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# ANALYSIS OF PROFESSORS' PERCEPTIONS TOWARDS INSTITUTIONAL REDEVELOPMENT OF BROWNFIELD SITES IN ALABAMA

by

Berkley Nathaniel King Jr.

A Dissertation
Submitted to the Graduate School
and the Center for Science and Mathematics Education
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

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December 2016

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ABSTRACT

ANALYSIS OF PROFESSORS' PERCEPTIONS TOWARDS INSTITUTIONAL REDEVELOPMENT OF BROWNFIELD SITES IN ALABAMA

by Berkley Nathaniel King Jr.

December 2016

This study was conducted to analyze professors' perceptions on the institutional redevelopment of brownfield sites into usable greenspaces. The U.S. Environmental Protection Agency (2016) refers to brownfields as sites, (either facility or land) under public law § 107-118 (H.R. 2869), which are contaminated with a substance that is classified as a hazard or a pollutant. Usable greenspaces, however, are open spaces or any open piece of land that is undeveloped, has no buildings or other built structures, and is accessible to the public (EPA, 2015).

Open green spaces provide recreational areas for residents and help to enhance the beauty and environmental quality of neighborhoods (EPA, 2015). In addition, in a study conducted by Dadvand et al. (2015), exposure to green space has been associated with better physical and mental health among elementary school children, and this exposure, according to Dadvand et al., could also influence cognitive development. Because of the institutional context provided in these articles and other research studies, a sequential mixed-methods study was conducted that investigated the perceptions of professors towards the redevelopment of brownfields near their campuses.

This study provided demographics of forty-two college and university professors employed at two institutions in the state of Alabama, a southeastern region of the United States. Survey questions were structured to analyze qualitative data. The secondary

method of analysis utilized descriptive statistics to measure the most important indicators that influences professors' perceptions. The collection of quantitative data was adapted from an instrument designed by Wernstedt, Crooks, & Hersh (2003).

Findings from the study showed that professors are knowledgeable and aware of the sociological and economic challenges in low income communities where brownfields are geographically located. Pseudonyms are used for the three universities which were contacted. Findings also indicate that Eta-One University is a recipient of an EPA Region 4 grant that focuses on educating low income communities in areas where brownfield sites are located. Recommendations from the study will be provided to local, state, and federal government agencies resulting from this data on professors' perceptions on the redevelopment of brownfield sites and the role in which universities and college professors play.

ACKNOWLEDGMENTS

I would like to express a heartfelt thanks to my committee chairman, Dr. Sherry Herron, for her kind words of encouragement, professional advice and mentorship, which successfully guided me through my doctoral studies. I offer sincere thanks to my external mentor and dissertation committee member Dr. Carol Johnson Dawson for providing sound mentorship throughout the fruition of my doctoral matriculation. I would like to thank the remaining committee members (Dr. Omar Harvey, Dr. David Patrick, and Dr. Kyna Shelley) for keeping me grounded and increasing my content knowledge in the areas of environmental and geological science, educational and scientific research.

My most sincere thanks go to Ms. Celia Young, the Administrative Secretary for the Center for Science and Mathematics Education at the University of Southern Mississippi. I appreciated her keen sense of knowledge of the doctoral process and operation, financial resources and scholarship opportunities, and most importantly, her love to nurture and a skill of building trusting relationships.

# DEDICATION

Thanks and praise to the Almighty God for giving me the strength, wisdom, knowledge and understanding to remain steadfast and know that his love for me has brought me thus far, and that it is everlasting. And that through him, his blessing work through others that played a pivotal role in my life. And the unconditional love and support my parents Berkley and Paulette King, sisters Tamara and Kayla, and Aunt Marguerite Scott for keeping me encouraged and motivated.

This dissertation is dedicated to all educators that created a pathway to educational success throughout my academic journey. Educators, you are the reason why I am accomplishing the ultimate educational goal. Therefore, I see a need to share with the world the institutions that deserve recognition in this process of dedication and celebration.

Firstly, Walter Parker Primary and Sir Jack Hayward High School (Freeport, Bahamas) this dissertation is dedicated to you; secondly, Miles College and Samford University (Birmingham, Alabama) this dissertation is also dedicated to you; and finally, the University of Southern Mississippi (Hattiesburg, Mississippi) this is a special dedication to you --"*Southern Miss, To The Top*!"

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LIST OF ABBREVIATIONS

| | |
|---|---|
| *ADEM* | Alabama Department of Environmental Management |
| *CERCLA* | Comprehensive Environmental Response, Compensation and Liability Act |
| *EPA* | Environmental Protection Agency |
| HAZWOPER | Hazardous Waste Operations and Emergency Response Standard |
| HBCU | Historically Black Colleges and Universities |
| NLP | National Priorities List |
| OSHA | Occupational Safety and Health Administration |
| PI | Principle Investigator |
| ROI | Returns of Investment |
| ROSA | Reform of the Superfund Act |

# CHAPTER I - INTRODUCTION

As college and university professors prepare to equip college students for a globally competitive world, their acquired skills, knowledge, and original ideas will have maximum impact among students. Therefore, Van den Bergh, Ross, and Douwe (2014) believe that professor's 'acquired skills and knowledge base are key to solving real-world problems. This belief is also supported by Merrill's (2002) research, which indicates that the application of knowledge in the real world promotes learning that is meaningful in context. As such, the need to educate higher education faculty and students about the importance of redeveloping brownfields into usable spaces is crucial. It is also equally important to educate college communities about the need to redevelop brownfields that are near college campuses.

The U.S. Environmental Protection Agency (2011) refers to brownfields as sites (either facility/land) under public law §107-118 (H.R. 2869) that are contaminated with a substance that is classified as a hazard or a pollutant. Although the Environmental Protection Agency (EPA) established the EPA's Brownfield Program in 1995 to identify polluted or hazardous sites throughout the United States, its mission focus has been on empowering the social, economic, and environmental welfare of communities. In doing so, the EPA has worked to transform and reducing land-derelict sites, but most importantly, to increase the sustainable reuse of brownfields.

Research by DeSousa (2006) identifies the significance of the University of Wisconsin-Milwaukee establishing a Center of Economic Development to provide research and technical assistance to neighboring communities and governmental departments, which have improvement projects in their areas. Moreover, the Center was

established and supported through research initiatives and grants to research professors at the University of Wisconsin-Milwaukee. The Center was designed initially to promote internal as well as external partnerships that bring together brownfield researchers who cannot only facilitate projects but also encourage best-practices that reduce barriers to brownfield redevelopment.

## Statement of the Problem

Institutions of higher education lack the motivation and technical support to redevelop brownfield sites that are located near their college communities. These institutions are composed of qualified research professors who can provide proper consultation; however, their expertise tends to be overlooked. As a result, professors are unmotivated to provide educational or professional recommendations that could increase institutional awareness and spur initiatives for brownfield redevelopment. The overall impact of brownfield redevelopment will potentially contribute to keeping campus communities aligned with sustainable environmental and cultural growth. However, at the moment, the complete opposite is occurring, as communities located near brownfields are losing their historical and cultural values (Ferber, 2011; Kurtović, Siljković, & Pavlović, 2014). While there are many studies on the success of brownfield redevelopment, the research is limited to how professors' perception on brownfield redevelopment can help their institutions to significantly impact community initiatives and promote collaborative, environmental efforts.

Varner, Lewis, and Brunelle's research (2014) focused on the establishment of *Sustainable Community Development Methods & Tools*. This is an educational program designed to engage community partnerships that will increase sustainable development

projects in the built environment. The course was also designed to promote student collaborative efforts with influential, external stakeholders.

## Purpose of the Study

This is a mixed-methods study that investigated the perceptions of professors towards the redevelopment of brownfield(s) near their campus communities; the most important indicators that influence professors' perceptions to redevelop brownfield sites.

## Research Questions

The following research questions will guide this study:

1. What are professors perceptions regarding the redevelopment of brownfields into usable greenspaces?
2. What are the most important indicators associated with brownfield sites that influence professors' perceptions to redevelop areas near their campus communities?

## Significance of the Study

According to the U.S. General Service Authority (2003) Memorandum of Agreement with the EPA, both agencies agreed to work collaboratively to provide the necessary resources to help potential brownfield redevelopers throughout the revitalization process and to campaign for more community engagement and education around brownfield concerns. In this study, there were three fundamental pillars of sustainability: social, economic, and environmental. As described by the EPA (1998) Office of Special Projects and Outreach, sustainable brownfield redevelopment is referred to as, "Redevelopment and growth that are maintained over the long-term and

occur within the limits of the environment so that the current needs of the citizens are met without compromising the ability of future generations to meet their needs" (p. 5).

Sustainable development involves the process of conceptualizing the three-pillars into a Venn-diagram model, which represents the overlapping relationship between all three aspects; while simultaneously sharing their interrelated constituent elements (Carter & Moir, 2012). First, social sustainability refers to individuals' well-being (e.g., health, shelter, educational advancements, ethical practices, and conservation of culture or heritage, etc.) and their pursuit for social advancement and physical changes within a community; however, social equity can be restricted by elements of its environmental conditions (Williams & Dair, 2007). Second, economic sustainability has to do with community advancements in effectively and efficiently increasing employment opportunities; supporting the diversification of business growth and opportunities (in urban settings); and developing long-term financial security in target areas (Dixon & Marston, 2003). Finally, environmental sustainability is the final pillar, which focuses on the land resource management of ecological and biological diversity (see Figure 1)

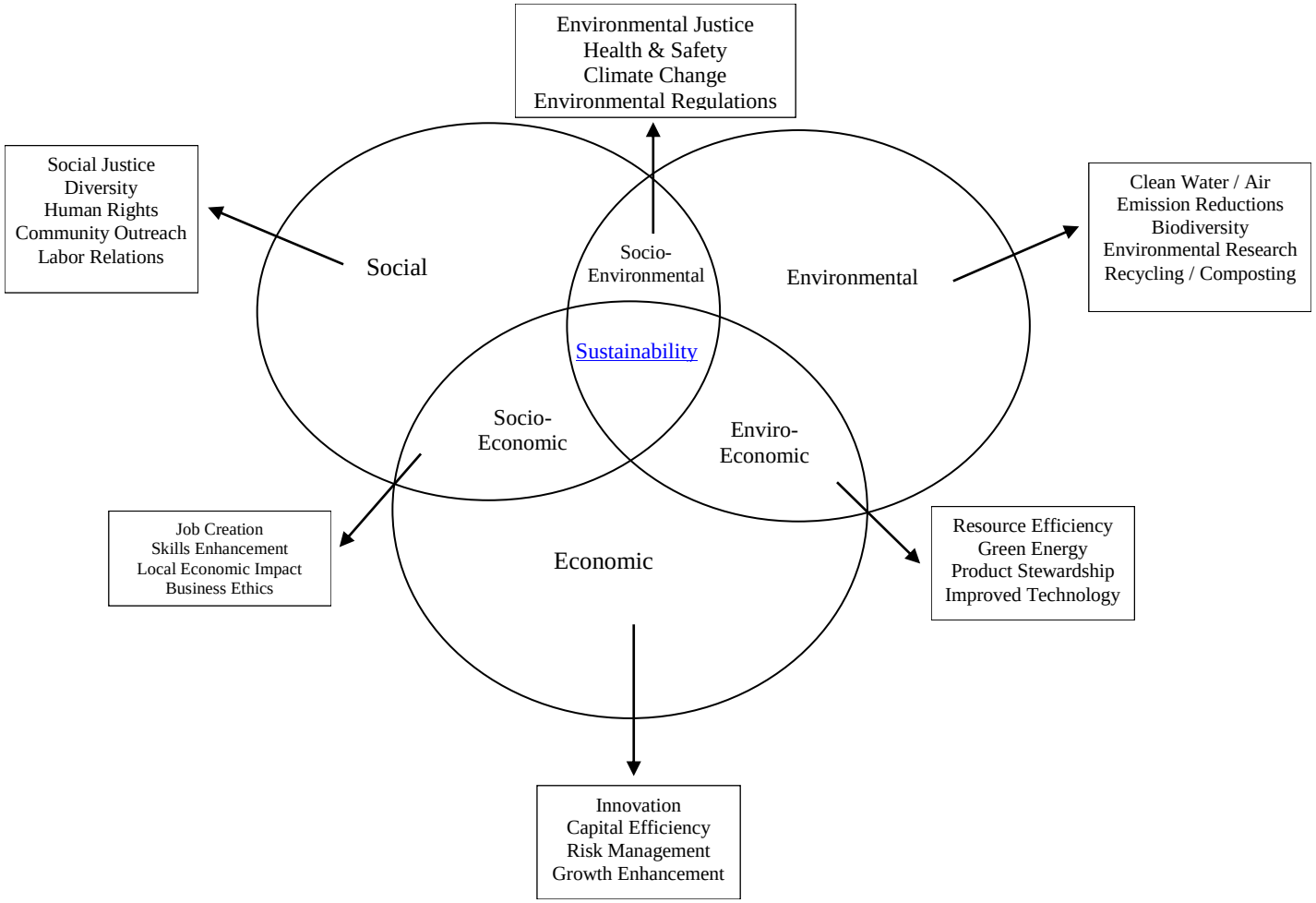


*Figure 1.* Sustainability Venn-Diagram concept that connects social, economic, and environmental sustainable pillars.

(Barbier, 1987).

## Definition of Terms

*Attitudes*, for the purpose of this dissertation, are defined as "An enduring organization of motivational, emotional, perceptual, and cognitive processes with respect to some aspect of the individual's world" (Schwarz & Bohner, 2001).

*Brownfield redevelopment* includes the support and encouragement for the rehabilitation of polluted lands or areas identified as contaminated.

*Familiarity* in this study relates to the degree to which you come in contact with a redevelop brownfield or the ability to identify a brownfield site.

*Greenspace* is "land that is partly or completely covered with grass, trees, shrubs, or other vegetation; and includes parks, community gardens, schoolyards, playgrounds, public seating areas, public plazas, and vacant lots" (U.S. Environmental Protection Agency, 2014).

*Memorandum of Agreement* is a legal written document of agreement between two or more parties.

*Perceptions* refer to the way we observe our environment and later, the interpretation of what we make of it with use of our senses (Heffner, 2014).

## Assumptions of the Study

This research study was conducted with the following assumptions:

1. Participants are volunteers in the study.
2. Participants respond to the survey in an open and honest manner.

## Limitations of the Study

The study has three acknowledged limitations:

1. The study is limited to brownfield sites and two universities in the state of Alabama.
2. The results of this study reflect perceptions of research professors who are employed at two higher educational institutions in Alabama.
3. The questionnaire used in the study is a site, multi-attribute decision making tool completed about the professors' perceptions of brownfield redevelopment.
4. Recruitment of participants is limited to professors available during the summer semester of 2016.

## Summary

The purpose of this study was to investigate the perceptions of professors towards the redevelopment of brownfield(s) in Alabama. An additional focus was to increase professors' awareness about how to engage their students and campuses in discussions about the conversion of brownfield sites into usable greenspaces. The research study is organized into five chapters. The first chapter presents an introduction of the study, statement of the problem, purpose of the study, significance of the study, and research questions. This chapter also includes definitions of terms, assumptions of the study, limitations of the study, and the organization of chapters relevant to the remainder of the research investigations.

However, Chapter II provides the review of related researched literature on perceptions of the redevelopment of brownfield sites into usable green spaces. Chapter II

contains six major sections. First, related information is provided in support of perceptions towards the redevelopment of brownfield sites into usable greenspaces. In addition, five sections include information on the historical background of brownfields, institutions for sustainable brownfield redevelopment, brownfield barriers (legal, economic, and social) as well as special partnerships and institutional initiatives (SPI's). A summary provides the major ideas for this chapter.

Chapter III describes the methodology and a description of the procedures used to conduct the research study. This chapter includes an introduction and adopts a sequential mixed analysis that is inclusive of both qualitative and quantitative research investigations, respectively. Chapter III also consists of a setting of the site specifics, a description of the participants, instruments used to gather the data, procedures used to analyze the data, data analyses that tell how the research questions are addressed. In addition, the researcher's positionality, and a summary of the chapter are present.

Chapter IV presents the results of the data. Moreover, it provides the instruments used to answer the research questions, a description of the sampled participants, qualitative data analysis, quantitative data analysis, and a summary of the chapter. Finally, Chapter V is comprised of a synopsis of the study, combination of analysis, implications, recommendation for future studies, and a summary.

# CHAPTER II – A REVIEW OF RELATED LITERATURE

This chapter presents a review of selected literature pertaining to professors' perceptions towards institutional redevelopment of brownfield sites in Birmingham, Alabama. Chapter II contains five major sections. The first section provides a historical background of professors' perceptions of institutional redevelopment of brownfield sites to usable greenspaces. Four sections include information on sustainable brownfield redevelopment, brownfield barriers (legal, economic, and social) as well as special partnerships and institutional initiatives (SPI's). Finally, a summary provides the major ideas for this chapter.

## A Historical Background

There is a critical need to investigate the perceptions of professors' interest(s) in providing consultation and guidance in support of increasing nearby property values, promoting the establishment of community civic leaders, and strengthening community-based grassroots organizations. Professors' perceptions will aid in determining the potential for revitalization in at-risk or low-income communities near college campuses. Any organization initiating brownfield redevelopment near a college campus should first gauge whether there is community-level awareness about environmental hazards; and most importantly, whether there is the will to forge a pathway towards sustainable development in that community. Therefore, the following framework proposed by Rhodes and Reinholt d (1999) is relevant to this research study because it illustrates an understanding of human response to hazardous conditions and environments. This model's greatest significance speaks to understanding community identity and the need to assist a community in seeing itself as an active, sustainable ecosystem, which requires

short term and long term strategic initiatives. The importance of communities also shows up in Ender's (2001) research, in which she identifies that a community should not only be a recipient of governmental aid in times of emergency, but rather, it should possess the self-sustained capacity to identify and reduce hazardous exposures. Ender concluded that this is most effective when communities are self-aware and involved in planning, mitigation, and preparedness efforts.

In the model presented in Figure 2, from left to right, the key steps illustrate the process whereby a hazard is introduced to a community. First, the community must become aware that a risk to human health and the environment exists. Environmental hazardous conditions are normally identified through community awareness and the scientific deployment of a soil screening test to identify and define contaminated site locations (Xiao, Wang, Wang, & Yu, 2006). However, if a community does not have the available resource(s) or experience to identify potential environmental risks, outside strategies and solutions may complicate the resolution process. Second, the recognition of a risk is an important stage to effectively address hazardous conditions. Research by Adger (2006) recommends reducing the level of risk through the assessing both human vulnerability and resilience within a social ecological system. In particular, human response to vulnerable conditions may be influenced by actions, beliefs, and intentions that are all shaped by social structures. The convergence of these factors is an integral part of a community's recovery assessment, evaluation, and ongoing recommendations. Finally, a community's interest in becoming proactive and environmentally aware about its "*invironment*" is essential (Bell, 2004; Smith-Cavros & Eiserhauer, 2014).

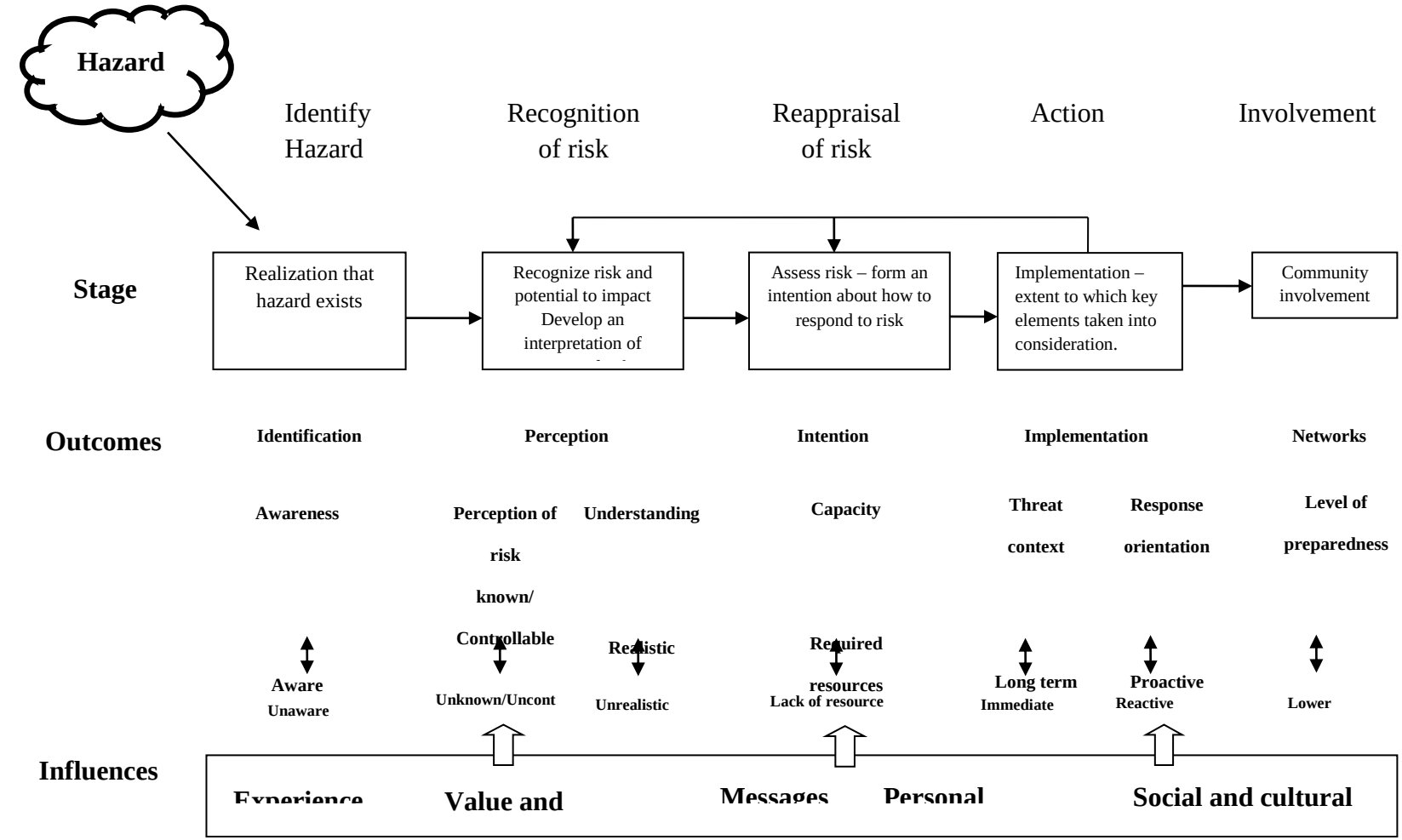


*Figure 2.* Model for Behavioral Change

Enders, 2001; Rhodes & Reinhold, 1999

Bullard (2000) looks at societal challenges and threats from an environmental justice perspective. Bullard's study addresses economic growth, social development, and environmental sustainability in predominately minority communities in the Southeastern United States. The author was determined to identify site-specific areas, their experiences to extreme environmental neglect, and the high exposures to chemical toxic release from point source and non-point source pollution.

