Appendix B: Technical Methods and Initial Findings

This memorandum provides a full description of the methodology used to analyze the economic impacts of brownfield remediation and redevelopment in Oregon. In the full report, this memorandum will become an appendix to the report. Throughout this memorandum, we refer to it as an appendix, so that the text can be easily integrated into the full report.

The purpose of our analysis is to evaluate, assess and quantify the economic effects of projects that received funding from the state of Oregon to remediate a brownfield. This appendix describes the methodology used to analyze the economic impacts of brownfield remediation and redevelopment.

The remainder of this appendix is organized into four sections:

1. **Framework for Evaluation** describes the general issues in economic evaluation and issues specific to economic development and this evaluation.
2. **Overview of Oregon Brownfields Programs** provides a general overview of the existing Brownfield Programs in Oregon, with an emphasis on those programs that provide financial incentives for the redevelopment of brownfield properties.
3. **Data and Methods** describes the different elements of our evaluation, including the methodology for the survey of 250 projects and detailed evaluation of eight projects.
4. **Supporting Documents.** Attached to this Appendix is the Survey instrument.

1. Framework for the Evaluation

In this section we present the structure our analysis. In the first part, we describe the goals of an economic evaluation. In the second part, we describe the principles of economic evaluation and illustrate the application of these principles in our report. In the third part, we classify the potential values and impacts associated with the Brownfields Program projects under evaluation. Finally, we describe the alternative baseline scenarios of our analysis.

1.1 Goals of Economic Evaluation

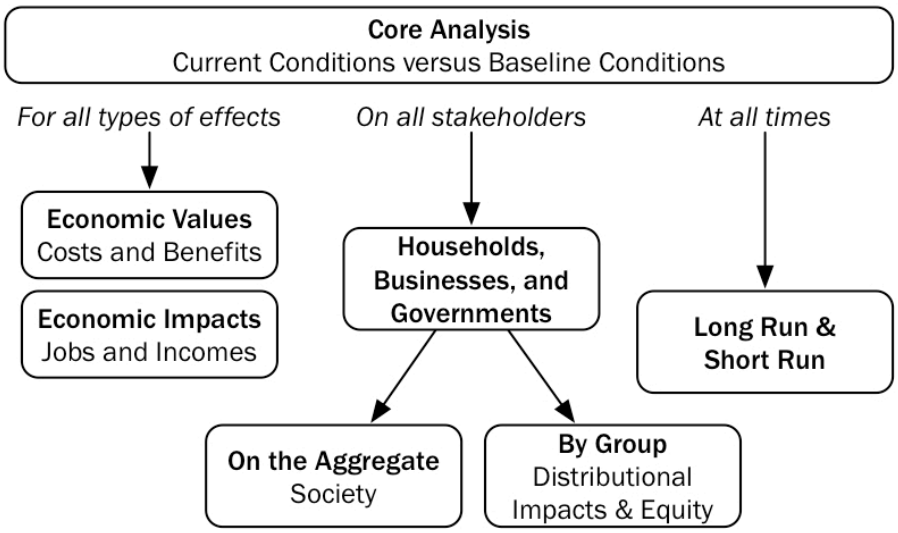
Among the tools economics offers for comparing competing alternatives, the most widely know and frequently used is benefit-cost analysis. A benefit-cost analysis describes the differences in net economic values—economic benefits minus economic costs—across alternatives. To estimate the *net* benefits of a program, one must compare its benefits and costs to whatever the benefits and costs would have been (or would be) without the program. That "different future" is often referred to as the "base case," "the base trend," or the "status quo" scenario or alternative. Such an evaluation begins with historical facts and recreates a future with and without the Brownfields Program.

In our experience, stakeholders and decision makers frequently care about other types of economic consequences besides changes in economic values. They want to know how policy

alternatives will affect things like jobs and income, which economists describe as economic impacts, and the distribution of changes in economic values and impacts among stakeholders, which economists generally address as economic equity or distribution. For these reasons, our analysis of the economic effects of Brownfields Program includes all of these components. We call this an evaluation of economic effects or an economic evaluation.

Figure 1 shows the goals of an economic evaluation: to be able to describe all types of economic effects, on all types of people, over all time periods, for all the relevant areas of impact.

Figure 1. The Goals of an Evaluation of Economic Effects



Source: ECONorthwest.

As Figure 1 shows, an evaluation of the economic effects of any program or policy begins with a complete description of the current and baseline conditions. To value a project's effects on economic values or economic impacts, it is important to identify each change attributable to the project or action, taking into account differences in the economy *with* the project or policy versus the world *without* it. In the context of this analysis, the "without scenario," or the baseline conditions, describes future conditions, that would have materialized without the Brownfields Program. The "with scenario" represents the current conditions as we see them today. As a result, the difference between the two is the economic values and impacts attributable to the Brownfields Program.

The first two categories of economic effects described in Figure 1 are economic values and economic impacts. Economic values are *those changes in the values of goods and services* available to Oregonians that result from the market and non-market activities associated with projects funded by the Brownfields Program. Such effects include changes in economic benefits, costs, or both. The second category, economic impacts, represents changes in jobs and incomes for workers, costs or revenues for private firms, and expenditures or tax revenues for governments. These impacts occur directly, as workers are employed on construction and restoration. They

also occur indirectly, as these workers spend dollars locally on goods and services, dollars that multiply through the local economy, supporting additional jobs and incomes.

Any policy or project has distributional implications and equity considerations; that is, the values and impacts of the project or policy are not evenly distributed across households, businesses, or governments. As a result, in the third category of economic effects shown in Figure 1, we describe the distribution of the two categories of effects both on the aggregate and by groups, i.e. across income brackets of households and geographic areas.

Finally, we describe the economic effects of the Brownfields Program over time—in both the short run and the long run. By addressing both of these effects, the analyst can avoid errors of omission and commission through confusing today and tomorrow. The literal differences between today and tomorrow would be trivial. But since the relevant period of time may stretch over decades, the figurative differences would likely be huge.

1.2 Principles of Economic Evaluation

The framework described above hides some important complexity inherent in conducting economic analysis. The accepted professional guidelines for economic analyses share common, fundamental elements that are important in the context of the evaluation. In addition to defining a clear analytical framework, which we have done above, these guidelines require researchers to follow a variety of principles. We outline these principles below.

- **Consistently define geographical and temporal boundaries.** Project-specific conditions dictate the appropriate geographic boundaries of analysis and time horizon across which to conduct an economic analysis. In this analysis, for those projects with benefits extending into the future, we set a period of analysis consistent with the life cycle of the project. Our appropriate geography for this analysis is both the local and statewide geographies. Specifically, we identify economic effects on both levels and, where necessary, distinguish the geography of the relevant beneficiaries.
- **Use objective data.** Objectivity requires, among other things, being clear about sources of data and providing a credible mix of sources to corroborate findings. For example, each project that receives funding from the Brownfields Program involves a variety of groups representing a range of perspectives, including but not limited to: (1) program recipient agencies; (2) directly-benefiting businesses; (3) partner agencies; (4) other public agencies; and (5) business organizations. In this analysis, we rely on multiple sources to enhance the credibility of the study.
- **Avoid double counting.** Some impacts and values overlap and so it is important to carefully describe economic effects without double counting. Some academics have criticized economic impact analysis methods that misuse multiplier effects in benefit-cost studies. In this analysis, we have taken care to avoid double counting. For example, where possible, we establish the extent to which indirect effects either create jobs for idle workers or displace other existing jobs.

