PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

Farm Storage Facility Loan Program

United States Department of Agriculture

Farm Service Agency

Final
June 2009

COVER PAGE

Proposed Action:

The United States Department of Agriculture (USDA) and the Commodity Credit Corporation (CCC) have agreed to implement changes to the Farm Storage Facility Loan (FSFL) Program enacted by Section 1614 of the Food, Conservation, and Energy Act of 2008 (2008 Farm Bill). The Farm Service Agency (FSA) administers the FSFL Program on behalf of the CCC. It stipulates increases to the maximum term of a farm storage facility loan and the maximum loan amount, identifies additional commodities (other than sugar) eligible for on-farm storage, clarifies the required loan security, allows for partial disbursement of loans, and no longer requires a severance agreement if certain conditions are met. In addition, the 2008 Farm Bill gives the Secretary of Agriculture discretionary authority to determine other eligible commodities. The USDA proposes to make fruits and vegetables requiring cold storage commodities eligible for the FSFL Program.

Type of Document: Final Programmatic Environmental Assessment

Lead Agency: Farm Service Agency (on behalf of CCC)

Sponsoring Agency: Farm Service Agency

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Comments:

This Final Programmatic Environmental Assessment was prepared in accordance with the USDA Farm Service Agency National Environmental Policy Act implementation procedures found in 7 Code of Federal Regulations 799, as well as the National Environmental Policy Act of 1969, Public Law 91-190, 42 USC 4321-4347, 1 January 1970, as amended.

The FSA will provide a public review and comment period prior to any final decision. An electronic copy of this Final Programmatic Environmental Assessment will be available for review at:
www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=landing
Or at:
http://public.geo-marine.com.

Mailed written comments regarding this assessment shall be submitted to:

FSFL Program PEA Comments
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Or emailed to: FSFLPEA@geo-marine.com
Or made online at: http://public.geo-marine.com.

EXECUTIVE SUMMARY

BACKGROUND

The United States Department of Agriculture (USDA) Commodity Credit Corporation (CCC) proposes to implement changes to provisions of the Farm Storage Facility Loan (FSFL) Program enacted by Section 1614 of the Food, Conservation and Energy Act of 2008 (2008 Farm Bill). This legislation, which was passed into law on June 18, 2008, creates the FSFL Program and reauthorizes program loans through September 30, 2012. It stipulates increases to the maximum term of a farm storage facility loan and the maximum loan amount, identifies additional commodities (other than sugar) eligible for storage, clarifies the required loan security, allows for partial disbursement of loans, and no longer requires a severance agreement if certain conditions are met. In addition, the 2008 Farm Bill gives the Secretary discretionary authority to determine other eligible commodities.

The FSFL Program is administered by the Farm Service Agency (FSA) on behalf of the CCC. This Programmatic Environmental Assessment (PEA) is being prepared by FSA to examine the potential environmental consequences associated with implementation of the new FSFL Program provisions of the 2008 Farm Bill.

PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to promulgate regulations to implement changes to the FSFL Program as provided for in Section 1614 of the 2008 Farm Bill. The need for the Proposed Action is to fulfill the CCC Charter Act (15 U.S.C. 714, et seq.) and FSA's responsibility as assigned the Secretary of Agriculture (hereinafter Secretary) to administer the provisions of the 2008 Farm Bill.

PROPOSED ACTION AND ALTERNATIVES

The Proposed Action is to implement changes to the FSFL Program as enacted by Congress in the in the 2008 Farm Bill. These changes include:

- Adding hay and renewable biomass as eligible FSFL commodities and their appropriate storage structure facility.
- Extending the maximum loan term to 12 years.
- Increasing the maximum loan amount to $500,000.
- Allowance for one partial loan disbursement and the final disbursement.
- Clarification of the loan security requirements and allowing the borrower the option to increase the down payment on a loan whereby not requiring a severance agreement from the holder of any prior lien on the real estate where the storage facility is located.
- Provision to the Secretary discretionary authority to determine other eligible commodities such as the addition of vegetables and fruits as eligible commodities that require cold storage facilities.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

No significant impacts to environmental resources associated with the implementation of the Proposed Action are expected. A summary of the potential impacts of the Proposed Action and the No Action alternative is presented in Table ES-1.