Consequently, results reveal these communities are unsustainable and lack governmental support from federal, state, and local levels sufficient to address environmental injustice. Particularly, research conducted by Saha and Patterson (2008) indicates that local governmental practices in many cities within the U.S. are not incorporating sustainable development as a framework, but rather, as a piece-meal effort. Only a few medium to large cities support sustainable initiatives that lead to social equity, economic prosperity, and environmental sustainability.

## Institutions for Sustainable Brownfield Redevelopment

From the college lecture halls to the technological and scientific workforce, research professors are continuously challenged to provide the research community with solutions that promote the transfer of knowledge from a classroom-setting to methods of application in addressing real-world problems. Moreover, professors are expected to demonstrate pedagogical skills that apply both methods of theory and practical applications. Transferring these skill sets from professor to student to learning communities promotes "application work," to address real-world problems in the workplace (Gardner & Korth, 1997).

Therefore, the need for research professors to educate students and equip their learning communities with knowledge about the importance of brownfield redevelopment is paramount. According to McCarthy (2001), brownfield redevelopment creates opportunities for all interested developers (private or public) to revitalize areas that were once thriving. Furthermore, McCarthy indicates that the potential impact of redevelopment can stimulate an increase in private sector investment, job creation, employment efforts, tax revenues (property and business), and environmental quality. Redevelopment also decreases crime rates and urban sprawl.

Supporting research comes from Cooper, Kotval, Kotval, and Mullin (2014). Their article focused on the redevelopment projects and collaboration of both institutions of higher education and neighboring properties. The authors investigated the common challenges around redevelopment that are experienced by private institutions throughout the U.S. Case studies of various institutions were used to provide success indicators relevant to redevelopment initiatives; The study included the following four institutions: Northeastern University's Davenport Commons, Yale School of Forestry and Environmental Studies with the City of Baltimore, Johnson and Wales University, and Worchester Polytechnic University.

Fernández-Esquinas and Pinto (2014) offer a methodological approach to understanding the potential impact of university resources on urban redevelopment. The authors explored the socioeconomic and financial benefits institutions of higher education bring to areas in need of redevelopment. Their strategic goal was to determine the level of interaction between institutions of higher education and surrounding communities on urban revitalization and regeneration. A meta-analysis of urban development research

was used in the article. The purpose behind this was to establish a conceptual framework inclusive of four dimensional factors: physical infrastructures, human resources, economic development, and civic engagement.

## Brownfield Barriers: Legal, Economic, and Social Challenges

### *Legal Challenges*

In Reisch's (2001) updated congressional report, the goal was to provide historical and operational information on the legislative process in support of brownfield redevelopment under the 106th Congress. Congress debated two major legislative issues: whether tax incentives should be adopted to increase cleanup efforts and whether brownfield cleanup programs should be outright approved. However, other important issues pertaining to the redevelopment program's existence focused on its powers under Superfund (CERCLA: subsection 111) and its effectiveness and validity.

Eisen (1996) identified the legal challenges experienced by developers during the process of petitioning for the use of brownfields for developmental purposes. These challenges are normally experienced under state and federal compliance statutes. Still, the major concern is on the increasing trend of manufacturers relocating to unspoiled suburban areas for developmental reasons, rather than utilizing and identifying the potential assets in brownfield sites. The article also provided a comprehensive review of the challenges involved in the redevelopment process of brownfield sites as well as challenges from current environmental state and federal laws and statutes. Eisen uses examples of case studies and the case-specific success and failure of Superfund costs and liabilities under the review of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).Inadequate community involvement and the

reformation of CERCLA's major challenges are identified as deterrents to the legality of brownfield redevelopment projects.

Because some attributes that come with brownfield redevelopment include aesthetic qualities and easy accessibility to the inner-city districts, environmental liability can deter a developer's interest in redevelopment. Nonetheless, this part of the process exists because of the legal uncertainty with environmental laws enforced by state and federal government agencies. Congressional efforts to amend CERCLA brought about the Reform of the Superfund Act (ROSA). The purpose of ROSA was to provide a sense of legal security to developers interested in revitalizing brownfields. Most importantly, stipulations around cleanup and liabilities needed to be more transparent. Thus, the Small Business Liability Relief and Brownfield Revitalization Act were signed into legislation in 2002, protecting the developers of brownfield redevelopment projects from liabilities or cleanup responsibilities contributed by prior property owners or corporations (Dull & Wernstedt, 2010).

Dull and Wernstedt's (2010) article was designed to serve as a guidebook for the transformation and redevelopment of brownfields into profitable, sustainable spaces. Washington State Department of Ecology, in collaboration with the Environmental Protection Agency, created this document to provide critical information to local government and non-governmental agencies' with developmental interests. Its focus was on identifying common considerations at each brownfield sites, and then exploring strategic methods to transition these sites from areas that are considered liabilities to project developers, into profitable communities, heralding socio-economic and environmental success. The guidebook strongly recommends accomplishing fifteen

milestones in an effort to successfully initiate a brownfield redevelopment project. Although this document caters specifically to the Washington state's environmental laws and guidelines, it still provides a roadmap for other states to replicate and implement into their environmental policy frameworks. The article also attempts to encourage corporate and industrial developers to utilize brownfield sites. Moreover, its goal is to eliminate further land degradation of unspoiled greenspaces. Ultimately, the authors not only identify the benefits of brownfield cleanup but also estimate the achievable assets and overall impact to communities in dire need of revitalization. The bottom-line approach is utilized as an economic development strategy that offsets liability and increases profitability.

*Economic Challenges*

According to Mansfield's (1991) article on industrial innovation and academia research, for many years resources from institutions of higher education have played a pivotal role in the economic development and success of various industries. For example, a report written by Hahn, Coonerty, and Peaslee (2003) was published in support of educational institutions, who view themselves as "economic anchors" to enhance community growth and development. The authors made this statement in their report:

> Higher education is relentlessly challenged to change and align its roles to respond proactively to the needs of students, communities and society as a whole. Economic relationships with the community and neighboring families are part of this challenge. Every college and university serves to some extent as an economic "anchor" in its respective community. They create jobs and many offer training and education for local residents; most support local businesses through

> the procurement of goods and services; some advance community development through real estate projects; others facilitate community service projects that have an economic component; and nearly all partner with government and civic groups to strengthen the economic health of the community. Occasionally, genuine issues arise through economic practices that can lead to strained relationships and destabilizing effects for all concerned. With a little planning and dedication however, colleges and universities can be tremendous economic and social assets for families and neighborhoods. This report highlights some of these "best practices" in the hopes of fostering such relationships. (p. 1)

This research attempts to estimate the impact of brownfield remediation on housing property values. The author identified the need to provide special consideration to these areas because of their poor aesthetic quality. These sites have been classified as "low-risk" contaminated sites and are normally "under-used" resulting in adverse impacts to nearby communities. They are also unwelcoming areas for developers and individuals choose not to reside there. The use of quasi-experimental design was employed in this study, and its purpose was to highlight prior research on the hedonics of property value and on the motivational efforts to remediate contaminated areas. To control bias, a comparison of three factors was observed.

*Social Challenges*

Since Zimmerman's (1993) research on social equity and environmental risk, the geographic locations of minorities (predominately Blacks and Hispanics) have often been identified as target areas that are exposed to inactive hazardous waste disposal sites identified by the National Priorities List (NLP) via CERCLA of 1986. The article

identifies areas like these that are restricted to financial funding through Superfund programs. According to the Holistic disaster recovery: Ideas for building local sustainability after a natural disaster (Adie, 2001), sustainable methods of rebuilding and revitalizing small to midsize communities after a hazardous or disastrous experience are critical. Sustainable approaches are built on promoting social and intergenerational equity during a communities' process of recovery. Furthermore, sustainable approaches are all about an individual's right to inherit the necessities of a decent life and the right to a safe and clean environment. Nevertheless, social inequity increases when communities are under socioeconomic distress. And social inequity increases when sustainable initiatives are not considered.

In this study, Zimmerman (1993) looked at those indicators of vulnerability that change the social fabric of a community. Some indicators include: damage to transportation, housing, public facilities, the environment, the local economy, health, public safety, and education. These risk indicators are experienced mostly by low-income and single-parent households, as well as the elderly or poor and language-challenged communities (Buckle, Mars, & Smale, 2000; NHRAIC, 2001). The review of case studies by Bullard (2000), identified indicators to address reason(s) for the current status of these communities. Findings suggested that industrial corporations conducted poor practices known as a path of least resistance in such communities, which involved releasing toxic chemicals among those who lack a political and economic voice. Therefore, the fight for environmental rights is an ongoing struggle.

As mentioned earlier, the existence of brownfield sites has a negative impact on educational systems. As environmental degradation increases and neighboring properties

transitions to derelict sites, crime also increases; thus, developers are discouraged from developing in these areas. Moreover, educational services are weakened because of the decrease in property tax revenue. Because developers are invariably granted development contracts in unspoiled suburban areas, this continues to be a growing dilemma **(**Cooper et al., 2014**)**.The overall implications of the social, economics, and legal challenges in brownfield redevelopment stem from each communities established policies and willingness to revisit those policies and determine ways to improve low-risk communities (Chilton, Schwarz, & Godwin, 2015).

## Special Partnership Initiatives

Higher education institutions are community-based entities that have the leverage, economic stability, and political networks to respond to brownfield sites. The ability of higher education to provide research in various disciplines is well respected by non-educational organizations and politicians, at large. Therefore, if higher education institutions can craft redevelopment initiatives that align with local policies and bring about societal recognition and change, they would become a more widely recognized voice for urban policy reformation at the local, state, and federal levels. According to McWilliams (1994), research on environmental justice and industrial redevelopment reflects the need to include community-based groups in the regulatory, decision-making process.

Cooper et al. (2014) indicate that in the future both universities and cities will become more reliant upon each other's resources. In addition, United States Secretary of Housing and Urban Design states that, "The long-term futures of both the city and the university in this country are so intertwined that one cannot—or perhaps will not—

survive without the other" (Cooper et al. 2014, p. 88). Indeed, the desire to bring together the academic research community with political partners in solving real world problems suggests that research professors (from a myriad of disciplines)at institutions of higher learning have a pivotal role to play in projects like brownfield redevelopment—particularly as universities expand their campuses.

The concept of applied research is a realistic approach to creating community and institutional trust, and, most importantly, a sense of successful partnership and collaboration. In an article written by Ghoshal, Arnzen, and Brownfield (1992), the perceptions of professors of Business Studies on learning alliance between business and business schools provides a platform for successful partnership initiatives that focus on "developing learning skills ... to help managers develop rich and sophisticated conceptual frameworks that allow them to generalize about important organizational and environmental events" (Ghoshal, Arnzen, & Brownfield, 1992, p. 51).

## Summary

This chapter has presented a review of selected literature pertaining to research professors' perceptions of the redevelopment of brownfields into usable green spaces. Chapter II contains five major sections. The first section provides a historical background of research professors' perceptions of the redevelopment of brownfields into usable greenspaces. Four sections include information on institutions and sustainable brownfield redevelopment; brownfield barriers: (legal, economic, and social challenges) as well as special partnerships and institutional initiatives. Finally, a summary provides the major ideas of the chapter.

# CHAPTER III - METHODOLOGY

This chapter presents the methodology to be used to answer two research questions:

1. What are professors' perceptions regarding the redevelopment of brownfields into usable greenspaces?
2. What are the most important indicators associated with brownfield sites that influence professors' perceptions to redevelop areas near their campus communities?

## Introduction

The methodology uses qualitative data and a sequential mixed analysis approach to look at the perceptions of professors regarding brownfield redevelopment. This study utilizes a two-phase approach. First, the primary method of data collection consisted of qualitative open-ended questions. Second, the data collection adopted descriptive statistics for ease of interpretation and investigate the most important indicators that influence professors perceptions to redevelop brownfield sites.

The fundamentals which lay the groundwork for a sequential mixed analysis design include finding out complementary strengths and non-overlapping weaknesses within this research study (Greene, 2007). Research studies of this type comprise of an integration of both qualitative and quantitative methods, respectively. Moreover, it was purposely intended for the research process to be enriched strategically with diversity (Johnson & Christensen, 2013).

According to Johnson and Turner's (2003) manuscript, research documents which utilize a mixed method approach are a composite of strategies such as field observations,

transcribed interviews, and questionnaires. This integrative approach is in agreement with a philosophical worldview assumption based on the *pragmatic* viewpoint of mixed method research (Feilzer, 2010; Hall, 2013; Johnson & Onwuegbuzie, 2004; Maxcy, 2003; Morgan, 2007).

A preliminary status of brownfields was retrieved from the Alabama Department of Environmental Management (2011). Justification for the information is based on the needed insight into economic shifts as well as the evolution of physical structures within certain city limits. Some structures are in proximal range to educational institutions. According to Medlen's thesis (2012), the shift of historic cities to brownfields was strongly motivated by economic shifts that changed cities from monocentric structures to polycentric structures, resulting in establishing "semi-autonomous sub-regions."

## Setting

This study took place at three universities in the state of Alabama, a southeastern area of the United States. Data was collected during the months of June and July of 2016. During the summer semester of 2016, faculty enrollment included both full-time and part-time professors. The yearly faculty employment across all three institutions varies between 800 and 823 full-time and part-time employees. During the time of the research, there were approximately 304 professors employed across the three institutions. To maintain confidentiality at all stages in the research, the participants' institutions were coded: EO (Eta-One) University, AO (Alpha-One) University, and GO (Gamma-One) University.

Table 1

*Professors' Demographics*

| Area of Academic Discipline | *N* | **%** |
|---|---|---|
| Humanities | 12 | 28.6 |
| Natural Sciences | 5 | 11.9 |
| Social Sciences | 9 | 21.4 |
| Formal Sciences | 2 | 4.8 |
| Professional & Applied Science | 14 | 33.3 |
| Total | *N*(42) | 100% |

This table provides a description of professors' demographics based on academic disciplines.

Table 2

*Professors' Demographics*

| Geographic Location | *N* | **%** |
|---|---|---|
| Northern Region | 0 | 0 |
| West Central Region | 0 | 0 |
| East Central Region | 40 | 95.2 |
| South West Region | 0 | 0 |
| Southeast Region | 2 | 4.8 |
| Total | *N*(42) | 100% |

This table provides a descriptive distribution of professors' demographics based on institutional geographic location.

## Description of Participants

All professors within all academic and professional disciplines across the university in three Alabama universities were invited to participate in the study. This group of professors was an accessible sample. To maintain confidentiality at all stages in the research, participants were coded to their respective institutions as: EO: 1 through 10; and AO: 1 through 10, and GO.

A total of 20 professors, 10 from EO, 10 from AO, and 0 from GO, agreed to participate in the focus group interviews. Prior to beginning the group interviews, participants were asked to sign a consent form, as well as the research study announcement. There was 100% agreement and return of consent forms. Possible reasons why professors from GO did not participate will be discussed in Chapter V.

Within the focus group population, 20% were males and 80% were females.

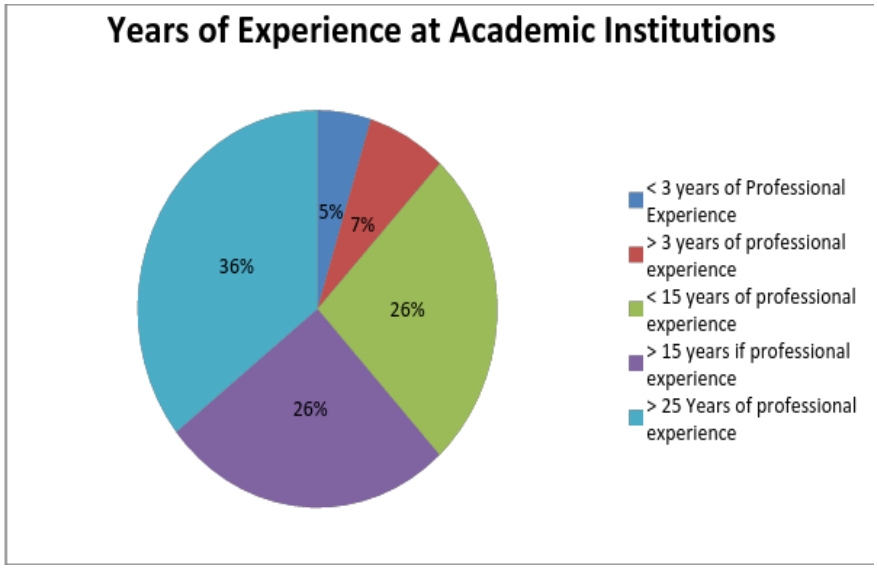


*Figure 3.* Years of Experience at Academic Institutions

A percent distribution of professors' years of experience at academic institutions ranging from < 3 years to > 25 years.

All participants recruited for the group interviews held doctoral degrees and are classified as experts in their respective academic disciplines. On average, the years of professional experience ranged from three years or more and up to twenty-five years.

## Instrumentation

For this research study, a survey initially designed and implemented by Wernstedt, Crooks, and Hersh (2003) was modified to fit this study was used to collect quantitative data (Appendix D). The original survey was used to measure stakeholders' (citizens and city planners) perceptions toward redevelopment efforts in Wisconsin. The instrument included 14 questions on a five-point scale rating. The survey was divided into three main components: participant's background information, redevelopment constraints, and institutional control. Once the survey was completed, participants were given the chance to provide qualitative feedback and commentary on their perceptions, feelings, or ideas of the survey questions (Wernstedt et al., 2003).

This instrument was modified to fit the research study. Only 8 out of the 14 questions were used, but continued to be divided into three main components: participant's background information, redevelopment constraints, and institutional control. Once the survey was completed, participants were given the chance to provide qualitative written feedback and verbal commentary on their perceptions, feelings, or ideas within the focus group interview.

## Procedures

Permission for the focus group interviews and questionnaire was granted by the University of Southern Mississippi's Institutional Research Board. Approval was granted to conduct research at each institution once the request for the research study application

was reviewed and accepted by each institution's institutional review board. The Provost of each of the three universities granted permission for the study to be conducted. Each institution assigned a co-investigator to closely monitor the data collection procedure and to ensure proper institutional research guidelines and protocols were maintained at all time. The co-investigators were also responsible for sending out letters to the faculty inviting them to participate with a link to the online survey. A total of 42 professors, 10 from EO, 32 from AO, and 0 from GO, completed the online survey.

The letter of invitation also included a link to select from the lunch menu of a well-known chain restaurant's online ordering system. The researcher was able to register focus group participants within this ordering system. The invitations were organized by date, time, and location of the event. Once these indicators were identified, an email was sent to the participants directly from the restaurant, requesting them to select from the lunch and snack menu online. All orders were tabulated and forwarded to the researcher for final order and delivery.

A total of 20 professors, 10 from EO, 10 from AO, and 0 from GO, agreed to participate in focus group interviews. Two separate interview sessions were held in conference rooms at EO and AO. Each one lasted approximately one hour and thirty minutes and was audio recorded. Lunch was served and then the professors were asked to sign the informed consent form. They then completed the online survey prior to the interview session.

Conducting research among focus groups has a potential advantage over conducting numerous individual interviews: it provides a setting for in-depth discussion and interaction that may not have occurred within an individual interview, thus enriching

and strengthening the quality of the discussion (King, 2008; Morgan, 1997). Participants were allowed the opportunity to share their feelings and experiences. The focus group interviews followed the alignment of the Morgan design (1992, 1997) that is composed of a heterogeneous collection of participants (of approximately six to ten participants) and is reliant on a relatively structured interview. To investigate diversity in participants' verbal and written responses, open-ended questions were designed and patterned from Land Redevelopment Instrument, which gave definition to the variation of the statistical findings. The researcher modeled the questions to be considered during the focus group from the questionnaire. They include the following:

1. Tell us about the Brownfield Grant Award Ceremony?
2. Are all of our brownfield sites within this geographical location contaminated?
3. How can your experiences relate to similar Brownfield sites like the ones presented?
4. Will STEM or STEAM students be able to participate in the training initiative?
5. How can you connect your institution to other college communities that were successful in converting brownfields to greenspaces for campus expansion?
6. How can you replicate ideas for your institution that are identical to other college communities that were successful converting brownfields to greenspaces for campus expansion?
7. Take a look at the multiple choice illustrations. Tell me, what do you see and give reasons to support your choice.

a. Anyone want to comment on the first illustration?

8. What benefits would a redevelopment project like UAB's bring to your institution, if replicated?
9. What about the second illustration? Why?
10. What about the third illustration? Why do you think it is?
11. Why do you think a brownfield redevelopment project is important?
    a. Why do you believe the level of reluctance exists in some communities to redevelop?
12. What would you recommend if financial assistance is provided for a brownfield conversion project?
13. What about the last illustration?
14. Do you believe there is a variation in experiences with redevelopment of brownfields between private and public institutions?
15. Has anyone ever seen a brownfield site converted to a greenspace?
16. What influences do professors possess that may change the negative perception of a brownfield sites and to aide in conversion efforts to a greenspace?
17. How do you think local institutions located near brownfield site(s) should look at a brownfield redevelopment project?
18. Do you believe research collaborations like the one you are participating in today can be beneficial for the college community?

The secondary method of data collection consisted of the survey instrument that was administered and stored in Qualtrics and later converted into an SPSS downloadable

file for further analyses. Identification of participants remained confidential. The modified multi-attribute instrument adopted by Kris Wernstedt et al. (2003) was used to assess the quantitative data (Appendix D). However, for this research study, only 8 out of the 15 itemized questions were used. It took the participants approximately 10-15 minutes to complete.