- **Fully account for market and non-market values.** Economists have long recognized that some economic benefits are not traded in markets and do not have market prices to indicate their value. For example, an industrial site may emit pollutants that degrades the quality of air and affects human health. This behavior imposes real economic costs on society, but because air quality is not traded in any established market, its non-market value may be difficult to quantify.
- In this analysis, where possible, we describe and quantify the economic value of the relevant costs and benefits of the Brownfields Program. Where the data limit our ability to quantify these values, however, we describe them qualitatively.
- **Accurately attribute credit.** The issue of attribution of credit is related to the idea properly attributing effects to causes and of doing so only once. For example, the evaluation must acknowledge roles of partner agencies and private funds in achieving the economic effects of projects that received Brownfields Program funds. For each of the economic effects described in this analysis, we describe the roles other stakeholders play in: (1) funding other aspects of the projects; (2) supporting the projects through in-kind support and implementation efforts; and (3) developing complementary projects that lead to similar economic outcomes.
- **Discount future benefits.** Economists use discounting to account for time preferences, that is, the preference for benefits or money earlier rather than later. Discounting entails reducing values that would materialize in the future by a percentage over time to standardize values occurring at different times to their equivalent, present value.
- **Describe sources of risk and uncertainty and how they may affect results.** For any economic analysis, it is important to consider all sources of risk and uncertainty in order to estimate and account for each. Generally, with increasing risk and increasing uncertainty, expected benefits decline. In this analysis, where appropriate, we acknowledge and describe the sources of risk and uncertainty that may affect our results. Where possible, we quantify them.

1.3 Classification of Project Values and Impacts

Each of the projects which received funding from the Brownfields Program result in a unique stream of economic values and impacts to the both the local community and the state. It is important to correctly define the program outcomes in sufficiently broad terms that capture the breadth of results. For the purposes of this analysis, we have classified impacts into five categories. See Table 1 for a complete list of these effects and how they interact with our baseline scenarios. The five categories of effects are:

1. **On-site economic effects.** Some off the economic values and impacts of the project will occur directly on the site. These include:

    1.1. Increased construction jobs and incomes. We identify the temporary economic impacts associated with jobs and incomes in the cleanup and construction of projects that received funding from the Brownfields Program.

1.2. **Increased operations jobs and incomes.** We identify the jobs and incomes in the on-going operation of any redevelopment project.

2. **Off-site economic effects.** Some of the economic values and impacts from the projects accrue to beneficiaries off-site. These include:

   2.1. **Neighborhood revitalization**. In some cases redeveloping a brownfield site may have a positive catalytic effect by creating a environment conducive to new investment that can transform neighborhoods and communities. The economic effects in this category include increased jobs and incomes, increased property values, increased tax revenue, and improved community livability.

   2.2. **Avoided costs associated with greenfield development**. Redevelopment on a brownfield site may have been an alternative to developing a Greenfield site. In this case, the Brownfields Program reduces sprawl and the need for expanded urban infrastructure.

3. **Avoided risks to public health**. The Environmental Protection Agency defines three threats to public health posed by brownfields: (1) environmental risks from biological, physical, and chemical site contamination; (2) social and economic risks from blight, crime, and vagrancy; and (3) safety risks from abandoned and derelict structures, open foundations, and other infrastructure or equipment that may be compromised.[1]

4. **Fiscal impacts**. Cleanup and redevelopment of a brownfield site can affect tax revenues to state and local governments. These impacts include:

   4.1. **Changes in property taxes**. By influencing the value of the site, contributions from the Brownfields Program may change the level of property taxes collected by local governments.

   4.2. **Changes in income taxes**. By influencing the number of jobs and incomes in a community, contributions from the Brownfields Program may change the level of income taxes collected by the state and local governments.

5. **Environmental justice implications**. Some toxic sites often correlate with the most distressed neighborhoods, which make it likely that many of these sites may face trade-offs in terms of environmental justice.

The projects display a mix of the economic effects above, depending on the baseline project conditions that would have persisted in the absence of funding from the Brownfields Program.

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[1] Environmental Protection Agency. 2006. Brownfields Public Health and Health Monitoring. EPA-560-F-06-210. July.

[2] There is an additional pathway, the Leaking Underground Storage Tank (LUST) program handles issues related to cleanup of soil and groundwater contamination from spills and releases from regulated underground storage tanks.

1.4 Identifying the Baseline Scenario

In this analysis, we examine the economic effects of projects funded in whole or in part by the Oregon Business Development Department Brownfields Program. The goal of any economic evaluation is to identify the *net* impacts of the policy or program under evaluation. To estimate the net impacts of a program, one must compare the existing values and impacts to whatever values and impacts would have been without the program. That "different future" is often referred to as the "base case." In order to accurately describe the economic effects of these projects, we must define the baseline and current conditions associated with them.

On a practical level, defining and describing the base case can be very difficult. There was no "control" site that had all of the same attributes as the clean up and redeveloped sites, but was not cleaned up or redeveloped. In this evaluation, part of our research is to define the base case, so we can identify the net impacts attributable to the Brownfields Program.

For the purposes of our analysis, we have identified four categories of alternative baseline scenarios, depending on the conditions that would have persisted in the absence of funding from the Brownfields Program. These categories are:

A. **No remediation.** In the absence of funding from a Brownfields program, the site would continue to be contaminated and pose risks to human health.

B. **No project.** In the absence of funding from the Brownfields Program, the applicant would not have built or developed the project in this location or elsewhere. For the purposes of this analysis, we assume the site would remain a brownfield today.

C. **The same project on a greenfield site.** Without funding from the Brownfields Program, some applicants would have built their projects on greenfields instead of the brownfield site. For the purposes of this analysis, we assume these projects are the same in terms of size and scope, but occur on a different site.

As part of our data collection and research, we have worked to identify the appropriate base case for each evaluated project. In Table 1 below, we align the five categories of economic effects with the three categories of alternative baseline scenarios on this page.

Table 1. Matrix of Relevant Effects by Alternative Baseline Scenario

Alternative Baseline Scenario	On-Site Economic Effects		Off-Site Economic Effects			Fiscal Impacts		
	1.1 Increased construction jobs and incomes	1.2 Increased operation jobs and incomes	2.1 Neighborhood revitalization	2.2 Avoided costs of greenfield development	3. Avoided costs of reduced risks to public health	4.1 Increased property taxes	4.2 Increased income taxes	5. Environmental justice implications
A. No remediation								
B. No project	X	X	X		X	X	X	X
C. Same project on a greenfield site			X	X	X			X

Source: ECONorthwest.

Under Scenario A, the Brownfields programs reduced the risk to public health (3).

Under Scenario B, the Brownfields Program contributed to increased jobs and incomes related to construction and operation (1.1 and 1.2), neighborhood revitalization (2.1), avoided costs of reduced risks to public health (3), and increased property taxes and income taxes (4.1 and 4.2). Both also have environmental justice implications (5).

A brownfield redevelopment project that would have been built on a greenfield site in the baseline scenario (Scenario C), would avoid costs from greenfield development (2.2) by reducing sprawl and the need for expanded urban infrastructure. Because these types of projects also redeveloped a brownfield site that would not have been developed, but for the program, they also lead to neighborhood revitalization (2.1), avoided costs of reduced risks to public health (3), and environmental justice implications (5). They would not, however, lead to increased construction jobs and incomes because those effects would have occurred in both with (on the brownfield site) and without (on the greenfield site) project conditions.

It will be very difficult to identify project that would have developed on a greenfield site, instead of redeveloping on a remediated brownfield site (Scenario C). This evaluation process will attempt to collect data describing that scenario.

1.5 Key Performance Measures

This evaluation of the Brownfields Programs focused on key performance measurements and outcomes:

- Leveraging rates for other project-related funds, including federal, local, other state, and private investment;
- Temporary economic impacts of initial investments in site testing and remediation and subsequent private sector investments;

- Temporary economic impacts of construction of site improvements;
- Ongoing economic impacts of long-term/permanent jobs anticipated and actually created or retained upon project completion;
- Quality-of-jobs by wage rates and type, as indicated by the industrial sector;
- Positive neighborhood benefits, such as improvements in quality of life, increased property values, and secondary/induced investment in neighboring properties
- Indirect economic impacts—capture the relatively greater indirect economic impacts of investments in sectors that contribute to the regional economy.
- Reduced sprawl and urban infrastructure
- Green building and sustainability attributes;
- Fiscal impacts and fiscal cost-effectiveness, including changes in property taxes and incomes taxes for the local and state governments;
- Reduced risk to public health; and
- Contributions to social purpose and environmental justice objectives.

