% of the money invested in the project is returned to the organization as a result of increased reputation.  | (0.26 x NBU annual expenses x number of years (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate  |
|                          | Market value of Carbon Credits                | \$24.50/t CO <sub>2</sub> -e | 7  | This metric captures the Market Value of Carbon Sequestered by multiplying Total Carbon Sequestered by the Carbon Price Forecast, using 1 ton per acre of carbon sequestration (for grassy areas and regions).  | (Tons per acre x number of acres x dollars per ton = value of carbon credits (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                             |
|                          | Market value of Nitrogen Credits              | \$2.52/kg N                  | 8  | This captures the Nitrogen offset credit as part of the water quality credit. Uptake/retention estimates are based on grass plant species. This is an opportunity value as there is no current market in Texas and is based on a national average of credit value   | (Kg retained per acre x number of acres x avg credit value x number of years = value of nutrient credits (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate |
|                          | Market Value of Phosphorus Credits            | \$6.51/kg P                  | 9  | This captures the Phosphorus offset credit as part of the water quality credit. Uptake/retention estimates are based on grass plant species. This is an opportunity value as there is no current market in Texas and is based on a national average of credit value | (Kg retained per acre x number of acres x avg credit value x number of years = value of nutrient credits (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate |
| Community at Large       | Enhanced Marketing and Outreach Opportunities | \$15,000/year                | 10 | Based on NPR advertising value and audience reach. Assumption is that news stories and positive press coverage will function as free advertising  | (Dollars per year x number of years = value of marketing and outreach (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                                    |
|                          | Sense of Accomplishment by Volunteering       | \$16,938/person              | 11 | Monetary equivalent of the wellbeing benefit derived from socially meaningful work (Value to Participants). This value multiplies the proxy by the number of volunteers every year.   | (Number of volunteers x dollars per year x number of years = sense of wellbeing (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                          |

|  |   |                     |    |  |   |
|--|---|---------------------|----|--|---|
|  | Sense of Community Pride                    | \$360/year/resident | 12 | Based on increased pride as a result of an improved perception of the area, using the number of residents in New Braunfels.  | (Number of residents x dollars per year x number of years = sense of community pride (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                            |
|  | Storm Flooding Protection                   | \$70/acre/year      | 13 | Value of storm protection and flood control, which is particularly valuable for the geography of this site to community members, infrastructure, and the municipality. The equation multiplies the proxy by the acreage of the site and over time. | (Number of acres x number of years x dollars per acre = value of storm protection (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                               |
|  | Air Quality                                 | \$115/acre/year     | 1  | Green space improves air quality by removing particulates and offsetting CO <sub>2</sub> e. The equation multiplies the proxy by the acreage of the site and over time.  | (Number of acres x number of years x dollars per acre = value of air quality (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                                    |
|  | Phosphorus Retention- social value          | \$339/kg P          | 14 | The social value of marginal Phosphorus is derived from the modeling of potential nitrogen credit trading based on the interaction between agricultural nonpoint sources and wastewater treatment plants mandated to reduce nitrogen emissions.    | (Kg retained per acre x number of acres x social cost per kg x number of years = nutrient retention social cost (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate |
|  | Nitrogen Retention- social value            | \$25.27             | 15 | The social value of marginal Nitrogen is derived from the modeling of potential nitrogen credit trading based on the interaction between agricultural nonpoint sources and wastewater treatment plants mandated to reduce nitrogen emissions.      | (Kg retained per acre x number of acres x social cost per kg x number of years = nutrient retention social cost (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate |
|  | Cultural Value (aesthetics, heritage, etc.) | \$11/acre/year      | 1  | Refers to aesthetic, artistic, educational, spiritual, and/or scientific values that an ecosystem provides to the community. The equation multiplies the proxy by the acreage of the site and over time.   | (Number of acres x number of years x dollars per acre = cultural value (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate  |
|  | Amenity Value                               | \$18.88/person/year | 16 | Amenity value of recreational locations, meaning those natural or physical   | (Number of visitors x number of years x dollars per person = amenity value (value is  |

|  |                                   |                        |    |   |  |
|--|-----------------------------------|------------------------|----|---|--|
|  |                                   |                        |    | qualities/characteristics of an area that contribute to people's appreciation of its recreational attributes. The equation multiplies the proxy by the acreage of the site and over time.   | calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate  |
|  | Carbon sequestration-social value | \$51/ton               | 17 | This metric multiplies the Total Carbon Sequestered by the Social Cost of Carbon, using 1 ton per acre (for grassy areas and regions) and the acreage of the site. The social cost of carbon is inclusive of various economic damages by carbon emissions, such as impacts on the environment, agriculture and human health.  | (Tons per acre x number of acres x dollars per ton = carbon social value (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                         |
|  | General Recreation                | \$13.54/visitor/year   | 18 | This value represents the consumer surplus of visiting an arboretum or nature center for the specific goal of experiencing those particular attributes during their visit. This equation multiplies the proxy by the number of visitors and over time.  | (Number of visitors x number of years x dollars per acre = general recreation value (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate              |
|  | Valuing the Water Resource        | \$64.14/household/year | 2  | Valuing the water resource in particular to its quality to residents in the watershed region includes various factors. The protection of the resource is motivated by the need to have higher quality drinking water, lower treatment costs, as well as the passive and recreational benefits that a cleaner water system provides. The equation multiplies the proxy by the number of households in New Braunfels and over time. | (Number of households x dollars per household x number of years = valuing the water resource (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate     |
|  | Archaeological Asset Protection   | \$18.20/household/year | 19 | The willingness to pay in annual household income tax to ensure permanent protection of ancient artifacts in a natural setting is critical to ensure future generations can have access to the historical significance of the place and findings. The equation  | (Number of households x dollars per household x number of years = archeological asset protection (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate |

|  |                           |                     |    |   |   |
|--|---------------------------|---------------------|----|---|---|
|  |                           |                     |    | multiplies the proxy by the number of households in New Braunfels and over time.  |   |
|  | Master Naturalist Program | \$150/year          | 20 | The value of this formal training for the volunteers that are deeply involved in the everyday naturalist and teaching activities is multiplied by the number of volunteers receiving it per year.   | (Number of volunteers trained x dollars per training x number of years = master naturalist program (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                              |
|  | Mental Health             | \$2.50/person/day   | 21 | The cost of mental health is reduced to a daily cost per person. This cost covers broad categories such as direct health costs, insurance costs, loss of productive time at work and such that occur as a result of mental health stress. This proxy is multiplied by the daily visitors who are able to benefit from the well documented positive impacts of being in green spaces and nature on mental health, thus reducing stress related costs | (Number of visitors x dollars per person x number of years = value of mental health (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate   |
|  | Physical Health           | \$3,063/person/year | 22 | Total health costs saved (by way of direct health costs and reduced morbidity) of people utilizing green spaces for physical activity is multiplied by the number of members who are able to access the site regularly for physical activity on the grounds, resulting in health care costs saved per year.   | (Number of members x dollars per person x number of years = value of physical health (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate  |
|  | Real estate value added   | \$1,915             | 1  | Proximity to green spaces carries with it an increase of property values for those owning homes close by. This proxy is multiplied by the nearest homes to the site.  | (Dollars increase in property value x number of the nearest homes to HWC within defined radius x 1 year (one time valuation) = real estate value added) - minus 5% discount rate  |
| Gardeners Applying Landscaping Practices | Gardener Water Savings    | \$0.008/gallon      | 23 | In order to show the value of educating the public on conservation-based landscaping techniques, this calculation assumes a number of gardeners/homeowners are inspired to replant their yards with native  | (Number of gardeners per year x avg TX yard size x 0.5 gal/sq ft water demand x 24 weeks (assume they water lawns for half the year at once a week to account for winter and rain events) x \$ per gallon (avg cost of water in TX) |

|  |                               |                   |        |  |   |
|--|-------------------------------|-------------------|--------|--|---|
|  |                               |                   |        | grasses and plants. The savings are generated by the fact that the use of native plants can use substantially less water than non-native species, reducing costs to the homeowner and reduced daily water demands on the water supplier. This calculation used statewide water rates but includes NBU data, as some inspired to adopt conservation-based lawn practices may not all come from the NBU water district | x 0.85 (percentage of water saved by switching to native vegetation) = value of water savings (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate   |
|  | Gardener Fertilizer Savings   | \$1.25/lb.        | 24     | Same as above, particular to fertilizer use. Native plants require less fertilizers, which reduce applications of polluting fertilizers and reduce Nitrogen sources in the local environment. This also results in costs savings for the homeowner. The calculations assume an average sized yard in Texas and regular frequencies of watering, fertilizer applications and mowing.                                  | (Number of gardeners per year x avg TX yard area x 3 lb. fertilizer/1000 sq ft of lawn x number of applications/year * cost of fertilizer per pound = value of fertilizer saved (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate) - minus 5% discount rate |
|  | Gardener Carbon- Social Value | \$51/ton          | 17, 25 | Same as above, particular to lawn mower use that emits significant amounts of GHG into the atmosphere. Native plants require less maintenance. thus, reducing air pollutants that are translated into the social cost of carbon saved. The calculations assume an average sized yard in Texas and regular frequencies of watering, fertilizer applications and mowing.   | (Number of gardeners per year x lb. avg of CO2 emitted by one gas mower per year) / 2 (assuming maintenance of native grass landscaping is halved) x social cost of carbon (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                                |
| Students Visiting for Educational Purposes | Educational Value             | \$6.01/person/day | 18     | Visiting environmental education centers provides an educational value per learner that is multiplied by the number of those visiting, participating, or attending classes onsite.   | (Number of visitors for educational experience x dollars per person x number of years = educational value (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate   |

|                          |                                 |                          |    |   |   |
|--------------------------|---------------------------------|--------------------------|----|---|---|
|                          | Field Trip Educational Value    | \$9.12/student           | 4  | Based on the cost of public education per hour, a value of participating in field trips to nature centers is multiplied by the number of students participating and assumes a typical field trip would last 2 hours onsite.   | (Dollar value of education per hour x 2-hour trip x number of students anticipated = value of field trips) - minus 5% discount rate   |
| Researchers and Academia | Earnings from Research Stipends | \$13000/student/year     | 26 | The site provides ample opportunities for graduate study research activities across a number of different disciplines, including archaeology, anthropology, environmental engineering, botany, conservation sciences, etc. This proxy is the averaged in and out of state annual graduate school tuition costs in a Texas state university multiplied by the number of graduate students anticipated to receive research stipends based on research conducted onsite. | (Number of students x dollars per year x number of years = value of research stipends (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate     |
|                          | Value of Citizen Science        | \$12/hour                | 27 | This proxy represents the value of volunteered nature observation time and documentation on the I-Naturalist app, based on the hourly rate of an undergraduate research field technician. The number of hours of citizen science hours tracked by HWC is multiplied by the proxy and over time.   | (Hours of logged citizen science hours per year x dollars per hour x number of years (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate      |
| Center                   | Visitor Fees Revenue            | \$8.00/visitor per visit | 28 | This proxy is multiplied by the number of visitors to the site, providing revenue to the center.  | (Number of visitors x dollars per ticket x number of years = value of visitor fee revenue (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate |
|                          | Grants and Donations Income     | \$60,000/year            | 28 | This proxy represents the amount of grants and donations received by the center.  | (Dollars per year x number of years = value of grants and donations (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                       |
| Employees at the Center  | Earnings- Staff                 | \$52.41/hour             | 28 | This proxy represents the hourly wages of key staff onsite.   | (Number of key staff x dollars per hour x hours per year x number of years = value of staff earnings (value is calculated for each year then  |

|  |  |              |    |  |   |
|--|--|--------------|----|--|---|
|  |  |              |    |  | aggregated over 25 years for NPV)) - minus 5% discount rate   |
|  | Earnings- Interns                      | \$34.31/hour | 28 | This proxy represents the hourly wages of key staff onsite.  | (Number of interns x dollars per hour x hours per year x number of years = value of intern earnings (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                 |
|  | Earnings- Retail Sales                 | \$15/hour    | 28 | This proxy represents the hourly wages of key staff onsite.  | (Number of retail staff x dollars per hour x hours per year x number of years = value of retail associates earnings (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate |
|  | Enhanced Earning Potential for Interns | \$2,082/year | 29 | Earning potential increases in annual salary for those who have experienced an internship versus not. On average, graduates with internship experience earn more per year and this is multiplied by the number of interns accommodated onsite. | (Number of interns x dollars per year x number of years = value of increased intern salaries (value is calculated for each year then aggregated over 25 years for NPV)) - minus 5% discount rate                        |