Table ES-1. Summary of Environmental Consequences

Resources	Proposed Action Alternative	No Action (Current Program)
Biological Resources *vegetation, wildlife, and protected species*	Long-term adverse impacts to vegetation associated with building construction are expected to be minor and limited to destruction of existing vegetation at the construction site. Potential short-term adverse effects to biological resources are associated with site preparation/construction of storage structures. These include potential increased soil erosion which could lead to vegetative loss and noise associated with machinery that may disturb wildlife. However, the effects are temporary and localized and minimized by use of Best Management Practices (BMPs) to reduce soil erosion. Site-specific environmental evaluations would be conducted prior to construction to identify any unique vegetative characteristics or wildlife requiring protection. If a site-specific environmental evaluation determines the potential presence of threatened or endangered species and their critical habitat in the construction area, consultation with U.S. Fish and Wildlife Service (USFWS) would occur prior to implementation of the practices to protect these resources. No significant negative impacts to biological resources would result from implementation of the Proposed Action.	The impacts of the current FSFL Program on biological resources are the same as those outlined for the Proposed Action. Protected species and/or their critical habitat that occur or have the potential to occur would be protected through informal consultation with the U.S. Fish and Wildlife Service during the site-specific evaluation. No significant impacts to biological resources are expected from the No Action alternative.

Table ES-1. Summary of Environmental Consequences (cont'd.)

Resources	Proposed Action Alternative	No Action (Current Program)
Water Resources *surface water, groundwater, and floodplains*	No significant impacts to water resources are expected from implementation of the Proposed Action Under the Proposed Action Alternative, the FSFL Program has potential to generate impacts to water resources due to ground disturbing activities associated with the construction of new buildings or structures or the alteration of existing buildings or structures. Ground disturbing activities have the potential to increase erosion and runoff leading to increased sedimentation of nearby waters. Impacts to water resources would be localized and cease with the conclusion of land preparation and/or construction activities and would not be significant. The use of BMPs such as silt fencing, erosion control blankets, and not operating heavy machinery under wet conditions would minimize any impacts.	Impacts to water resources under the No Action Alternative are the same as those outlined for the Proposed Action Alternative. Depending on the size and location of the project area, a Storm Water Pollution Prevention Plan (SWPPP) may be required; however, for areas less than one acre the use of BMPs would minimize these impacts. No significant impacts to water resources are expected from the No Action alternative.
Soils	Impacts from implementation of the Proposed Action on soil resources are not expected to be significant. Long-term adverse effects to soil are expected to be minor and are associated with site preparation for storage facility construction. Short- term, localized disturbance to soils during implementation of the FSFL Program could include ground disturbing activities such as grading, leveling, and associated installation of storage structures. These activities may result in temporary minor increases in wind and water soil erosion on the construction site and the immediate surrounding	The FSFL Program would continue to be implemented as currently administered. Impacts to soil resources under the No Action Alternative are the same as those outlined for the Proposed Action Alternative. Depending on the size and location of the project area, a SWPPP may be required thereby mitigating potential impacts to soil resources from stormwater discharge. For project areas less than one acre, the use of BMPs would minimize potential impacts to soil resources.

Table ES-1. Summary of Environmental Consequences (cont'd.)

Resources	Proposed Action Alternative	No Action (Current Program)
Soils (cont'd.)	area and sedimentation of adjacent waterbodies. Impacts may be minimized or eliminated through implementation of a SWPPP and/or BMPs such as installation of silt and erosion fencing, stockpiling topsoil, and not using heavy machinery under wet soil conditions	
Cultural Resources	Potential impacts to historic properties include the destruction of both previously identified and unrecorded archaeological sites due to construction of the facility and land clearing activities; alterations to historic buildings and structures due to modification; directly destroying or limiting access to Traditional Cultural Properties, and adverse effects to historic farmsteads or landscapes due to the construction of new buildings or structures or the alteration of existing buildings or structures. Prior to any ground disturbing activity, a site specific environmental evaluation in accordance with FSA-850 Environmental Evaluation procedures would determine the potential for historic properties to be present in the proposed storage construction area. In accordance with7 CFR §1436.17, no proposed FSFL action can be approved that has been determined to have significant adverse impacts to historic properties listed or eligible for listing on the National Register of Historic Places. Consultation with the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) would ensure measures to avoid or minimize impacts to historic properties are taken.	Impacts to cultural resources under the No Action Alternative are the same as those outlined for the Proposed Action Alternative. Site specific environmental evaluation would be completed in accordance with 1-EQ (Revision 2) in consultation with SHPO/THPO and would take into account the effects of the FSFL Program on historic properties eligible for the National Register of Historic Places. No significant negative impacts to cultural resources are expected.