2. Overview of Oregon Brownfields Programs

This section of the appendix discusses the Cleanup programs administered by the Oregon Department of Environmental Quality (DEQ) and the public funding mechanisms.

2.1 Oregon Cleanup Programs-Administrative Pathways

The DEQ offers multiple programs to help advance the organization's efforts in environmental cleanup and site restoration. The Cleanup Program's administrative pathways allow property owners and government officials the flexibility to address cleanup based on site-specific criteria and the necessary level of agency oversight.[2]

The same standards apply to cleanup of contaminated sites under each of the different administrative programs. The programs provide private parties with a range of levels of state oversight and liability protection. All processes generally arrive at a "No Further Action" (NFA) determination, or equivalent, as a final outcome, either on its own or as part of a Prospective Purchaser Agreement (PPA).

While all of these programs share the common purpose of cleaning up and redeveloping brownfields, the methodology should also be sensitive to variations. For example, the Orphan Site program has an orientation to sites that represent "serious threats to human health or the

[2] There is an additional pathway, the Leaking Underground Storage Tank (LUST) program handles issues related to cleanup of soil and groundwater contamination from spills and releases from regulated underground storage tanks. Because the LUST program is administered separately from the State's brownfields and cleanup programs, we do not include it in this analysis.

environment," and therefore might sometimes be used on sites where there is no immediately anticipated redevelopment. Additionally, the PPA program does not involve any project subsidy, therefore there is no "leverage" and impacts must be treated differently than projects where there is a subsidy.

Table 2. Cleanup Program Administrative Pathways

Administrative Pathway	Types of Sites	Level of State Involvement
Site Response	Medium and High Priority / High Risk; typically an enforcement action against an uncooperative participant	DEQ provides oversight throughout the investigation and cleanup, and selects the remedial action.
Voluntary Cleanup Program	Low to High Risk; used for cooperative participants	DEQ provides oversight throughout the investigation and selects or approves the remedial action though a collaborative process.
Independent Cleanup Pathway	Low to Moderate Risk; optional process for limited protection on low-risk cleanups	A site owner can complete the investigation and cleanup independently, and request final approval from DEQ.
PPA	Low – Moderate Risk; typically necessary part of transaction	DEQ and Work Party Agree on Remedial Action and Schedule
Orphan Site Program	High Priority / Moderate – High Risk; used where owner/PLP is unable to pay for all cleanup-related costs	State Lead Cleanup

Site Response Program

The Site Response Program is an enforcement process that occurs when DEQ discovers a highly toxic site. In this scenario, DEQ compels the responsible party to take action (i.e., investigation and/or cleanup). Outside of the Site Response Program, participants interested in receiving DEQ oversight must decide between one of the Voluntary Cleanup Program pathways (discussed below).

The Site Response Program aims to address and expedite medium and high priority sites that may not otherwise be cleaned up. DEQ compels the responsible party to investigate these sites under an enforceable order or decree and may impose penalties for non-compliance. The agency continues to provide oversight throughout the investigation and cleanup process, and ultimately selects the appropriate remedial actions. The primary purpose of the program is to respond to those sites that pose the highest risk to public health and the local environment. The Site Response Program is required to cite enforcement actions for any site listed on the United State Environmental Protection Agency's National Priorities List (NPL) that is not currently being remediated through the Voluntary Cleanup Program (VCP).

For any identified site where there is no responsible party or the responsible party is unwilling or unable to pay for the investigation or cleanup activities, the site may be referred to DEQ's Orphan Sites Program.

Voluntary Cleanup and Independent Cleanup Pathways

Outside of the Site Response Program, participants interested in receiving DEQ oversight must decide between one of the Voluntary Cleanup Program pathways.

In the **Voluntary Cleanup Program (VCP)**, property owners willfully enroll. VCP sites may be of low, moderate, or high environmental priority. In this program, DEQ provides active oversight throughout the investigation and remediation through a collaborative process with the participant.

The **Independent Cleanup Pathway (ICP)** is a subset of all Voluntary Cleanup Program enrollees and is designed for property owners of low- to moderate- risk sites. The ICP is similar to the VCP program in that participants voluntarily enroll. However, DEQ provides little to no oversight in the ICP, thereby leaving the participant responsible for more liability and risk.

The Voluntary Cleanup Program was authorized by the 1991 Legislature in order to provide willing parties DEQ oversight while they investigate and, if necessary, clean up contamination from their properties. This cooperative process helps parties move through the process more efficiently, and meet sometimes tight funding and redevelopment deadlines. If DEQ determines that the chemicals of concern have been adequately characterized and restored to a level protective of human health and the environment, DEQ will issue a No Further Action (NFA) letter to the responsible party. NFAs are only issued after cleanup activities are completed, reviewed, and approved by a public comment process.

The Voluntary Cleanup Program is the most common administrative pathway for cleanup of brownfield properties. In 2010, DEQ reported that there were approximately 400 active Voluntary Cleanup Program sites, with approximately 300 sites following the traditional VCP, and approximately 100 in the Independent Cleanup Pathway program.

Prospective Purchaser Agreement

A Prospective Purchaser Agreement (PPA) is a legally binding agreement between the DEQ and a prospective purchaser or prospective lessee, which limits the purchaser's or lessee's liability under state law for environmental cleanup at the property in exchange for providing a "substantial public benefit" (ORS 465.327).

From the purchaser's perspective, the PPA is a tool to manage risk that provides certainty about the requirements for cleanup and protection from potential claims. With these protections, a purchaser can have greater certainty about cleanup costs and liability for past releases. PPAs can also satisfy lender concerns and make it easier for a project to obtain outside financing.

PPAs are a frequently used tool for promoting cleanup and redevelopment of brownfields in Oregon. Between 1995 and 2010, DEQ had negotiated 128 PPAs.[3]

Eligibility. The state places a number of requirements on a purchaser to allow them access to the protections provided by a PPA.

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[3] Landman, C. Oregon Department of Environmental Quality. Personal communication. May 25, 2011.

- Innocent Purchaser—The prospective purchaser must not be responsible for contaminating the property. This means they cannot have caused the contamination as an operator of a facility or the transporter of hazardous materials, or be responsible as an owner of the property.
- Future Use—The proposed future use of the property will not exacerbate the contamination or interfere with necessary cleanup actions.
- Significant Public Benefit—This factor is evaluated on a case-by-case basis, but typically involves:
  - Substantial new resources to facilitate cleanup;
  - Substantial environmental cleanup activities;
  - Productive reuse of a vacant or abandoned industrial or commercial facility; and
  - Development of the property by a public agency or nonprofit to addresses an important public purpose.

Legislative Enhancements to PPAs in 2011. Legislation effective January 1, 2012 protects "innocent purchasers" (i.e., persons not responsible for prior contamination at a site) from litigation by third parties. It also expands PPAs to include the release or spilling of oil (in addition to hazardous substances), and allows DEQ the option to streamline the process for PPAs by providing greater liability protection through administrative order rather than judicial decree.

Types of PPAs. The legislation described above has resulted in three different forms of PPAs: Administrative Agreement PPA, Consent Order PPA, and Consent Judgment PPA. The Administrative Agreement version is the simplest and quickest, but cannot provide third-party liability protection. The Consent Order and Consent Judgment versions do provide third-party protection, but both require a 30-day public notice and comment period. The fundamental difference between these two types is that a Consent Judgment is formally reviewed and executed in court while the Consent Order is accomplished administratively by the DEQ. Prospective purchasers decide which type to use based on their risk tolerance and schedule constraints.

Orphan Site Program

The Orphan Site Program addresses those sites that are contaminated by a release of hazardous substance and where there is no responsible party to pay for the necessary cleanup actions. In these cases, the parties responsible for contamination are unknown or unable to pay for the remedial actions. Sites where the business has either dissolved, has gone into bankruptcy, is no longer operational, or is too small to afford cleanup may be placed into the Orphan Sites Program. Sometimes, small business with inadequate financial resources may be responsible for only partial cleanup costs. Other times, it is simply impossible to identify a responsible property owner.