## Citations

|   |  |
|---|--|
| 1 | "The Value of Conservation Easements: The Importance of Protecting Nature and Open Space," West Hill Foundation for Nature, Inc., (December 2002)  |
| 2 | Douglas J. Krieger, (2001) "The Economic Value of Forest Ecosystem Services: A Review", The Wilderness Society   |
| 3 | Costanza, R., Limburg, K., Naeem, S., O'Neill, R. V., Paruelo, J., Raskin, R. G., & Sutton, P. (1997). The value of the world's ecosystem services and natural capital, 387, 9.  |
| 4 | Christin, Z., Batker, D., Harrison-Cox, J., (2011). Economic Impact of Metro Parks Tacoma Ecosystem Services: Economic Impact Study Phase II Earth Economics, Tacoma WA, Earth Economics   |
| 5 | Oregon Department of Agriculture (2000), "Economic analysis of containment programs, damages, and production losses from noxious weeds in Oregon." <a href="http://www.oregon.gov/ODA/PLANT/docs/pdf/weed_body_a.pdf">www.oregon.gov/ODA/ PLANT/docs/pdf/weed_body_a.pdf</a> |
| 6 | Simon Cole (2013) "The Impact of Reputation on Market Value," World Economics, Volume 13, Number 3   |
| 7 | Lucy Johnston, Ezra Hausman, Bruce Biewald, Rachel Wilson, David White, "2011 Carbon Dioxide Price Forecast", Synapse Energy Economics, Inc. February 2011   |

|    |  |
|----|--|
| 8  | "Offset Credit Stacking: Background Paper for the EPRI Greenhouse Gas Emissions Offset Policy Dialogue Workshop #13," Electric Power Research Institute, (November 2012)   |
| 9  | Ducnuigeen, J (1997). Relative Nutrient Requirements of Plants Suitable for Riparian Vegetated Buffer Strips, Virginia Dept. of Env Quality, <a href="https://www.potomacriver.org/wp-content/uploads/2014/12/ICP97-4_Ducnuigeen.pdf">https://www.potomacriver.org/wp-content/uploads/2014/12/ICP97-4_Ducnuigeen.pdf</a>   |
| 10 | NPR & Restore the Earth Foundation reports (2017)  |
| 11 | Daniel Fujiwara, Paul Oroyemi and Ewen McKinnon (2013) "Wellbeing and civil society: Estimating the value of volunteering using subjective wellbeing data," UK Department for Work and Pensions and the Cabinet Office   |
| 12 | Social Value Lab (2011). SROI Forecast of Phase 1 of the Vineburgh Development - Social Value UK. Glasgow, Scotland.   |
| 13 | U.S. Fish and Wildlife Service (2012), "National Wildlife Refuge Wetland Ecosystem Service Valuation Model, Phase 1 Report" <a href="https://www.fws.gov/economics/Discussion%20Papers/USFWS_Ecosystem%20Services_Phase%20I%20Report_04-25-2012.pdf">https://www.fws.gov/economics/Discussion%20Papers/USFWS_Ecosystem%20Services_Phase%20I%20Report_04-25-2012.pdf</a>  |
| 14 | Stephen Faulkner, Wylie Barrow, Bob Keeland, Susan Walls, David Telesco (2011) "Effects of conservation practices on wetland ecosystem services in the Mississippi Alluvial Valley," Ecological Applications, Volume 21  |
| 15 | M. Ribaud (2005) "Nitrogen sources and Gulf hypoxia: potential for environmental credit trading," Ecological Economics, Vol. 52, No. 2   |
| 16 | Boyle, K. et al. (1988) Welfare Measurements Using Contingent Valuation: A Comparison of Techniques, American Journal of Agricultural Economics, vol. 70, issue 1, 20-28   |
| 17 | Social Cost of Carbon; <a href="http://www.epa.gov/climatechange/EPAactivities/economics/scc.html">http://www.epa.gov/climatechange/EPAactivities/economics/scc.html</a>   |
| 18 | Pam Kaval and John Loomis, (October 2003) "Updated Outdoor Recreation Use Values with Emphasis on National Park Recreation," USDA Forest Service   |
| 19 | Lundhede, T., Bille, T., & Hasler, B. (2013). Exploring Preferences and Non-use Values for Hidden Archaeological Artefacts: A Case from Denmark. International Journal of Cultural Policy, 19(4), 501-530  |
| 20 | Texas A&M AgriLife Extension Program, <a href="https://txmn.tamu.edu/">https://txmn.tamu.edu/</a>  |
| 21 | American Psychological Association, APA Working Group on Stress and Health Disparities. (2017). Stress and health disparities: Contexts, mechanisms, and interventions among racial/ethnic minority and low-socioeconomic status populations. Retrieved from <a href="http://www.apa.org/pi/health-disparities/resources/stress-report.aspx">http://www.apa.org/pi/health-disparities/resources/stress-report.aspx</a> |
| 22 | Vert, C. et al (2019), Health Benefits of Physical Activity Related to an Urban Riverside Regeneration, International Journal of Environmental Research and Public Health; Basel Vol. 16, Iss. 3, (2019). DOI:10.3390/ijerph16030462   |
| 23 | Statewide average water ratepayer water cost in Texas & California Dept of Water Resources   |
| 24 | Keeler, B. L., et al. (2016). The social costs of nitrogen. <i>Science advances</i> , 2(10), e1600219. <a href="https://doi.org/10.1126/sciadv.1600219">https://doi.org/10.1126/sciadv.1600219</a>   |
| 25 | Environmental Protection Agency (2015), National Emissions from Lawn and Garden Equipment, <a href="https://www.epa.gov/sites/default/files/2015-09/documents/banks.pdf">https://www.epa.gov/sites/default/files/2015-09/documents/banks.pdf</a>   |
| 26 | College Tuition Compare - Texas State University, <a href="https://www.collegetuitioncompare.com/edu/228459/texas-state-university/tuition/">https://www.collegetuitioncompare.com/edu/228459/texas-state-university/tuition/</a>  |

|    |   |
|----|---|
| 27 | Sauermann and Franzoni (2015), "Crowd science user contribution patterns and their implications", National Academy of Sciences, PNAS January 20, 2015, 112 (3) 679-684  |
| 28 | Headwaters of the Comal - NBU Internal Documentation  |
| 29 | National Association of Colleges and Employers (2018), Unpaid Internships and the Career Success of Liberal Arts Graduates, <a href="https://www.nacweb.org/job-market/internships/unpaid-internships-and-the-career-success-of-liberal-arts-graduates/">https://www.nacweb.org/job-market/internships/unpaid-internships-and-the-career-success-of-liberal-arts-graduates/</a> |

## 7.5 Correcting for Discount Factors

In order to ensure consistency with the SROI process, it is necessary to correct the initial values of the outcomes to be more reflective of the changes that are actually due to the project or activity. In other words, we are determining the “net value impact.” This is done via a number to corrections as defined in 7.5.1 through 7.5.8 and illustrated in Figure 10 and Tables 11 and 12. The Headwaters project is unique in that the site was essentially unused immediately prior to the beginning of this work. As noted above, the site was a maintenance yard for NBU, but those operations were moved to a different location. Once vacant, discussion began to determine a viable use for the site. This fact of starting from a “blank slate” relative to what Headwaters wishes to accomplish means that some correction factors are by and large, not applicable, as described in detail below.

### 7.5.1 Counterfactual (Deadweight)

Table 11 shows the values for the deadweight analysis and a justification/explanation for each proxy. The change in deadweight accounted for in the total SROI value is -35%. Establishing a deadweight of 0% was particularly straightforward for some of the proxies in this project and is justified. Prior to the established of the center, the area was a heavily asphalted utilities location for the local water distributor.

For other proxies such as well-being, which is much less straightforward, a deadweight that reflects our confidence in the proxy is provided. For example, in the case of physical health, we assign the benefit from particularly to an elder population at a retirement home across the street. Even more so, it is assigned to those with active memberships to ensure a reasonable frequency of site visits. This offers paying members convenient access and accessibility in an area that is otherwise primarily urbanized or privately owned. Hence, while they may gain their exercise by walking along the roadside, it is less likely than gaining it from coming to the center which they have already paid to have access to. In this case, the proxy was given a 25% deadweight estimate. For mental health, some may find mental breaks in many things and experiences that are hard to capture. We do believe the center can be attributed to part of this, as studies show the effectiveness of nature in providing mental health benefits and that the center emphasizes this by offering a peaceful environment and mindfulness geared workshop opportunities for visitors. Regardless, to be conservative, a deadweight of 75% is given.

With regards to many of the education and research-based proxies, the justifications for the selected deadweights given are primarily based on the fact that this site is extremely **unique** with regards to both environmental ecology and archeology research opportunities. Being the headwaters site of the river, the archeological findings are of previous civilizations that have lived in that particular area; thus, researchers would have to come to this particular site in order to study it. If the center was not there, the artifacts would have remained undiscovered and unprotected. For field trips, the same justification for above applies here. This center offers students a **unique** experience as opposed to other nature parks and has trained volunteers to guide tailored educational experiences. Other proxies such as relevant training (gardeners and Master Naturalists), as well as the wellbeing derived from volunteering have also been given deadweight assignments to account for other motivations, influences or activities in the volunteer’s or visitor’s life that may also contribute to these positive impacts.

**Table 11: Deadweight of Outcomes**

| Outcome                                      |                | Deadweight % | Displacement % | Attribution % | Drop off % | Corrected Value | Justification   |
|--|----------------|--------------|----------------|---------------|------------|-----------------|---|
| Soil Formation                               | \$181.13       | 0%           | 0%             | 0%            | 0%         | \$181.13        | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Soil Stabilization                           | \$17,896.72    | 0%           | 0%             | 0%            | 0%         | \$17,896.72     | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Support of Pollinator Populations            | \$3,644.70     | 0%           | 0%             | 0%            | 0%         | \$3,644.70      | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Water Quality Treatment Equivalent           | \$7,124.34     | 0%           | 0%             | 0%            | 0%         | \$7,124.34      | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Refuge Habitat Creation                      | \$1,059.89     | 0%           | 0%             | 0%            | 0%         | \$1,059.89      | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Biological Control- Invasive Species Control | \$1,026,388.23 | 0%           | 0%             | 0%            | 0%         | \$1,026,388.23  | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Social License to Operate in the Region      | \$6,392,902.92 | 25%          | 0%             | 0%            | 0%         | \$4,794,677.19  | This total investment over 25 years is not solely coming from NBU, other investors may already carry positive reputations in the community coming into this project   |
| Market Value of Carbon                       | \$2,183.29     | 0%           | 0%             | 0%            | 0%         | \$2,183.29      | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem  |

|                                    |                 |     |    |    |    |                 |   |
|------------------------------------|-----------------|-----|----|----|----|-----------------|---|
| Reduction - Open Space             |                 |     |    |    |    |                 | service did not and could not have existed prior to this project and this particular physical site  |
| Nitrogen Offset Credit             | \$256.25        | 0%  | 0% | 0% | 0% | \$256.25        | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Phosphorus Credit                  | \$94.84         | 0%  | 0% | 0% | 0% | \$94.84         | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Increased Marketing Opportunities  | \$211,409.17    | 0%  | 0% | 0% | 0% | \$211,409.17    | This center did not exist before this project, thus there was no positive awareness or interest carried forward   |
| Increased Sense of Community Pride | \$27,169,100.22 | 50% | 0% | 0% | 0% | \$13,584,550.11 | The community may be experiencing other uplifting initiatives and projects at the same time which may contribute to increased community pride as a whole  |
| Air Quality                        | \$6,943.21      | 0%  | 0% | 0% | 0% | \$6,943.21      | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Phosphorus Retention               | \$4,937.98      | 0%  | 0% | 0% | 0% | \$4,937.98      | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Nitrogen Mitigation                | \$2,569.59      | 0%  | 0% | 0% | 0% | \$2,569.59      | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Cultural Value                     | \$2,656.53      | 0%  | 0% | 0% | 0% | \$2,656.53      | There was no public access prior to conversion of utilities site to nature center   |
| Amenity Value                      | \$1,424,868.37  | 0%  | 0% | 0% | 0% | \$1,424,868.37  | There was no public access prior to conversion of utilities site to nature center   |