## Data Analyses

The research questions for this study used a sequential mixed method approach to provide an analysis of triangulated data (Terrell, 2012). The purpose of interpolating a mix method approach was to minimize biases, to provide an overlap of data, and to present a more authentic description in the analysis of data. Surveys and transcriptions of focus groups were used to collect the data and later combined to provide a summary of result. Survey information was stored online through Qualtrics statistical software to be analyzed and interpreted. To organize the collected data, the professors' verbal responses were arranged into a matrix of transcribed responses (Appendix E).

Data analyses included categorizations, descriptions, and interpretations of qualitative data. The findings from the research investigation were used to formulate conclusions. The 3-2-1 teaching tool was used to enrich implications for future research. According to Regier (2012), the 3-2-1 teaching tool is an assessment based strategy used to evaluate the student's level of comprehension and understanding about a specific unit or topic. This method of written reflections also helped to bring together the overall perceptions of professors towards institutional redevelopment of brownfield sites (see Appendix G).

## Researcher Positionality

The redevelopment of a brownfield into a greenspace, as an approach to sustainable development, has been a passion of mine since I became a college educator. Redeveloping derelict areas near college campuses can be essential in providing a new beginning for communities that are facing economic, social, cultural, and environmental adversity. Moreover, a college or university community that is successful in revitalizing brownfield(s) into a usable greenspace can provide a road-map that is sustainable and replicable for others in dire need.

Having the opportunity to work at an institution of higher education, I have been exposed to numerous qualified research professors that can provide professional in-house consultation; however, they are constantly over-looked. Therefore, professors' motivation to provide educational or professional recommendations ultimately diminishes. Their initial intent and desire is to contribute to a learning community that has the potential to become an environment where students are eager to learn and professors are motivated to research and instruct. If we begin to identify a college or a university role in educating its students and faculty and in holding them accountable to their external community, the overall impact could create initiatives that enforce and support redevelopment efforts. The need to utilize in-house research professors may be identified as contributing to the protection and sustainability of a college's external environment.

## Summary

The subjects for this study were research professors invited from colleges and universities in Alabama. Data for the study was collected through a mixed-method design of survey and focus groups. The participants were engaged in an online survey

questionnaire and focus group interview questions. The survey instrument was administered through Qualtrics one hour prior to the focus group interview questions. Overall, the empirical results from the survey provide an overview of professors' perceptions regarding the redevelopment of brownfield sites. The qualitative data provides a diversity of information to assess whether professors' perceptions can be a driving force in positively impacting institutional potential for converting brownfield sites into usable greenspaces for campus expansion.

# CHAPTER IV – PRESENTATION AND ANALYSIS OF DATA

This chapter is a presentation and analysis of collected data. Two research questions were used to review and analyze the data.

1. What are professors' perceptions regarding the redevelopment of brownfield sites into useable greenspaces? The method of analysis to address this question was qualitative in nature.
2. What are the most important indicators associated with brownfield sites that influence professors' perceptions to redevelop areas near their campus communities? Descriptive statistics were adopted to address this research question.

## Qualitative Data Analysis

The data analysis includes categorization, descriptions, and interpretations of professors' written and verbal responses. To maintain confidentiality at all stages in the research, both the participants and their institutions were coded: EO (Eta-One), AO (Alpha-One), and GO (Gamma-One). The first interview occurred among ten professors at Eta-One. The professors were recruited from a range of academic disciplines. The area of disciplines consisted of Natural Sciences, Formal Sciences, Humanities, and Professional & Applied Sciences. Nine professors were female and the remaining professor was male. The letter codes for these interviews were EO (Eta-One): numbers 1 through 10, and PI for Principle Investigator.

The second interview occurred among ten professors at Alpha-One. The professors were recruited from across academic disciplines. The area of disciplines consisted of Natural Sciences, Formal Sciences, Humanities, and Professional & Applied

Sciences. Seven of the professors were female and the remaining three professors were male. The letter codes for these interviews were AO (Alpha-One): numbers 1 through 10, and PI for Principle Investigator. The qualitative analysis of data was conducted to address the following:

*RESEARCH QUESTION 1*: What are professors' perceptions regarding the redevelopment of brownfield sites into useable greenspaces?

The data was categorized by perceptions on redevelopment constraints, diverse opportunities, redevelopment importance, and land recognition. The initial category for perceptions on redevelopment constraints consisted of the emerging theme of partnership and collaboration. The second category for perception of diverse opportunities consisted of the emerging themes: job training and internship through grant funding. The third category for perceptions on redevelopment importance consisted of the emerging themes: Health disparities, aesthetic influences, safety, and functionality. The final category for perceptions on land recognition consisted of the emerging themes: Nasty and abandon.

*Redevelopment Constraints*

*Partnership and Collaboration.* To determine professors' perceptions relating to partnership and collaborative efforts, they were asked: What would you recommend if financial assistance were provided for a brownfield conversion project?

Responses in this subcategory were related to using financial assistance for professors to organize community partnerships to discuss and offer long-term solutions about the effect of abandoned properties near colleges or universities--where individuals in the areas live or work; Other response were related to using financial assistance to investigate the probability to redevelop brownfield sites in areas where professors are

employed and at other nearby colleges or institutions. Also, participant AO-3 suggested using financial assistance to change programs on college campuses to include program and curricula changes that educate students about the redevelopment processes and the sociological and risk assessments needed as it concerns brownfield conversion (see Appendix E).

Participants were asked another question: "How can financial assistance improve collaboration across Science Technology Engineering Arts and Mathematics (STEAM) disciplines? For brownfield redevelopment projects, participant A-O6 provided insight on the idea of using financial assistance to establish partnerships among students at different colleges and universities. This participant referenced the following: (see Appendix E).

> I would like to talk about relationships that exist among students enrolled at another institution within a 3 to 4-mile radius of Eta-One College and approximately an 8-mile radius from Alpha-One University. I have taught students at this HBCU for a while in a pre-performance program designed for high school students from low income families. This program helps first generation students get to college and through basic education. Based on my observations, there are some students who have fears about how they will perform in math and science courses. I think it would be an excellent idea if financial assistance would be used to partner students and professors from all three institutions to foster a brownfield redevelopment project. I think this kind of collaboration will increase students' levels of motivation or make them feel as though they can succeed in using math and science skills in the STEAM PROGRAM.

"Yes, I love that idea!" stated participant AO-6, who considered the idea as a triangulated brownfield redevelopment project among professors and students and among colleges and universities. And the PI immediately responded with suggestions for writing brownfield redevelopment project grants to provide student internships in environmental courses. This portion of the discussion was completed by participant AO-1, with suggestions to extend the use of financial assistance to leverage partnerships between professors and industry. There would also be partnerships between professors and students who may be interested in receiving scholarships for brownfield redevelopment projects (see Appendix E). For example participant AO-5 suggested,

> One thing we can consider is the students becoming trained professionally in HAZWOPER training, but that training is important because it can get them the jobs they are looking for.

*Diverse Opportunities*

Zohn, Olson-Morgan, and Durchslag-Richardson (2011) research article on brownfields indicated two significant reasons for brownfield redevelopment reluctance. First, the authors pointed to over-competitive funding from both federal and private sectors, and then to economic liabilities that extended beyond the project redevelopment. In this research study, professors also perceived economics as an important theme to promote diverse opportunities.

*Job Training Through Grant Funding*

Responses in this subcategory were related to the need to increase job opportunities among residents directly affected by economic deprivation or neglect associated with the presence of brownfields in their communities. Participants from Eta-

One University stressed the importance of offering employment opportunities to train their residence with the skills to address economic revitalization strategies and to build a stronger socio-economic community status. Professor EO-1 was ecstatic to share with his colleagues the great news on the success of the institution awarded a grant through the United States EPA – Region 4 in the amount of $200,000.00 for five consecutive years to increase a city-wide brownfield redevelopment economic agenda. The agenda was designed to address the first phase of the grant initiative, which is inclusive of creating diverse job opportunities to employ the most at-risk city-wide residents, and most importantly, to train and educate them with the skills that will positively impact their livelihood and to uplift working families out of poverty. For example, Professor EO-1 stated:

> The institution will be looking to address some key issues like: community individuals in need of GED training, skills for resume writing, and increase skills for verbal interview. EPA and City planners look at the economy in North Birmingham area, where lots of the health care providers and companies were removed and relocated to the downtown UAB, Princeton or Brookwood areas'. Also, most all of the popular grocery stores moved as the North Birmingham area began to decline economically; consequently, this area of the city was stripped of its resources. However, we are trying to redevelop these brownfield sites to greenspaces or useable greenspaces, bring industries and businesses back to the community and making them more accessible to the people, with hopes that property value will increase. We also want to increase economic growth and employment. Establish healthier residential living that is affordable. We want the

> job market to be more marketable and pleasing to the people in the community, from that perspective. The training grant cycle will look at addressing the community soft skills needs and residential life planning needs, as well as, HAZWOPER training inclusive of: general industry training, forklift training, and asbestos abatement. This grant will make the people in the community more marketable for the industry (see Appendix E).

In response to professor EO-1, professor EO-2 expressed a feeling of trust in support that the EPA is utilizing its federal resources to redevelop brownfield sites within range of the campus community. For example, EO -2 stated:

> Feels like the EPA and ADEM brownfields program empowers states, communities and other stakeholders to work together to prevent, assess, safely clean-up, and sustainably reuse brownfields (see Appendix E).

*Internship* Establishing a brownfield internship program is the direction that participants propose to establish. The program would prepare students with the scientific techniques, skills and readiness to explore careers in the field of brownfield redevelopment. To determine the participants' perception of opportunities through internship programs, they were asked: How will STEM or STEAM students be able to participate in the training initiative? In response to the question, professor EO-1: stated,

> Moreover, they will be able to blend in with the training and help to perform assessments for phase-one. They will be trained to collect soil samples and learn how to geographically map out sample locations once it is identified (see Appendix E).

Whereas, EO-5 stated:

> About a year ago, we meet with the Mayor of Tarrant for acquisition of an abandoned piece of property which has a restaurant on it that is no longer in service. Our institution has a culinary arts program that can utilize this space for campus expansion. The Mayor's office is interested in the possible outcome. Firstly, I think and feel that this will offer our institution a unique chance to redevelop the abandoned site into useable space to enhance academic learning and increase campus space (see Appendix E).

*Redevelopment Importance*

*Health Disparities* To determine professors' perceptions about health disparities, they were asked: Are all brownfield sites within this geographical location contaminated?

Responses in this subcategory were related to contamination that adversely affects human health in workplace environments and communities where colleges and universities are geographically located near brownfield sites. In particular, the identification of abandoned facilities and cattle car trucks that may contain harmful levels of lead and asbestos; and the potential exposure to a persistent organic pollutant like PCB's (Polychloro-biphenyl's) and other carcinogenic or corrosive hazards in the soil, air, or water (see Appendix E) were explored. The following responses were given by three professors, two were female and one was male. Professors EO-1 said,

> Well, if it's a brownfield site, there is something there. To what degree, they would have to perform an assessment. For a brownfield site, it could be an abandoned building where they could have lead, asbestos especially with the age of a building; it could be contaminated and could cause health problems.

However, assessments of sites should be performed before renovation so that projects like this can positively support the reuse of unwanted space (see Appendix E). Professors EO-5 stated,

> This is how adverse impacts happen to people within a community and that's when healthcare and health problems arise" (see Appendix B).

Whereas, professors EO-2 asked,

> Will the neighboring college community, the one located near one of the United States' major steel corporations be brought into the study because this plant is in the backyard of this institution and the community? The reason I asked is because I grew up in that community and liaised with professors at the college located in the area. Over the years residing in the city, I have witnessed the deaths of residents, resulting from similar chronic illnesses, such as, upper respiratory illness or other types of severe respiratory health problems (see Appendix B).

Professor EO-3 stated,

> I was wondering if the company was able to inform the people in this area because we are situated between the northern and the southern campuses in relationship to that area geographically ranging from 9$^{th}$ avenue to 5$^{th}$ avenue. If they are actually storing waste products in these big cattle cars—and there are a lot of them—why haven't the proper agencies communicated this information to the public? In this area, a lot of people's lives were affected with different types of chronic illnesses; most of whom I grew up with (see Appendix E).

Another question asked of participants was: Why do you think a brownfield redevelopment project is important? The analysis into health disparities emerged and

presented itself as differences across urban areas with potential drawbacks and negligence to affected communities. For example, four professors (two male and two female) from Alpha-One University acknowledged that human health is a key issue in terms of addressing national efforts to rectify these types of high risk exposures in regionally affected communities. Professor AO 8 states,

> When you are living or working in a health risk area where brownfield sites are located, the long-term effects are very critical in terms of human health and well-being.

Professor AO 5 expressed a moment-to-moment experience about communities becoming strategic in addressing the problem(s) that exist in their communities through open communication, so their voices can be heard. It was also suggested that issues like this not only present disparities in health but also present social justice challenges, thus adversely affecting the social fabric of the community (see Appendix E). Also, professor AO 3 enriched the discussion on health disparities by sharing the importance of looking at the cause-effect relationship on human health. For example:

> If you have green space in cities the physical, social, psychological health is impacted positively. People spend time together, exercise and they feel the sense of sacredness. Concrete buildings don't instill spirituality, trees and grass facilitate spiritual experiences and that costs you less with regards to hospital expenses.

*Aesthetics Influences* Aesthetic influences emerged within the analysis of data repeatedly in many forms as a "want" or a "desire" to achieve. Therefore, the analysis indicates that these influences reemerged across multiple facets. For example, professor

EO-3 felt as though the need to redevelop brownfield sites located near the campus community would increase health awareness through the introduction of green infrastructures, thus, establishing a positive perception within and throughout the community. When asked: What type of greening ideas can transform your campus environment? Professor EO-3 stated,

> We can incorporate more campus jogging trails and more sporting facilities surrounded by public greenspace. Incorporating greenspace would eventually attract students and positively impact our student enrollment because students will want to attend our institution because the campus will provide a sense of community wellness (see Appendix E).

Professor EO-1 made recognition to Eta-One College's outreach efforts to convert the property of a nearby abandoned high school into a community health and wellness center; and, professor EO-4 expressed the desire to create a campus community garden (see Appendix E).

Aesthetic influences also emerged from the analysis of data through the willingness of professors to introduce STEM or STEAM students to brownfield redevelopment initiatives. However, Professor AO-4 was persistent to reflect on a moment-to-moment experience:

> I was just in San-Diego for my parent's 60$^{th}$ anniversary and we stayed in a place called Liberty Station, which was a huge military base that has now been converted into a one of the most interesting public sites I have ever visited. It's somewhat like a sprawling mall. It's a deconstructed mall and it has residential

> and lots of open space and green pathways. So it's really incredibly inviting, and I am so impressed with what they have done (see Appendix E).

*Safety* Although professors were able to identify the benefits of incorporating green infrastructures within their campus communities, one professor was able to reflect on the benefits aesthetic influences that bring a sense of safety to a campus community. The theme '*safety*' emerged as professor AO-7 shared evidence on her past experiences as a doctoral student at a nearby university. She indicated that community safety is established when green spaces are incorporated into a university's blueprint. For example, she stated,

> Those changes made the university more accessible to students. After redevelopment, it actually felt like you were at a college/university instead of feeling as if you were just walking in the city. It also made the campus safer because students no longer had to cross major roads or highways. I can definitely see the benefit of universities using the brownfield sites in this way (see Appendix E).

When asked: What beneficial factor(s) come out of a brownfield redevelopment initiative?

Professor AO-7 felt encouraged to state,

> I just want to talk about the impact that Railroad Park made, especially with me being a doctoral student and being in walking distance from classes. It has just made the community feel a lot safer, especially when there is such a high concentration of crime, homeless people and poverty. Now I see a lot of grocery

> stores are being established in the area. For example, a Publix coming that way and lots of housing communities...so it's just really nice (see Appendix E)

Finally, aesthetic influences were reemphasized according to professor AO-7 with regards of Alpha-One University being known specifically as a beautiful campus with a costly price to maintain. In addition, professor AO-7 also indicated how aesthetic value positively impacted institutions. For example, she stated,

> One reason our freshmen students come to Alpha-One University is because the campus is so beautiful. We were paying $30,000 just to keep the grass beautifully trimmed and green (see Appendix E).

*Functionality* Redevelopment constraints plague the functionality of a redeveloped brownfield site. Professors frequently identified areas surrounding converted brownfield sites as areas that are either contaminated or in dire need of restoration. Professors were asked the question: What beneficial factor(s) comes out of a brownfield redevelopment initiative? Their responses were far-fetched. However, their perceptions remained centered around a successful conversion site: Railroad Park. One professor, AO-2, stated that he has made close connections with the president of Railroad Park and has personally witnessed the economic-growth benefits that accrued as a result of its existence in the city (see Appendix E). Professor AO-1 indicated that Railroad Park created a sense of inclusiveness across communities and brought together all types of people from different socio-economic backgrounds (see Appendix E).

*Land Recognition*

To engage professors in the discussion, they were asked to analyze four photographic depictions related to either a brownfield site or a green space (see Appendix

H, for depictions). This procedure was conducted to examine their visual interpretations. They were asked in each depiction to identify what they saw (either a brownfield site or a green space) and then to give reason(s) to support their answer choice. Professor AO-10 identified the first photographic depiction as a green space. Professor AO-7 stated,

> It looks like a green space but it could have been a former brownfield site that has been successfully transformed into a greenspace (see Appendix E).

In opposition to professor AO-7's visual identification of the first depiction, professor AO-3 had a conflicting analysis but, yet, a unique response. Professor AO-7 stated,

> Well, I think it is a brownfield because of its close proximity to an urban area. It's out-skirts usually have a lot of industrial companies and it just has that look; it looks like a redeveloped industrial site (see Appendix E).

In other instances, some professors were able to identify the first visual depiction, as well, as indicated by its exact geographical location. Professor EO-4 said,

> Yes, it looks like the nearby University's greenspace. That area was nothing but buildings when I was a student. They demolished the buildings and created a green space. I was a student from 2003 to 2007. My graduating class endured most of the redevelopment of the green space area. I made observations on steps involved in the creation of the green space out of a reclaimed area (see Appendix E).

In addition, professor EO-3 said,

> To be concise, this nearby university redevelopment of its greenspace area actually started with land clearing in the year 2001 to 2002. At that time, I also

attended this university as a graduate student and lived in an on-campus apartment near the development site (see Appendix E).

The second photographic depiction elicited professors' responses:

A brownfield site; and looks like an abandoned building. (Appendix E)

A non-residential area that looks nasty; an industrial site that may hold chemicals; very few trees and plants (see Appendix E).

Professors provided the following responses for the third photographic depiction:

A recreational facility; artificial synthetic turf; A soccer field, green space; green facility (see Appendix E).

The final photographic depiction elicited the following responses from the professors:

Unwise use of land, pretty nasty; it looks industrial (see Appendix E).

## Quantitative Data

The secondary method for data collection adopted descriptive statistics for ease of statistical interpretation and to address the second research question:

*RESEARCH QUESTION 2:* What are the most important indicators associated with brownfield sites that influenced professors' perceptions to redevelop areas near their campus communities?

Statistical analysis was conducted using Qualtrics survey software through the University of Southern Mississippi and later transposed into IBM SPSS statistics 20. The research sample consisted of 42 professors across all academic and professional disciplines. They were invited to participate from three universities in the state of Alabama. To maintain confidentiality at all stages in the research, both the participants' and their institutions were coded: EO (Eta-One), AO (Alpha-One), and GO (Gamma-

One). This group of professors was an accessible sample. All professors were invited to participate in the study and were asked to sign a consent form if they agreed to participate. Participatory contributions help to provide state, regional and national agencies', other academic and research institutions with an understanding of professors' perceptions toward institutional redevelopment of brownfield sites into useable green spaces for campus expansion.

*Land Recognition*

To investigate the perceptions of professors toward the redevelopment of brownfield sites near their campus communities and whether those perceptions relate to the specific geographical location of the university and the brownfield site, the Land Redevelopment Survey instrument, designed by Wernstedt, Crooks, and Hersh (2003) was adopted. To investigate professors' perceptions, the fourth survey question looks to investigate their level of brownfield recognition. The item reads: "Please characterize your general familiarity with brownfields in your local area." Table 3 provides a summary of the results.

Table 3

*Perception on general familiarity*

| | | *Frequency* | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 20 | 47.6 | 48.8 | 48.8 |
| | 2 | 5 | 11.9 | 12.2 | 61.0 |
| | 3 | 9 | 21.4 | 22.0 | 82.9 |
| | 4 | 5 | 11.9 | 12.2 | 95.1 |
| | 5 | 2 | 4.8 | 4.9 | 100.0 |

| | | | | |
|---|---|---|---|---|
| | Total | 41 | 97.6 | 100.0 |
| Missing | System | 1 | 2.4 | |
| Total | | 42 | 100.0 | |

Descriptive Test Statistics for professors' perception based on general familiarity of brownfield sites.

Response of perception ranged from numbers one through five on a Likert scale; one (completely unfamiliar) through five (strongly familiar). The data in the Table 3 show that a significant percent of professors are completely or slightly unfamiliar with brownfield sites that may be located in areas in close proximity of their college campuses. For example, 47.6% of professors indicated that they are completely unfamiliar with brownfield sites; and 11.9% of the professors indicated that they are slightly unfamiliar, which represents over a half of the population's response; whereas, a small percentage of professors indicated a moderate to strong familiarity with brownfield sites in close proximity to their institutions. The mean score among professors regarding their general familiarity is ($M$ = 2.12, SD = 1.288).

*Redevelopment Importance*

To investigate professors' perceptions, the fifth survey question seeks to investigate their level of concern for redeveloping a contaminated property. The corresponding item reads: "You may have heard various reasons why some people think it is important for communities across the state to redevelop contaminated properties. Please indicate your view of the importance of each of the following reasons why contaminated properties should be redeveloped in your local area" (see Appendix C). To summarize the results, the instrument identified the following ten itemized indicators: increased tax revenue; eyesore removal, more efficient use of infrastructure; creation of

jobs; reduced public health risks; reduced environmental risk, reduced sprawl; diversity business mix; promotion of green space; and an area-wide redevelopment agenda. These indicators were ranked on a 5-point Likert scale.

Findings in the initial indicator present a 100% response rate. All professors agreed that the redevelopment of brownfield sites is important because it significantly increases the tax revenue. Next, 23.8% of the professors stated that that there is a moderate level of importance; whereas, a slight increase of professors, at 28.6% viewed it as important; and 21.4% indicated an increase of tax revenue as very important. Table 4 provides a summary of the results.