The program focuses first on emergency response sites that pose the greatest risk to human health and the environment. To ensure that contamination is contained, DEQ may choose to move forward with investigation and cleanup prior to the identification of a responsible party, retroactively seeking cost recovery after cleanup. Identified responsible parties may also chose to challenge the claim in court. In these situations, DEQ may proceed with the cleanup before a final decision is reached.

Sites are directed to the Orphan Sites Program through the Site Assessment Program, responsible for discovering, evaluating, and ranking sites and recommending further action. The program has two primary sources of funding. Landfill cleanups are addressed through the solid waste orphan site account, which is funded by the special assessment of solid waste disposal. Other sites, known as "industrial orphans," are funded through the sale of long-term bonds. The debt on bonds is paid for through state general funds and hazardous substance possession fees.

2.2 Declarations of Completion

No Further Action Designations

A No Further Action (NFA) designation represents a formal declaration from DEQ that the site has been restored to a level that no longer poses unacceptable risks to human health and the environment. Achieving a NFA means that property owners and developers can more confidently invest in their property and limits threats of future environmental regulatory measures. It is important to note that an NFA is not a legal settlement of liability.

The level of DEQ involvement throughout the remediation process is dependent upon the administrative pathway chosen. As stated, the VCP offers more agency oversight than the ICP. Additional DEQ oversight often results in a more time-intensive and costly process than an independent cleanup, but provides more certainty in the outcome of the project and a better chance of achieving an NFA.

During the 2010 fiscal year, DEQ issued NFA decisions at 51 sites. Since its inception in 1988, DEQ's Cleanup Program has made NFA decisions at 1,453 sites. This amounts to nearly one-third of all sites in the state's Environmental Cleanup Site Information (ECSI) database. Of these NFAs, approximately 787 were issued to sites within the VCP program, allowing far more NFAs than the Site Response Program could have completed alone.

However, NFA determinations may be rescinded or reopened under specific circumstances. In some instances, NFAs are issued on a conditional basis whereby the property owner must complete specific remediation efforts, engineering, and institutional controls as outlined by the NFA letter. If DEQ finds that these measures have not been successfully completed, the NFA may be revoked. Additionally, NFAs may specifically address individual contaminants and certify successful cleanup as it relates to those toxins mentioned by name in the NFA. If new hazards are discovered on-site, or advancements in scientific knowledge raise new concerns, DEQ may reopen the NFA and impose additional cleanup requirements. DEQ has stated they

are very careful with regards to "re-openers" though, and only occasionally reopens cases when there is clear evidence of a new risk to human health or the environment.

The DEQ has indicated that the VCP is designed to help participants reach their environmental goals for a site as quickly and inexpensively as possible. However, with proper notification to DEQ, participants have the option of withdrawing from VCP, and if this occurs, DEQ is unlikely to take any follow-up action unless it considers the site a high environmental priority.

While very small, some risks do exist for participants who willfully enroll into the VCP program. For example, should the participant decide to drop out of the VCP or not perform cleanup requirements within a reasonable timeframe, DEQ is likely to move it to the Site Response program if the agency considers the site of adequate priority.

Certification of Completion

Under the PPA process, the DEQ issues a Certification of Completion when the responsible party has conducted all of the cleanup (except post-closure maintenance and monitoring) specified in the PPA. This certification is more "robust" than an NFA, because the DEQ cannot compel the responsible party to conduct more investigation or cleanup if/when new information becomes available, except under narrow circumstances (e.g., the responsible party exacerbates the problem or creates a new one).

2.3 Public Funding Mechanisms-Direct Financing

This section summarizes the existing direct financing programs. Brownfield projects typically benefit from multiple sources of funding and financing, from both public and private sectors, which often are not specific to brownfield projects. The entire analysis of the economic impacts of brownfields programs focuses on these programs, along with the PPA.

A number of public grants and loans are available in Oregon through various federal, state, and local government agencies to help overcome financial obstacles associated with brownfield redevelopment. Successful brownfield projects often combine funding from a number of sources that are targeted for both cleanup and redevelopment. The following section provides a brief overview of the primary public funding sources for brownfield projects in Oregon. While these are identified as the primary funding sources, brownfield projects are often able to leverage funds from a variety of sources beyond those discussed in this appendix.

Oregon Business Development Department (OBDD)

OBDD, also known as Business Oregon, oversees two separate funding programs aimed at assisting the cleanup and redevelopment of brownfield sites: the Brownfield Redevelopment Fund (BRF) and the Oregon Coalition Brownfields Cleanup Fund (OCBC). The State Legislature established both funds ((ORS 285A.185 to 192); the BRF in 19997 and OCBC in 2005. Interest earned by the both the BRF and the OCBC is credited back to the individual funds. Money in the funds is continuously appropriated to OBDD for use in supporting brownfield projects.

Oregon Coalition Brownfield Cleanup—The OCBC program is funded through a cooperative agreement between the U.S. EPA and OBDD and managed through a revolving fund separate and distinct from the State General Fund. Business Oregon awards loans and grants for brownfield site cleanup, similar to a revolving loan fund, to local governments, nonprofits, public, and private entities as a 20% cost-share award in amounts up to $1 million.

Brownfield Redevelopment Fund—This fund provides for loans and grants for site assessment and cleanup projects in varying amounts to local governments, nonprofits, public, and private entities. Grants are less common and are awarded on a case-by-case basis depending on the applicant's financial situation. In order to receive funding, a project must demonstrate a contribution to economic development or community revitalization. Examples of public benefits that factor into the funding decision include family-wage job creation, assistance to rural or economically distressed communities or addressing an urgent need of a local population.

DEQ Site-Specific Assessments (SSA)

The Targeted Brownfield Assessment program (TBA) is a service provided through an EPA contract in which a contractor conducts "site-specific assessments" (SSA), an environmental assessment to address the requestor's needs. Unlike grants, EPA does not provide funding directly to the entity requesting the services, rather DEQ provides the SSAs through a Cooperative Agreement with EPA Region 10.

Typical eligibility requirements for applicants and properties apply. Environmental consultants already under contract with EPA conduct the assessment work. The value of these assessments is approximately $50,000. A SSA may encompass one or more of the following activities:

- An "all appropriate inquiry" assessment (Phase I), including a historical investigation and a preliminary site inspection;
- A more in-depth environmental site assessment (Phase II), including sampling activities to identify the types and concentrations of contaminants and the areas to be cleaned; and
- Evaluation of cleanup options and/or cost estimates based on future uses and redevelopment plans.

Orphan Site Program

The Orphan Site Program, discussed above in Section 2.1. Oregon Cleanup Programs-Administrative Pathways, addresses those sites where there is no responsible party to with the ability to pay for the necessary cleanup actions. The program has two primary sources of funding. Landfill cleanups are addressed through the solid waste orphan site account, which is funded by the special assessment of solid waste disposal. Other sites, known as "industrial orphans," are funded through the sale of long-term bonds. The debt on bonds is paid for through state general funds and hazardous substance possession fees.

2.4 Public Funding Mechanisms-Tax Programs

Tax incentives are financial tools that governments implement to encourage private investment to accomplish various economic and social objectives. The State of Oregon does not have tax incentives specifically targeted to brownfield cleanup and development, but there are several business tax credit and property tax abatement programs that may be applicable to certain brownfield projects. Tax incentives offer advantages to local governments by providing financial support to developers without directly taking money out of the current budget. Tax credit and exemption programs include the Oregon Investment Advantage and the Business Energy Tax Credit. The Enterprise Zone program provides tax abatement in targeted areas.

Oregon's property tax assessment framework includes a provision for reducing the assessed value of a property by the cost to cure environmental impacts. This valuation system has been used to reduce property taxes on some contaminated properties to nearly zero.