|                                     |                 |     |    |    |    |                 |   |
|-------------------------------------|-----------------|-----|----|----|----|-----------------|---|
| Social Cost of Carbon - Open Space  | \$3,079.16      | 0%  | 0% | 0% | 0% | \$3,079.16      | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| General Recreation Consumer Surplus | \$1,021,860.05  | 0%  | 0% | 0% | 0% | \$1,021,860.05  | There was no public access prior to conversion of utilities site to nature center   |
| Valuing Water Protection            | \$25,569,873.32 | 50% | 0% | 0% | 0% | \$12,784,936.66 | The community could value other regions of the watershed more than the headwaters site, or valued it before the HWC was implemented   |
| Archaeological Asset Protection     | \$7,921,256.83  | 0%  | 0% | 0% | 0% | \$7,921,256.83  | The archaeological artifacts were undiscovered prior to conversion of utilities site to nature center   |
| Sense of Accomplishment             | \$1,278,306.17  | 50% | 0% | 0% | 0% | \$639,153.09    | Volunteers may be volunteering for other causes at the same time, gaining wellbeing from volunteering from multiple sources   |
| Master Naturalist                   | \$11,320.46     | 25% | 0% | 0% | 0% | \$8,490.35      | It is possible that the motivation to receive the Master Naturalist training is not solely based on volunteering at HWC   |
| Mental Health                       | \$188,674.31    | 75% | 0% | 0% | 0% | \$47,168.58     | Visitors may have experienced other mental health enhancing experiences the same day as their visit to HWC from other sources   |
| Physical Health                     | \$4,623,275.22  | 25% | 0% | 0% | 0% | \$3,467,456.42  | Members may exercise roadside in addition to this site, though unlikely given the highly urbanized area in which the members live   |
| Storm Protection and Flood Control  | \$16,065.22     | 0%  | 0% | 0% | 0% | \$16,065.22     | The area was converted from concrete and asphalt surfaces to natural land for this project, this ecosystem service did not and could not have existed prior to this project and this particular physical site |
| Real Estate Value Added             | \$478,750.00    | 0%  | 0% | 0% | 0% | \$478,750.00    | This enhancement in property value is specific to proximity to green spaces, which did not exist in this defined property radius before the conversion of the site  |

|   |                |     |    |    |    |                |  |
|---|----------------|-----|----|----|----|----------------|--|
| Gardeners-<br>Water Savings                     | \$3,694,997.00 | 50% | 0% | 0% | 0% | \$1,847,498.82 | They could learn similar sustainable gardening skills elsewhere, but not as targeted and comprehensive as what the HWC offers                              |
| Gardener-<br>Fertilizer Saving                  | \$339,750.00   | 50% | 0% | 0% | 0% | \$169,806.88   | They could learn similar sustainable gardening skills elsewhere, but not as targeted and comprehensive as what the HWC offers                              |
| Gardener- CO2                                   | \$100,072.85   | 50% | 0% | 0% | 0% | \$50,036.43    | They could learn similar sustainable gardening skills elsewhere, but not as targeted and comprehensive as what the HWC offers                              |
| Educational<br>Value                            | \$136,071.91   | 25% | 0% | 0% | 0% | \$102,053.93   | Visitors may have learned some material on regional archeology and native ecosystems elsewhere   |
| Field Trip<br>Educational<br>Value              | \$206,485.16   | 0%  | 0% | 0% | 0% | \$206,485.16   | The learning opportunities that this site provides is very unique as being the only headwaters location of the river and also an archeologically rich area |
| Earnings from<br>Research<br>Stipends           | \$2,173,528.00 | 0%  | 0% | 0% | 0% | \$2,173,528.00 | The research opportunities that this site provides is very unique as being the only headwaters location of the river and also an archeologically rich area |
| Citizen Science                                 | \$23,455.99    | 0%  | 0% | 0% | 0% | \$23,455.99    | This only counts citizen science hours of visitors logging hours as volunteers specific to their site visit and observations                               |
| Revenue to<br>Center from<br>Visitors to Site   | \$603,757.78   | 0%  | 0% | 0% | 0% | \$603,757.78   | There was no public access prior to conversion of utilities site to nature center  |
| Grants and<br>Donations                         | \$905,636.67   | 0%  | 0% | 0% | 0% | \$905,636.67   | All grants and donations would be received by the Center to fund their specific initiatives, which wouldn't exist before                                   |
| Earnings from<br>Direct - Staff<br>Jobs Created | \$3,290,866.32 | 0%  | 0% | 0% | 0% | \$3,290,866.32 | These are jobs that are created as a direct result of the center's existence, and would not be there if not for this project                               |
| Earnings from<br>Direct - Other-                | \$1,077,176.34 | 0%  | 0% | 0% | 0% | \$1,077,176.34 | These are internships that are created as a direct result of the center's existence, and would not be there if not for this project                        |

|  |              |     |    |    |    |              |  |
|--|--------------|-----|----|----|----|--------------|--|
| Intern Jobs Created                                  |              |     |    |    |    |              |  |
| Earnings from Direct - Retail Sales Jobs Created     | \$470,931.07 | 0%  | 0% | 0% | 0% | \$470,931.07 | These are jobs that are created as a direct result of the center's existence, and would not be there if not for this project |
| Enhanced Future Employment Opportunities for Interns | \$31,425.59  | 25% | 0% | 0% | 0% | \$23,569.19  | They could get another internship elsewhere at the same time or within the same year   |

### 7.5.2 Attribution

The Center project is the only entity operating the project on this location and all outcomes attributed to this location and project are attributed to this project. If an outcome can be realized in another manner in a difference location, as defined in section 7.5.1 on Deadweight, then it would not be a Center project-related outcome. In other words, no outcome will originate at this location that would not be attributable to this project. Thus, **the attribution rate for all stakeholder group outcomes is 0%.**

### 7.5.3 Displacement

The outcomes identified by stakeholders in the qualitative phase of the research conducted by EcoMetrics LLC were not directly correlated to displacing any specific phenomena. Other third-party literature consulted did not identify any types of displacements specifically to the Headwaters project. For example, there is no reason to suspect that visitors would come to this site instead of another if the interest is to experience the unique elements of this location. The Center presents a new and unique opportunity that supplements, not replaces, something else. To further address uncertainty, we used a very conservative number of visitors to reflect only those that are specifically interested in what the Center has to offer. We did not include in the approximation of site visitors the overall number of regional visitors and tourists who may not be very selective where they go. Thus, **the displacement rate for all stakeholder group outcomes is 0%.**

### 7.5.4 Drop-Off

Headwaters is an ongoing operation that serves as a center open to visitors. For the socio-economic outcomes, there is no reason to expect drop-off as the benefits stem from a continuous flow of visitors, site users for events and meetings, and school groups. It is also expected that the site will have ongoing research activities and other educational and outreach functions. For example, recently the site hosted a community art festival. There is no reason to expect any of these to drop off, although the rate and pace may vary over time, for example related to seasonal activities. Even with only Phase I element in place, the site had steady use until the COVID-related slowdowns. From an environmental standpoint, there is no expected drop-off as these noted outcomes are annual and relatively continuous. Thus, **the drop-off rate for all stakeholder group outcomes is 0%.**

### 7.5.5 Testing Outcomes for Materiality

In accordance with SVI's Principle 4 Guidance- Only Include what is Material, we used the following test:

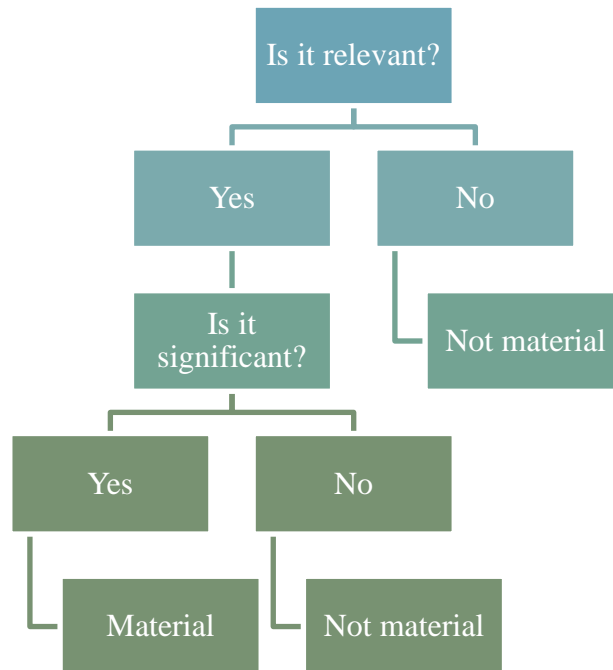
Outcomes are included if they are relevant and are relevant if the activity contributes to the outcome and:

- stakeholders perceive an outcome as important to them;
- peers are already managing the outcome and have demonstrated its value;
- the organization has a policy to include the outcome;
- there are existing social norms that demand it; or
- there are financial consequences to the organization for not including this outcome in the analysis.

Outcomes of the Headwaters project were determined by first analyzing collected information from the qualitative phase of research (see description in section 3 "Research Methodologies"). Collected stakeholder input information was quantitatively analyzed to determine frequencies, differences, and similarities of outcomes identified by participants across stakeholder categories. Only outcomes identified by stakeholder groups during the qualitative research phase were included. Once outcomes were identified by stakeholder group, third-party (secondary source) literatures were consulted to validate research findings within broader third-party literature and other relevant studies. Quantities for the Environment stakeholder were based primarily on the nature of the four acres of restored open space by examining the various attributes of these native grasses and plants. Secondly, environmental benefits are created from removing part of the Spring concrete cap and other protective measures of the surface water. We derived quantities of visitors to the site, both tourists and education visitors, from qualitative research, input from site staff, and projections based on Phase I data collected by Center staff. Quantities of outcomes for all other stakeholder groups were derived from third-party literature and stakeholder input as defined elsewhere in this report. Duration of outcomes for valuation purposes was set as a 25-year outlook as requested the Center Director. The EcoMetrics methodology incorporated these various inputs to determine the value of outcomes which were shared with and validated by relevant stakeholders as described above.

Causality between the outcomes and the project was determined based on stakeholder engagement and relevant third-party literature. All outcomes are directly linked to the project, as no other factors or inputs were determined to have caused any of the outcomes identified by stakeholder groups and third-party literature. In short, the first event in the chain of events is the development of Headwaters project to which all identified outcomes are directly linked. Some of these events may have begun in Phase I, but some outcomes will not trigger until Phase II. Outcomes noted by stakeholders, indirectly implied by stakeholders, or naturally extrapolated for Phase II based on predictions consistent with stakeholder input and third-party literature review and verified by review of other information are noted as material.

Relevance was determined by the materiality of the outcome, that is, if it was a material outcome articulated by a member of a stakeholder group during the qualitative phase of the research. For the Environment stakeholder, the only group that cannot speak for itself, relevance was determined by third-party literature as well as suggestions by EcoMetrics LLC, applicable stakeholders, government agencies, or Center staff.



**Figure 6: Determining Materiality Through Relevance and Significance**

#### 7.5.6 Unintended or Negative Outcomes

EcoMetrics methodologies were designed to capture unintended consequences or negative outcomes stemming from the project and what would happen without the project. The stakeholder engagement process explored the following questions to account for unintended or negative outcomes:

- Do outcomes change over time? As the site comes online and matures, does it impact who uses it differently?
- What possibilities are there for reduced or increased usage of the Center, once fully implemented, over time and for whom?
- What kinds of uses might change over time?
- Do certain outcomes impact groups differently?
- Do you think development of the site might have any unintended negative impacts or outcomes over time?