Table ES-1. Summary of Environmental Consequences (cont'd.)

Resources	Proposed Action Alternative	No Action (Current Program)
Socioeconomic	Long-term socioeconomic and positive societal benefits are expected from implementation of the Proposed Action Alternative. The proposed increase in loan terms and total amount of loans authorized increase the ability of producers to effectively manage their crop production and provides more flexibility in selling crops at the right time to maximize their value. The general changes to the program would allow for the construction of more storage capacity or the inclusion of additional fundamental components necessary for the full optimization of the storage facilities (i.e., handling and drying equipment) that may not have been available given the previous loan cap. No longer requiring severance agreements under certain conditions and allowing use of subparcels where the storage facility is proposed as collateral makes it easier for beginning or socially disadvantaged farmers to obtain on-farm storage facilities. Inclusion of hay and biomass expands the benefits of the program to foster new developments such as biomass energy generation or allow for more efficient marketing and distribution of non-traditionally stored crops. The addition of fruits and vegetables and their required cold storage facilities extends the season such commodities may be marketed, increases crop preservation, and improves year round cash flow for producers, especially helpful to specialty and market farmers. Potential negative impacts include increased competition with	The No Action alternative could produce minor, negative socioeconomic effects to a portion of the population in that those producers currently not eligible under the program (i.e., hay, biomass, and small fruit and vegetable producers requiring on-farm cold storage options) would not benefit. However, these effects are minor, limited to specific sites and a small population of producers.

Table ES-1. Summary of Environmental Consequences (cont'd.)

Resources	Proposed Action Alternative	No Action (Current Program)
Socioeconomic (cont'd.)	commercial, off-farm storage facilities at the regional level. However, FSFL is not a lender of last resort, and producers can find other sources of credit to construct on-farm storage facilities. National trends are for economies of scale and integration of processing steps provide producers greater opportunities to achieve more value for their crops. Short-term fluctuations in local employment opportunities may occur as part of this process. Commercial storage enterprises will continue to have functions for producers in the long-term after equilibrium is reached where on-farm storage capacity demand has been met and the return on investment to construct new or expand existing facilities would be zero or negative. This program is highly site specific and is unlikely to generate significant changes to the construction or storage facility fabricators or component fabricators based on past use statistics.	
Human Health and Safety	No significant negative impacts to human health and safety would result from implementation of the Proposed Action Alternative. Certain safety structures and equipment required by CCC are eligible for FSFL Program funding, such as ladders on grain silos. Compliance with applicable OSHA regulations and laws, regulations, procedures and guidelines governing hazardous substance use ensures no significant negative impacts to human health or safety would occur from construction of new storage facility types for newly eligible hay, biomass, and fruits and vegetable commodities.	Impacts similar to those presented for the Proposed Action are expected from continued implementation of the FSFL Program as currently administered. No significant negative impacts to human health or safety are expected from the current FSFL Program if existing laws, regulations, procedures, and guidelines are followed that protect human health and safety.

TABLE OF CONTENTS

Page

FIGURES

Page

TABLES

Page

ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-Containing Materials
ATSDR	Agency for Toxic Substances and Disease Registry
ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
BCAP	Biomass Crop Assistance Program
BMPs	Best Management Practices
CAA	Clean Air Act
CCC	Commodity Credit Corporation
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFCs	Chlorofluorocarbons
CFR	Code of Federal Regulations
CRIA	Civil Rights Impact Analysis
CSREES	Cooperative State Research, Education, and Extension Service
CWA	Clean Water Act
CZMP	Costal Zone Management Plan
EA	Environmental Assessment
EI	Erodibility Index
EPCRA	Emergency Planning and Community Right-to-Know Act
EO	Executive Order
EPA	Environmental Protection Agency
1-EQ	FSA Handbook: Environmental Quality Programs for State and County Offices
2-EQ	FSA Handbook: Environmental Risk Management for State and County Offices
1-FSFL	FSA Handbook: Farm Storage Facility Loan Program for State and County Offices
ERS	Economic Research Service
ESA	Endangered Species Act
2008 Farm Bill	Food, Conservation, and Energy Act of 2008
FEMA	Federal Emergency Management Agency
FSA	Farm Service Agency