The Oregon Department of Revenue developed an administrative rule to provide a methodology for valuing contaminated property for the purpose of assessing property taxes (OAR 150-308.205-(E)). The rule defines a "contaminated site" as real property that is on the USEPA National Priority List (a Superfund site), in the DEQ inventory of confirmed releases, an illegal drug manufacturing site, or demonstrated to have had a release of hazardous substances. The rule requires that all three commonly used appraisal methods, the sales comparison approach, the cost approach, and the income approach, be used to determine real market value of a contaminated site. The property values derived from these methods are adjusted to account for a number of factors related to the contamination including:

- Cost to cure defined as "the discounted present value of the estimated after-tax cost of the remaining remedial work specific to the subject property to remove, contain, or treat the hazardous substance. Cost to cure may include the cost of environmental audits, surety bonds, insurance, monitoring costs, and engineering and legal fees. The costs must be directly related to the clean up or containment of a hazardous substance"
- Limitations on use of the property due to the contamination or governmental restrictions
- Fiscal implications such as the increased cost to insure or finance the property.

3. Preliminary Data Assessment

This evaluation measures the effects of the Brownfields Program projects across the state, in terms of economic development and social well being. The focus of the evaluation is 250 projects for improvements to redevelopment sites that were completed in the years 1994 and 2013. In this section, we summarize the data provided by the Oregon Business Development Department (OBDD) regarding the sites that have been assisted through four Oregon brownfields programs:

- The Orphan Sites Fund;
- Brownfield Redevelopment Fund/ OBDD;

- Site Specific Assessments (SSA)/Targeted Brownfields Site Assessments using US EPA funds; and
- Prospective Purchaser Agreements (PPA).

The aim of this analysis is to provide a preliminary summary of existing data maintained by OBDD. This data provides a baseline understanding of funding, ownership, and redevelopment status. The remainder of the research and analysis conducted throughout this project will expand our understanding of these projects.

3.1 General Characteristics of Sites

OBDD provided the ECONorthwest Team a database that comprised projects that received some kind of state assistance from 1994 to 2013.[4] The database showed that 250 projects have received state assistance in at least one of the four programs. The three programs that involve funding (all but the PPA) totaled $81.5 million in expenditures.

Table 3 summarizes the programs, the number sites assisted, and the funds expended. Of the 250 projects, 42% resulted in a PPA. The PPA is not a funding program, but instead limit's liability with the aim of incenting redevelopment of the site.

The data in Table 3 show that the Orphan Sites Fund accounts for 80% of the total program funds. This reflects the public health orientation of the Orphan Sites program and the lack of private funds.

Table 3. Brownfields Program Summary

Program	Number of Sites	Percent of all Sites	Funds Expended	Percent of All Funds	Mean Expenditure per Site	Median Expenditure per Site
PPA	106	42%	NA	NA	NA	NA
Orphan Fund	94	38%	$64,871,133	80%	$690,118	$200,260
OBDD Fund	54	22%	$15,025,867	18%	$278,257	$60,000
SSA	45	18%	$1,575,743	2%	$35,017	$26,733
Total	**250**	**100%**	**$81,472,743**	**100%**	**$325,891**	**$70,473**

Note: Some sites are double counted because they received funding from more than one state source.

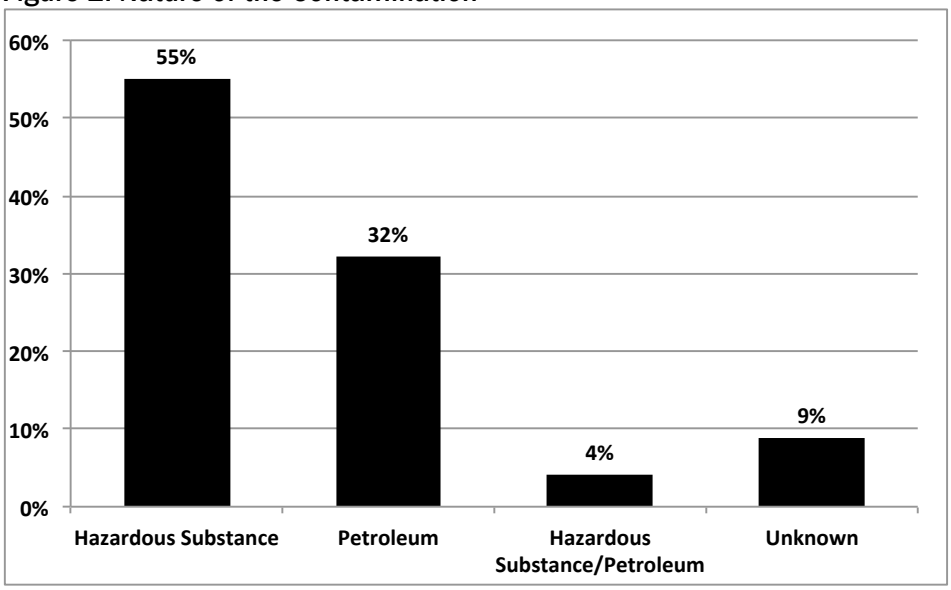
More than half of the sites (58%) received assistance in the form of both site assessment and cleanup. Only a few sites (3%) were assisted only in the cleanup category.

Figure 2 shows that hazardous substance sites comprise more than half of the sites in the four programs and petroleum sites make up about one-third of the sites.[5]

[4] The data are based on the identified PPA completion date.

[5] One site had no information in the field that described the nature of the contamination.

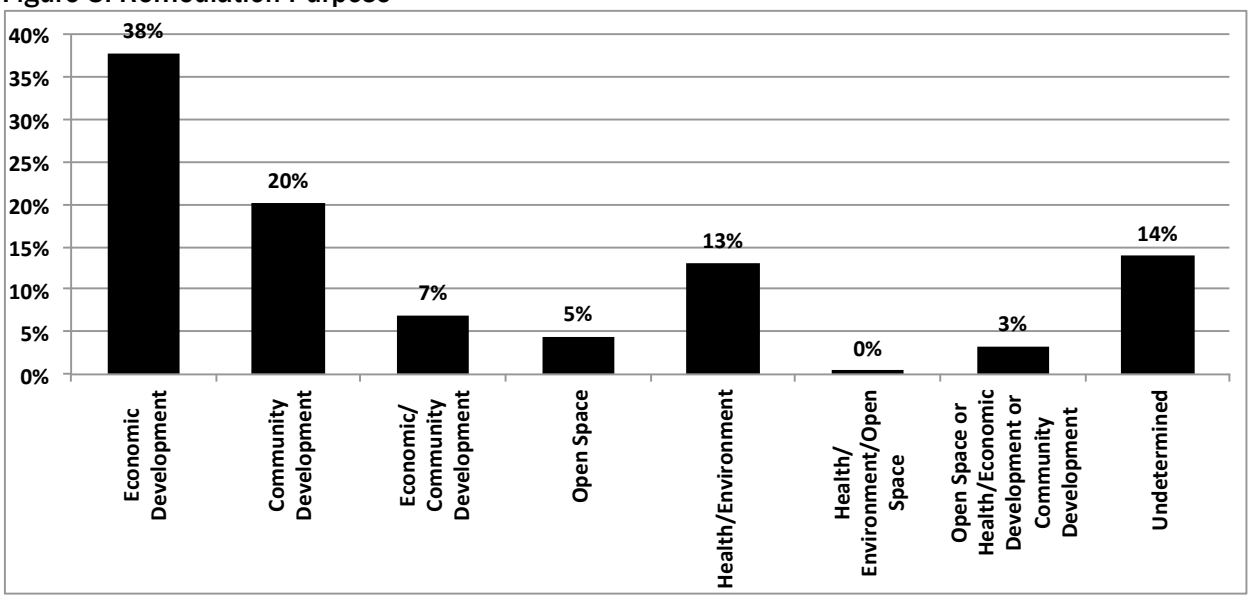
Figure 2. Nature of the Contamination



Source: OBDD database.

OBDD identified the purpose of remediation, shown in Figure 3. The most common remediation purpose was Economic Development, making up 38% of classified sites, followed by Community Development, at 20%.[6] Non-development projects (health, environment, and open space) constituted 18% percent of classified sites. The vast majority of the sites classified as "Health/Environment" received funds from the Orphan Site program (31 of the 36 total sites). This public health emphasis reflects the statutory purpose of the Orphan Site program.