Table 4

*Perception on tax revenues*

| Q5-1 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 1 | 2.4 | 2.4 | 2.4 |
| | 2 | 10 | 23.8 | 23.8 | 26.2 |
| | 3 | 10 | 23.8 | 23.8 | 50.0 |
| | 4 | 12 | 28.6 | 28.6 | 78.6 |
| | 5 | 9 | 21.4 | 21.4 | 100.0 |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on tax revenues of brownfield sites

The second indicator presents a 100% response rate. 90.4% of professors indicated a significantly high response that falls within the moderately important to very important range. For example, 23.8% of professors stated that there is a moderate level of

importance to remove eyesores near their institutions' and across the state; 21.4% of the professors viewed it as important; and 45.2% viewed it as very important. The mean to remove eyesores score among professors is ($M$ = 4.00, SD = 1.104). Table 5 provides a summary of the results.

Table 5

*Perception on removal of eyesores*

| Q5-2 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 1 | 2.4 | 2.4 | 2.4 |
| | 2 | 3 | 7.1 | 7.1 | 9.5 |
| | 3 | 10 | 23.8 | 23.8 | 33.3 |
| | 4 | 9 | 21.4 | 21.4 | 54.8 |
| | 5 | 19 | 45.2 | 45.2 | 100.0 |
| Total | | 42 | 100.0 | 100.0 | |

Descriptive Test Statistics for professors' perception based on the removal of eyesores.

The third indicator presents a 97.6% response rate. 78.6% of professors indicated a significantly high response that falls within the moderately important to very important range. For example, 40.5% of professors stated that there is a moderate level of importance to create jobs near their institutions and across the state; and 38.1% viewed it as very important. However, 2.4% provided no response. The mean to create jobs score among professors is ($M$ = 4.12, SD = .900). Table 6 provides a summary of the results.

Table 6

*Perception on the creation of jobs*

| Q5-4 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 2 | 3 | 7.1 | 7.3 | 7.3 |
| | 3 | 5 | 11.9 | 12.2 | 19.5 |
| | 4 | 17 | 40.5 | 41.5 | 61.0 |
| | 5 | 16 | 38.1 | 39.0 | 100.0 |
| | Total | 41 | 97.6 | 100.0 | |
| Missing | System | 1 | 2.4 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception on the importance to create jobs.

The fourth indicator presents a 100% response rate. 97.7% of professors indicated a significantly high response that falls within the moderately important to very important range. For example, 4.8% of professors stated that there is a moderate level of importance to reduce public health risks near their institutions and across the state; 26.6% of the professors viewed it as important; and 66.7% viewed it as very important. The mean health risk score among professors is ($M$ = 4.57, SD = .703). Table 7 provides a summary of the results.

Table 7

*Perception on public health risks*

| Q5-5 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 2 | 1 | 2.4 | 2.4 | 2.4 |
| | 3 | 2 | 4.8 | 4.8 | 7.1 |
| | 4 | 11 | 26.2 | 26.2 | 33.3 |
| | 5 | 28 | 66.7 | 66.7 | 100.0 |
| Total | 42 | 100.0 | 100.0 | | |

Descriptive Test Statistics for professors' perception on reducing public health risks.

The fifth indicator presents a 100% response rate. A combined score of 85.7% of professors indicated a significantly high response between important to very important regarding their perception to reduce environmental risks. However, a combined score of 11.9% of professors indicated that there is a slight to moderate level of importance to reduce environmental risks near their institutions and across the state; and <3% viewed environmental risks as not important. The mean environmental risk score among professors is ($M$ = 4.45, SD = .942). Table 8 provides a summary of the results.

Table 8

*Perception to reduce environmental risks*

| Q5-6 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 1 | 2.4 | 2.4 | 2.4 |
| | 2 | 1 | 2.4 | 2.4 | 4.8 |
| | 3 | 4 | 9.5 | 9.5 | 14.3 |
| | 4 | 8 | 19.0 | 19.0 | 33.3 |
| | 5 | 28 | 66.7 | 66.7 | 100.0 |
| Total | | 42 | 100.0 | 100.0 | |

Descriptive Test Statistics for professors' perception to reduce environmental risks.

The sixth indicator presents a 97.6% response rate. 78.6% of professors indicated a significantly high response that falls within the important to very important range. For example, 35.7% of professors stated that there is an importance to promote green space near their institutions and across the state; whereas, 33.3% of professors viewed it as important. However, 2.4% provided no response on the level of importance to promote green space. The mean to promote green space scores among professors is ($M$ = 3.88, SD =1.077). Table 9 provides a summary of the results.

Table 9

*Perception to promote greenspace*

| Q5-9 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 2 | 7 | 16.7 | 17.1 | 17.1 |
| | 3 | 5 | 11.9 | 12.2 | 29.3 |
| | 4 | 15 | 35.7 | 36.6 | 65.9 |
| | 5 | 14 | 33.3 | 34.1 | 100.0 |
| | Total | 41 | 97.6 | 100.0 | |
| Missing | System | 1 | 2.4 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception to promote greenspace

The seventh indicator presents a 100% response rate. A combined score of 57.2% of professors indicated a response between important to very important. However, a combined score of 38.1% of professors indicated that there is a slight to moderate level of importance for an area-wide redevelopment agenda near their institutions and across the state; whereas, 4.8% viewed an area-wide redevelopment agenda as not important. The mean area-wide redevelopment agenda score among professors is ($M$ = 3.64, SD = 1.206). Table 10 provides a summary of the results.

Table 10

*Perception to redevelop as an area-wide agenda*

| Q5-10 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 2 | 4.8 | 4.8 | 4.8 |
| | 2 | 6 | 14.3 | 14.3 | 19.0 |
| | 3 | 10 | 23.8 | 23.8 | 42.9 |
| | 4 | 11 | 26.2 | 26.2 | 69.0 |
| | 5 | 13 | 31.0 | 31.0 | 100.0 |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception on redevelopment as an area-wide agenda.

*Redevelopment Constraint/Barriers*

To investigate professors' perceptions, the seventh survey question looks to investigate professors' perceptions on various factors that may make it difficult for developers to redevelop brownfield sites. The item reads: "Across the state, various factors may make it difficult for developers to redevelop brownfield properties. Please rate the level of constraint in your local area." The response of perception ranged from numbers one through five on a Likert scale; one (not a constraint) through five (very important constraint). To summarize the results, the instrument identified the following three itemized indicators: lack of cooperation from local government; community opposition; and unfavorable lending terms. These indicators were ranked on a 5-point Likert scale.

Findings in the initial indicator present a 90.5% response rate. A combined score 69% of professors indicated that the lack of cooperation from local government in their

local area is a moderate constraint to an important constraint. However, 4.8% of the professors viewed the lack of local government cooperation as not a constraint; whereas 9.5% stated that it is an important constraint. 9.5% of professors did not provide a response. The mean trusting to private parties score among professors is ($M$ = 3.39, SD = .974). Table 11 provides a summary of the results.

Table 11

*Perception on lack of cooperation from local government*

| Q8-5 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 2 | 4.8 | 5.3 | 5.3 |
| | 2 | 3 | 7.1 | 7.9 | 13.2 |
| | 3 | 15 | 35.7 | 39.5 | 52.6 |
| | 4 | 14 | 33.3 | 36.8 | 89.5 |
| | 5 | 4 | 9.5 | 10.5 | 100.0 |
| | Total | 38 | 90.5 | 100.0 | |
| Missing | System | 4 | 9.5 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professor' perception based on the lack of cooperation from local government.

Results from the second indicator presented a 90.5% response rate. A combined score of 78.5% of professors indicated community opposition as a constraint in their local area, ranging from slight to very important. However, 11.9% of the professors responded that community opposition is not a constraint that makes it difficult for developers to redevelop brownfield sites; whereas 9.5% stated that it is an important constraint and may make it difficult for developers to redevelop brownfield sites. 9.5% of professors did not

provide a response. The mean community opposition score based on professors' perceptions is ($M$ = 3.03, SD = 1.219). Table 12 provides a summary of the results.

Table 12

*Perception on community opposition*

| Q8-6 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 5 | 11.9 | 13.2 | 13.2 |
| | 2 | 8 | 19.0 | 21.1 | 34.2 |
| | 3 | 10 | 23.8 | 26.3 | 60.5 |
| | 4 | 11 | 26.2 | 28.9 | 89.5 |
| | 5 | 4 | 9.5 | 10.5 | 100.0 |
| | Total | 38 | 90.5 | 100.0 | |
| Missing | System | 4 | 9.5 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors/ perception based on community opposition.

Results from the third indicator presented an 88.1% response rate. A combined score of 66.6% of professors indicated unfavorable lending terms as a constraint in their local area, ranging from moderately important to very important. However, 14.3% of professors responded that unfavorable lending terms is a slight constraint that makes it difficult for developers to redevelop brownfield sites; whereas 7.1% stated that it is a very important constraint and may make it difficult for developers to redevelop brownfield sites. 11.9% of professors did not provide a response. The mean community opposition score based on professors' perceptions is ($M$ = 3.24, SD = .830). Table 13 provides a summary of the results.

Table 13

*Perception on unfavorable lending terms*

| Q8-8 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 2 | 6 | 14.3 | 16.2 | 16.2 |
| | 3 | 19 | 45.2 | 51.4 | 67.6 |
| | 4 | 9 | 21.4 | 24.3 | 91.9 |
| | 5 | 3 | 7.1 | 8.1 | 100.0 |
| | Total | 37 | 88.1 | 100.0 | |
| Missing | System | 5 | 11.9 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on unfavorable lending terms.

*Role of State / Federal Environmental Agencies*

The role of the state and federal environmental agencies is the third quantitative category that consisted of five itemized questions. To investigate professors' perceptions on state environmental agencies' responsibility overseeing cleanup at brownfield sites, the fifth survey question reads: "In comparison to the mid-1990's, the behavior of the Alabama Department of Environmental Management with respect to contaminated properties TODAY is?" The response of perception ranged from numbers one through five on a Likert scale; one (less) through five (more) (see Appendix C). To summarize the results, the instrument identified the following five itemized indicators: trust of private parties; ease in working with; willingness to negotiate; fairness; and thoroughness. These indicators were ranked on a 5-point Likert scale.

Findings in the initial indicator present an 83.3% response rate. A combined score 40.5% of professors agreed that there is less to no change in behavioral approach of the Alabama Department of Environmental Management since the mid-1900's although legislation and environmental regulations have evolved. A combined score of 42.9% of the professors viewed ADEM's change in behavioral approach to be often to more. The mean trusting to private parties score among professors is ($M$ = 3.57, SD = 1.037). Table 14 provides a summary of the results.

Table 14

*Perception on trust to private parties*

| Q9-1 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 2 | 4.8 | 5.7 | 5.7 |
| | 2 | 1 | 2.4 | 2.9 | 8.6 |
| | 3 | 14 | 33.3 | 40.0 | 48.6 |
| | 4 | 11 | 26.2 | 31.4 | 80.0 |
| | 5 | 7 | 16.7 | 20.0 | 100.0 |
| | Total | 35 | 83.3 | 100.0 | |
| Missing | System | 7 | 16.7 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on trust to private parties.

Results in the second indicator presented an 81% response rate. A combined score 54.8% of professors agreed that there has been less to no change in ease working with the Alabama Department of Environmental Management since the mid-1900's although legislation and environmental regulations have evolved. A combined score of 26.2% or the professors viewed ADEM's change in behavioral approach to be often to more; whereas, 19% or professors did not respond. The mean score for ease of working with

ADEM is recorded as, ($M$ = 3.06, SD = .919). Table 15 provides a summary of the results.

Table 15

*Perception on change of ease working with ADEM*

| Q9-2 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 2 | 4.8 | 5.9 | 5.9 |
| | 2 | 6 | 14.3 | 17.6 | 23.5 |
| | 3 | 15 | 35.7 | 44.1 | 67.6 |
| | 4 | 10 | 23.8 | 29.4 | 97.1 |
| | 5 | 1 | 2.4 | 2.9 | 100.0 |
| | Total | 34 | 81.0 | 100.0 | |
| Missing | System | 8 | 19.0 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on ease in working with ADEM.

Findings in the third indicator presented an 81% response rate. A combined score 52.4% of professors agreed that there is less to no change for Alabama Department of Environmental Management willing to negotiate since the mid-1900's although legislation and environmental regulations have evolved. A combined score of 28.6% of the professors viewed ADEM's change in behavioral approach to be often to more; and 19% of professors did not respond to the question. The mean score for ease in working with ADEM is recorded as, ($M$ = 3.09, SD = .933). Table 16 provides a summary of the results.

Table 16

*Perception on ADEM's will to negotiate*

| Q9-5 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 2 | 4.8 | 5.9 | 5.9 |
| | 2 | 6 | 14.3 | 17.6 | 23.5 |
| | 3 | 14 | 33.3 | 41.2 | 64.7 |
| | 4 | 11 | 26.2 | 32.4 | 97.1 |
| | 5 | 1 | 2.4 | 2.9 | 100.0 |
| | Total | 34 | 81.0 | 100.0 | |
| Missing | System | 8 | 19.0 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on ADEM's will to negotiate.

Results in the fourth indicator presented an 81% response rate. A combined score 54.7% of professors agreed that there is less to no change in fairness with the Alabama Department of Environmental Management since the mid-1900's although legislation and environmental regulations have evolved. A combined score of 26.2% of the professors viewed ADEM's change in behavioral approach to be fair, which was observed as often to more; whereas, 19% of professors did not respond to the question. The mean score for ease to work with ADEM is recorded as, ($M$ = 3.18, SD = 1.058). Table 17 provides a summary of the results.

Table 17

*Fairness of ADEM*

| Q9-9 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 3 | 7.1 | 8.8 | 8.8 |
| | 2 | 3 | 7.1 | 8.8 | 17.6 |
| | 3 | 17 | 40.5 | 50.0 | 67.6 |
| | 4 | 7 | 16.7 | 20.6 | 88.2 |
| | 5 | 4 | 9.5 | 11.8 | 100.0 |
| | Total | 34 | 81.0 | 100.0 | |
| Missing | System | 8 | 19.0 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' based on the fairness of ADEM.

Findings in the fifth indicator presented an 81% response rate. A combined score of 54.7% of professors agreed that there is less to no change with the Alabama Department of Environmental Management being thorough since the mid-1900's although legislation and environmental regulations have evolved. A combined score of 26.1% of the professors viewed ADEM's change in behavioral approach to be thorough, which was observed as often to more; whereas, 19% of professors did not respond to the question. The mean score for ease to work with ADEM is recorded as, ($M$ = 3.03, SD = 1.114). Table 18 provides a summary of the results.

Table 18

*Perception on change in approach*

| Q9-12 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 4 | 9.5 | 11.8 | 11.8 |
| | 2 | 5 | 11.9 | 14.7 | 26.5 |
| | 3 | 14 | 33.3 | 41.2 | 67.6 |
| | 4 | 8 | 19.0 | 23.5 | 91.2 |
| | 5 | 3 | 7.1 | 8.8 | 100.0 |
| | Total | 34 | 81.0 | 100.0 | |
| Missing | System | 8 | 19.0 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on change in approach to be thorough.

*State or Regional Environmental Agency: Constraints / Barriers*

Barriers and constraints of state or federal environmental agencies is the fourth quantitative category that consisted of five itemized questions. To investigate professors' perceptions on state environmental agencies' responsibility overseeing cleanup at brownfield sites, the sixth survey question reads: "Please indicate the importance of each of the following possible constraints to the ability of ADEM to oversee cleanups in an effective and timely fashion." The response of perception ranged from numbers one through five on a Likert scale; one (not a constraint) through five (very important constraint). (See Appendix C). To summarize the results, the instrument identified the following five itemized indicators: inadequate funding for staff; pressure from political leaders; lack of authority; lack of support from the general public; and lack of inter-agency coordination. These indicators were ranked on a 5-point Likert scale.

Results in the initial indicator present an 83.3% response rate. Only 7.1% of professors indicated that ADEM's ability to oversee cleanups in a timely and effectively

manner is a slight constraint as a result of inadequate funding for staff. However, a combined score of 76.2% of the professors viewed ADEM's timely and effective manner to cleanup sites as a moderately important constraint to a very important constraint because of inadequate staff funding; whereas, 16.7% of professors did not respond. The mean for ADEM's timely and effectiveness in cleanup pertaining to inadequate staff funding score among professors is ($M$ = 3.91, SD = .981). Table 19 provides a summary of the results.

Table 19

*Perception on inadequate staff funding*

| Q10-1 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 2 | 3 | 7.1 | 8.6 | 8.6 |
| | 3 | 9 | 21.4 | 25.7 | 34.3 |
| | 4 | 11 | 26.2 | 31.4 | 65.7 |
| | 5 | 12 | 28.6 | 34.3 | 100.0 |
| | Total | 35 | 83.3 | 100.0 | |
| Missing | System | 7 | 16.7 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception of constraint based on inadequate staff funding.

Findings in the second indicator present an 83.3% response rate. Only 7.2% of professors indicated that ADEM's ability to oversee cleanups is not a constraint to a slight constraint because of pressure from political leaders. However, a combined score of 76.2% of the professors viewed ADEM's timely and effective manner to cleanup sites as a moderately important constraint to a very important constraint because of political pressure; whereas, 16.7% of professors did not respond. The mean for ADEM's timely

and effectiveness in cleanup due to political pressure score based on professors' perceptions is ($M$ = 3.94, SD = 1.056). Table 20 provides a summary of the results.

Table 20

*Perception ADEM's timely & effective response*

| Q10-4 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 1 | 2.4 | 2.9 | 2.9 |
| | 2 | 2 | 4.8 | 5.7 | 8.6 |
| | 3 | 8 | 19.0 | 22.9 | 31.4 |
| | 4 | 11 | 26.2 | 31.4 | 62.9 |
| | 5 | 13 | 31.0 | 37.1 | 100.0 |
| | Total | 35 | 83.3 | 100.0 | |
| Missing | System | 7 | 16.7 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics on professors' perception based on ADEM's timely and effective response to clean-up.

Results in the third indicator present an 83.3% response rate. 61.9% of professors indicated that ADEM's ability to oversee cleanups as a moderately important to an important constraint based on the lack of authority. However, only 9.5% of the professors viewed a lack of authority within ADEM as the result of timely and effective manner to cleanup sites as a moderately important constraint to a very important constraint; whereas, 2.4% of the professors thought it was not a constraint. 16.7% of professors did not respond. The mean for ADEM's timely and effectiveness in cleanup due to ADEM's lack of authority score based on professors' perceptions is ($M$ = 3.37, SD = .942). Table 21 provides a summary of the results.

Table 21

*Perception on ADEM's lack of authority*

| Q10-5 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 1 | 2.4 | 2.9 | 2.9 |
| | 2 | 4 | 9.5 | 11.4 | 14.3 |
| | 3 | 15 | 35.7 | 42.9 | 57.1 |
| | 4 | 11 | 26.2 | 31.4 | 88.6 |
| | 5 | 4 | 9.5 | 11.4 | 100.0 |
| | Total | 35 | 83.3 | 100.0 | |
| Missing | System | 7 | 16.7 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on ADEM's lack of authority.

Findings in the fourth indicator present an 83.3% response rate. 78.6% of professors indicated that ADEM's ability to oversee cleanups as a moderately important to a very important constraint based on the lack of support from the general public. However, only 4.8% of the professors viewed a lack of general public support within ADEM as not a constraint to a slight constraint that impacts a timely and effective manner to cleanup sites; whereas, 16.7% of professors did not respond. The mean for ADEM's timely and effectiveness in cleanup due to ADEM's lack of general public support score based on professors' perceptions is ($M$ = 3.83, SD = .985). Table 22 provides a summary of the results.

Table 22

*Perception based on lack of general support*

| Q10-6 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 1 | 2.4 | 2.9 | 2.9 |
| | 2 | 1 | 2.4 | 2.9 | 5.7 |
| | 3 | 11 | 26.2 | 31.4 | 37.1 |
| | 4 | 12 | 28.6 | 34.3 | 71.4 |
| | 5 | 10 | 23.8 | 28.6 | 100.0 |
| | Total | 35 | 83.3 | 100.0 | |
| Missing | System | 7 | 16.7 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception on the lack of general support.

Results in the final indicator present an 83.3% response rate. A combined score of 71.4% of professors indicated that ADEM's ability to oversee cleanups as a slight importance to a very important constraint based on the lack of inter-agency coordination. However, only 2.4% of the professors viewed a lack of inter-agency coordination within ADEM as not a constraint impacting the timely and effective manner to cleanup sites; whereas, 16.7% of professors did not respond. The mean for ADEM's timely and effectiveness in cleanup due to ADEM's lack of inter-agency coordination score based on professor's perceptions is ($M$ = 3.43, SD = .979). Table 23 provides a summary of the results.

Table 23

*Perception on ADEM's lack of inter-agency coordination*

| Q10-7 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 1 | 2.4 | 2.9 | 2.9 |
| | 2 | 5 | 11.9 | 14.3 | 17.1 |
| | 3 | 11 | 26.2 | 31.4 | 48.6 |
| | 4 | 14 | 33.3 | 40.0 | 88.6 |
| | 5 | 4 | 9.5 | 11.4 | 100.0 |
| | Total | 35 | 83.3 | 100.0 | |
| Missing | System | 7 | 16.7 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on ADEM's lack of inter-agency coordination.

## Summary

The purpose of this chapter was to provide an analysis of collected data. The triangulation of data included an integration of both professors' focus group qualitative interview verbal responses and descriptive statistics, respectively. It was purposefully intended for results to be enriched with diverse and combined responses between both qualitative and quantitative analysis. The analysis of data included categorization, descriptions, and interpretations of professors' written and verbal responses corresponding to their perceptions regarding the redevelopment of brownfields into useable greenspaces. On the contrary, the secondary method for data collection used descriptive statistics for ease of statistical interpretation relating to the most important factor(s) that influenced professors' perceptions on the redevelopment of brownfield sites in Alabama.

In Chapter V, data analysis has been compiled and reviewed to draw final conclusions. The qualitative and quantitative data were analyzed separately and later combined to address the research questions and to provide recommendations for future studies.