FSFL	Farm Storage Facility Loan
HCFCs	Hydrochlorofluorocarbons
HEL	Highly Erodible Lands
HFCs	Hydrofluorocarbons
IAP	Interagency Agricultural Projections Committee
LBP	Lead-Based Paint
NASS	National Agriculture Statistics Service
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
ODSs	Ozone-Depleting Substances
OSHA	Occupational Safety and Health Administration
PEA	Programmatic Environmental Assessment
PPM	Parts Per Million
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
RUSLE	Revised Universal Soil Loss Equation
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Officer
SWPPP	Storm Water Pollution Prevention Plan
TCP	Traditional Cultural Properties
THPO	Tribal Historic Preservation Officer
U.S.	United States
USC	U.S. Code
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USDOE	U.S. Department of Energy
USFWS	U.S. Fish and Wildlife Service
UVB	Ultraviolet B

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 BACKGROUND

The United States Department of Agriculture (USDA) Commodity Credit Corporation (CCC) proposes to implement changes to provisions of the Farm Storage Facility Loan (FSFL) Program enacted by Section 1614 of the Food, Conservation and Energy Act of 2008 (2008 Farm Bill). This legislation, which was passed into law on June 18, 2008, creates the FSFL Program and reauthorizes program loans through September 30, 2012. It stipulates increases to the maximum term of a farm storage facility loan and the maximum loan amount, identifies additional commodities (other than sugar) eligible for storage, clarifies the required loan security, and allows for partial disbursement of loan collateral if certain conditions are met. In addition, the 2008 Farm Bill gives the Secretary discretionary authority to determine other eligible commodities.

The FSFL Program is administered by the Farm Service Agency (FSA) on behalf of the CCC. This Programmatic Environmental Assessment (PEA) is being prepared by FSA to examine the potential environmental consequences associated with implementation of the new FSFL Program provisions of the 2008 Farm Bill.

1.1.1 Regulatory Compliance

This PEA is prepared to satisfy the requirements of the National Environmental Policy Act (NEPA; Public Law [PL] 91-190, 42 U.S. Code [USC] 4321 et seq.); implementing regulations adopted by the Council on Environmental Quality (CEQ; 40 Code of Federal Regulations [CFR] 1500-1508); and FSA implementing regulations, Environmental Quality and Related Environmental Concerns – Compliance with NEPA (7 CFR 799). The intent of NEPA is to protect, restore, and enhance the human environment through well-informed Federal decisions. A variety of laws, regulations, and Executive Orders (EO) apply to actions undertaken by Federal agencies and form the basis of the analysis prepared in this PEA. These include but are not limited to:

- National Historic Preservation Act
- Endangered Species Act
- Clean Water Act
- Clean Air Act
- EO 12898, Federal Actions to Address Environmental Justice in Minority
- Populations and Low Income Populations
- EO 11988, Floodplain Management
- EO 11990, Protection of Wetlands

1.1.2 The Existing Farm Storage Facility Loan Program

The FSFL Program was originally established in 1949, but was discontinued in the early 1980s when adequate on-farm storage capacity was attained. FSFL Program loans were re-established in 2000 under the authority of the CCC Charter Act (15 U.S.C. 714, et

seq.) to address new storage capacity shortages (Library of Congress 2009). The USDA FSA administers the FSFL Program on behalf of the CCC under its Farm Programs Price Support Division. The program provides low interest loans to producers to construct on-farm storage for commodities such as certain whole grains, rice, varieties of beans, peanuts, and oilseeds. FSFL implementing regulations are found in 7 CFR §1436 and departmental guidance is provided in FSA *Handbook: Farm Storage Facility Loan Program for State and County Offices* (1-FSFL).