Figure 3. Remediation Purpose

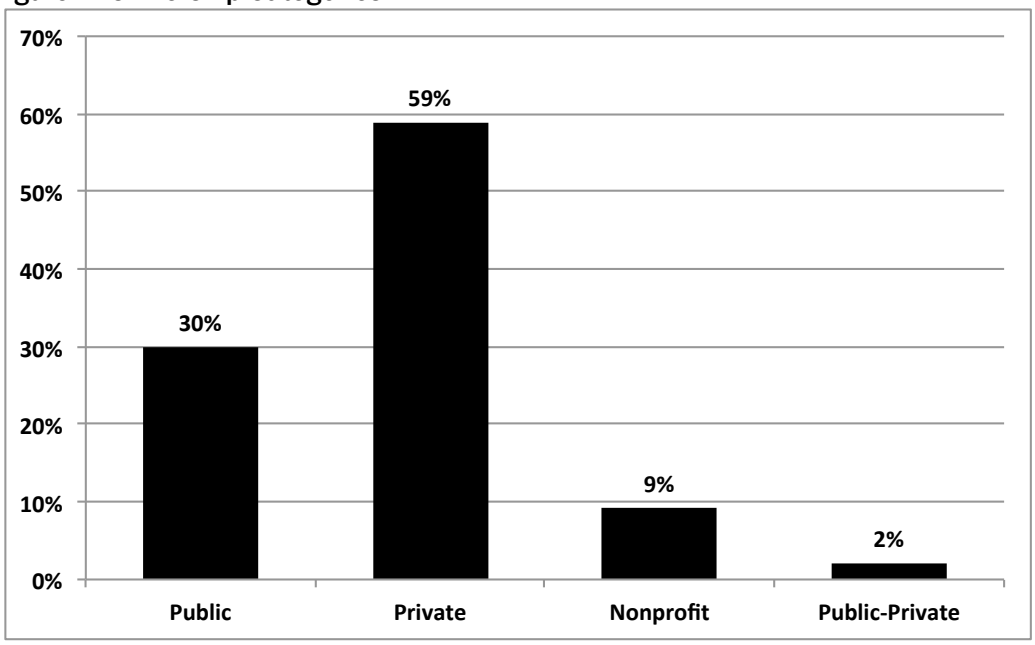


Source: OBDD database.

[6] Of the 250 sites in the database, six lacked a redevelopment types.

Privately owned sites outnumber publicly owned sites by a two-to-one margin; nonprofit sites amount to 9% of assisted sites. Only a very small portion (2%) of the sites was a public-private partnership (see Figure 4).[7]

Figure 4. Ownership Categories

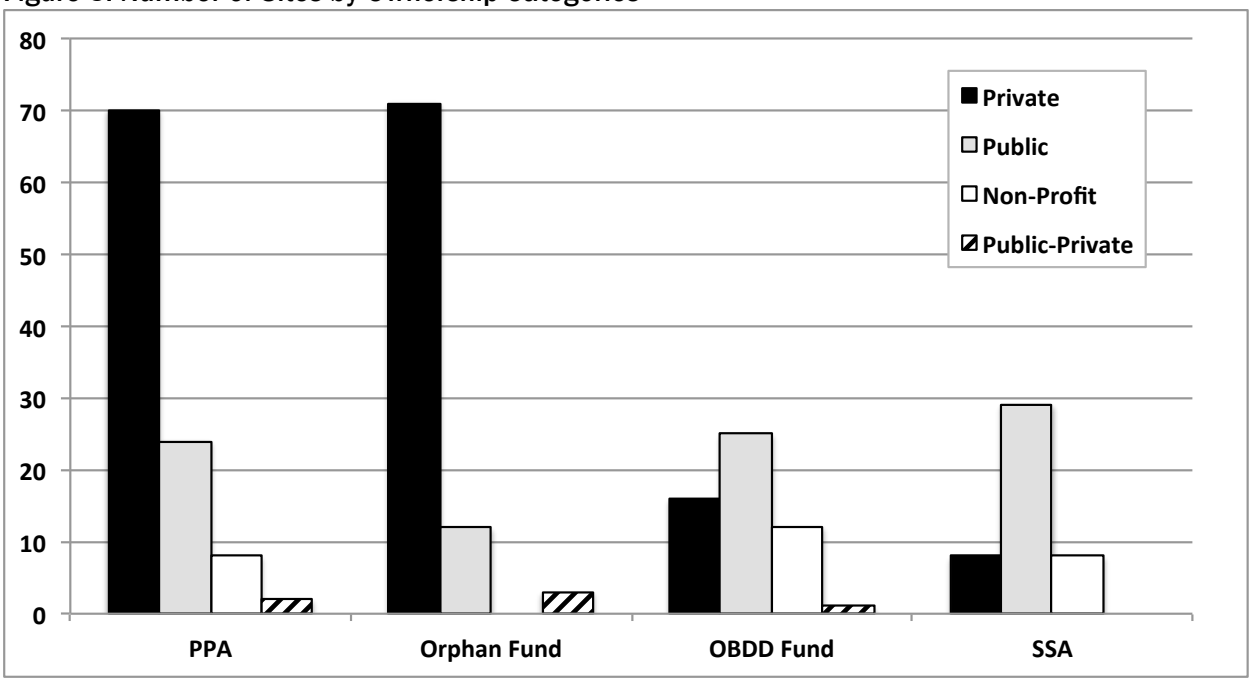


Source: OBDD database.

By running cross-tabulations, the ECONorthwest Team found that the four programs are strongly differentiated in the degree to which they assist public vs. private sites. The Orphan Site and PPA programs are strongly oriented to private sites; whereas, OBDD and SSA programs tend to assist publicly owned sites.

[7] Of the 250 sites in the database, nine lacked ownership data.

Figure 5. Number of Sites by Ownership Categories



Source: OBDD database.

Geographically, the sites assisted are very spread out. Table 4 shows the number of projects in each county. Every county in Oregon, with the exception of Sherman County, has benefited from at least one assisted project, and all but six of those counties have had more than one project. Multnomah County is the only jurisdiction that accounts for more than 10% of assisted sites, coming in at 56 sites assisted, which is 22% of all sites.

Table 4. Geographic Distribution of Projects, by County

County	Number of Projects	% of Total Projects
Baker	4	2%
Benton	9	4%
Clackamas	19	8%
Clatsop	4	2%
Columbia	8	3%
Coos	5	2%
Crook	5	2%
Curry	1	0%
Deschutes	6	2%
Douglas	8	3%
Gilliam	2	1%
Grant	1	0%
Harney	3	1%
Hood River	1	0%
Jackson	5	2%
Jefferson	1	0%
Josephine	3	1%
Klamath	8	3%
Lake	3	1%
Lane	13	5%
Lincoln	4	2%
Linn	11	4%
Malheur	9	4%
Marion	8	3%
Morrow	1	0%
Multnomah	56	22%
Polk	2	1%
Tillamook	7	3%
Umatilla	10	4%
Union	5	2%
Wallowa	2	1%
Wasco	5	2%
Washington	13	5%
Wheeler	1	0%
Yamhill	7	3%

Source: OBDD database.

3.2 Preliminary Assessment of Redevelopment

The ECONorthwest Team reviewed the database provided by OBDD to provide a preliminary assessment of the redevelopment status of the 250 projects. The summary is inherently preliminary, further research will enhance the information about the sites' redevelopment status. Table 5 shows the preliminary summary of the projects' redevelopment status.

Table 5. Summary of Redevelopment Status

	Number	Percent of All Sites	Percent of Redeveloped Sites
REDEVELOPED			
Industrial	35	14%	43%
Residential	8	3%	10%
Retail	13	5%	16%
Office/ Institutional	12	5%	15%
Mixed use	4	2%	5%
Park/Habitat/Open space	10	4%	12%
Total-Redeveloped	**82**	**33%**	**100%**
NO KNOWN REDEVELOPMENT			
Planned	30	12%	
Unclear/TBD	69	28%	
Existing Business Retained	6	2%	
No Reuse/ Vacant	59	24%	
Endangered	4	2%	
Total-No Known Redevelopme	**168**	**67%**	

Note: Some sites are double counted because they received funding from more than one state source.