For the Headwaters site, the main negative consequences if the project were not to occur would be some other use for the land that would be less desirable. For example, several stakeholders noted that they prefer it would not be developed as residential or commercial. Leaving it as a vacant unused site for the long term would also be a negative outcome.

Conversely, there was essentially unanimous consent among all stakeholders that the planned use was positive and desired. All felt this was an excellent use of the site, and one that would capitalize on the environmental, natural, cultural, and historical value of the area. The only negative concerns regarding the planned development of the site were that stakeholders wanted to make sure that it was well-communicated that the resource exists for public use.

From an environmental perspective, again, there was essentially unanimous consent that the planned use of the site would maximize the potential environmental value of the area, most notably contribute to source water protection of the Comal Springs as a supply source.

This Headwaters project is somewhat unique in that there are essentially no perceived downsides of planned use, especially in the eyes of the stakeholders.

**Table 12: Materiality and Significance of Outcomes**

| Stakeholder              | Outcome                                       | Was the Outcome Identified by Stakeholders During Qualitative Phase of Research? | Was the Outcome Confirmed by Third Party Research? | Is the Outcome Relevant? | Notes                                     |
|--------------------------|---|--|--|--------------------------|---|
| Environment              | Soil Formation                                | Yes  | Yes  | Yes                      | Only alluded to generally by Stakeholders |
|                          | Soil Stabilization                            | Yes  | Yes  | Yes                      |   |
|                          | Pollinator Populations Support                | Yes  | Yes  | Yes                      |   |
|                          | Water Quality- Natural Treatment              | Yes  | Yes  | Yes                      |   |
|                          | Refuge Habitat Creation                       | Yes  | Yes  | Yes                      |   |
|                          | Biological Control- Invasive Species          | Yes  | Yes  | Yes                      |   |
| Funders (NBU and Donors) | Enhanced Reputation                           | Yes  | Yes  | Yes                      |   |
|                          | Market Value of Carbon Credits                | No   | Yes  | Yes                      | Extrapolated from Team experience         |
|                          | Market Value of Nitrogen Credits              | No   | Yes  | Yes                      | Extrapolated from Team experience         |
|                          | Market Value of Phosphorus Credits            | No   | Yes  | Yes                      | Extrapolated from Team experience         |
| Community at Large       | Enhanced Marketing and Outreach Opportunities | Yes  | Yes  | Yes                      |   |
|                          | Sense of Accomplishment by Volunteering       | Yes  | Yes  | Yes                      |   |
|                          | Sense of Community Pride                      | Yes  | Yes  | Yes                      |   |
|                          | Storm Flooding Protection                     | Yes  | Yes  | Yes                      |   |
|                          | Air Quality                                   | Yes  | Yes  | Yes                      |   |
|                          | Phosphorus Retention- Social Value            | Yes  | Yes  | Yes                      |   |

|  |  |     |     |     |                                   |
|--|--|-----|-----|-----|-----------------------------------|
|  | Nitrogen Retention-Social Value                | Yes | Yes | Yes |                                   |
|  | Cultural Value (including archaeology)         | Yes | Yes | Yes |                                   |
|  | Amenity Value                                  | Yes | Yes | Yes |                                   |
|  | Carbon Sequestration-Social Value              | Yes | Yes | Yes |                                   |
|  | General Recreation                             | Yes | Yes | Yes |                                   |
|  | Valuing the Water Resource                     | Yes | Yes | Yes |                                   |
|  | Archaeological Asset Protection                | Yes | Yes | Yes |                                   |
|  | Master Naturalist Program                      | Yes | Yes | Yes |                                   |
|  | Mental Health                                  | Yes | Yes | Yes |                                   |
|  | Physical Health                                | Yes | Yes | Yes |                                   |
|  | Real Estate Value Added                        | Yes | Yes | Yes |                                   |
| Gardeners Applying Landscaping Practices   | Gardener Water Savings                         | Yes | Yes | Yes |                                   |
|  | Gardener Fertilizer Savings                    | Yes | Yes | Yes |                                   |
|  | Gardener Carbon-Social Value                   | Yes | Yes | Yes |                                   |
| Students Visiting for Educational Purposes | Educational Value Towards Future Opportunities | Yes | Yes | Yes |                                   |
|  | Field Trip Educational Value                   | Yes | Yes | Yes |                                   |
| Researchers and Academia                   | Earnings from Research Stipends                | Yes | Yes | Yes |                                   |
|  | Value of Citizen Science                       | Yes | Yes | Yes |                                   |
| Center                                     | Visitor Fees Revenue                           | Yes | Yes | Yes |                                   |
|  | Grants and Donations Income                    | Yes | Yes | Yes |                                   |
| Employees at the Center                    | Earnings- Staff                                | Yes | Yes | Yes |                                   |
|  | Earnings- Interns                              | Yes | Yes | Yes |                                   |
|  | Earnings- Retail Sales                         | Yes | Yes | Yes |                                   |
|  | Enhanced Earning Potential for Interns         | No  | Yes | Yes | Extrapolated from Team experience |

## 7.5.7 Sensitivity Analysis

### 7.5.7.1 Accounting for General Uncertainty

This discount rate can be considered an error bar of +/- 5% for all the values across the outcomes. As seen in Table 13, the lowest values are highlighted in the 10% column, though none become negative in the analysis. Those that are close to zero were already initially relatively small numbers.

**Table 13: Discount Rate of Outcomes**

| Social Value (Non-Market Value)                   | Present Value- 0% | Present Value- 5% | Present Value- 10% |
|---|-------------------|-------------------|--------------------|
| General Recreation Consumer Surplus               | \$1,760,200       | \$1,021,860.05    | \$682,215.61       |
| Educational Value                                 | \$234,390         | \$136,071.91      | \$90,844.52        |
| Social Cost of Carbon - Open Space                | \$5,304           | \$3,079.16        | \$2,055.72         |
| Air Quality                                       | \$11,960          | \$6,943.21        | \$4,635.44         |
| Phosphorus Retention                              | \$8,505.89        | \$4,937.98        | \$3,296.70         |
| Nitrogen Mitigation                               | \$4,426.24        | \$2,569.59        | \$1,715.52         |
| Support of Pollinator Populations                 | \$6,278.15        | \$3,644.70        | \$2,433.28         |
| Soil Formation                                    | \$312             | \$181.13          | \$120.92           |
| Soil Stabilization                                | \$31,428          | \$17,896.72       | \$11,827.34        |
| Storm Protection and Flood Control                | \$28,280          | \$16,065.22       | \$10,446.28        |
| Biological Control- invasive species control      | \$1,768,000       | \$1,026,388.23    | \$685,238.72       |
| Cultural Value                                    | \$4,576           | \$2,656.53        | \$1,773.56         |
| Water Quality Treatment Equivalent                | \$12,272          | \$7,124.34        | \$4,756.36         |
| Amenity Value                                     | \$2,454,400       | \$1,424,868.37    | \$951,272.58       |
| Sense of Accomplishment                           | \$2,201,940       | \$1,278,306.17    | \$853,424.52       |
| Earnings from Direct - Retail Sales Jobs Created  | \$811,200         | \$470,931.07      | \$314,403.65       |
| Earnings from Direct - Other- Intern Jobs Created | \$1,855,484.80    | \$1,077,176.34    | \$719,145.95       |
| Earnings from Direct - Staff Jobs Created         | \$5,668,665.60    | \$3,290,866.32    | \$2,197,052.70     |
| Increased Marketing Opportunities                 | \$375,000         | \$211,409.17      | \$136,155.60       |

|  |                 |                 |                 |
|--|-----------------|-----------------|-----------------|
| Enhanced future employment opportunities for interns | \$54,132        | \$31,425.59     | \$20,980.40     |
| Earnings from Research stipends                      | \$3,744,000     | \$2,173,528.02  | \$1,451,093.76  |
| Increased sense of community pride                   | \$46,800,000    | \$27,169,100.22 | \$18,138,672.03 |
| Refuge Habitat creation                              | \$1,724.08      | \$1,059.89      | \$731.29        |
| Valuing Water Protection                             | \$40,701,179.20 | \$25,569,873.32 | \$17,850,601.61 |
| Gardener Water Savings                               | \$6,364,800     | \$3,694,997.63  | \$2,466,859.40  |
| Archaeological Asset Protection                      | \$13,644,722    | \$7,921,256.83  | \$5,288,400.37  |
| Citizen Science                                      | \$40,404        | \$23,455.99     | \$15,659.72     |
| Physical Health                                      | \$7,963,800     | \$4,623,275.22  | \$3,086,597.36  |
| Field Trip Educational Value                         | \$355,680       | \$206,485.16    | \$137,853.91    |
| Master Naturalist                                    | \$19,500        | \$11,320.46     | \$7,557.78      |
| Mental Health  | \$325,000       | \$188,674.31    | \$125,963       |
| Gardener Fertilizer Savings                          | \$585,000       | \$339,613.75    | \$226,733.40    |
| Gardener Carbon - Social Value                       | \$172,380       | \$100,072.85    | \$66,810.78     |
| Real Estate Value Added                              | \$478,750       | \$478,750       | \$478,750       |
| <b>Market Value</b>                                  |                 |                 |                 |
| Market Value of Carbon Reduction - Open Space        | \$4,354.68      | \$2,183.29      | \$1,275.23      |
| Nitrogen Offset Credit                               | \$441.40        | \$256.25        | \$171.08        |
| Phosphorus Credit                                    | \$163.36        | \$94.84         | \$63.31         |
| Grants and Donations                                 | \$1,560,000     | \$905,636.67    | \$604,622.40    |
| Revenue to Center from visitors to site              | \$1,040,000     | \$603,757.78    | \$403,081.60    |
| Social license to operate in the region              | \$7,981,864.38  | \$6,392,902.92  | \$5,656,020.10  |

#### 7.5.7.2 Sensitivity of Select Proxies

Table 14 shows the sensitivity analysis for select proxies. Proxies not included in this analysis either had a direct input from the stakeholder or site-specific study, or the most conservative value for the proxy estimate was used. Proxies included are those in which the range of potential value estimates available is considerable, or the inputs were “best guesses”, guided by the stakeholders participating in the study. The

impact of the low estimates on the total SROI is a difference of -36%, while the high estimates yield an increase of 2%. The justification for each is included in the table.

**Table 14: Sensitivity Analysis of Outcomes (not deadweight-corrected)**

| Outcome                              | Current Proxy        | Low Estimate Proxy  | High Estimate Proxy | Current SROI Values | Totals of Changes in Study Value - LOW (\$) | Totals of Changes in Study Value - HIGH (\$) | Justification for Changes   |
|--------------------------------------|----------------------|---------------------|---------------------|---------------------|---|--|---|
| Soil Stabilization                   | \$150 tons/acre/year | \$75/tons/acre/year | n/a                 | \$17,896.00         | \$8,948.36                                  | \$17,896.00                                  | A high estimate of soil stabilization was used as the City of New Braunfels is experiencing extremely high growth rates (one of the fastest growing cities according to the census) in recent years. This brings high level of construction and thus a loss of sediment. To reflect any lower periods of development, we halved the proxy |
| Water Quality- Natural Treatment     | \$118/acre/year      | \$11/acre/year      | \$225/acre/year     | \$7,124.00          | \$664.13                                    | \$13,584.55                                  | The original value used the midpoint of relevant studies. The high and low ends are calculated here for sensitivity   |
| Refuge Habitat Creation              | \$18.74/acre/year    | \$2.33/acre/year    | n/a                 | \$1,059.89          | \$131.78                                    | \$1,059.89                                   | A high value proxy was used due to the ecosystem studies provided of the site and the critical nature of the headwaters in the watershed as a whole, particularly rich in biodiversity.   |
| Biological Control- Invasive Species | \$34                 | \$17                | n/a                 | \$1,026,388.23      | \$513,194.12                                | \$1,026,388.23                               | This value reflects the cost of remediation avoided if invasive plant species were to be managed appropriately. To account for any factors that may lower this, such as advances in technology or processes that may streamline invasive species removal, the proxy is halved   |
| Market value of Nitrogen Credits     | \$2.52/kg N          | \$0                 | \$10                | \$256.25            | \$0.00                                      | \$1,016.86                                   | As there is currently no nutrient retention market in Texas, a conservative national average was used to show the opportunity value of nitrogen retention. The low value reflects a scenario where no credits are obtained, and the high value reflects a neighboring national market for nitrogen credits.                               |