# CHAPTER V – CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS, AND SUMMARY

Chapter V summarizes professors' perceptions towards institutional redevelopment of brownfield sites in Alabama. This chapter abridges the purposes, research methods and the findings drawn from an analysis of qualitative and quantitative data. The study was guided by two research questions:

1. What are professors' perceptions regarding the redevelopment of brownfields into useable greenspaces?
2. What are the most important indicators associated with brownfield sites the influences professors' perceptions to redevelop areas near their campus communities?

## Combined Analysis

*RESEARCH QUESTION 1:* What are professors' perceptions regarding the redevelopment of brownfields into usable greenspaces?

To determine professors' perceptions regarding the redevelopment of brownfields into usable greenspaces, a 3-2-1 Reflections Strategy was used. According to Regier (2012), the 3-2-1 teaching tool is an assessment based strategy used to evaluate the students' level of comprehension and understanding about a specific unit or topic. However, this assessment strategy was adopted as a method of treatment to summarize respondents' perceptions and to bring forth questions that can aide future research studies. Also, the written reflection method allowed professors to examine, interpret and express their perceptions about institutional redevelopment of brownfield sites. In this research study, the focus group respondents were given a chance to summarize three

main idea(s) from the discussion; identify two captivating discussion points; and pose questions that remain unclear (see Appendix G). This strategy encouraged participants to focus on questions asked of them; process, verbalize and analyze their own perceptions; then write their perceptions using the 3-2-1 strategy.

According to written reflections, professors' discovered that the focus group interview provided them with an enriched discussion of environmental challenges and positive outcomes surrounding the presence of brownfield sites in close proximity to their campus communities. From the qualitative research, enriched discussions and positive outcomes surrounding the presence of brownfield sites in close proximity to their campus communities were revealed. For example, professors noted the need for colleges and universities to work collaboratively to address community-wide efforts pertaining to the redevelopment of brownfield sites (see Appendix E). Also, they discovered that communities benefit the most when institutional collaboration and partnership ventures are considered. Participants often emphasized the sensitivity for a decrease in the competitive nature of grant funding opportunities and the urgency for the need of an increase in public awareness of converting brownfield sites into usable greenspace areas (Appendix E).

The focus group discussions unveiled an array of interesting topics. One essential insight of professors was an increase in the value of property near the redevelopment of brownfield sites. Also, participants in the study suggested the significance of institutions playing a major role in educating the public. In fact, an interdisciplinary group of experts in their respective fields generated a very interesting and multifaceted discussion around the need for colleges and universities to redesign and update their program curricula and

to use teaching approaches that focus on addressing community redevelopment efforts where brownfield sites are located in high crime areas (see Appendix E). One participant believes that redeveloping brownfield sites into greenspaces creates a space for recreational activities and fellowship; and can be a motivating factor for others to determine how to create greenspaces in different areas of their neighborhoods.

Moreover, most professors expressed interests in finding ways to successfully carryout special partnership initiatives between other institutions in an effort to gain redevelopment funding through state and federal agencies. Others found it interesting that Eta-One University is the leading institution to initiate a prominent role in the community to bring about awareness pertinent to brownfield redevelopment efforts (see Appendix E). The aforementioned observations and discernments of participants can be supported by research from Cooper et al. (2014) indicating that in the future both universities and cities will become more reliant upon each other's resources. In addition, the United States Secretary of Housing and Urban Design states that, "The long-term futures of both the city and the university in this country are so intertwined that one cannot—or perhaps will not—survive without the other" (Cooper et al, 2014, p. 88). Indeed, the desire to bring together the academic research community with political partners in solving real world problems suggests that research professors (from a myriad of disciplines) at institutions of higher learning have a pivotal role to play in projects like brownfield redevelopment—particularly as universities expand their campuses.

Furthermore, participants posed questions about the current status on redevelopment efforts that transform brownfield sites into useable greenspaces. Examples of these questions included:

- What methods of action local cities conduct to evaluate and identify areas that are brownfield sites and what clean-up efforts are being performed?
- What educational role could their institution play in brownfield redevelopment?
- How can we bring brownfield redevelopment issues into the classroom in a meaningful way?
- What are the reasons why greenspace is so successful in the twenty-first century?
- How do you find accurate and current information on a brownfield location?
- How will brownfield redevelopment ultimately benefit Alabama and the United States?
- How could a sustainability course be developed for the Law School?
- How can our institution create a collaboration that connects us with what is happening to institutions like Eta-One University?

*RESEARCH QUESTION 2*: What are the most important indicators associated with brownfield sites that influence professors' perceptions to redevelop areas near their campus communities?

Quantitative data were used to identify the most important indicators associated with brownfield sites that influence professors' perceptions. These indicators or recurring themes were land recognition, aesthetic influences, health disparities, and job training and employment.

*Land Recognition*

Professors were shown visuals of different sites from a variety of locations. They were asked to identify, analyze and discuss photographic depictions to determine their recognition of brownfield or greenspace sites. This method of treatment was incorporated to better understand professors' depth of familiarity of common brownfield and greenspace features. In support of this approach, a curriculum entitled *The Livability Curriculum Brownfield Lesson* by DuRant (n.d.), is a practical course of study adopted and implemented by the Department of Education for the State of South Carolina. The curriculum was designed to teach students in Greenville, South Carolina how to: become familiar with brownfield sites; understand the challenges associated with brownfields; and to learn redevelopment efforts adopted by the city of Greenville (DuRant, n.d.). Also, this curriculum is designed with visual depictions followed by questions to establish a means of formative and summative assessment.

As a result, to address the recognition of brownfield sites, strategies from this site, (DuRant, n.d.), were utilized to investigate professors' abilities to recognize visual aesthetics associated with a brownfield site. They were asked: "What do you see in the pictures that make you think or feel the site(s) may be a brownfield or a greenspace?" Professors' verbal responses indicated a recurring theme of an, "industrial site". Professor AO-4 suggested that the depictions were similar to a brownfield site:

> Well, I think it is a brownfield because of its close proximity to an urban area. It's out-skirts usually have a lot of industrial companies and it just has that look; it looks like a redeveloped industrial site (see Appendix E).

Whereas, professor AO-2 stated:

> It is a brownfield because it is a non-remediated industrial site. It has a garage that suggests a link to an industry that may have held chemicals (see Appendix E). Other types of features used to recognize a brownfield site range from the lack of trees and greenery at a site, the physical color of a site, or the nastiness of the physical appearance of the site (see Appendix E).

However, statistical findings show that a significant percent of professors are completely or slightly unfamiliar with brownfield sites that may be located in close proximity to their college campuses. For example, 47.6% of professors indicated that they are completely unfamiliar with brownfield sites; and 11.9% of the professors indicated that they are slightly unfamiliar, which represents over a half of the population's response; whereas, a small percentage of professors indicated a moderate to strong familiarity with brownfield sites in close proximity to their institutions. The mean score among professors regarding their general familiarity is ($M$ = 2.12, SD = 1.288).

Table 24

*Perception on general familiarity*

| | | *Frequency* | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 20 | 47.6 | 48.8 | 48.8 |
| | 2 | 5 | 11.9 | 12.2 | 61.0 |
| | 3 | 9 | 21.4 | 22.0 | 82.9 |
| | 4 | 5 | 11.9 | 12.2 | 95.1 |
| | 5 | 2 | 4.8 | 4.9 | 100.0 |
| | Total | 41 | 97.6 | 100.0 | |
| Missing | System | 1 | 2.4 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on general familiarity.

*Redevelopment Importance*

The category on redevelopment importance is significant to the research study because it presented three themes that correlate with the quantitative data: Health disparities, aesthetic influences, and redevelopment barriers and constraints. First, professors' perceptions on the importance of redeveloping brownfield sites presented the need to address the potential risk(s) brownfield sites may have to both public health and the physical environment. For example, professor's indicated the potential for humans to become exposed to harmful chemicals from the presence of unknown chemicals or substances contained in cattle car trucks, or carcinogens and other hazards in the soils. Professor EO 1 stated:

> Well, if it's a brownfield site, there is something there. To some degree, they would have to perform an assessment. For a brownfield site, it could be an

> abandoned building where they can have lead, asbestos especially with the age of a building; it can be contaminated and can cause health problems. However, assessments to sites should be performed before renovation to projects like this can happen which positively supports the reuse of unwanted space (see Appendix B).

According to the Model for Behavior Change (Enders, 2001; Rhodes & Reinhold, 1999), this response models a behavior for change and an understanding about brownfield redevelopment. In support of the model, the professor relates a brownfield site to something that actually exists in the physical environment and is potentially hazardous. Professor EO-1 also recommended an assessment to the site, which is the third step according to the Model for Behavior Change (p. 24).

Another professor looked at how the existence of brownfield sites affects the healthcare and public health status of a community. For example, professor EO-5 stated,

> This is how adverse impacts happen to people within '*that community'* and that's when healthcare and health problems arise (see Appendix E).

Supporting research by Chilton et al. (2015) shows that brownfield sites have an indirect effect on healthcare and public health, while identifying socioeconomic and demographic indicators' as culprits to public health and healthcare, in geographic areas where brownfield sites are located (Chilton et al., 2015). However, another statistical indicator presents a 100% response rate where 97.7% of professors indicated a significantly high response that falls within the moderately important to very important range. For example, 4.8% of professors stated that there is a moderate level of importance to reduce public health risks near their institutions and across the state; 26.6% of the

professors viewed it as important; and 66.7% viewed it as very important. The mean health risk score among professors is ($M$ = 4.57, SD = .703). Table 25 provides a summary of the results.

Table 25

*Perception on Reducing Health Risks*

| Q5-5 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 2 | 1 | 2.4 | 2.4 | 2.4 |
| | 3 | 2 | 4.8 | 4.8 | 7.1 |
| | 4 | 11 | 26.2 | 26.2 | 33.3 |
| | 5 | 28 | 66.7 | 66.7 | 100.0 |
| Total | 42 | 100.0 | 100.0 | | |

Descriptive Test Statistics for professors' perception on reducing public health risks.

*Aesthetic Influences*

Secondly, aesthetic influence in this research revolved around a want or a desire to achieve a sense of beauty or invoke an emotion of beauty near their campus communities. The analysis indicates that these influences reemerged across indicators. For example, professor EO-3 felt as though the need to redevelop brownfield sites located near the campus community would increase health awareness through the introduction of green infrastructures, thus, establishing a positive perception within and throughout the community. For example, when asked, "What type of greening ideas can transform your campus environment?" Professor EO-3 stated,

> We can incorporate more campus jogging trails and more sporting facilities surrounded by public greenspace. Incorporating greenspace would eventually

attract students and positively impact our student enrollment because students will want to attend our institution because the campus will provide a sense of community wellness (see Appendix B).

Professor EO-1 recognized Eta-One College's outreach efforts to convert the property of a nearby abandoned high school into a community health and wellness center; and, professor EO-4 expressed the desire to create a campus community garden (see Appendix E). Statistically, 78.6% of professors indicated a significantly high response that falls within the moderately important to very important range; and 90.4% of professors indicated a significantly high response that falls within the moderately important to very important range for reason why they think it is important for the removal of eyesores. For example, 23.8% of professors stated that there is a moderate level of importance to remove eyesores near their institutions' and across the state; 21.4% of the professors viewed it as important; and 45.2% viewed it as very important. The mean to remove eyesores score among professors is ($M$ = 4.00, SD = 1.104). Table 26 provides a summary of the results.

Table 26

*Perception on the Removal of Eyesores*

| Q5-2 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 1 | 2.4 | 2.4 | 2.4 |
| | 2 | 3 | 7.1 | 7.1 | 9.5 |
| | 3 | 10 | 23.8 | 23.8 | 33.3 |
| | 4 | 9 | 21.4 | 21.4 | 54.8 |
| | 5 | 19 | 45.2 | 45.2 | 100.0 |
| Total | | 42 | 100.0 | 100.0 | |

Descriptive Test Statistics for professors' perception based on the removal of eyesores.

For example, Professor AO 10 stated:

> The benefit to this is that people can now live in areas and not have to see eyesores; thus it may change the perceptions of people and motivate them to want to do the right thing for everyone, regardless of the city or socioeconomic background (see Appendix E).

Therefore, the perceptions of professors indicated a strong aesthetic attitude (want and desire) for the removal of brownfield eyesores across the state and as a mitigating effect, to redevelop these sites into recreational sites and other types of greenspaces. The diverse views of professors provide a valid desire for change that is a beneficial indicator for communities across the state. In addition, research by Walker, Hipel, and Inohara (2008) suggests that it is beneficial for cities to reuse brownfield sites and to invest in them as a means to motivate private development.

*Job Training and Employment*

Professors saw the need for job training and employment through grant funding opportunities as an importance to address an area-wide redevelopment agenda. Chiappe, et al. (2016) point out that remediating brownfield sites brings positive economic returns. The authors acknowledged the passage of the Brownfields Voluntary Redevelopment Act as the reason for such success. The returns are based on indicators such as: employment, employment and payroll, property values, retail and sales taxes, state income taxes, federal income taxes; and federal Returns of Investment (ROI).To support the research, professor EO-1 stated:

> The institution will be looking to address some key issues like: community individuals in need of GED training, skills for resume writing, and increased skills for verbal interview. EPA and City planners look at the economy in North Birmingham area, where lots of the health care providers and companies were removed and relocated to downtown UAB, Princeton or Brookwood areas'. Also, most all of the popular grocery stores moved as the North Birmingham area began to decline economically; consequently, this area of the city was stripped of its resources. However, we are trying to redevelop these brownfield sites to useable greenspaces, bring industries and businesses back to the community and make them more accessible to the people, with hopes that property value will increase. We also want to increase economic growth and employment. We want to establish healthier residential living that is affordable. We want the job market to be more marketable and pleasing to the people in the community from that perspective. The training grant cycle will look at addressing the community soft skills needs and residential life planning needs as well as HAZWOPER training

inclusive of general industry training, forklift training, and asbestos abatement. This grant will make the people in the community more marketable for the industry (see Appendix E).

Statistically, 78.6% of professors indicated a significantly high response that falls within the moderately important to very important range. For example, 40.5% of professors stated that there is a moderate level of importance to create jobs near their institutions and across the state; and 38.1% viewed it as very important. However, 2.4% provided no response. The mean to create jobs score among professors is ($M$ = 4.12, SD = .900). Table 27 provides a summary of the results.

Table 27

*Perception to Create Jobs*

| Q5-4 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 2 | 3 | 7.1 | 7.3 | 7.3 |
| | 3 | 5 | 11.9 | 12.2 | 19.5 |
| | 4 | 17 | 40.5 | 41.5 | 61.0 |
| | 5 | 16 | 38.1 | 39.0 | 100.0 |
| | Total | 41 | 97.6 | 100.0 | |
| Missing | System | 1 | 2.4 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on the importance to create jobs.

Also, professors statistically perceived the importance of addressing the current employment challenges through an area-wide agenda; and to provide employment and job training to residents affected mostly by socioeconomic deprivation. For example, a

combined score of 57.2% of professors indicated that redevelopment efforts should be addressed in their local area, ranging from important to very important. However, a combined score of 38.1% of professors indicated that there is a slight to moderate level of importance for an area-wide redevelopment agenda near their institutions and across the state; whereas, 4.8% viewed an area-wide redevelopment agenda as not important. The mean area-wide redevelopment agenda score among professors is ($M$ = 3.64, SD = 1.206). Table 10 provides a summary of the results.

Table 28

*Perception to Redevelop as an Area-Wide Agenda*

| Q5-10 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1 | 2 | 4.8 | 4.8 | 4.8 |
| | 2 | 6 | 14.3 | 14.3 | 19.0 |
| | 3 | 10 | 23.8 | 23.8 | 42.9 |
| | 4 | 11 | 26.2 | 26.2 | 69.0 |
| | 5 | 13 | 31.0 | 31.0 | 100.0 |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on redevelopment as an area-wide agenda.

*Redevelopment Constraints*

Barriers and constraints are another indicator that impedes a community from advancing through brownfield redevelopment efforts. For example, Professor EO 2 asked her colleague an interesting question:

> Will our neighboring city located next to one of the United States' major steel corporation be factored into the grant funding study? This plant is in the backyard of one of the college communities and residential areas that is historic to the city of Birmingham (see Appendix E).

However, Professor EO 1answered:

> I recently attended a Brownfield conference in Montgomery, AL held by the EPA. The city you are referring to was one of the municipalities that can apply for Brownfield site grants, but one of the major requirements is that the city has to be economically and financially sound. Based on current media sources, that city is not economically or fiscally sound. Therefore, I do not see how they can apply for a grant through the EPA. From my understanding the EPA performs a financial background check and if it does not appear to be promising for long-term financial returns, they are not going to invest in your city. It is just like a personal credit check; "bad credit is worse than no credit (see Appendix E).

In support of the verbal responses, the quantitative data presented an 88.1% response rate. A combined score of 66.6% of professors indicated unfavorable lending terms as a constraint in their local area, ranging from moderately important to very important. However, 14.3% of professors responded that unfavorable lending terms is a slight constraint that makes it difficult for developers to redevelop brownfield sites; whereas 7.1% stated that it is a very important constraint and may make it difficult for developers to redevelop brownfield sites. 11.9% of professors did not provide a response. The mean community opposition score based on professors' perceptions is ($M$ = 3.24, SD = .830). Table 29 provides a summary of the results.

Table 29

*Perception on Unfavorable Lending Terms*

| Q8-8 | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 2 | 6 | 14.3 | 16.2 | 16.2 |
| | 3 | 19 | 45.2 | 51.4 | 67.6 |
| | 4 | 9 | 21.4 | 24.3 | 91.9 |
| | 5 | 3 | 7.1 | 8.1 | 100.0 |
| | Total | 37 | 88.1 | 100.0 | |
| Missing | System | 5 | 11.9 | | |
| Total | | 42 | 100.0 | | |

Descriptive Test Statistics for professors' perception based on unfavorable lending terms.

According to the Environmental Protection Agency Region 1(2015) website document entitled, "EPA New England FY 2016 Brownfields Grant Guidelines Workshop: Revolving Loan Fund Grant Presentation," it is clearly stated that only twelve awardees, nationally, will be granted up to $200,000.00 for a five-year revolving period to support revitalization efforts for brownfield sites. Moreover, those recipients must: "*Have a wealth of potential borrowers, sub-grantees and sites.*" In addition, the EPA has a ranking criteria or rubric designed for potential recipients. As a grant rubric criteria, the EPA requests potential recipients to provide the probability of receiving funds during the grant period; and also provide proof of past projects similar in nature and their success rates to leverage efforts (EPA, 2015).

These types of stipulations make it difficult for communities in dire need of revitalization efforts to see the potentiality of revitalizing their communities, especially

when they are facing multiple socioeconomic facets that do not meet the grant funding criteria.

## Conclusions

First, professors' ability to recognize a brownfield site was based on their general familiarity which relates to "the degree to which you come in contact with a redeveloped brownfield or the ability to identify a brownfield site." Findings conclude that the recognition of brownfield sites was based on common visual features associated with a brownfield. This association holds validity pursuant to the Alabama Land Recycling and Redevelopment Act, Code of Alabama 1957,§ 22-30E-4 (ADEM Admin., 2006). According to 335-15-1-02 of the Act, a brownfield is defined as,

> A real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant.

This definition provides key indicators to aid the visual recognition of a brownfield site. These indicators are either identifiable objects that may appear to be "hazardous substances" or potential "pollutants." The Act also defines these indicators as:

> "Hazardous substance" means any substance included on the List of Hazardous Substances and Reportable Quantities, codified as 40 CFR Part 302, Table 302.4, in force and effect on the effective date of 335-15-1 and subsequent revisions thereof, or any substance listed on the List of Extremely Hazardous Substances and Their Threshold Planning Quantities, codified as 40 CFR Part 355, Appendix A, in force and

> effect on the effective date of 335-15 and subsequent revisions thereof" (ADEM Admin., 2006).

Whereas a,

> Pollutant includes but is not limited to dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste (ADEM Admin., 2006).

Secondly, concluding evidence on the importance to redeveloping brownfield sites implied that professors possessed the knowledge of self-awareness and preparedness to address the challenges associated with brownfields. The significance of the Model for Behavior Change identifies that understanding a risk relies on the influence of one's beliefs and values (Enders, 2001; Rhodes & Reinhold, 1999). The perceptions of professors illustrate the capacity to change behavior in response to a potential risk. This is itself an advantage to communities in need of proper planning and mitigation efforts. Therefore, the perceptions of professors regarding the redevelopment of brownfield sites also bring forth a sense of happiness and fulfillment to address redevelopment challenges, specifically, sociological and economic challenges.

Third, professors perceive that securing federal funds is a solution to developing a job training and employment initiative, thus reviving economic equity and creating social equality. A practical move toward this goal is creating a sustainability pathway as recommend by Barbier's (1987) sustainability model in Figure 1. A key factor to redeveloping a brownfield site is based on the accessibility of financial resources.

Therefore, the final category looked to the availability of funding as a constraint or a barrier to the redevelopment of brownfield sites.

## Recommendations

1. Investigate the effectiveness of state environmental policies that address brownfield redevelopment projects in the state of Alabama. A research article written by Greenberg, M., Lawrie, K., Mayer, H. et al. (2001) recognizes brownfield redevelopment as having the greatest impact if looked at through the lens of a '*smart growth policy*'. Greenberg et al. stated that there is a lack of progressive indicators that yield positive strides toward redeveloping brownfield sites in the United States. Furthermore, these researchers recommend investigating cost-effective strategies to address socio-economic indicators and to strongly encourage the development of policies which motivate a political will to recognize and implement a smart growth policy for brownfield development.
2. Compare sustainable brownfield redevelopment planning trends in urban designs across urban and suburban regions in the state of Alabama.
3. Investigate successful economic and sociological indicators that are practical in nature and relevant to addressing disparities across low-income cities where brownfields sites have been identified.
4. Determine whether brownfield sites are regional areas of uncertainty or are they areas that are segregated by political design and neglect.

5. Explore whether there is a progressive trend in the redevelopment of current brownfield sites and identify whether emergent themes are moving with aggressive strides.
6. Implement strategic goals in institutional plans that will increase and motivate colleges and universities to become actively involved in repairing the sociological, economic, and political frameworks in low-income communities.
7. Investigate whether there is a difference in perceptions between local government and institutions of higher education in cities where brownfields are located. This recommendation is posed because it was determined that Gamma-One University showed a disinterest in redevelopment efforts. Although they are located in a community that is socially and economically deprived, a professor from this institution indicated that not only is he not motivated to participate in a brownfield redevelopment study but he is not aware of brownfield sites. The professor from Gamma-One University communicated this information in a written text: "I have no motivation to complete a survey on a subject I have never heard of".
8. Design effective teaching strategies and student learning goals to address brownfield redevelopment across academic curricula.
9. Design an accountability plan for institutional and community-wide collaboration for brownfield redevelopment.