- At least 82 sites (33% of all assisted sites) have been redeveloped (including those under construction).
- Industrial re-use was the most frequently cited redevelopment: 35 sites (or 43 % of all redeveloped sites) were classified as industrial use. No other use category accounted for more than 13 sites. Only four sites were classified as mixed use.
- Of the four programs, the PPA program has the highest rate leading to redevelopment, almost 50% of sites assisted with a PPA is completed or under construction. The Orphan Sites and SSA programs have re-use rates that are much lower: 19% and 20%, respectively. The likely reasons for the lower re-use rates in these two programs are:
  - The Orphan Site program has a strong orientation to sites that pose a "serious threat to human health or the environment;" "likelihood or feasibility of redevelopment" is not a criterion for entry into the program;
  - The SSA program has a strong orientation to publicly owned sites (see Figure 5, and publicly-owned sites are generally more difficult to redevelop.

Table 6. Summary of Redevelopment Status by Program

	Redeveloped Sites				Total Sites Assisted	Redeveloped sites as % of Sites Assisted
	Industrial	Non-Industrial	Park/Habitat	Total Sites		
PPA	21	23	6	50	106	47%
Orphan Fund	6	12	0	18	94	19%
OBDD Fund	12	5	2	19	54	35%
SSA	2	4	3	9	45	20%
Total	**41**	**44**	**11**	**96**	**299**	**32%**

Note: Some sites are double counted because they received funding from more than one state source.

The ECONorthwest Team identified a subset of projects we call "Iconic Projects," those projects that merit particular attention for their re-use activity. The preliminary list of these projects includes the following.

- Reynolds Metals, Port of Portland – FedEX Ground re-use with 440,000 square feet of new space and 550 jobs.
- Triangle Park, Portland – The site, although just a gas station, is facilitating a much larger University of Portland expansion.
- Pearl Court, Portland – A mixed-use sustainable redevelopment.
- International Terminal, Port of Newport.
- Consumer's Power, Corvallis – Triple C Plaza development site (154,000 square foot new shopping center). There has been a long history of redevelopment attempts on property.
- Birtcher Business Park, Fairview – The project won several sustainability awards.
- Coe Manufacturing Co, Tigard – A new steel fabricating operation.

3.3 Implications for the Impact Analysis

Preliminary indications are that Oregon's record for brownfields re-use leans much heavier to the industrial side than many studies have found in other parts of the country.[8] The implications of this finding, if it holds through the survey of sites, is that the impact study should concentrate on job and economic base benefits of brownfields investments; smart growth benefits might be de-emphasized.

It will also be important to capture and quantify the public health benefits of site remediation projects that are carried out to protect public health and environment and have little or no relationship to redevelopment.

[8] For example, a 2006 study of 50 brownfields projects in Missouri found that mixed use, office, retail, and residential uses all ranked slightly higher than industrial re-use. (Source: Files were made available to the author from the Missouri Department of Environmental Quality).

4. Data Collection Methods

The full analysis of the economic impacts of the brownfields programs will be based on three sets of data:

- OBDD and DEQ data;
- Project Survey; and
- Case studies.

This section describes our proposed methods for data collection.

4.1 OBDD and DEQ Data

The OBDD and DEQ data provide information to develop summary descriptions, funding sources, and contact information for each project. The evaluation included two segments of OBDD and DEQ data

Summary Database

OBDD and DEQ provided key data from the summary database to: identify each project, summarize project costs, and supply summary descriptions. See Section 3, Preliminary Data Assessment for a summary description of the database.

Contact List

OBDD will provide ECONorthwest with the most up-to-date list of contacts for each of the 250 projects (name, title, organization, physical address, mailing address if different than the physical address, phone number, fax and email address). The updated contact list is critical for disseminating the survey, and arranging to conduct the case studies. In the cases where we can not contact a project manager/developer or can not receive answers to the economic questions that are central to this evaluation effort, the consultant team will attempt to reach at least one public or private sector representative, preferably among the following: (1) local public official familiar with economic development, (2) chamber of commerce or business organization, or (3) directly affected business (if applicable).

4.2 Project Survey

The project survey will measure outcomes of the Brownfields Program projects. As such, the survey complements, but did not duplicate, data available from OBDD.

The ECONorthwest Team staff will develop an impact survey, which we will send to all 250 project applicants. The preliminary draft of the survey is shown in the appendix to this document. The surveys will request that respondents return the survey to ECONorthwest by mail or via the internet. We will ask the lead contacts of the projects selected for case studies to review and hand-in their surveys during site visits with the consultant team.

Survey Data

The survey's basic purpose is to determine the outcomes of projects supported by the Brownfields Program and to gather information about the key measures listed in Section 1.5, Key Performance Measures.

The survey will also include a component soliciting suggestions and comments regarding OBDD and DEQ services. We will summarize the information we glean from this section in a separate memorandum to OBDD.

Logistics of Disseminating and Retrieving Surveys

The survey will be prepared and distributed both through US Mail and email. To maximize the response rate, respondents will be able to use either the mailed paper copy or an on-line version.

There are seven steps for disseminating the survey to project contacts and retrieving survey data.

1. **Identify contact.** OBDD lacks contact information for a large number of sites, particularly those that received funding from the Orphan Sites program. The ECONorthwest Team will identify the City, County, and Port (if applicable) jurisdiction for each of the sites that lack any contact information. We will contact staff in the respective Assessment and Taxation departments to determine if there is a known owner of the site.

   If the property lacks an identified owner, we will contact staff in the respective Planning and Development departments and Economic Development departments to determine the status of the sites. We will reach out to staff that have familiarity with the sites and can report to us if the site has been redeveloped in any way. We will also visit any sites that are reasonable close to sites visited during the site visit element of the study.

2. **Prepare cover letter.** In consultation with OBDD, the consultant team will prepare three cover letters. The first will come from OBDD, signed by an OBDD official, on Department stationary and mailed in a Department envelope. It will notify recipients that a survey would arrive within a week regarding these projects, introduce the consultant team, and ask recipients to respond. The remaining two cover letters will accompany the survey itself, one to the 250 project contacts not selected for a case study and the other to the eight contacts whose projects are selected for case study. All envelopes and letters will be individualized with a mail merge. All three letters described the evaluation will ask for cooperation, and explain the importance of completing the survey. The letters will include contact information for staff at OBDD and ECONorthwest, should recipients have questions. Additional aspects of the letters are described below:

   a. The cover letter will be both emailed and sent in hard copy form. The e-mailed version will lead to the on-line survey.

b. The cover letter to the project contacts that were not selected for case studies will ask applicants to fill out the survey, and mail it or fax it back to ECONorthwest or complete the on-line verion. The letter will establish a response date at one-week from the mailing, and project contacts will be offered the opportunity to telephone ECONorthwest and complete the survey over the phone. The letter will include ECONorthwest's telephone number, address, and fax number and staff contact information. We will include a stamped envelope addressed to ECONorthwest with the survey.

c. The cover letter to the contacts of the eight case study projects will tell the project contacts to expect a phone call from ECONorthwest to schedule a site visit and to prepare the survey response in advance of the site visit, when it will be collected and reviewed as part of the interview process.

3. **Individualize surveys.** The consultant team will fill in basic project information before mailing, including: project name, project number, organization of the project proponent, type of project, funding source and amount, and a brief project description.

4. **Mail and email 250 surveys.** The packet will include a cover letter, stamped envelope addressed to ECONorthwest, as well as the survey. We will print the first page of the survey on OBDD stationary. The email will include a link to an on-line version of the survey.

5. **Follow-up.** Three days after responses are due for the mail surveys, the consultant team will phone contacts that have not yet responded and offer to take information over the telephone. The consultant team will make every reasonable effort to secure a 75% response rate, including re-mailing or emailing the surveys. Additional OBDD efforts may be requested to solicit responses from the "last hold outs," such as phone calls, or additional letters/reminder post cards prepared by the consultant team.

6. **Data entry.** The consultant team will enter survey data and merge these findings with the initial project data supplied by OBDD.