|   |                        |                |                |                 |                |                 |  |
|---|------------------------|----------------|----------------|-----------------|----------------|-----------------|--|
| Market Value of Phosphorus Credits      | \$6.51/kg P            | \$0            | \$10           | \$94.84         | \$0.00         | \$145.68        | Same logic as above for Nitrogen, but pertains to Phosphorus retention and credits   |
| Sense of Accomplishment by Volunteering | \$16,938/person        | \$150/person   | n/a            | \$1,278,306.17  | \$11,320.46    | \$1,278,306.17  | A high value was used here, driven by previous studies and volunteer enthusiasm and commitment expressed during the stakeholder engagement period. The low value was provided by the same reference study, but reflects a difference in population size and frequency of volunteering  |
| Air Quality                             | \$115/acre/year        | \$53/acre/year | n/a            | \$6,943.21      | \$3,199.92     | \$6,943.21      | A high value was used and appropriate as the immediate area remains primarily urbanized. This concentrates the positive impact of green spaces on air quality given the denseness of the area. The low value reflects another study's valuation for comparison   |
| Valuing the Water Resource              | \$64.14/household/year | \$0            | n/a            | \$25,569,873.32 | \$0.00         | \$25,569,873.32 | the nature of this variable is essentially "all or nothing" in terms of willingness to pay in tax dollars. Thus, the value used shows that all the community would accept and pay for this protection, or not at all for the low-end estimate  |
| Earnings from Research Stipends         | \$12000/student/year   | \$6,000        | \$15,600       | \$2,173,528.02  | \$1,086,764.01 | \$2,825,586.42  | For the low estimate, half the annual tuition value is used, assuming part of their tuition is covered by other sources such as faculty discretionary funds. The high estimate shows the case of an international student fully funded by this project's research funding. The base case used reflects a local student fully concentrated on this project, paying in-state tuition |
| Visitor Fees Revenue (# of visitors)    | 5000 visitors/year     | 4000           | \$6,000        | \$603,757.78    | \$483,006.23   | \$724,509.34    | A sensitivity analysis was run using the projected number of visitors to the site, plus or minus 1000 per year   |
| Grants and Donations Income             | \$60,000/year          | \$30,000/year  | \$120,000/year | \$905,636.67    | \$452,818.34   | \$1,811,273.35  | To show any uncertainty in fundraising, the projected grants and donations income is halved and doubled for this analysis  |

|   |                              |                |     |                |              |                |   |
|---|------------------------------|----------------|-----|----------------|--------------|----------------|---|
| Gardeners -<br>Total<br>Environmental<br>Impact | 10% of projected<br>visitors | 1% of visitors | n/a | \$4,134,684.23 | \$413,468.43 | \$4,134,684.23 | The combined impact of gardeners adopting sustainable landscaping skills (water, fertilizer and carbon) assumed 10% of visitors per year would contribute to this. To be more conservative, 1% is taken for a low-end estimate. |
|---|------------------------------|----------------|-----|----------------|--------------|----------------|---|

As the project is still in the early, predictive stages, it is difficult to fully understand all of the parameters that would need to be analyzed for sensitivity. For example, possible sensitivity parameters could be the credit trading value of carbon, nitrogen, and phosphorus. However, these totals are relatively insignificant and even swings of 100% in price from the approximated amount would not make a material difference. For other parameters that are more significant, for example some of the financial proxies for social value, there is not enough indication at this early stage to raise a concern. The same for projected numbers of site users. In the future, as we learn more about how the project is evolving, we will introduce additional parameters for sensitivity analysis. To account for the uncertainty in doing sensitivity analysis at this stage, the study used relatively conservative estimates. For example, we used a single fee per visitor although some visitors might be there for a specific event or purpose that would involve a higher entry cost.

### 7.5.8 Statement of Risks of Overclaiming

All outcomes assessed in this analysis are directly associated with the development of the site, including social, economic, and environmental outcomes for several different stakeholder groups. No stakeholders noted any instances of displacement or drop-off of outcomes as a result of the development of the site. Along these lines, few stakeholders identified any situation where the outcomes would occur/grow without this project or that any other anticipated activities would contribute to the development of these types of outcomes in the region, especially considering the high existing development in the area, and the previously mentioned point that most land in Texas is privately owned and not accessible to the public. The Comal Springs site is truly unique, and the combination of the environmental, social, cultural, and historical attributes are not common. EcoMetrics LLC does not have any knowledge of other existing projects in the area that have contributed the outcomes identified herein.

### 7.5.9 Limitations

#### 7.5.9.1 Stakeholder numbers and proportions

This study was done as a forecast for the planned Center. As described above, the Center is to provide a place of learning and recreation and is value-added for the community. It is not possible to identify every possible stakeholder, or even type of stakeholder, who will ultimately utilize the site. A statistical, or percentage, sampling was not practical, nor would it be conclusive as total numbers are not known. Instead, the analysis targeted representative sampling of the “types” of stakeholders likely to engage with the Center. And the individuals chosen from these group types were those already connected to the Center somehow, and therefore had a strong working knowledge of what could happen in the future. **Therefore, although the total number of stakeholders is relatively low compared to the size of the potentially impacted population, at this early and predictive stage, it is representative of future conditions.** See Sensitivity Analysis Section (7.5.7) above for discussion on how this factor could impact calculated values.

#### *7.5.9.2 The nature of predictive analysis*

It is important to note that this analysis is **predictive**- in other words, it is predicting outcomes and their respective values. The project is only recently getting underway, and it will take time, likely on the scale of years, to have enough trend and performance data information to update, correct, and validate the predictions in this report. Secondly, we envision that some of the indicators, and outcomes themselves, can and will be further refined as we learn more. These outcomes are included herein but may need several years to materialize.

#### *7.5.9.3 Primary vs secondary research*

Given the practical constraints of budgets and time, and in this particular period, the constraints of the pandemic at the time in which this study was conducted, obtaining primary research studies for all the proxies included would not be feasible. To provide a robust report given these limitations, we conduct extensive research and apply a range of appropriate social and ecosystem services proxies where direct study inputs are not available. The credibility of the sources that are referenced are highly scrutinized (primarily peer reviewed academic journal articles or publications by highly regarded and established organizations such as govts and foundations). Despite the high standards of research, there may always be gaps in research, dynamic and changing landscapes from when the regional research might have been conducted, issues of regional applicability, financial and economic factors (such as inflation, etc.), that may influence the study. To account for this uncertainty, we apply a discount factor across the entire study's proxy list.

#### *7.5.9.4 Stakeholder expertise/validation*

It is important to point out that the stakeholders, in some cases, do not have the expertise to validate the exact values of some of our proxies. So, whereas they identified and validated the outcomes, they were not in an expert's position to say which might be a more appropriate selection for a proxy if there is a range to choose from. In these cases, we rely on our own team's expertise (all working professionals in the social and environmental fields) and highly credible, peer reviewed and publicly available research. In many cases, however, the stakeholder's expertise was highly relevant and taken into account, such as the specific groups working in local biodiversity studies and the archeological research team.

### **7.6 Net Valuation of Outcomes – SROI Map Stage 4**

We can now take the uncorrected values of the outcomes from Table 9, and information from Table 11 to determine the corrected, or net value, created for each outcome (Table 12). These corrected net outcome values are presented in Sections 8 and 9 sorted by stakeholder and Center pillars, and by market and non-market category. As noted above, the corrected net value is the same as the calculated value for all outcomes.

**Table 15: SROI Mapping Stage 4 – Corrections to Values**

| Outcome   | Value of Outcome in Currency | Deadweight % | Displacement % | Attribution % | Drop off % | Corrected Net Value |
|---|------------------------------|--------------|----------------|---------------|------------|---------------------|
| Soil Formation  | \$181.13                     | 0%           | 0%             | 0%            | 0%         | \$181.13            |
| Soil Stabilization  | \$17,896.72                  | 0%           | 0%             | 0%            | 0%         | \$17,896.72         |
| Support of Pollinator Populations   | \$3,644.70                   | 0%           | 0%             | 0%            | 0%         | \$3,644.70          |
| Water Quality Treatment Equivalent  | \$7,124.34                   | 0%           | 0%             | 0%            | 0%         | \$7,124.34          |
| Refuge Habitat Creation   | \$1,059.89                   | 0%           | 0%             | 0%            | 0%         | \$1,059.89          |
| Biological Control- Invasive Species Control  | \$1,026,388.23               | 0%           | 0%             | 0%            | 0%         | \$1,026,388.23      |
| Social License to Operate in the Region (effects to reputation; positive impact on communities) | \$6,392,902.92               | 25%          | 0%             | 0%            | 0%         | \$4,794,677.19      |
| Market Value of Carbon Reduction - Open Space   | \$2,183.29                   | 0%           | 0%             | 0%            | 0%         | \$2,183.29          |
| Nitrogen Credit*  | \$256.25                     | 0%           | 0%             | 0%            | 0%         | \$256.25            |
| Phosphorus Credit*  | \$94.84                      | 0%           | 0%             | 0%            | 0%         | \$94.84             |
| Enhanced Positive Awareness and Interest for the Center and Community                           | \$211,409.17                 | 0%           | 0%             | 0%            | 0%         | \$211,409.17        |
| Sense of Accomplishment*  | \$1,278,306.17               | 50%          | 0%             | 0%            | 0%         | \$639,153.09        |
| Air Quality*  | \$27,169,100.22              | 50%          | 0%             | 0%            | 0%         | \$13,584,550.11     |
| Phosphorus Retention  | \$16,065.22                  | 0%           | 0%             | 0%            | 0%         | \$16,065.22         |
| Nitrogen Mitigation   | \$6,943.21                   | 0%           | 0%             | 0%            | 0%         | \$6,943.21          |
| Cultural Value  | \$4,937.98                   | 0%           | 0%             | 0%            | 0%         | \$4,937.98          |
| Amenity Value   | \$2,569.59                   | 0%           | 0%             | 0%            | 0%         | \$2,569.59          |
| Social Cost of Carbon - Open Space  | \$2,656.53                   | 0%           | 0%             | 0%            | 0%         | \$2,656.53          |

|   |                 |     |    |    |    |                 |
|---|-----------------|-----|----|----|----|-----------------|
| General Recreation Consumer Surplus               | \$1,424,868.37  | 0%  | 0% | 0% | 0% | \$1,424,868.37  |
| Valuing Water Protection                          | \$3,079.16      | 0%  | 0% | 0% | 0% | \$3,079.16      |
| Archaeological Asset Protection                   | \$1,021,860.05  | 0%  | 0% | 0% | 0% | \$1,021,860.05  |
| Valuing the water resource*                       | \$25,569,873.32 | 50% | 0% | 0% | 0% | \$12,784,936.66 |
| Master Naturalist                                 | \$7,921,256.83  | 0%  | 0% | 0% | 0% | \$7,921,256.83  |
| Mental Health                                     | \$11,320.46     | 25% | 0% | 0% | 0% | \$8,490.35      |
| Physical Health                                   | \$188,674.31    | 75% | 0% | 0% | 0% | \$47,168.58     |
| Storm Protection and Flood Control                | \$4,623,275.22  | 25% | 0% | 0% | 0% | \$3,467,456.42  |
| Real Estate Value Added                           | \$478,750       | 0%  | 0% | 0% | 0% | \$478,750       |
| Gardeners- Water Savings*                         | \$3,694,997.63  | 50% | 0% | 0% | 0% | \$1,847,498.82  |
| Gardener- Fertilizer Saving*                      | \$339,613.75    | 50% | 0% | 0% | 0% | \$169,806.88    |
| Gardener- CO2*                                    | \$100,072.85    | 50% | 0% | 0% | 0% | \$50,036.43     |
| Educational Value                                 | \$136,071.91    | 25% | 0% | 0% | 0% | \$102,053.93    |
| Field Trip Educational Value                      | \$206,485.16    | 0%  | 0% | 0% | 0% | \$206,485.16    |
| Earnings from Research Stipends*                  | \$2,173,528.02  | 0%  | 0% | 0% | 0% | \$2,173,528.02  |
| Citizen Science                                   | \$23,455.99     | 0%  | 0% | 0% | 0% | \$23,455.99     |
| Revenue to Center from Visitors to Site*          | \$603,757.78    | 0%  | 0% | 0% | 0% | \$603,757.78    |
| Grants and Donations*                             | \$905,636.67    | 0%  | 0% | 0% | 0% | \$905,636.67    |
| Earnings from Direct - Staff Jobs Created         | \$3,290,866.32  | 0%  | 0% | 0% | 0% | \$3,290,866.32  |
| Earnings from Direct - Other- Intern Jobs Created | \$1,077,176.34  | 0%  | 0% | 0% | 0% | \$1,077,176.34  |

|  |              |     |    |    |    |              |
|--|--------------|-----|----|----|----|--------------|
| Earnings from Direct - Retail Sales Jobs Created     | \$470,931.07 | 0%  | 0% | 0% | 0% | \$470,931.07 |
| Enhanced Future Employment Opportunities for Interns | \$31,425.59  | 25% | 0% | 0% | 0% | \$23,569.19  |

\*Values noted were tested for Sensitivity Analysis and the pre-deadweight total is \$35,725,559.00 with a sensitivity range of \$2,973,514.00 as a low to \$37,411,267.00 as a high.