## Limitations of the Study

The study has three acknowledged limitations:

1. The study was limited to brownfield sites and universities in the state of Alabama.
2. The results of this study reflect perceptions of research professors who are employed at higher education institutions in Alabama.
3. The questionnaire used in the study is a site, multi-attribute decision making tool completed on professors' perceptions of brownfield redevelopment.
4. Recruitment of participants was limited to those available during the summer semester.

## Summary

This study investigated the perceptions of professors towards the redevelopment of brownfield(s) near their campus communities; the most important indicators that influence professors perceptions to redevelop brownfield sites. The subjects who participated in this study were 42 professors from the state of Alabama. Chapter V is a summary of data collected from professors who participated in the study. Professors' focus group qualitative interview verbal responses and descriptive statistics were used to strengthen the design of this research. The triangulation of data was a sequential mix design (Terrell, 2012) which engaged professors in a focus group discussion that allowed them to verbalize their perceptions, complete an online survey, and provide 3-2-1 written responses.

The professors' responses were audio-taped, transcribed, and organized into a matrix for ease of comparison, interpretation, and analysis of the collected data. On the contrary, the secondary method for data collection used descriptive statistics for ease of statistical interpretation and was later combined to bring forward the most important

indicators that influenced professors' perceptions on the redevelopment of brownfield sites in Alabama and to address the second research question. Therefore, the data were analyzed relative to the following research questions:

1. What are professors' perceptions regarding the redevelopment of brownfields into usable greenspaces?
2. What are the most important indicators associated with brownfield sites that influence professors' perceptions to redevelop areas near their campus communities?

Finally, Chapter V provided the conclusions, implications, limitations, and recommendations for future investigations.

APPENDIX A – Institutional Review Board

Permission of Statement

THE UNIVERSITY OF
SOUTHERN MISSISSIPPI.

INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board

**NOTICE OF COMMITTEE ACTION**

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 16041211
PROJECT TITLE: Analysis of Professors' Perceptions toward Institutional Redevelopment of Brownfield Sites in Alabama
PROJECT TYPE: New Project
RESEARCHER(S): Berkley King
COLLEGE/DIVISION: College of Science and Technology
DEPARTMENT: Center for Science and Math Education
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Exempt Review Approval
PERIOD OF APPROVAL: 05/10/2016 to 05/09/2017
**Lawrence A. Hosman, Ph.D.**
**Institutional Review Board**

## APPENDIX B – Announcement

### Land Redevelopment Announcement

### Purpose

This study draws on the expertise and opinions of professors' perceptions on the redevelopment of brownfield sites in the state of Alabama. The goal of the survey is to collect diverse views across academic disciplines about the redevelopment of brownfield sites, including the possible objectives of such redevelopment and its potential constraint(s) that affect it. This information will be used to develop a better understanding of the past successes and remaining challenges in redeveloping brownfield sites for campus expansion.

### Benefits to You

The results of the survey will be shared, other survey participants and interested federal, state, local, and private for-profit and non-profit entities. The survey results will provide a more detailed picture of redevelopment of brownfield sites: what higher educational influences and factors can drive the process, or create barriers to it. The results could also shape future policies related to the redevelopment of brownfield sites near colleges and universities in your region/area.

### Instructions

Please answer all 8 questions. The questionnaire is designed so that it will take a minimal amount of your time. Even if you think you do not know much about brownfield sites, we are interested in your perceptions.

## Confidentiality

Your answers to this survey are confidential. No information you give will be released in any way that can identify you. Survey responses will not be attributed to any individual. Data from the survey will be aggregated and used in statistical analyses to compare experiences and perceptions of the redevelopment of brownfield sites in Alabama. You are guaranteed confidentiality. This information may be published or presented at a professional conference or student research symposium. All identifying information will be removed before presentation or publication.

Alternative Procedures: There are no alternative procedure(s).

## Risks

There are no foreseeable psychological or physical risks resulting from this questionnaire and you may withdraw from participating in this study at any time during the process without penalty.

## Participant's Assurance

This project has been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board at 601-266-XXXX. Participation in this project is completely voluntary, and participants may withdraw from this study at any time without penalty, prejudice, or loss of benefits. Any questions about the research should be directed to Berkley N. King, Jr. at xxxx.xxxx@xxxxx.usm.edu or 601-266-XXXX.

If you have questions or concerns regarding your rights as a participant you may contact the Chair of Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39606-0001, (601) 266-XXXX.

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| _____ | _____ |
| Signature of the Research Subject | Date |
| _____ | _____ |
| Signature of Person Explaining the Study | Date |

APPENDIX C – Focus Group Interview Questions Developed

by Berkley Nathaniel King Jr.

1. Tells us about the Brownfield Grant Award Ceremony?
2. Are all of our brownfield sites within this geographical location contaminated?
3. How can your experiences relate to similar Brownfield sites like the ones presented?
4. Will STEM or STEAM students be able to participate in the training initiative?
5. How can you connect your institution to other college communities that were successful converting brownfields to greenspaces for campus expansion?
6. How can you replicate ideas for your institution that are identical to other college communities that were successful converting brownfields to greenspaces for campus expansion?
7. What do you see in the pictures that make you think or feel the site may be a brownfield or a greenspace?
8. What benefits a redevelopment project like UAB's bring to your institution, if replicated?
9. What about the second illustration? Why?
10. What about the third illustration? Why do you think it is?
11. Why do you think a brownfield redevelopment project is important?
12. What would you recommend if financial assistance is provided for a brownfield conversion project?

13. What about the last illustration?
14. Do you believe there is a variation in experiences with redevelopment of brown fields between private and public institutions?
15. Has anyone ever seen a brownfield site converted to a greenspace?
16. What influences do professors possess that may change the negative perception of a brownfield sites and to aide in conversion efforts to a greenspace?
17. How do you think local institutions located near brownfield site(s) should look at a brownfield redevelopment project?
18. Do you believe research collaborations like the one you are participating in today can be beneficial for the college community?

APPENDIX D – Brownfield Redevelopment Instrument Modified

by Berkley Nathaniel King Jr.

Brownfield Redevelopment Instrument

by

Kris Wernsted, Lisa Crooks, and Robert Hersh (2003)

Modified by Berkley N. King, Jr.

Q1 Check the region of the state in which your institution is located.

- ❍ Northern Region: Cherokee, Cullman, Colbert, DeKalb, Etowah, Franklin, Jackson, Lauderdale, Lawrence, Limestone, Madison, Marshall, and Morgan. (1)
- ❍ West Central Region: Bibb, Chilton, Dallas, Fayette, Greene, Hale, Lamar, Marion, Perry, Pickens, Sumter, Tuscaloosa, Walker, and Winston. (2)
- ❍ East Central Region: Blount, Calhoun, Chambers, Clay, Cleburne, Coosa, Jefferson, Randolph, Shelby, St. Clair, Talladega, and Tallapoosa (3)
- ❍ South West Region: Baldwin, Conecuh, Escambia, Mobile, Clarke, Choctaw, and Marengo. (4)
- ❍ Southeast Region: Autauga, Barbour, Bullock, Butler, Coffee, Covington, Crenshaw, Dale, Elmore, Geneva, Henry, Houston, Lee, Lowndes, Macon, Montgomery, Pike, and Russell. (5)

Q2 Check the discipline which best describes your area of expertise

- ❍ Humanities (Religion, Philosophy, the Arts, History) (1)
- ❍ Natural Sciences (Biology, Chemistry, Physics, Earth Science, and Space Sciences) (2)
- ❍ Social Sciences (Anthropology, Archeology, Ethnic Studies, Geography, Sociology, Psychology, Political Science, and Organizational Studies) (3)
- ❍ Formal Sciences (Applied Mathematics, Pure Mathematics, Computer Sciences, Logic, Statistics, Systems Sciences) (4)
- ❍ Professions & Applied Sciences (Agriculture, Architecture, Business, Education, Engineering, Law, Communication, Medicine, Library Science, and Physical/Recreational Performances) (5)

Q3 How many years if professional working experiences do you have (including your current position and previous positions)?

- ❍ Less than 3 years (1)
- ❍ More than 3 years (2)
- ❍ Less than 15 years (3)
- ❍ More than 15 years (4)
- ❍ More than 25 years (5)

Q4 Please characterize your general familiarity with brownfield sites in your local area (select your answer).

- ❍ Completely unfamiliar (1)
- ❍ Slightly unfamiliar (2)
- ❍ Moderately familiar (3)
- ❍ Familiar (4)
- ❍ Strongly Familiar (5)

Q5 You may have heard various reasons why some people think it is important for communities across the state to redevelop contaminated properties. Please indicate your view of the importance of each of the following reasons why contaminated properties should be redeveloped in your local area, using a scale of 1 (not important) to 5 (very important).

| | Not important (1) | Slightly important (2) | Moderately important (3) | Important (4) | Very important (5) |
|---|---|---|---|---|---|
| remove eyesores (2) | ❍ | ❍ | ❍ | ❍ | ❍ |
| create jobs (4) | ❍ | ❍ | ❍ | ❍ | ❍ |
| reduce public health risk (5) | ❍ | ❍ | ❍ | ❍ | ❍ |
| reduce environmental risk (6) | ❍ | ❍ | ❍ | ❍ | ❍ |
| diversify business mix (8) | ❍ | ❍ | ❍ | ❍ | ❍ |

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| promote green space (9) | ❍ | ❍ | ❍ | ❍ | ❍ |
| part of area-wide redevelopment agenda (10) | ❍ | ❍ | ❍ | ❍ | ❍ |

Q6 The Alabama Department of Environmental Management (ADEM) is the principal state agency with the responsibility for overseeing cleanup at sites that are classified as a brownfield. The final questions relate to the ADEM's role. Since the mid-1990s, the approach that ADEM has taken on the redevelopment of brownfield sites has changed as legislation and regulations have evolved. Please indicate, to the best of your knowledge, the change in the behavior of ADEM with respect to contaminated properties in your local area over this time period. Select 1 for less agreement with the label on the left, 5 for most agreement with the label on the right, or 2, 3 or 4 for intermediate positions.

In comparison to the mid-1990s, the behavior of Alabama Department of Environmental Management with respect to contaminated properties TODAY is:

| | Less (1) | Rarely (2) | No Change (3) | Often (4) | More (5) |
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| Trusting to private parties (1) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Easy to work with (2) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Fair (9) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Thorough (12) | ❍ | ❍ | ❍ | ❍ | ❍ |

Q7 Across the state, various factors may make it difficult for developers to redevelop brownfield sites. Please rate the level of constraint in your local area of each of the following items. Use the scale of 1 (not a constraint) to 5 (very important constraint).

| | Not a constraint (1) | Slight constraint (2) | Moderate constraint (3) | Important constraint (4) | Very important constraint (5) |
|---|---|---|---|---|---|
| Lack of cooperation from local government (1) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Community opposition (2) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Unfavorable lending terms (3) | ❍ | ❍ | ❍ | ❍ | ❍ |
| Possible U.S. EPA Involvement (4) | ❍ | ❍ | ❍ | ❍ | ❍ |

Q8 The Alabama Department of Environmental Management may face a number of constraints to overseeing cleanups at sites in your local area that are contaminated. Please indicate the importance of each of the following possible constraints to the ability of the ADEM to oversee cleanups in an effective and timely fashion.

| | Not a constraint (1) | Slight constraint (2) | Moderate constraint (3) | Important constraint (4) | Very important constraint (5) |
|---|---|---|---|---|---|
| pressure from political leaders (4) | ❍ | ❍ | ❍ | ❍ | ❍ |
| lack of authority (5) | ❍ | ❍ | ❍ | ❍ | ❍ |
| lack of support from the general public (6) | ❍ | ❍ | ❍ | ❍ | ❍ |
| lack of inter-agency coordination (7) | ❍ | ❍ | ❍ | ❍ | ❍ |

APPENDIX E – Transcribed Data

Faculty Responses to Interview Questions on Institutional Redevelopment of Brownfield Site

To maintain confidentiality at all stages in the research, both the participants' and their institutions were coded: Eta-One, Alpha-One and Gamma-One. The first interview occurred among ten professors at Eta-One. The professors' were recruited from across academic disciplines. The area of disciplines consists of Natural Sciences, Social & Behavioral Sciences, Humanities and the Arts, and Business Studies. Nine professors were females and the remaining professor was a male. The letter codes for these interviews were EO (Eta-One): numbers 1 through 10, and PI for Principle Investigator.

EO (Eta-One) Interview Session No.1

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| **PI:** | **Thank you for participating in the focus group session. Before we begin, I would like for us to review the information in the packet. First, review the consent form. Print your name at the top of the form, then sign at the bottom. At the end of the session I will then provide you a copy of the consent form. Let us begin the session. I am going to share with you two short reading articles. The first reflects information on a brownfield grant offeree; and the second article is a fact sheet from Johnson and Whales University. I will give you two minutes to review each article, then we will discuss. Began reading the article. Based on the information provided in the first article, how many of us attended?**<br><br>**Okay, seven out of eleven. Everybody knew about it. No?** |
| **PI:**<br><br><br>**EO 1:** | Tells us about the Brownfield Grant Award Ceremony?<br><br><br>According to the first article, there were three grant awardees. Lawson State Community College received a $200,000.00 grant to train local |

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| | Birmingham city residence about ways of addressing cleanup of brownfield sites. It also will help with creating jobs for the unemployed or at risk community residence. Because I am familiar with the grant award, I can also inform you that the city of Birmingham was an awardee of $400,000.00 to aid in phase-one assessment of brownfield sites. Tarrant City was awarded $200,000.00 to conduct the brownfield site clean-up efforts.<br>The first phase will consists of strategic planning to effectively carryout implementation of the second phase, which consists of cleanup efforts. A portion of the grant awarded an amount of $200,000.00 from the EPA (Environmental Protection Agency) Region 4. I wrote the brownfield redevelopment grant to carry-out the job training initiative. Currently, I will be meeting with EPA to complete a planning agenda and create a working template to resubmit to EPA so job training can begin. The meeting with EPA will begin at 1:00PM to talk to discuss and to review the tentative planning cycle. Several months ago a MOU (Memorandum of Understanding) between EPA and an institution of higher education in the Birmingham area, to venture out and educate people throughout the city of Birmingham, and to partner with the city. It was proposed to have community fairs to help create jobs, promote proper health planning, and focus on helping to improve people soft skills. The institution will be looking to address some key issues like: community individuals in need |

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| | of GED training, skills for resume writing, and increase skills for verbal interview. EPA and City planners look at the economy in North Birmingham area, where lots of the health care providers and companies were removed and relocated to the downtown UAB, Princeton or Brookwood areas'. Also, most all of the popular grocery stores moved as the North Birmingham area began to decline economically; consequently, this area of the city was stripped of its resources. However, we are trying to redevelop these brownfield sites to greenspaces or useable greenspaces, bring industries and businesses back to the community and making them more accessible to the people, with hopes that property value will increase. We also want to increase economic growth and employment. Establish healthier residential living that is affordable. We want the job market to be more marketable and pleasing to the people in the community, from that perspective. The training grant cycle will look at addressing the community soft skills needs and residential life planning needs, as well as, HAZWOPER training inclusive of: general industry training, forklift training, and asbestos abatement. This grant will make the people in the community more marketable for the industry. |
| **EO 2:** | Oh-My-Goodness, you got lucky Mr. King; this is great news, you are conducting this research at perfect time! |

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| **PI:** | How can your experiences relate to similar Brownfield sites like those presented? |
| **EO 3:** | There are two coke plants in my community. They have been targeted as point source polluters by the EPA. The reason I am aware of this situation is because I live in there. |
| **EO 2:** | Feels like the EPA and ADEM brownfields program empowers states, communities and other stake-holders to work together to prevent, assess, safely clean-up, and sustainably reuse brownfields. A brownfields site is a real property. The expansion, redevelopment or reuse of which they become complicated by the presence or potential presence of the hazardous substance or pollutant like in Tarrant City. On January 11th, 2002 President George Bush signed in the Small Business and Liability Relief and Brownfield Revitalization Act and under this brownfield law, EPA provides financial assistance to eligible applicants. So our institution is right on target with this grant. |
| **PI:** | Will STEM or STEAM students be able to participate in the training initiative? |
| **EO 3:** | Well, the fact that a local institution of higher education is involved in |

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| | the brownfield site cleanup initiative, our STEM or STEAM students can use the grant opportunity to conduct research in efforts of supporting the grant's purposes and mission. They can also participate by assisting in job training for workforce redevelopment, and to help to reestablish motivation for individuals who have lost their jobs or need job training. |
| **EO 1:** | Our STEM or STEAM students are taught about blood work pathogens and are also taught about chemical response incident command so they may work in hospitals and labs in that standpoint. Moreover, they will be able to blend in with the training and help to perform assessments for phase-one. They will be trained to collect soil samples and learn how to geographically map out sample locations once it have been identified; and they will also acquire the skills to able to submit samples to the labs for further testing. The testing will help in the cleanup efforts in phase-two to convert brownfield site(s) to greenspaces. I can recall on the city of Tarrant successfully creating greenspaces with a walking trail. These entities go hand-in-hand but first we have to train and educate the community of what a brownfield site is. North Birmingham and Collegeville have been going through this brownfield issue for about 100 years. Incidents of cancer, chronic illnesses and deaths in that The real estate value is below the poverty line and is difficult to get people to relocate into the area. So we have to have sustainable ways of addressing |

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| | this problem. There are also superfund sites in the area. Funding is available but as the developer, the barrier is purchasing a property that is labeled as a brownfield. As a developer you may not know what is on the site or property, but the liability can cost you money in the millions to remediate the site. Certain regulations may apply during the purchase of a brownfield site; if you were not involved in the contamination process of the site then you will not be held accountable. There are federal funds available to help with cleanup of these sites when you submit application to the EPA. Also, the Alabama Department of Environmental Management (ADEM) and other state and local agencies you can collaborate in cleanup efforts. But the only thing about communities is that you have to gain access to properties however, some property owners may not want the assistance due to the lack of education or they may not want to be held liable for the contamination to their property. |
| **EO 2:** | Therefore, you cannot conduct an assessment for phase-one of redevelopment. |
| **EO 1:** | That makes sense. Sometimes you would have to cross over neighborhood properties to get to a brownfield site. |
| **EO 5:** | Contaminants on those properties may have some levels of coal from nearby mining plants during emission release and it settles onto |

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| **EO 1:** | properties and things of that nature. |
| **EO 2:** | But in phase two, isn't that when they go in and start redeveloping and cleaning up? |
| **EO 1:** | About a year ago, we meet with the Mayor of Tarrant for acquisition of an abandon piece of property which has a restaurant on it that is no longer in service. Our institution has a culinary arts program that can utilize this space for campus expansion. The Mayor's office is interested in the possible outcome. Firstly, I think and feel that this will offer our institution a unique chance to redevelop the abandon site into useable space to enhance academic learning and increase campus space. The campus also proposed to have a restaurant there so |
| **EO 6:** | Grant funding would be needed to refurbish the building and place equipment's in the building so we can take students on site and utilize the space as an on the job in the classroom environment. This too will provide students with the opportunity to practice subsistence farming and grow their own produce; and practice sustainable business. This is how I think students will acquire good business skills and get training on revitalizing abandon areas for profitable returns. In other words, this will have a long-term, generational impact in communities in need. |

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| **EO 1:** | Well, what's out in Collegeville?<br><br>There were several companies in North Birmingham, especially, the Collegeville area where there are abandon railroads facilities that are still owned by the railroad companies and US Steel.<br><br>Do you know if they are going to be held reliable to come back and perform a clean-up?<br><br>To a certain degree, yes. For example, with the Red Mountain Park project, US Steel owned a large portion of the contaminated site but they only had to pay rent on the building that existed on the site. So, they addressed the problem by completely demolishing all the buildings to remove the liability out of the equation. This was so because the buildings had nothing to do with the land. They were just responsible for maintaining the building space so the risk and liability was significantly reduced. But when we look at, for example, a gas station and the presence of petroleum in the soil or even abandon dry-cleaning companies that may have left and dump things out in the soil. In this case, once you begin phase-one and discover the soil is contaminated, you would have to conduct a geographical mapping from the building all |

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| | the way out. Therefore, you would have about 50 acres saved and only 5 acres contaminated so that's not that bad. However, if you decide to purchase an abandon building on a property, when looking at real estate value, it may be price for a dollar and may seem to be an awesome deal but realistically it will not be worth constructing on because you will discover potential contaminants. Therefore, you are not only responsible for building but you are also responsible for cleaning up the contaminated site. |
| **PI:** | How can you replicate ideas for your institution that are identical to other college communities that were successful converting brownfields to greenspaces for campus expansion? |
| **EO 3:** | We can incorporate more campus jogging trails and more sporting facilities surrounded by public greenspace. Incorporating greenspace would eventually attract students and positively impact our student enrollment because students will want to attend our institution because the campus will provide a sense of community wellness. |
| **EO 5:** | As far as student residential facility goes, we can provide more student employment. As stated earlier, greenspace for campus expansion can attract more students because students that may want to come from other |

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| | states or cities and may not want to live on campus; however, our current campus capacity cannot accommodate them. Thus, converting brownfield sites to greenspace for campus expansion purposes can be a possible solution that will definitely help the school and for residential efforts. |
| **EO 1:** | Like mentioned earlier, we need additional dorms. This would be a new recruitment strategy even if our students go out in our neighborhood and give out literature because a lot of people are still not as aware of what a brownfield sites not aware. |
| **PI:** | Are all of our brownfield sites within this geographical location contaminated? |
| **EO 1:** | Well, if it's a brownfield site, there is something there. To what degree, they would have to perform an assessment. For a brownfield site, it could be an abandon building where they can have lead, asbestos especially with the age of a building; it can be contaminated and can cause health problem. However, assessments to sites should be performed before renovation to projects like this can take happen which positively supports the reuse of unwanted space. |