7. **Estimates.** Partial responses should be anticipated and analysts may need to use industry averages and rules of thumb to estimate certain impacts. For example, capital investment represented by a project can be derived from square footage, type of construction, and an industry average cost-per-square-foot.

The survey instrument is included in the Appendix of this document.

4.3 Case Studies

In-depth case studies provide essential documentation of the nature of projects, including direct economic effects and indirect effects beyond the ability to collect data through surveys. Moreover, these case studies balance the results reported by project proponents and

observations by local business and other government interests. The combination of site visits and surveys allow us to present both quantitative and qualitative program impacts.

The ECONorthwest Team will identify eight representative projects for site visits based on the thorough review of OBDD data described earlier in this chapter. After approval by the OBDD staff, we will finalize the list of projects for site visits and finalize the schedule for conducting them.

Project Selection

ECONorthwest will propose a selection of eight projects for case studies to OBDD after reviewing the 250 case files and finalizing the project data set. The projects selected for case studies are similar, though not identical, to the characteristics of the full set of 250 Brownfields Program projects being evaluated, balancing the type of project, the geographic distribution, and the project scale.

There are two approaches to selecting projects. One option is to select a random, representative sample; a second option is to identify a list of 'iconic projects' that exemplify the Brownfields program. Both approaches have advantages and disadvantages. A random sample allows the researchers to extend the results of the case studies of the full set of 250 projects, while a set of iconic projects allows the researches to provide detailed insight into projects that OBDD may have particular interest in, and hopes to learn specific lessons from.

The ECONorthwest Team recommends using a blended approach. The full set of projects is reasonably large, at 250. The survey should provide robust data to describe the Brownfields program. The case studies will provide different information—detailed insights into individual projects. By identifying iconic projects across a distribution of project type, geography, and scale, the case studies will allow the researchers to gain insights into a diverse group of projects that will enhance OBDD's understanding of successful, exemplary projects.

Based on prior experience with evaluations, we anticipate that we will need substitutions for one or more of the projects initially selected for case study. It would not be surprising to find that one or more projects cannot be examined in-depth due to staff turnover and insufficient availability of key community informants.

Types of projects. ECONorthwest will consult with OBDD as to the most useful way to categorize and group sites for analytical purposes. The categories are described in Section 3, Preliminary Data Assessment, and could include:

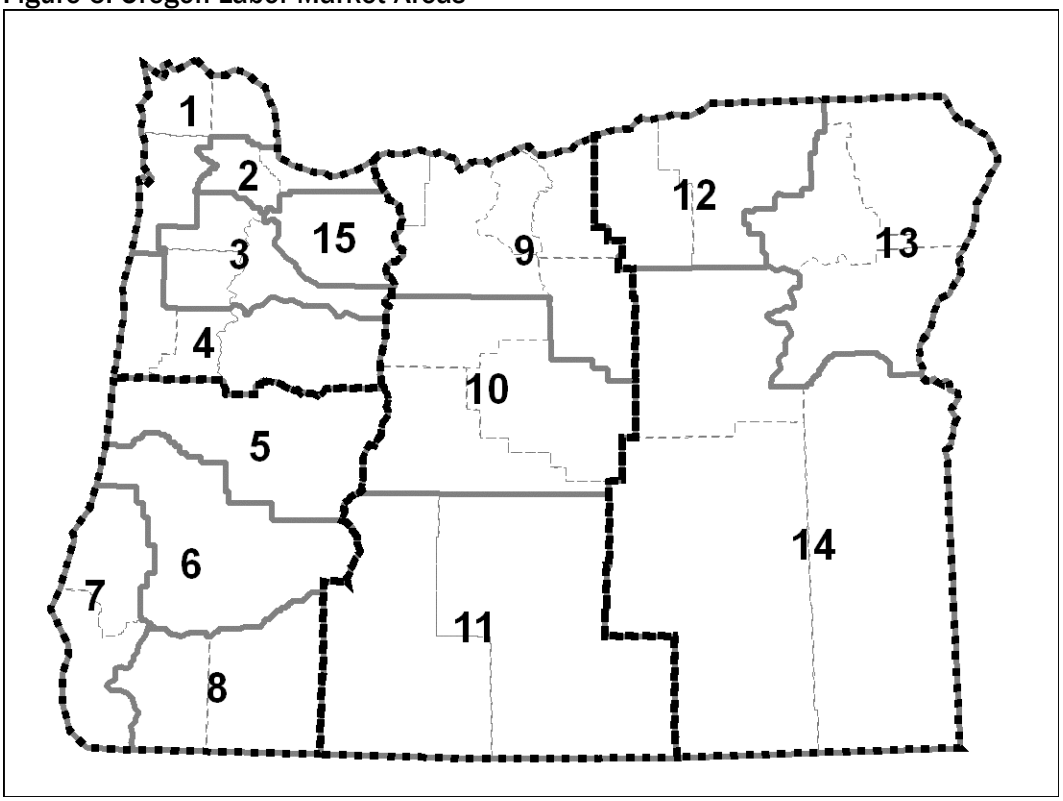
- By program and nature of the assistance;
- By the re-use category, such as industrial, commercial, residential, mixed use;
- By public purpose objective, such as economic development, community development, or open space;
- By public vs. private development entities; and

- By urban, suburban, and rural sites.

Geographical distribution. To assure that the case study sample represented a similar geographical distribution as seen for the 250 projects, we will select the eight case study projects from regions based on the 15 labor market regions administered by the Oregon Employment Department. We consolidated these 15 labor market regions into four larger areas for the purpose of selecting case studies.

Figure 6 is a map of the 15 OLMIS Labor Market Areas by county. The map also shows the numbered OLMIS regions and the four consolidated regions: Northwest, Southwest, Central, and East.

Figure 6. Oregon Labor Market Areas



Source: ECONorthwest

Table 7 shows the geographic distribution of the 250 projects across the four regions. The majority of the projects were in the Northwest region, where the bulk of Oregon's population lives.

Table 7. Geographic Distribution of Projects, by Region

Region	Number of Projects	% of Total Projects
Northwest	148	59%
Southwest	35	14%
Central	32	13%
East	35	14%

Source: OBDD database.

The ECONorthwest Team recommends selecting case studies that include at least one project from each of the four consolidated regions.

Project scale. Total investment by OBDD for the projects amounted to $81.5 million, with a mean average of $326,000 and a median value of $70,000. The ECONorthwest Team recommends selected case studies that include projects that include a range of public investment, from the low end to the high end of the range.

Field Work and Findings

The field work will consist of collecting survey data and conducting interviews. We will collect background information from the project files as well as through baseline economic assessments of project target areas and counties. Findings include quantitative and qualitative project impacts and "but-for" analyses.

Survey. The survey data will be collected on-site during field visits with each of the eight OBDD grant and/or loan recipients.

Interviews. Two to four on-site interviews will be conducted for each project. In addition to representatives of the funding recipients, interviews were conducted most often with (other) local or county development staff, local government and civic leadership and private sector representatives. The consultant team will develop formal interview guides and interview procedures so that the qualitative and quantitative data collected from the interviews can be compared within and across projects. The guide will be submitted to OBDD for review before we enter the field. The interviews and analyses of the results will provide essential in-depth documentation of the nature of the projects and their direct and indirect economic effects. Results will be attributed to the other projects as practicable.

Substitution of Case Study Projects

As we discussed, we will propose the set of eight case studies to consider the following factors:

- Type of project (industrial and commercial sites, water/sewer, transportation and port);
- Geographical distribution across Oregon; and
- Scale of OBDD investment

We organized each of the 250 projects according to these factors and select the case studies to best reflect the overall composition of all 250 projects under evaluation. Should one or more of the selected projects not be feasible to pursue as a case study, another project would be selected on the basis of "best fit" as the replacements for projects that are removed, if any. The selection of substitute projects would be guided by maintaining the closest fit possible of the set of eight case studies to the overall characteristics of the 250 projects. We would review reasons to remove a project from the case study list with OBDD staff and would propose substitutions for OBDD approval.

4.4 Final Project Database

The final Project Database will provide a cohesive set of project data. The project database will be the accumulation of research conducted throughout the project.