**Key- Description of Headers:**

Deadweight: What would have happened without the activity?

Displacement: What activity did you displace?

Attribution: Who else contributed to the change?

Drop Off: Does the outcome drop off in future years?

Corrected Net Value: Quantity times financial proxy, less deadweight, displacement, attribution, and drop-off.

## 8.0 Summary of Social Value Created

To calculate the net present value (NPV) of the project, the costs and benefits incurred or generated over a 25-year time period need to be forecasted and summed. For these costs and benefits to be comparable, it was necessary to employ a discount rate in calculating the NPV of identified outcomes.

### 8.1 Stakeholder Value

The SROI analysis of the anticipated outcomes for each stakeholder group shows a positive social return associated with the Headwaters project (Table 16). An investment of \$27,838,056, which include two main capital investments totaling \$16,000,000 creates approximately \$58,614,502 of net social impact over 25 years, resulting in an indicative SROI ratio of 2.11:1. In other words, the SROI analysis presents evidence that substantiates that for every dollar invested in Headwaters by Funders, \$2.11 is returned to community stakeholders in social value.

Of the over 65 million dollars of social value, the largest components are source water protection and sense of community pride. This is not surprising as the site is critically important to protecting the Comal Springs that represent a very important regional water source. Because of the importance of the site to the community in terms of cultural, historical, and community aspects, it is expected that the value of community pride would be notable. Other large value outcomes include water savings by those who apply techniques learned at the site, and physical health value especially for recurring users such as Center members.

Educational value seems low compared to other outcomes but that is a function of the how the financial proxies are applied. In reality, students are also part of the community and would share in some of the other value created for “community at large.” Other more indirect educational value provided by the unique scientific, cultural, and historical nature of the site is reflected in the research and academia related outcomes, and archaeological asset value outcomes.

As noted by the various stakeholders, especially the environmental government agencies, the water supply and quality and biodiversity aspects of the site are critically important, and this is reflected in the outcomes associated with water supply, quality, and habitat. The balance of species is important, especially with some threatened and endangered species present, and controlling invasive species is necessary, as reflected by the relatively high value of the biological control outcome. Other environmental outcomes are of much lower value mainly because of the small acreage of restored open space. As more restoration occurs in future phases, these values will increase accordingly.

**Table 16: Social Return on Investment by Stakeholder Group.**

| Stakeholder        | Outcome                                       | Social Value Creation | Social Value Creation per Stakeholder Group |
|--------------------|---|-----------------------|---|
| Environment        | Soil Formation                                | \$181.00              | <b>\$1,056,295.00</b>                       |
|                    | Soil Stabilization                            | \$17,897.00           |   |
|                    | Pollinator Populations Support                | \$3,645.00            |   |
|                    | Water quality- Natural Treatment              | \$7,124.00            |   |
|                    | Refuge Habitat Creation                       | \$1,060.00            |   |
|                    | Biological Control- Invasive Species          | \$1,026,388.00        |   |
| Community at Large | Enhanced Marketing and Outreach Opportunities | \$211,409.00          | <b>\$41,626,151.00</b>                      |
|                    | Sense of Accomplishment by Volunteering       | \$639,153.00          |   |
|                    | Sense of Community Pride                      | \$13,584,550.00       |   |
|                    | Storm Flooding Protection                     | \$16,065.00           |   |
|                    | Air Quality                                   | \$6,943.00            |   |
|                    | Phosphorus Retention- Social Value            | \$4,938.00            |   |
|                    | Nitrogen Retention- Social Value              | \$2,570.00            |   |
|                    | Cultural Value (including archaeology)        | \$2,656.00            |   |
|                    | Amenity Value                                 | \$1,424,869.00        |   |
|                    | Carbon sequestration- Social Value            | \$3,079.00            |   |
|                    | General Recreation                            | \$1,021,860.00        |   |
|                    | Valuing the Water Resource                    | \$12,784,937.00       |   |
|                    | Archaeological Asset Protection               | \$7,921,257.00        |   |
|                    | Master Naturalist Program                     | \$8,490.00            |   |
|                    | Mental Health                                 | \$47,169.00           |   |
|                    | Physical Health                               | \$3,467,456.00        |   |
|                    | Real Estate Value Added                       | \$478,750.00          |   |

|  |  |  |                        |
|--|--|--|------------------------|
| Gardeners Applying Landscaping Practices   | Gardener Water Savings                         | \$1,847,499.00   | <b>\$2,067,342.00</b>  |
|  | Gardener Fertilizer Savings                    | \$169,807.00   |                        |
|  | Gardener Carbon- Social Value                  | \$50,036.00  |                        |
| Students Visiting for Educational Purposes | Educational Value Towards Future Opportunities | \$102,054.00   | <b>\$308,539.00</b>    |
|  | Field Trip Educational Value                   | \$206,485.00   |                        |
| Researchers and Academia                   | Earnings from Research Stipends                | \$2,173,528.00   | <b>\$2,196,984.00</b>  |
|  | Value of Citizen Science                       | \$23,456.00  |                        |
| Employees at the Center                    | Earnings- Staff                                | \$3,290,866.00   | <b>\$4,862,542.00</b>  |
|  | Earnings- Interns                              | \$1,077,176.00   |                        |
|  | Earnings- Retail Sales                         | \$470,931.00   |                        |
|  | Enhanced Earning Potential for Interns         | \$23,569.00  |                        |
|  |  | <b>Carryover from Phase I</b>  | <b>\$6,496,649.00</b>  |
|  |  | <b>Total Present Value</b>   | <b>\$58,614,502.00</b> |
|  |  | <b>Total Investment (Ph. I and II)</b>                                   | <b>\$27,838,056.00</b> |
|  |  | <b>Social Return on Investment (dollar returned per dollar invested)</b> | <b>2.11</b>            |

## 8.2 Market Value Creation

Additionally, \$7,304,419 in direct market value is returned to Funders largely from the value of enhanced reputation, license to operate, and brand positivity, a direct market return of \$0.26 for every dollar invested. The overwhelming portion of this market value is enhanced reputation and brand value created by the funders investing in the project. Of the funders, at this point it is expected that this will benefit primarily NBU. The next highest component of market value is the revenue coming into the Center by way of research funding, visitor and site user fees, and grants and donations.

Also accounted for as market returns are the valuations of carbon sequestered and the values of nitrogen and phosphorous offsets created by introducing the restored natural area by the spring. However, due to the small acreage, these values are relatively minor. Note that Texas does not yet have a regulatory agency-supported water quality credit trading market. As such, any purchases of water quality credits would not be eligible for compliance offset and be voluntary with prices set by the specific transaction. There are national and international carbon markets, and carbon offsets can be banked as assets.

**Table 17: Market Return on Investment by Stakeholder Group.**

| Stakeholder              | Outcome                            | Market Value Creation  | Social Value Creation per Stakeholder Group |
|--------------------------|------------------------------------|--|---|
| Funders (NBU and Donors) | Enhanced Reputation                | \$4,794,677.00   | <b>\$4,797,211.00</b>                       |
|                          | Market Value of Carbon Credits     | \$2,183.00   |   |
|                          | Market Value of Nitrogen Credits   | \$256.00   |   |
|                          | Market Value of Phosphorus Credits | \$95.00  |   |
| Center                   | Visitor Fees Revenue               | \$603,758.00   | <b>\$1,509,395.00</b>                       |
|                          | Grants and Donations Income        | \$905,637.00   |   |
|                          |                                    | <b>Carryover from Phase I</b>  | <b>\$997,813.00</b>                         |
|                          |                                    | <b>Total Present Value</b>   | <b>\$7,304,419.00</b>                       |
|                          |                                    | <b>Total Investment (Ph. I and II)</b>                                   | <b>\$27,838,056.00</b>                      |
|                          |                                    | <b>Market Return on Investment (dollar returned per dollar invested)</b> | <b>0.26</b>                                 |

In sum, with an initial investment of \$27,838,056 in financial capital, the community and funding stakeholders see a return of \$65,918,921 over 25 years for a total return on investment of 2.37:1.

## 9.0 Alignment with the Center's Pillars

The Headwaters at the Comal Center and organization has structured its mission and vision around 4 key pillars:

- Create Community
- Educate and Demonstrate
- Partner in Research
- Protect and Conserve

These pillars reflect the categories around which the Center will design its programs, projects, and activities. As part of the analysis, EcoMetrics LLC sorted all the outcomes by pillar (Table 18). The intent was to reflect the market and social value created in each of the pillars, to give an indication of how the project, especially Phase II, will support the intended mission and vision.

The Create Community and Protect and Conserve pillars represent the majority of the value created, representing approximately 90% of all value created. Of the four pillars, having the emphasis on these two pillars makes sense in that protecting the resource and environment, as well as providing a versatile and necessary attribute for the community are important aspects of the Center. However, as noted above in Section 8 with the education outcomes and the stakeholders, the lower values for the research and

education pillars are more a function of how the outcomes are valued, than any diminished importance. For example, we contend that the create community pillar, by virtue of what the site does, indirectly supports educational aspects. Another example is the citizen science outcome which provides education opportunities for K-12 students as well as adults. Secondly, for both Educate and Demonstrate and Partner in Research, value of outcomes will notably increase as Phase II is completed and the site expands in terms of use and variety of offerings.