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| **EO 5:** | This is how adverse impacts happen to people within that community and that's when healthcare and health problems arise. |
| **EO 3:** | I grew up on the North side of Bessemer in a city call Pullman, right on the edge of the Birmingham city line. It is known within the community that waste is contained in big cattle car trucks. I am thinking about this but don't completely understand why those cattle car trucks are there. I know a lot of people I grew up with were affected with different types of chronic diseases and I was wondering if the company was able to inform the people in this area because we are situated between the Birmingham campus and the Bessemer. Well, that area ranging from 9$^{th}$ avenue to 5$^{th}$ avenue. If they are storing waste in these big cattle car, in which there are a lot of them; why haven't the proper agencies communicating or transparent with the community about these types of situation? |
| **EO 1:** | Hypothetically, if I knew I have a contaminant on my property that has the potential of making the community ill, I'm not going to allow anybody on my property. In comparison, companies do the same. For example, emissions are released into the air from industrial companies that is hard to determine the point source especially if the direction of wind shifts. So determining the culprit is almost next to impossible. So from that stand point it is too complex to definitively say which company |

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| | is to blame. Another example is when you have railroad carts moving back and forth throughout the community, every company utilizing the railway tends playing the blame-game. I agree with you madam, we should be transparency. I grew out in Wylam, where there is a Choctaw Mine Taft Coal Plant that gives a high volume off foul odors throughout the day and especially during the night hours. Over the past two decades pretty much everyone in my community has been diagnosed with some chronic type of cancer and others have already died from some toxic level of exposure. The most demoralizing impact sociologically is that the company never took responsibility of the adverse effect to the community. The community's level of environmental education and awareness is very low; consequently, it is very difficult for the community to make steady strides to a healthy standard of living. In the early development and operational phases of the Choctaw Mine Plant, US Steel played an intricate role because it was US Steel that aided in the initiation of their employees. They had what they use to call commissaries which they used their own money to purchase food or groceries so it was not until the following generation that we realized that something is wrong in this community and a lot of these people were suffering with chronic illnesses or chronic malady that is due to the surrounding environment. |

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| **EO 2:** | Will our neighboring college campus closely located near one of the United States' major steel corporation be brought into the study because this plant is in the backyard of this institution and the community? The reason I asked is because I grew up in that community and liaised with professors at the college located in this area. Over the years residing in the city, I have witnessed numerous death of residence from similar chronic illnesses, such as upper respiratory or other types of severe respiratory health problems. |
| **EO 1:** | For job training purpose of the grant only specific zoned areas of Jefferson County was identified; it was two zip codes in the North Birmingham area. |
| **EO 2:** | But the community I am from is a part of Jefferson County. Currently, we are all aware of the political and financial turmoil Fairfield is experiencing, but individuals who lived closer to that plant, for example: from 59$^{th}$ street and further on entire families died from cancer or upper respiratory illness. |
| **EO 1:** | I recently attended a Brownfield conference in Montgomery, AL., held by the EPA. Fairfield was one of the municipalities that can apply for Brownfield site grants, but one of the major requirements is that the city has to be economically and physically sound. Based on current media |

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| | sources, the city we are discussing is not economically or physically sound. Therefore, I do not see how they can apply for a grant through the EPA. To me appears as though the EPA performs a financial background check and if it does not appear to be promising for long-term financial returns, they are not going to invest in your city. It is just like a personal credit check, "bad credit is worse than no credit". Fairfield is in a poor financial situation. |
| **PI:** | What do you see in the pictures that make you think or believe the site(s) may be a brownfield or a greenspace? |
| **EO 4:** | Yes, it looks like the University of Alabama at Birmingham's greenspace. That was nothing but buildings when I was there and they demolished the buildings and created a greenspace. I was a student at UAB from 2003 to 2007. My graduating class endured most of the redevelopment of the greenspace area. I was able to make observation of how they created a greenspace out of the reclaimed area. |
| **EO 3:** | To be concise, UAB redevelopment of its greenspace area actually started with land clearing in the year 2001 to 2002. At this time, I was attending UAB, as a graduate student and lived in an on-campus |

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| | apartment near the development site. |
| **EO 4:** | Clearing was still going on when I first started UAB in 2002. I had classes in the old recreational center that is no-longer there due to the redevelopment on campus. That entire area is now a greenspace. |
| **PI:** | What benefits a redevelopment project like UAB's bring to your institution, if replicated? |
| **EO 3:** | Clean air. |
| **EO 4:** | It gives the students a gathering space. We are a commuter campus. Students are dropped by parents off during the early morning hours and not picked up until in the early to late evening hours. Even though there are two to three campus dorms, there is still a need for additional living space for students. We are a commuter campus but yet, we do not have anywhere for them to congregate. If you create a greenspace the entire campus both students and faculty can benefit from its existence. The greenspace can include different areas to put wireless access on the green, set up picnic tables. |
| **EO 1:** | At this moment, we are in the planning phase of converting the old |

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| | Wynona high school property into a community wellness area and family park, inclusive of a Starbucks and a recreational and fitness-rooms. It will be an area that can sustain the community through the day and evening hours. |
| **EO 4:** | We can do a community garden as well, with a focused emphasis on organic and healthy eating, it is expensive particularly where the campus is located to eat and to have the space somewhere to eat and will give our students something to do to beautify their own space. |
| **PI:** | What about the second illustration? Why? |
| **EO 10:** | Brownfield, because the building looks abandon. |
| **PI:** | What about the third illustration? Why do you think it is? |
| **EO 9:** | A soccer field, soil, trees, greenspace, a green facility. |
| **EO 1:** | I would like to state an important point that a building that is empty or abandon on a property can have hazardous waste on it or can be just cleaned up or revitalized but it can still be classified as a brownfield, according to the EPA's definition. |

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| **PI:** | What about the last illustration? |
| **EO 1:** | A combination of both a brownfield site and a greenspace. The brownfield is in the middle of a greenspace. This picture is similar to the site in Tarrant. A brownfield site is normally surrounded by a greenspace, this why revitalization projects are needed; to restore an area to its original site of being. |
| **PI:** | Why do you think a brownfield redevelopment project is import?<br>● Why do you believe the level of reluctances exists in some communities to redevelop? |
| **EO 5:** | It creates an eco-friendly environment and helps with economic growth. |
| **EO 4:** | It decreases crime rates; and revitalize the housing industry. |
| **EO 2:** | Redevelopment is important but areas like Avondale that are being redeveloped are facing gentrification or displacement of the people. Now, there are a lot of cute, trendy little restaurants coming in but that tends to gentrify or leads to gentrification of the area but affordable houses are now being displaced and houses are becoming less and less affordable. |

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| **EO 7:** | In Homewood for example, we could not afford to buy homes there because there was so much naturalization and the prices went up. The people in the service industry, like, the policemen, firemen, teachers, and the postmen are not able to afford homes in the neighborhood. People who lived in Santa Monica would sometimes have to commute 2 hours each way. That's not a sustainable community. You would want the people who support in the community be able to live in the community. That's a huge problem with all of these things. I wish I had a better answer but how to negotiate that is really tough. |
| **EO 4:** | I would really like to know if there are any success stories. I don't know of any success stories. |
| **EO 2:** | Redevelopment brings morale back to the community; and a sense of pride. |
| **EO 7:** | It stops further contamination. |
| **EO 3:** | It helps to increase brownfield redevelopment awareness and importance. |
| **EO 6:** | I'm also aware of the hope project that they did downtown was really |

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| | successful. They set it up as a mixed income population environment that I believe was very important for reintroducing redevelopment efforts. I can't remember the percentages but there were a lot of people who were skeptical because it was mixed income. I know of some students whose families who lived down there because one of their parents worked down in the area and they thought it was great. |
| **EO 8:** | Before it was low income housing so you have a certain amount. Some people still being displaced and it becomes a social justice issue. How much is too much? It becomes a moral issue. It's not quantifiable it becomes political. I don't think there is a perfect answer to any of this but I do think that the most successful approximations and justice whenever something like this is going to take place in the community that the people who have to power to make decisions and implementation should first ask the people what do they think and how do they feel and listen to them. Don't go there and say this is what we are going to do what do you think about it? Say this is what we are thinking about doing what do you think about it? |

Faculty Responses to Interview Questions on Institutional

Redevelopment of Brownfield Sites

To maintain confidentiality at all stages in the research, both the participants' and their institutions were coded: Eta-One, Alpha-One and Gamma-One. The second interview occurred among ten professors at Alpha-One. The professors' were recruited from across academic disciplines. The area of disciplines consists of Natural Sciences & Mathematics, Education, Public Health, and Law. Seven of the professors were females and the remaining three professors were males. The letter codes for these interviews were AO (Alpha-One): numbers 1 through 10, and PI for Principle Investigator.

Alpha-One (AO) Interview Session No.2

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| **PI:** | **Thank you for participating in the focus group session. Before we begin, I would like for us to review the information in the packet. First, review the consent form. Print your name at the top of the form, then sign at the bottom. At the end of the session I will then provide you a copy of the consent form. Let us begin the session. I am going to share with you two short reading articles. The first reflects information on a brownfield grant offeree; and the second article is a fact sheet from Johnson and Whales University. I will give you two minutes to review each article, then we will discuss. Begin reading the article.** |
| **PI:** | How can your experiences relate to similar Brownfield sites like the ones presented? |

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| **AO 1:** | I love the fact that they turn this site into a public greenspace on the bay and something for the public good. I would be interested to see if it's truly a bay to see if they managed the revitalization site with no subsequent runoff. |
| **AO 2:** | Yeah, that's something I would be more concerned about too, but I can relate to this area because I've recently visited Providence and amazed of how they are redeveloping a lot of the industrial areas; I am a great proponent of this type of redevelopment. |
| **AO 3:** | It depends on whether the institution is public university or private. It also depends on where the university is located and what the surrounding community looks like. Because some campuses make have some type of historical value surrounding it, so there may be many factors surrounding it. So I guess, what comes to mind is when a university gets a grant like this, are there strings attached and conditions they would have to deal with, or are there other implications with the University or college that they like or may not like? I was wondering if they would only do this with public universities, which I think may be another problem. |
| **AO 1:** | I remember my dad was in the Navy and I grew-up going in and out of |

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| | ship yard areas and those are not usually located in the "Mountain-Brooks" side of towns. |
| **AO 3:** | So there are a lot of nasty contaminations? |
| **AO 1:** | Yeah, so I'm almost certain our campus is situated on a field cope point which is a part of shipyard, that that's actually a significant improvement. |
| **AO 2:** | I know UAB has done a tremendous job with conversion and reuse of land into greenspace for campus expansion purposes. Well Alpha-One University has done a bit of that as well. We have taken a little redevelopment of the industrial shop and converted it into our new academic art facility. |
| **AO 7:** | Well I have been at UAB for a while and I remember when that area that had the 15 street classroom building; they completely remodeled the area and built a new recreational facility. The pre-existent recreational center was on 13th. Those changes made the university more accessible to students. After redevelopment, it actually felt like you are at a college/university instead of feeling as if you are just walking in the city. It also made the campus safer because students no longer have to cross |

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| | major roads or highways. I can definitely see the benefit of universities using the brownfield sites in this way. |
| **AO 2:** | I recall one of the difficulties that UAB had maybe 5-6 years ago was a lot of the community concerns about their "Willy-Nilly" expansion. One of the things UAB did was entering into discussions and agreements with their neighbors as to where their boundaries were going to be. |
| **PI:** | How can financial assistance improve collaboration across Science Technology Engineering Arts and Mathematics (STEAM) disciplines? |
| **AO 6:** | I would like to talk about the relationship between Eta-One University and Alpha-One University. I have taught a while for upward bound at a nearby Liberal Arts college which helps the first generation students get to college and through basic education. Many of these students have a negative perception towards STEM and I think it would be an excellent idea if the relationship between Alpha-One University and Eta-One University, or other colleges like Eta-One University can be foster.<br>I think it will increase students' level of motivation or make them feel as though they can attend Alpha-One University and succeed. You would be surprise when you mention math or science their responds would be, "oh my goodness, I would never do that!" The minority students in high |

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| | school have such a poor perception and negative attitude towards STEM areas of discipline in comparison of what they can actually do, achieve and accomplish. For example, when I tell people that I have a masters in Mathematics they be like, "Ooooh", when it is really not that big of a deal, but for many of the minority students, it is. I think this is so because they believe they cannot do it or they believe they cannot succeed at a place like Alpha-One. So just for Alpha-One's name to be mentioned as they are taking classes at Eta-One, they can say they that their overall goal is to attend Alpha-One once I am complete with two year degree and feel as though they attend this great institution and succeed. |
| **AO 7:** | Let's also bring in the other nearby college's students because they also first generation college students. |
| **AO 6:** | Yes, I love that idea! |
| **AO 7:** | That's what I would consider triangulation of data, or a triangulated project. |
| **AO 3:** | And for the graduate environmental science program, anyway we can tap into funding or scholarship funds to help introduce them into the graduate environment science program? |

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| **AO 1:** | Well, do you mean through a grant? |
| **AO 3:** | Well, I don't know if a brownfield grant would fund this type of request. Surely there should be an amount of funds out there for these students to enter into the graduate environmental science program. |
| **AO 1:** | I think that would have to be something partnership through an industry rather than just anything scholarship out there. |
| **AO 6:** | There are not that many grants out there that foster scholarship funding for Masters degrees. |
| **AO 1:** | Undergraduate and PhD's are the two areas where funding and scholarship money is normally provided. |
| **AO 3:** | I would to tie in somewhat of an insular and compatible fir training of these people who will be working on brownfield sites. |
| **AO 1:** | What you may get for students in the graduate environmental science program at Alpha-One is funding for them to work on brownfield sites to become trained consultants rather than scholarship money. Or we can |

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| | look the funding as an internship stipend for our students or work-study. |
| **AO 5:** | One thing we can consider is the students becoming trained professionally in HAZWOPER training, but that raining is important because it can get them the jobs they are looking for. |
| **AO 8:** | You know we offer that because they get that through the 40-hours of OSHA certification. |
| **AO 1:** | We can get funding if we can match and train a community person and one of our graduate students to become HAZWOPER certified at the same time. So for every person in-house, we train someone out in the community and teams can be created in the community. I think this would be great partnership idea as well because a lot of our graduate environmental management students are international and they will become certified and be able to understand the American culture in a practical and applied sense or perspective. |
| **AO 3:** | Based on what everyone is talking about: partnering with a local HBCU, Eta-One University, and the utilization of graduate students to gain internship opportunities to become HAZWOPER certified to help in brownfield clean-up efforts, created a sense of cultural motivation for |

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| | change to develop. That's what I perceive. Being able to bring in all three entities with grant funding which will increase the level of motivation in students and at the same time increase the percent in diversity. |
| **AO 9:** | Gamma-One is in the heart of brownfield city and its location may be completely surrounded brownfield sites. I think it will be a great opportunity to pull-in other institutions like Gamm-One that are also situated in the middle of brownfield sites. Gamma-One normally partner with us on numerous of things. So, yes I do believe they will be very interested. Moreover, they offer an undergraduate program in urban and environmental studies and also have the center for the environment. All of their undergraduate students are required to conduct research before they graduate, so they are always scrambling to find different research projects. So between their urban ecology and research focus, I think they will be willing to collaborate. |
| **PI:** | How can you connect your institution to other college communities that were successful converting brownfields to greenspaces for campus expansion? |
| **AO 1:** | Well, Alpha-One was cut out of a forest. In the 1950's the land was |

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| | given to them so this was a forest attracted land. So it was developed as a suburban area and the campus evolved as the city grew and expanded. So yes, it was a greenspace. |
| **AO 4:** | That's interesting. |
| **AO 5:** | I think, that this issue as it pertaining to whether an institution is private or public that there is a moral obligation of any community to in dismiss of its members based upon decisions made by the community leadership in times past; whether there are national security issues, like military bases or are they a purely profit driven corporations like foundries and so forth. So to me I think that's the bottom line is the moral obligation and it cannot be disregarded by the community at large, which means tax paid money allocated for that. |
| **AO 4:** | I was just in San-Diego for my parent's 60th anniversary and we stayed in a place called Liberty Station, which was a huge military base that has now been converted into a one of the most interested public sites I have ever visited. It's somewhat like a sprawling mall. It's a deconstructed mall and it has residential and lots of opened space and green pathways. So it's really incredibly inviting and I am so impressed with what they have done. |

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| **AO 2:** | One good local example is Railroad Parks. I was a good friend of the Railroads Park President, so I take this redeveloped area very personally. I think people from all the surrounding communities would say Railroad Park is a very well used facility in Birmingham; and that it too helps with economic growth and development for the city. So these two indicators are positives. However, much of the work done to develop the park itself wasn't brownfield money, but much of the funding that went into the initial assessment of the site and investigation was brownfield funding. And off course the development of the park acted as the remediation of the site. |
| **AO 6:** | I totally agree with what he said. And would like to talk about rebuilding the community and make observations of increase of safety to that area; or to look at the reuse-of and removal-of old abandoned buildings, as well as the area in now well-lit public area and very attractive and have infiltrated into a positive impact to the community even into the broader southern area of the city. |
| **AO 2:** | I agree with your statement. Having been involved with Railroad Park redevelopment project, I was also familiar with the University of |

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| | Alabama at Birmingham redevelopment plans and those have shifted dramatically because they now see railroad park as a buffer on the north side of their campus. Therefore, they alter some of their redevelopment plans to incorporate better access to railroad park and their part of development of the campus and their whole redevelopment of the campus plans. |
| **AO-1** | One of the great things about railroad park is the fact that it is for the entire city of Birmingham; so, I hate to say the term, '*ghettoized*', but the park is inclusive of every little community with its' own control. However, the surrounding areas in the city don't really have a good system wide community like railroad park, but it provides one of the few places you can go in the community and people come across Birmingham where you can run into someone from Norwood or someone from Brookwood. I can also relate to a really cool site in current redevelopment in Trussville City, and have placed a housing community alongside the Cahaba River. The name of this area is called Trussville Springs. It is incredible site to see how the area is redeveloping. |
| **AO 7:** | I just want to talk about the impact that Railroad Park and made, especially with me being a doctoral student and being in walking distance from classes; it has just made the community feel a lot safer, |

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| | especially when that area when there is such a high concentration of crime, homeless people and poverty. Now I see a lot of grocery stores are being established in the area. For example, a Publix coming that way and lots of housing communities…so it's just really nice! |
| **PI:** | What do you see in the pictures that make you think or feel the site(s) may be a brownfield or a greenspace? |
| **AO 3:** | Well, I think it is a brownfield because of its close proximity to an urban area. It's out-skirts usually have a lot of industrial companies and it just has that look; it looks like a redeveloped industrial site. |
| **AO 9:** | Yeah, it looks redeveloped now. |
| **AO 10:** | It looks like a green space but it could have been a former brownfield site where it is located but has been successfully transformed into a greenspace. |
| **AO 1:** | I put brownfield converted to greenspace. |
| **AO 3:** | I put greenspace I guess because it reminded me so much of UAB's |

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| | campus. |
| **AO 10:** | It is UAB's campus! |
| **AO 7:** | That area was primarily residential that's why I opted more for the greenspace choice. Well I have been at UAB for a while and I remember when that area that had the 15 street classroom building completely remodeled that area and then the New Rex Center came. The old Rex Center was on 13th. Those changes made UAB more accessible and gave UAB more of a campus feel in which you actually feel like you are at a college/university instead of feeling as if you are just walking in the city. It also made the campus safer in terms of crossing the road. I can definitely see the benefit of universities using the brownfield, brown space in this way. |
| **AO 4:** | I thought of it being a greenspace because of its good use of trees and grass and its intend for design of activities and human use |
| **PI:** | What benefits a redevelopment project like UAB's bring to your institution, if replicated? |
| **AO 5:** | The mission for Alpha-One would speak to this from my initial |

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| | statement as a moral and ethical issue and if Alpha-One wants to stand behind its mission then that who Samford to be supportive of this kind of effort and receive consequently some kind of recognition and act according to their mission. |
| **AO 3:** | If we are not aware, a lot of our graduate students in the Masters of Environmental Science & Management Program are begging for internship opportunities and if Alpha-One, itself was playing a role in any kind of assessment project on brownfield redevelopment, this would be a great opportunity for the graduate environmental science students to take part in applied research and internship. |
| **AO 2:** | My professional background, as many people know, served representing many clients of Brownfield cleanup sites; some direst and others not so direst. But at the same time, one thing I always encounter is the respect of the local community. Are being provided with accurate information or can we trust the information that we getting or is this just being done on the cheap so they can get out of here and they could just leave us holding the bag so to speak. So I think the unique role of an institution like Alpha-One University with its professed mission and value would be almost like a guarantor of the quality of the information that is being provided to the community. And at the same time listening in a more |

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| | sensitive way to the concerns of the people in the community. |
| **AO 1:** | One of the things in a more controversial perspective, would institutions ever would be willing to take that role? That quit a risk in terms of exposure. |
| **AO 3:** | Keep in mind that most cases of brownfield redevelopment come about when everyone realizes that it's going to be a win-win-win situation. Businesses are trying to get out of liability constraint that may be applied from the EPA. They are trying to find comfort and present that there is a good side where the community can get something out of a redevelopment project. So if it is not a win-win-win you can begin feeling that upfront and if it's not going to look like a good fit then all of those thoughts would probably happen. But keep in mind that when its win-win-win is when the outcome of a redevelopment of a brownfield site yields positive results. |
| **AO 1:** | A win for us would be, to partner with Eta-One. They are in an area that does have a lot of brownfields. Another professor and I are working on and have written a grant to get transfer students to come to Alpha-One because it can be a huge barrier thinking about coming to Alpha-one from Eta-One even though the two institutions are only a few miles apart |

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| | from each other. |
| **AO 3:** | Remind me please, where is Eta-One? |
| **AO 1:** | Go down Lakeshore Highway; behind or on the foot of Red Mountain Park. |
| **AO 3:** | Wow, very close to our institution. |
| **PI:** | What about the second illustration? Why? |
| **AO 2:** | A brownfield because it is a non-remediated industrial site. It has a garage that suggests a link an industrial that may have hold chemicals. |
| **AO 5:** | A none-residential area with a piece of land with previous use. It really looks like some nastiness. |
| **AO 1:** | Very few trees and plants. The color too suggested it being a brownfield site to me. |
| **AO 4:** | I may be very familiar with that site. It looks like an Alagsco old site. |
| **PI:** | What about the third illustration? Why do you think it is? |