**Table 18: Stakeholder Market and Social Return on Investment by Center Pillar**

| Center Pillar    | Outcomes                                      | Market Value Creation | Social Value Creation | Market and Social Value Creation per Center Pillar |
|------------------|---|-----------------------|-----------------------|--|
| Create Community | Enhanced Reputation                           | \$4,794,677.00        |                       | \$39,036,538.00                                    |
|                  | Sense of Community Pride                      |                       | \$13,584,550.00       |  |
|                  | Cultural Value (including archaeology)        |                       | \$2,657.00            |  |
|                  | Amenity Value                                 |                       | \$1,424,868.00        |  |
|                  | Enhanced Marketing and Outreach Opportunities |                       | \$211,409.00          |  |
|                  | Sense of Accomplishment by Volunteering       |                       | \$639,153.00          |  |
|                  | Physical Health                               |                       | \$3,467,456.00        |  |
|                  | Mental Health                                 |                       | \$47,169.00           |  |
|                  | Earnings- Staff                               |                       | \$3,290,866.00        |  |
|                  | Earnings- Interns                             |                       | \$1,077,176.00        |  |
|                  | Earnings- Retail Sales                        |                       | \$470,931.00          |  |
|                  | Visitor Fees Revenue                          | \$603,758.00          |                       |  |
|                  | Archaeological Asset Protection               |                       | \$7,921,257.00        |  |
|                  | General Recreation Consumer Surplus           |                       | \$1,021,860.00        |  |
|                  | Real Estate Value Added                       |                       | \$478,750.00          |  |
|                  | Gardener Water Savings                        |                       | \$1,847,499.00        |  |

|                         |  |              |                |                 |
|-------------------------|--|--------------|----------------|-----------------|
| Educate and Demonstrate | Gardener Fertilizer Savings                    |              | \$169,807.00   | \$3,313,577.00  |
|                         | Gardener Carbon Reduction-Social Value         |              | \$50,036.00    |                 |
|                         | Grants and Donations Income                    | \$905,637.00 |                |                 |
|                         | Enhanced Earning Potential for Interns         |              | \$23,569.00    |                 |
|                         | Field Trip Value                               |              | \$206,485.00   |                 |
|                         | Master Naturalist Program                      |              | \$8,490.00     |                 |
|                         | Educational Value Towards Future Opportunities |              | \$102,054.00   |                 |
| Partner in Research     | Earnings from Research Stipends                |              | \$2,173,528.00 | \$2,196,984.00  |
|                         | Value of Citizen Science                       |              | \$23,456.00    |                 |
| Protect and Conserve    | Soil Formation                                 |              | \$181.00       | \$13,877,361.00 |
|                         | Soil Stabilization                             |              | \$17,897.00    |                 |
|                         | Pollinator Populations Support                 |              | \$3,645.00     |                 |
|                         | Water Quality- Natural Treatment               |              | \$7,124.00     |                 |
|                         | Biological Control- Invasive Species           |              | \$1,026,388.00 |                 |
|                         | Market Value of Carbon Credits                 | \$2,183.00   |                |                 |
|                         | Market Value of Nitrogen Credits               | \$256.00     |                |                 |
|                         | Market Value of Phosphorus Credits             | \$95.00      |                |                 |

|  |   |                       |                        |                        |
|--|---|-----------------------|------------------------|------------------------|
|  | <b>Storm Flooding Protection</b>  |                       | \$16,065.00            |                        |
|  | <b>Air Quality</b>  |                       | \$6,943.21             |                        |
|  | <b>Phosphorus Retention- Social Value</b>   |                       | \$4,937.98             |                        |
|  | <b>Nitrogen Retention- Social Value</b>   |                       | \$2,569.59             |                        |
|  | <b>Carbon sequestration- Social Value</b>   |                       | \$3,079.16             |                        |
|  | <b>Habitat Creation</b>   |                       | \$1,059.89             |                        |
|  | <b>Valuing the Water Source</b>   |                       | \$12,784,936.66        |                        |
|  | <b>Carryover from Phase I</b>   | <b>\$997,813.00</b>   | <b>\$6,496,649.00</b>  |                        |
|  | <b>Total Present Value</b>  | <b>\$7,304,419.00</b> | <b>\$58,614,502.00</b> | <b>\$65,918,921.00</b> |
|  | <b>Total Investment (Ph. I &amp;II)</b>   |                       |                        | <b>\$27,838,056.00</b> |
|  | <b>Market and Social Return on Investment (dollar returned per dollar invested)</b> | <b>0.26</b>           | <b>2.11</b>            | <b>2.37</b>            |

## 10.0 Conclusions and Recommendations

This study evaluates the integrated market and social returns of the Headwaters at the Comal Education Center project in New Braunfels, Texas. Integrated return is defined as the comprehensive economic, social, and environmental benefits of a project and presents a holistic depiction of the interrelatedness of factors contributing to an organization's capacity to create value over time. Integrated reporting focuses on the nature and quality of an organization's relationship with its key stakeholders including how and to what extent the organization recognizes and responds to its key stakeholders' needs and interests. In this analysis, integrated social value was quantified using the EcoMetrics model, which was built on the guiding principles of SVI's SROI Methodology. Stakeholder relationships are of primary importance to this approach. The SVI approach concerns an in-depth, evidence-based understanding of change for a full range of community stakeholders with recognition of both positive and negative changes as well as intended and unintended outcomes. Value in this context refers to the relative importance placed by a stakeholder group on one potential outcome over another. Assigning these valuations using SVI principles requires the use of financial proxies, as many of the identified outcomes are difficult to quantify using conventional accounting practices.

It is also important to note that because of the environmental component of this project, and it not being a typical SROI project, as well as the fact that this was an analysis of Phase II which is yet to occur, we had to modify the stakeholder process by using proxies for some anticipated stakeholders, as well as the environment itself. We do expect, however, that in subsequent evaluative reviews, we will reach out to these more specific stakeholders and also increase the number of stakeholders engaged.

Finally, we may find in subsequent reviews that we need to add or alter indicators. For example, we used a set fee for any type of visitor, but we anticipate that over time, with other site use types becoming available, pricing structure may change and that will impact use revenues. As this evolves, we will make adjustments in subsequent reviews. In summary, at this predictive stage there are some predictions that would be too speculative if we were to be too granular, and thereby compromising the “Do Not Overclaim” principle. A wealth of information was provided that significantly supported establishing the baseline information and understanding anticipated outcomes. EcoMetrics LLC relied heavily on the various studies and planning conducted prior to the beginning of the site changes, and during Phase I. We recognize that Phase I was just a start in the transformation of this former NBU maintenance yard into a world-class showcase educational site and center. We also know that Phase II is but another step of a multiphase, long-term vision for the site, and that as each phase comes to fruition, more outcomes will be identified, and existing outcomes will see increase in value created.

- ***Integrate added value of One Water concept demonstration, education programming and community engagement.*** As noted in the report, over the next several years, NBU will be promoting increased conservation measures and incorporating innovative water management strategies as part of a One Water initiative. Headwaters will serve as a critical demonstration and education site for this work, amplifying the efforts of NBU and government partners tremendously. As site development continues and as Headwaters deepens community engagement on One Water, the EcoMetrics study should be updated to further identify, quantify, and value outcomes. This study already has identified several water-related benefits that could support NBU’s overall goals, and further quantitative analysis can further strengthen knowledge of value created by the site.

It was clear from the research and site observations, and particularly the stakeholder engagement, that the Headwaters project and site is a very important addition to the local area, region, and the state of Texas as a whole. The site offers a unique opportunity to address source water protection of a very significant supply, and simultaneously provide a place to experience and learn about that water resource. This aspect, combined with the biodiversity and habitat importance, as well as the cultural and historical attributes allows for an unprecedented opportunity for everyone. The fact that most of the land in Texas is privately owned and public access to places is limited, the alignment of such as a valuable site combined with the ability to provide public access provides for an excellent situation.

## 10.1 Recommendations

Headwaters is well on its way to realizing its mission and vision. Phase I, albeit limited, has already seen productive results, and Phase II will build on that success. In regard to the EcoMetrics SROI analysis, the following recommendations are proposed:

- *Continued stakeholder engagement.* This SROI analysis has demonstrated the value of formally engaging with local and regional community members who have been to date and are potentially going to be further impacted by development and operation of the project to understand from their perspective what will change and how they value that change. To establish the long-term impact of the project on these local and regional stakeholders, Headwaters should continue to stay in contact with stakeholders as the project progresses and repeat the stakeholder engagement in the future. Specifically:
  - Identify and engage stakeholders from groups identified as possible beneficiaries but who did not yet exist at the time of this predictive
  - Enlarge the sampling size of stakeholder for as many of the stakeholder groups as possible. Consider “on the spot” interviews, exit surveys, or other follow up options for future users of the site
  - Add a feedback portion to the Center’s website to allow for feedback regarding valuation of benefits aspects
- *Communicate the impact.* The SROI analysis reveals several impacts that the development of the project can have on a variety of stakeholders. Many of these impacts may be readily apparent to local stakeholders, such as the physical alteration of the landscape, while other impacts, such as the management of habitat, may be less apparent. It is important for Headwaters to communicate the ongoing results of the project to impacted stakeholders and potential investors to demonstrate the outcomes achieved by the project. Headwaters already has a very informative website and provides annual reports to the public. These provide an excellent avenue to be able to communicate the increased detail and content provided by the EcoMetrics analysis.
- *Measure the outcomes of the Headwaters project.* Use the methodology and lessons learned from this analysis to monitor the outcomes of the project, using the theory of change as the framework from which to identify expected and unexpected outcomes. Headwaters should continue to engage with stakeholders at regular intervals to understand the social value creation process over time and continue to build off the goodwill developed to date. Specifically:
  - Collect information on relevant and key assumptions for valuation, for example such as actual number of visitors, actual research opportunities realized, and donor funding levels
- *Integrate implications of the One Water Strategy.* As noted in the report, NBU is integrating a One Water Strategy and they see Headwaters as a centerpiece of their effort. As this concept evolves, the EcoMetrics study should be updated to further identify, quantify, and value outcomes related to the site and the One Water Strategy. This study already has identified several water-related benefits that could support NBU’s overall goals, and further quantitative analysis can further strengthen knowledge of value created by the site.
- As part of accomplishing these reviews, the outcomes, proxies, and specific quantification and valuation indicators should be updated. At this point, it is too soon to speculate exactly which will change and how. Specifically:
  - For the parameters noted as sensitive or having resulted in notable limitations during the predictive analysis, continue to conduct research to reduce the uncertainty and variability in the proxies.

## Appendix I – Stakeholder Engagement Process

As noted in the report, 35 stakeholders were interviewed. In addition, feedback from stakeholder engagement done during the master planning phase was also consulted. A survey of educational camp attendees was also reviewed. Information collected was both qualitative and some degree of quantification analysis was conducted using a ranking system for current and anticipated outcomes (Appendix II). Most of the interviews were recorded (for a few, it was not practical), and notes taken by the interviewers were created for all of the interviews. Emailed survey results were tabulated for statistical analysis. The ratings from the in-person interviews were not statistically evaluated because they were inconsistent across interviews and very subjective. This task however was supplemental, and we did outcome ranking qualitatively and took conservative position that if an outcome was mentioned, it was considered material. Future reviews of the project once Phase II is underway will include more formal surveys to allow more complete statistical analysis.

## Appendix II – Stakeholder Survey

The following survey was mailed to 34 of the 35 interviewees, of which 16 returned replies. This survey was a modified version of the full interview form (Appendix III). Five outcome classes were rated, from a scale of 1 to 5 for current and anticipated conditions. The outcomes classes were economic, cultural/social, Educational, Ecologic, and Community Enhancement. These major groups capture all of the sub outcomes listed in the report. The average for current was 4.1 and for anticipated was 4.4. The reason the two are so close is that the site is currently already an educational center and is providing benefits, with Phase II anticipated to add even more. Because the scaling was so narrow (1 to 5 vs. for example, 1 to 10) the averages dampened the noted high expectations for Phase II. Secondly, ratings were not requested for the pre-Center conditions (when it was a maintenance yard) because many stakeholders did not have a working knowledge of site use in enough detail to rate it accurately.

**Name**

**Title**

**Organization**

**Primary Stakeholder Group**

- ☐ **Local government**
- ☐ **Community stakeholder**
- ☐ **Education and research**
- ☐ **Volunteer**
- ☐ **Employed/contracted by the project**
- ☐ **Local Business**
- ☐ **Conservation Group**
- ☐ **Landowner**
- ☐ **Indigenous Community**
- ☐ **Other**

**Current Value and Impact (pre project implementation)**

Current Economic Value & Impact (local business, tourism, tax base, etc.)