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| **AO 2:** | Is that artificial synthetics-turf or actual grass. |
| **AO 3:** | What difference does it makes? |
| **AO 2:** | Well, artificial synthetics-turf is plastic. |
| **AO 3:** | Okay, I know that. |
| **AO 2:** | Well, the definition of a greenspace talks about the use of trees and grass, not artificial turf predominately. |
| **AO 3:** | So if it is artificial synthetic-turf, it will not be categorized as a greenspace? |
| **AO 2:** | Based on the EPA's definition, I would say no. |
| **AO 4:** | I would assume it is a redeveloped municipal solid waste facility transformed into a recreational facility. |
| **AO 9:** | One thing that strikes me is that even if it is synthetic-turf and not real grass. It looks like thought has been given great consideration especially |

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| | into drainage and erosion issues and ways to keep that from being a problem. It looks like there are plantings there to help with the problem. So it appears as though thought was given in the planning process in greening this area. Making it a place obviously for recreational purpose. |
| **PI:** | Why do you think a brownfield redevelopment project is important?<br>• Why do you believe the level of reluctance exists in some communities to redevelop? |
| **AO 3:** | Redevelopment of brownfields is important because it increases revitalization of the wasted city space. Revitalization of particular areas that are in dire need of redevelopment can be economically profitable to the marketing industry and property value. Communities are reluctant to change because it may increase the exposure to gentrification. |
| **AO 10:** | People can live in those areas it again. In other words, the benefit to this is that people can now live in city areas and not have to see eyesores; thus, it may change the perceptions of people and motivate them to want to do the right thing for everyone, regardless of the city or socioeconomic background. |
| **AO 5:** | I think that it will bring the community in for conversation; and to create not just an image but a reality of the community's participation so that |

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| | they actually ask the community to talk and listen as opposed to coming in pronouncing what they are getting ready to do because it really becomes like a political push-back. Feelings of being threatened are usually grounded by lack of understanding and information so they may be real threats or not but they're threats and to bring people into the conversation it reduces the misperception they have and gives them the sense of agency in terms of the decision. Also of importance, politically dominant agencies tend to assume that they are more knowledgeable than the community members in terms of what would be good for them and it may be good for them but it might not. I think that any times you talk about the community's context, listening to those who will be impacted is the first line of effort to get participation and cooperation. The dominant agent may not see themselves as a threat but they may feel as if they are benign. In fact, they might be a terrible threat. |
| **AO 7:** | Because of their presumptions and maybe experiences of their lack of being considerate in the process of decisions. |
| **AO 2:** | The majority doesn't feel like the powers to be might not honor it |
| **AO 10:** | We had a major planning meeting about six years ago to get input from |

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| | the community so we told them what all we wanted and they did what they wanted to do and ignored us. There was developer that wanted to come in and place a 150 unit apartment right on the side of the elementary school which would be a traffic nightmare and the community just got fed up and they said this is not going to happen because this was not part of the master plan that we discussed. I think there is an element where as a leader you make yourself vulnerable because if you get feedback from the community it's very disrespectful not to incorporate that in the master plan and if you get feedback and ignore it that's even more offensive to the community than if you never asked. |
| **AO 8:** | There are two different situations being talked about here. On one hand there is a change in some developing patterns in the community and when you have an environmental problem associated with brownfield, leaving it alone is not an option.<br>Talking about the majority of the information is given, when you are living or working in a health risk area where brownfield sites are located, the long-term effects are very critical in terms of human health and well-being. In the city of Anniston, for example, Monsanto and its problems up there; the children were more important now and there is a huge grant to do work for children's health. Moreover, people bodies were polluted |

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| | at extreme toxic levels because of the exposure to PCBs. That was bad enough but if you don't do something about it with rapid response, it can affect and adversely harm human health in long-terms. |
| **AO 5:** | Let me tell you something that we know about this area, some people might say well it's always been that way however, life is short in one generation. I think that people can hear if the voice is dialogical. In other words, what do you think about this, it seems to be the long term impacts of this affect the family. It is about social justice and not just about you. It might take a while for it to work out like that people who are looking for a profit is not particularly interested in long term issues. At UAB redevelopment of space is nonprofit and they are just trying to create a healthy community. If you put in a 24 story apartment building next to the school what you are looking for is profit and get out. Are you going to live here? No, those are the folks that are the bad guys. |
| **AO 10:** | What I learned, I learned it the hard way. Parents are not expected to be rationale about their children's health and often when experts come in and do exactly what you said they shouldn't do; well, that's bottom line for the parents and the people that live there. So, what does this mean for my children? Unless you connect with the concerns of the parents in a way that makes sense then you won't get any kind of community |

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| | support. |
| **AO 6:** | Because land is limited. There is only so much of it and brownfield sites are generally in urban areas where they can be put to more profitable use and unused, remediated hazardous waste sites… |
| **AO 9:** | The more green space that we convert to impermeable space we're destroying the biological richness of the area and we know that we have a huge transportation problem over here and a huge issue of generating $CO_2$. If we could redevelop locally and not have people driving with their motors running 65 on 280 then that benefits everybody in terms of ozone problem. Urban infield is a wise way of developing. We win. |
| **AO 3:** | The 'cause-effect' on health. If you have green space in cities the physical, social, psychological health is impacted positively. People spend time together, exercise and they feel the sense of sacredness. Concrete buildings don't instill spirituality, trees and grass facilities spiritual experiences and that costs you less with regards to hospital expenses. |
| **AO 7:** | One reason our freshmen students come to Alpha-One is because the campus is so beautiful. We were paying $30,000 just to keep the grass |

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| | beautifully trim and green; at the cost of high levels of nitrogen across the street into the creek. What appears to be a green space was really secondary to golf courses in terms of contamination. |
| **AO 2:** | However, the contract was changed. Moreover, that was something we discovered and addressed accordingly. |
| **PI:** | What would you recommend if financial assistance is provided for a brownfield conversion project? |
| **AO 1:** | Community partners are needed, as a lawyer you may say:"oh this might not hurt my kids", but as a scientist all I can say is:"our understanding right now at these particulate levels we are less dogmatic because all we know is what we know right now and we might not know what the effects might be 60 years from now to minute quantities. Also scientists are concern about exposure limits and what type toxin it may be? For two weeks, it might not have an affect but exposing humans to concert with other things there might be synergistic effects. I think that's one of the issues of having scientist come to talk to people in the communities we don't want to lie to people to give people false assurance and that sometimes become a problem too. How do we say as far as we understand this should be good but we can't make any promises |

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| **AO 5:** | You can't teach probability. If there is something that you have strong convincing evidence about I would be willing to step forward and say the risks are relatively high. |
| **AO 1:** | As scientists, we don't have a problem saying that the risk is relatively high; it's when we are asked to say the other thing; Is this safe for your kids? You don't want to say unequivocally it's going to be safe if you know that the evidence isn't there to say that it is safe for human but most things may have been tested on small water flukes but it was only looked at for a short period of time and 50% of them die but we don't even know whether it affects their reproduction to translate to say if this is safe for your children; and the second question is if we make a change will this be safe for our kids? |
| **AO 3:** | We are not talking about what is safe for your children; we are talking about what is likely to be unsafe. |
| **AO 1:** | I understand that you are saying we should make a change. Second question, if we make a change will this be safe for the children? Are my kids going to be safe if we cover it up and turn it into a playground? |

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| **AO 3:** | If Alpha-One is given a grant what would you do with it? This is a teaching institution, not a research institution. How do we provide education? Training students in risk assessment, sociology and the bigger picture. Maybe it's time for an update of our curriculums or programs. We can get help and train students both undergrad and graduate students through research and assessment. The deliverable is education. |
| **AO 4:** | Long term progress is to go into the communities and have non-credit educational experiences for community leaders. For example, pastors and let them be the educators to the community. If the community doesn't trust the scientist they might trust the pastor. It doesn't have to be a religious leader it could just be someone like a gate keeper to the community who the community sees as having wisdom and listening to new information. That may be the first level of trying to bring information to people about the risks in the community. From the social aspect, finding the gatekeeper in the community to relay the information might work better than the scientist giving the information. Also, another option is to present a picture to the community and ask them what they see. Someone might see that it was contaminated with lead. There is no galvanizing factor here and what that does is that we know it stays in the |

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| | body for a long time. |
| **AO 5:** | There was a meeting. He said something about you could develop a brown field into a green space and not know what you are covering up. Would that be a factor in which you consider? And I was trying to enter the Fairfield area because of the plant over there and other respiratory diseases children had and relative amount of cancers that occur in adults. |
| **AO 3:** | There was a galvanizing business, the family retired but they didn't just cover it up, they dug it up and removed it. I would imagine that the relative risk of contamination if they didn't just cover it up. If they put the dirt back there this was never reclaimed. There are just trees there now. |
| **AO 7:** | Most of the grounds for redevelopment is not just private entity acting on their own to just go dig something up and decide lets clean it up. It is usually the government involved as well with very specific requirements for ground water monitoring? I still would like to know if you're hitting bedrock, clay, risk assessments, what sort of cap do you need; can contaminants leave by air or water? There is a lot of detailed thought that goes into it. Nothing in this world is perfect but it is important to |

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| | recognize that there is a level of control that goes into redevelopment. |
| **AO 9:** | If you have to do it under administrative order from EPA it is identified as a site that needs cleaning up then that's one thing. On the other hand, there are a lot of other sites that get cleaned up by private parties but there is a financially beneficial use to be put to it. Another example, the English village in Birmingham, a nice residential area. |
| **PI:** | What about the last illustration? |
| **AO 4:** | I would say a brownfield site because it looks industrial and poorly managed in terms of its surrounding waste and unwise use of land. |
| **AO 2:** | It's really a detriment to the community. |
| **AO 8:** | It's pretty nasty. |
| **AO 5:** | Is the greenery around it helpful? |
| **PI:** | Do you believe there is a variation in experiences with redevelopment of brown fields between private and public institutions? |

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| **AO 2:** | AO-One is right in a residential type green field, not really brown field but when you go into profit companies there is always fear when companies are faced with a choice to buy green field. There is no problem with the dollar rate with brown field and that's when a can of worms is opened. What will the public perception be? What are people going to think? If you develop a brown field to be used for commercial purpose that doesn't require a residential clean up the public reaction is erratic. You wouldn't have a higher clean up standard. The company might say if you do a residential clean up at this standard might as well buy the brown field. Those are the factors people look at. How far to push it when it comes to economic investment? |
| **AO 4:** | When I worked on Alabama plant for a while, legislature was finally passed not to redevelop industrial sites in Birmingham but to develop the one industrial site in a small town in Alabama, 'The Mill', small restaurants and shops. Based on my experience, redevelopment depends a lot on the intent to do so or the level of the developer's motivation. I believe that public institutions like UAB or private institutions have a better sense of its community responsibilities than a profitable corporation. |
| **AO 1:** | On the other hand, some institutions perceptions would be like, "what's |

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| | the minimum I have to do and get out". |
| **PI**<br><br>**AO 2:** | Has anyone ever seen a brownfield site converted to a greenspace?<br><br>We had a landfill….good redevelopment and positive for the community. It was a good field and it gave lacrosse a chance to do their thing. |
| **PI:**<br><br>**AO 8:** | What influences do professors possess that may change the negative perception of a brownfield sites and to aide in conversion efforts to a greenspace?<br><br>I only teach freshman communication, not environmental or biological sciences, but we have a focus group where we take the students out into the community for community service and engage them in the community. They go in the park and talk about the history and how the park brings the community together. |
| **PI** | How do you think local institutions located near brownfield site(s) should look at a brownfield redevelopment project? |

| | |
|---|---|
| **AO 1:** | Groups of professors can write grants and partner with communities that can help facilitate change and the powerful work they can do to motivate the students to be interested and involved in making a community change and a strive for progress. |
| **AO 3:** | They can implement in the curriculum and talk about context involving natural environment even if it's a small part of the course to prompt students to stop and look at the environment. For example, trash on the streets or campus, high nitrogen levels and the lawn. If there is a brownfield nearby, ask them what they think about it philosophically and economically. This is a concept that has to be institutionalized. |
| **PI** | Do you believe research collaborations like the one you are participating in today can be beneficial for the college community? |
| **AO 8:** | Yes, we have a lot of workshops that generate great ideas but no one has the actual time to follow through with the ideas because they are so busy with their jobs. |
| **AO 5:** | We did an exercise in one of my international law classes where former students from England, current students here and a colleague of mine students from Ukraine, we worked on the project separately then later |

| | |
|---|---|
| | got together on skype and discussed the project. I'm not sure of the long term effects but I'm sure it could have planted a seed. |
| **AO 2:** | Teaching the pros and cons; teaching the economic and biologically aspects of brownfield sites converted to greenspaces; and research can be done across the university's departments or colleges. People in the business sector should also be included in those discussions but they need to be educated in these areas the most. |

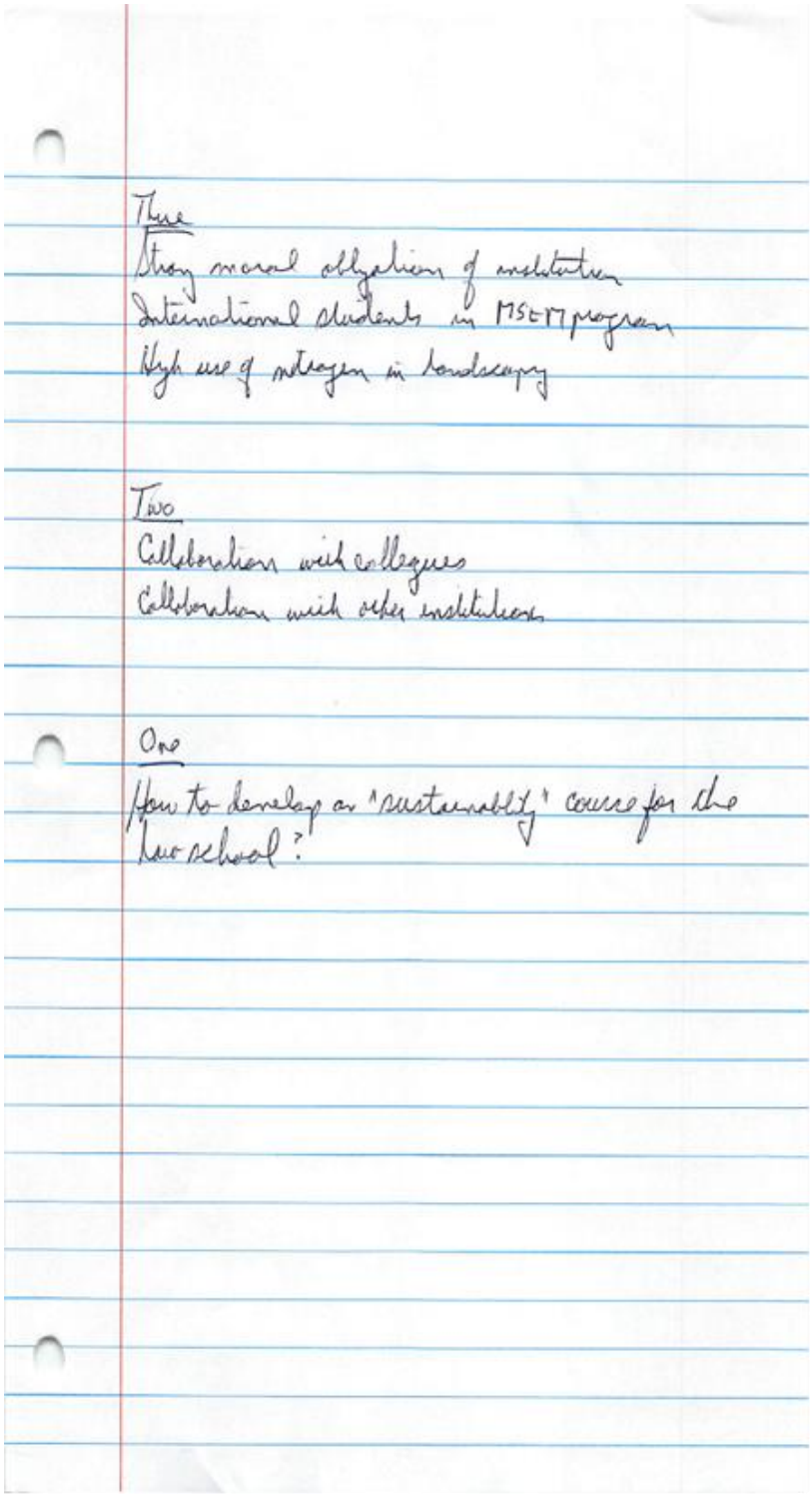
APPENDIX F – Quantitative Output

Table 30

*Descriptive Statistics*

| **Descriptive Statistics** | | | | | |
|---|---|---|---|---|---|
| | Frequency | Minimum | Maximum | Mean | Standard deviation |
| Q1 | 42 | 3 | 5 | 3.10 | .431 |
| Q2 | 42 | 1 | 5 | 3.02 | 1.645 |
| Q3 | 42 | 1 | 5 | 3.81 | 1.153 |
| Q5 | 41 | 1 | 5 | 2.12 | 1.288 |
| Q6_2 | 42 | 1 | 5 | 4.00 | 1.104 |
| Q6_3 | 42 | 2 | 5 | 3.93 | .947 |
| Q6_4 | 41 | 2 | 5 | 4.12 | .900 |
| Q6_5 | 42 | 2 | 5 | 4.57 | .703 |
| Q6_6 | 42 | 1 | 5 | 4.45 | .942 |
| Q6_8 | 41 | 1 | 5 | 3.32 | 1.254 |
| Q6_9 | 41 | 2 | 5 | 3.88 | 1.077 |
| Q8_4 | 38 | 1 | 5 | 3.71 | 1.113 |
| Q8_5 | 38 | 1 | 5 | 3.39 | .974 |
| Q8_6 | 38 | 1 | 5 | 3.03 | 1.219 |
| Q8_7 | 38 | 2 | 5 | 3.55 | .950 |
| Q8_8 | 37 | 2 | 5 | 3.24 | .830 |
| Q8_9 | 38 | 1 | 5 | 3.26 | 1.057 |
| Q9_1 | 35 | 1 | 5 | 3.57 | 1.037 |

| | | | | | |
|---|---|---|---|---|---|
| Q9_2 | 34 | 1 | 5 | 3.06 | .919 |
| Q9_9 | 34 | 1 | 5 | 3.18 | 1.058 |
| Q9_12 | 34 | 1 | 5 | 3.03 | 1.114 |
| Q10_4 | 35 | 1 | 5 | 3.94 | 1.056 |
| Q10_5 | 35 | 1 | 5 | 3.37 | .942 |
| Q10_6 | 35 | 1 | 5 | 3.83 | .985 |
| Q10_7 | 35 | 1 | 5 | 3.43 | .979 |
| Valid N (listwise) | 29 | | | | |



Three
Strong moral obligation of institution
International students in MSEM program
High use of nitrogen in landscaping

Two
Collaboration with colleagues
Collaboration with other institutions

One
How to develop an "sustainably" course for the law school?

3 Learned

1) Exact EPA definition
2) Grants available to Educational institutions.
3) That astroturf or invasive species border can be called greenspace
4) I learned a lot from watching Berkley run the focus group.

2 Interests

1) Partnership w/ Lawson
2) Better understanding of Risk Assessment
3) Getting to know Carol better. ☺

1 Question

1) What is Lawson States Grant + Plan

★ I was so impressed by how Berkley moderated the discussion

3 things discovered:
1. This interdisciplinary group of faculty interacted to generate a very interesting + multifaceted discussion
2. Brownfield redevelopment is likely to play a big role in the strategic planning of many Bham area educational institutions.
3. Faculty in different disciplines have different perspectives on workload constraints & faculty engagement in projects like this.

2 interesting things:
1. Brownfield redevelopment has already had a significant impact on the Bham area
2. Lawson State has received a grant for redevelopment.

1 question:
How can we at Samford create a collaboration that will unite us to what is happening to Lawson State?

Three things that I have discovered

1. A brownfield is a space that causes a community a lot of problems but no one want to take responsibility for the problems.
2. Working together with higher education can and will help raise awareness about brownfield issues
3. Creating a green space can be a motivation factor to other areas

Two things that interest me

1. How can I help and get more involved with assisting with raising awarness about EPA
2. Becoming part of more research about EPA

One question about the topic

1 How to get information about brownfield locations?

Notes/Comments

Relationship between a greenspace and a brownfield
- A brownfield was once a greenspace
- A brownfield can become a greenspace once again
- Both can occupy space on earth (space)

Alabama Department of Environmental Management
- Areas are most likely invisible to them until an issue is posed
- If enterprise (businesses, schools, jobs, etc.) is not the end-goal, are efforts being sought to clean-up brownfields for the environments sake?

In favor of a higher-education institution leading the clean-up and redevelopment of a brownfield
- Only with the proper caution and safeguards in place

Closing:
Discovery ① Lawson State has received a grant funds related to brownfield redevelopment ② Education on this topic is lacking ③ As usual, money determines the level of progress

Interest ① Higher Education can take advantage of brownfield funding/grants to expand ② Communities can be revived by brownfield redevelopment

Question ① Does the process of brownfield clean-up/redevelopment pose health risks that equal or exceed current health risks posed by the mere existance of the brownfield?

Greenspaces can be created from former brownfields.

* 3 things we discussed ?

1) We learned what brownfields are.
2) The liability & responsibility issues associated w/ clean up efforts.
3) How different communities are impacted by brownfields.

* 2 things that interest you ?

1) The identification & clean up process for brownfields.
2) The roles local colleges can play during the planning & implementation phases.

* 1 Question.

What are the different cities/counts around Alabama doing to identify & clean brownfields? How are communities being notified?

3 - insights
2 - interests
1 - question

Insights:
(1) Brownfield redevelopment can be a win - win - win situation

(2) Thoughtful Engineering of redeveloped brownfield sites can have major positive impact

(3) Redeveloped brownfield sites can enrich communities by creating space for recreation + fellowship

Important

Interests:
(1) Find meaningful classroom ways to incorporate soc. justice / brownfield redevelopment across disciplines

(2) Work collaboratively with the community to address brownfield sites; especially Lawson St. C.C.

Question:

1. How can I bring these issues into my classroom in a meaningful way?

How can we further conversation to make an impact in brownfield sites in Bham?

APPENDIX H - Land Recognition Depictions

Depiction 1

Depiction 2

Depiction 3

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