No Value/Impact      1      2      3      4      5      Significant Value/Impact

**Current Cultural/Societal Value & Impact (historical significance, family traditions, etc.)**

No Value/Impact      1      2      3      4      5      Significant Value/Impact

**Current Education/Research Value & Impact (K-12 education, university research, eco-tourism, etc.)**

No Value/Impact      1      2      3      4      5      Significant Value/Impact

**Current Ecological Value & Impact (habitat protection, environmental quality, restoration, conservation)**

|                 |   |   |   |   |   |                          |
|-----------------|---|---|---|---|---|--------------------------|
| No Value/Impact | 1 | 2 | 3 | 4 | 5 | Significant Value/Impact |
|-----------------|---|---|---|---|---|--------------------------|

**Current Community Enhancement Value/Impact**

|                 |   |   |   |   |   |                          |
|-----------------|---|---|---|---|---|--------------------------|
| No Value/Impact | 1 | 2 | 3 | 4 | 5 | Significant Value/Impact |
|-----------------|---|---|---|---|---|--------------------------|

**Anticipated Value & Impact (once project is complete)**

**Anticipated Economic Value & Impact (local business, tourism, tax base, etc.)**

|                 |   |   |   |   |   |                          |
|-----------------|---|---|---|---|---|--------------------------|
| No Value/Impact | 1 | 2 | 3 | 4 | 5 | Significant Value/Impact |
|-----------------|---|---|---|---|---|--------------------------|

**Anticipated Cultural/Societal Value & Impact (historical significance, family traditions, etc.)**

|                 |   |   |   |   |   |                          |
|-----------------|---|---|---|---|---|--------------------------|
| No Value/Impact | 1 | 2 | 3 | 4 | 5 | Significant Value/Impact |
|-----------------|---|---|---|---|---|--------------------------|

**Anticipated Education/Research Value & Impact (K-12 education, university research, eco-tourism, etc.)**

|                 |   |   |   |   |   |                          |
|-----------------|---|---|---|---|---|--------------------------|
| No Value/Impact | 1 | 2 | 3 | 4 | 5 | Significant Value/Impact |
|-----------------|---|---|---|---|---|--------------------------|

**Anticipated Ecological Value & Impact (habitat protection, environmental quality, restoration, conservation)**

|                 |   |   |   |   |   |                          |
|-----------------|---|---|---|---|---|--------------------------|
| No Value/Impact | 1 | 2 | 3 | 4 | 5 | Significant Value/Impact |
|-----------------|---|---|---|---|---|--------------------------|

**Anticipated Community Enhancement Value/Impact**

|                 |   |   |   |   |   |                          |
|-----------------|---|---|---|---|---|--------------------------|
| No Value/Impact | 1 | 2 | 3 | 4 | 5 | Significant Value/Impact |
|-----------------|---|---|---|---|---|--------------------------|

## Appendix III – Full Interview Form

These questions are a general guide only and not all questions were asked of all stakeholders.

Name

Contact Information

Stakeholder Information

If Other, please specify As this type of stakeholder, why are you interested in this project?

Primary Stakeholder Group

Secondary Stakeholder Group

Additional Group (if applicable)

Additional Group (if applicable)

Additional Group (if applicable)

Additional Group (if applicable)

### Current and Future Use

What are your or your organization's current uses of the land surrounding the project site?

If Other, please specify

How often do you or your organization use the land surrounding the project site for these activities?

What is the likelihood that your or your organization's use of the land surrounding the site will increase as a result of the project?

What would the frequency of your or your organization's use change to?

If you expect an increase, why would this decrease happen?

What is the likelihood that your or your organization's use of the land surrounding the site will decrease as a result of the project?

What would the frequency of your or your organization's use change to?

If you expect a decrease, why would this decrease happen?

What other unexpected or unanticipated factors might have resulted in a drop-off of use for the land surrounding the project after the site was built?

What factors resulted in increase of use of the land surrounding the site? How will this change with the planned expansion?

What positive outcomes could this project have? Please list below

How likely is this outcome? Benefit of consequences? How widespread? Over what period of time?

Comments

What negative outcomes could this project have? Please list below

How likely is this outcome? Severity of consequences? How widespread? Over what period of time?

Comments

Considering the various kinds of outcomes of this site and the planned expansion, what do you think the most direct outcome will be for you or your organization?

### Anticipated Value and Impacts of Project

For each of the following impact categories, rank on a scale of 1-5 the impact of the project?

Category

Economic- Including local business, and tourism.

Cultural/Societal- Including: historical significance, family traditions, cemeteries etc.

Education/Research-Including: K-12 education, university researcher, eco-tourism.

Ecological-Including: Habitat protection, environmental quality, restoration, and conservation.

Community Enhancement-Including: Quality of life issues, resilience, etc

\* To the best detail available, what is the impact under the category that prompted the rating.

1=No Value/Impact, 5=Significant Value/Impact

### Monetary Values

Is this a good use of funding to the region?

Is this project important enough that it would be worth more than the current funding? If so, how much more?

Do you think this project costs too much money and some of the funds should be used for other purposes? What purposes? How much?

Would the money have been better spent if the project was done elsewhere?

## Appendix IV – Works Cited

### Population, Poverty, Employment, and Income data:

U.S. Census Bureau (2019). *QuickFacts*. Retrieved from <https://www.census.gov/quickfacts/fact/table/newbraunfelscitytexas,comalcountytexas,TX,US/PST045219>

U.S. Census Bureau (2019). *American Community Survey*. Retrieved from [https://data.census.gov/cedsci/table?tid=ACSDP5Y2019.DP03&g=0400000US48\\_1600000US4850820](https://data.census.gov/cedsci/table?tid=ACSDP5Y2019.DP03&g=0400000US48_1600000US4850820)

U.S. Census Bureau (2019). *American Community Survey*. Retrieved from [https://data.census.gov/cedsci/table?tid=ACSDP5Y2019.DP03&g=0400000US48\\_0500000US48091](https://data.census.gov/cedsci/table?tid=ACSDP5Y2019.DP03&g=0400000US48_0500000US48091)

U.S. Census Bureau (2019). *American Community Survey*. Retrieved from <https://data.census.gov/cedsci/table?d=ACS%205-Year%20Estimates%20Data%20Profiles&tid=ACSDP5Y2019.DP03>

U.S. Census Bureau, *Estimated Percent of People Age 0-17 in Poverty for Comal County, TX [PPU18TX48091A156NCEN]*, retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/PPU18TX48091A156NCEN>

*Prehistoric background*. Headwaters at the Comal. (2020, June 8). Retrieved from <https://headwatersatthecomal.com/the-headwaters/historical-information/prehistoric/>

*Historical information*. Headwaters at the Comal. (2020, June 8). Retrieved from <https://headwatersatthecomal.com/the-headwaters/historical-information/>

Comal Springs and Landa Park. (n.d.). Retrieved from <https://www.edwardsaquifer.net/comal.html>

### General References

International Integrated Reporting Council. (2013). *Capitals: Background paper for< IR>* (p. 12).

International Integrated Reporting Council.

Social Ventures Australia. (2011). *Managing to Outcomes: A Guide to Developing an Outcomes Focus* (p. 28). Social Ventures Australia. <https://www.socialventures.com.au/assets/>

SROI Network. (2012). *A Guide to Social Return on Investment*. Cabinet Office.

**Table 10 References (in order of citation number)**

- 1        “The Value of Conservation Easements: The Importance of Protecting Nature and Open Space,” West Hill Foundation for Nature, Inc., (December, 2002)
  
- 2        Douglas J. Krieger, (2001) "The Economic Value of Forest Ecosystem Services: A Review", The Wilderness Society
  
- 3        Costanza, R., Limburg, K., Naeem, S., O'Neill, R. V., Paruelo, J., Raskin, R. G., & Sutton, P. (1997). The value of the world's ecosystem services and natural capital, 387, 9.
  
- 4        Christin, Z., Batker, D., Harrison-Cox, J., (2011). Economic Impact of Metro Parks Tacoma Ecosystem Services: Economic Impact Study Phase II Earth Economics, Tacoma WA, Earth Economics
  
- 5        Oregon Department of Agriculture (2000), “Economic analysis of containment programs, damages, and production losses from noxious weeds in Oregon.” [www.oregon.gov/ODA/PLANT/docs/pdf/weed\\_body\\_a.pdf](http://www.oregon.gov/ODA/PLANT/docs/pdf/weed_body_a.pdf)
  
- 6        Simon Cole (2013) "The Impact of Reputation on Market Value," World Economics, Volume 13, Number 3
  
- 7        Lucy Johnston, Ezra Hausman, Bruce Biewald, Rachel Wilson, David White, "2011 Carbon Dioxide Price Forecast", Synapse Energy Economics, Inc. February 2011
  
- 8        “Offset Credit Stacking: Background Paper for the EPRI Greenhouse Gas Emissions Offset Policy Dialogue Workshop #13,” Electric Power Research Institute, (November 2012)
  
- 9        Ducnuigee, J (1997). Relative Nutrient Requirements of Plants Suitable for Riparian Vegetated Buffer Strips, Virginia Dept. of Env Quality, [https://www.potomacriver.org/wp-content/uploads/2014/12/ICP97-4\\_Ducnuigee.pdf](https://www.potomacriver.org/wp-content/uploads/2014/12/ICP97-4_Ducnuigee.pdf)
  
- 10       NPR & Restore the Earth Foundation reports (2017)
  
- 11       Daniel Fujiwara, Paul Oroyemi and Ewen McKinnon (2013) "Wellbeing and civil society: Estimating the value of volunteering using subjective wellbeing data," UK Department for Work and Pensions and the Cabinet Office
  
- 12       Social Value Lab (2011). SROI Forecast of Phase 1 of the Vineburgh Development - Social Value UK. Glasgow, Scotland.
  
- 13       "U.S. Fish and Wildlife Service (2012), ""National Wildlife Refuge Wetland Ecosystem Service Valuation Model, Phase 1 Report""  
[https://www.fws.gov/economics/Discussion%20Papers/USFWS\\_Ecosystem%20Services\\_Phase%20I%20Report\\_04-25-2012.pdf](https://www.fws.gov/economics/Discussion%20Papers/USFWS_Ecosystem%20Services_Phase%20I%20Report_04-25-2012.pdf)

- 14 Stephen Faulkner, Wylie Barrow, Bob Keeland, Susan Walls, David Telesco (2011) "Effects of conservation practices on wetland ecosystem services in the Mississippi Alluvial Valley," *Ecological Applications*, Volume 21
- 15 M. Ribaudó (2005) "Nitrogen sources and Gulf hypoxia: potential for environmental credit trading," *Ecological Economics*, Vol. 52, No. 2
- 16 Boyle, K. et al. (1988) *Welfare Measurements Using Contingent Valuation: A Comparison of Techniques*, *American Journal of Agricultural Economics*, vol. 70, issue 1, 20-28
- 17 Social Cost of Carbon; <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>
- 18 Pam Kaval and John Loomis, (October 2003) "Updated Outdoor Recreation Use Values with Emphasis on National Park Recreation," USDA Forest Service
- 19 Lundhede, T., Bille, T., & Hasler, B. (2013). Exploring Preferences and Non-use Values for Hidden Archaeological Artefacts: A Case from Denmark. *International Journal of Cultural Policy*, 19(4), 501-530
- 20 Texas A&M AgriLife Extension Program, <https://txmn.tamu.edu/>
- 21 American Psychological Association, APA Working Group on Stress and Health Disparities. (2017). Stress and health disparities: Contexts, mechanisms, and interventions among racial/ethnic minority and low-socioeconomic status populations. Retrieved from <http://www.apa.org/pi/health-disparities/resources/stress-report.aspx>
- 22 Vert, C. et al (2019), Health Benefits of Physical Activity Related to an Urban Riverside Regeneration, *International Journal of Environmental Research and Public Health*; Basel Vol. 16, Iss. 3, (2019). DOI:10.3390/ijerph16030462
- 23 Statewide average water ratepayer water cost in Texas & California Dept of Water Resources
- 24 Keeler, B. L., et al. (2016). The social costs of nitrogen. *Science advances*, 2(10), e1600219. <https://doi.org/10.1126/sciadv.1600219>
- 25 Environmental Protection Agency (2015), *National Emissions from Lawn and Garden Equipment*, <https://www.epa.gov/sites/default/files/2015-09/documents/banks.pdf>
- 26 College Tuition Compare - Texas State University, <https://www.collegetuitioncompare.com/edu/228459/texas-state-university/tuition/>
- 27 Sauermann and Franzoni (2015), "Crowd science user contribution patterns and their implications", *National Academy of Sciences, PNAS* January 20, 2015, 112 (3) 679-684
- 28 Headwaters of the Comal - NBU Internal Documentation

29 National Association of Colleges and Employers (2018), Unpaid Internships and the Career Success of Liberal Arts Graduates, <https://www.nacweb.org/job-market/internships/unpaid-internships-and-the-career-success-of-liberal-arts-graduates/>