An eligible borrower may be a landowner, landlord, operator, producer, tenant, leaseholder, or sharecropper. Eligible borrowers must:

- have a satisfactory credit history, no delinquent Federal debt, and demonstrate an ability to repay debt;
- produce an eligible commodity;
- demonstrate the need for the storage capacity increase;
- provide proof of Federal Crop Insurance;
- be in compliance with USDA provisions for highly erodible lands and wetlands;
- conform to local land zoning, land use, and building codes for the proposed storage structure; and
- provide proof of structural peril insurance and flood insurance as it applies.

Eligible producers must demonstrate construction of the storage facility is in compliance with NEPA and must have never been convicted under Federal or State law of a disqualifying controlled substance violation.

Loans may be made only for the purchase and installation of eligible storage facilities appropriate for the storage of the eligible commodity, permanently affixed drying or handling equipment, or for remodeling existing facilities. The facility or equipment must have a use-life of at least 10 years. Loans may include the costs for conducting certain environmental and historical evaluations before any work begins. Any storage structure for commercial purposes is ineligible, as are portable or permanent weigh scales.

The maximum term of the loan is seven years with no extensions granted. The maximum principal amount of any FSFL Program loan is 85 percent of the net cost of the applicant's needed storage or handling equipment, not to exceed $100,000 for each borrower signing the loan note and security agreement. All loans are secured by a promissory note and security agreement. Loans under $50,000 which have been determined to require additional security, and loans exceeding $50,000 individually or in aggregate, require a lien on the real estate on which the farm storage facility is located in the form of a real estate mortgage, deed of trust, or other security instrument approved by CCC. CCC is the primary lien and secondary liens must sign a severance agreement. The applicant is required to make a minimum down payment representing the difference between the net cost of the storage facility and the amount of the loan to the supplier or contractor, currently 15% of the loan principal, before the loan is disbursed. Interest on all loans is at the rate equivalent to that charged on U.S. Treasury securities of comparable maturity on the date the loan is approved. The loan funds are not disbursed

until the completed structure or installed equipment has been inspected and approved by FSA.

Applicants must pay a non-refundable $45.00 fee to the local county FSA office, provide a legal description of the land where the facility is proposed and any land offered as security, provide copies of contracts, project cost breakdown, copies of site plans and/or estimates for all work, and complete FSA forms. FSA county committees may approve delivery of storage structure parts, site preparation, and foundation construction before the loan is approved, but not before the environmental evaluation is completed. Upon approval of the storage loan, applicants are given four months to complete construction and to submit cost documentation, which may be extended on a case-by-case basis.

It had been determined in 2000 that this program as a whole did not have a significant impact on the quality of the human environment, thus neither an Environmental Assessment nor Environmental Impact Statement for the program was completed at that time (Federal Register May 11, 2000 Vol. 65 No. 92:30345). However, because it is possible that individual projects may have limited impacts on the local environment, environmental evaluations in accordance with 7 CFR §799 and FSA *Handbook: Environmental Quality Programs for State and County Offices* (1-EQ Revision 2) for each project is conducted to determine the need for environmental assessment and/or mitigation. In accordance with 7 CFR §1436.17, no proposed FSFL Program action can be approved that has been determined to have significant impacts on the human environment or cultural resources.

As of February 2009, a total of 19,025 loans valued at $731,453,541.46 have been approved in the lower 48 States that contributed a total of 562,493,806 bushels of on-farm grain storage, with most loans occurring in the central and southeast States (Figure 1.1-1). The top five States with the most loans dispensed are Iowa, Minnesota, South Dakota, Illinois, and Nebraska; the highest total is about $93.3 million awarded to any one State. The most prevalent eligible storage structures constructed and/or renovated are storage bins and the most common eligible equipment acquired is affixed drying and handling equipment. Figure 1.1-2 presents the total number of storage structures and equipment by type purchased with FSFL Program funds from 2000 to 2009 for each State.

The national default rate on FSFL Program loans since re-authorization of the program in 2000 is relatively low. Only nine loans in five states involving mostly loans that were $50,000 or less, with a total value to date of $152,343, have been defaulted. Figure 1.1-3 shows the distribution of defaults from 2000 to 2009 by State.

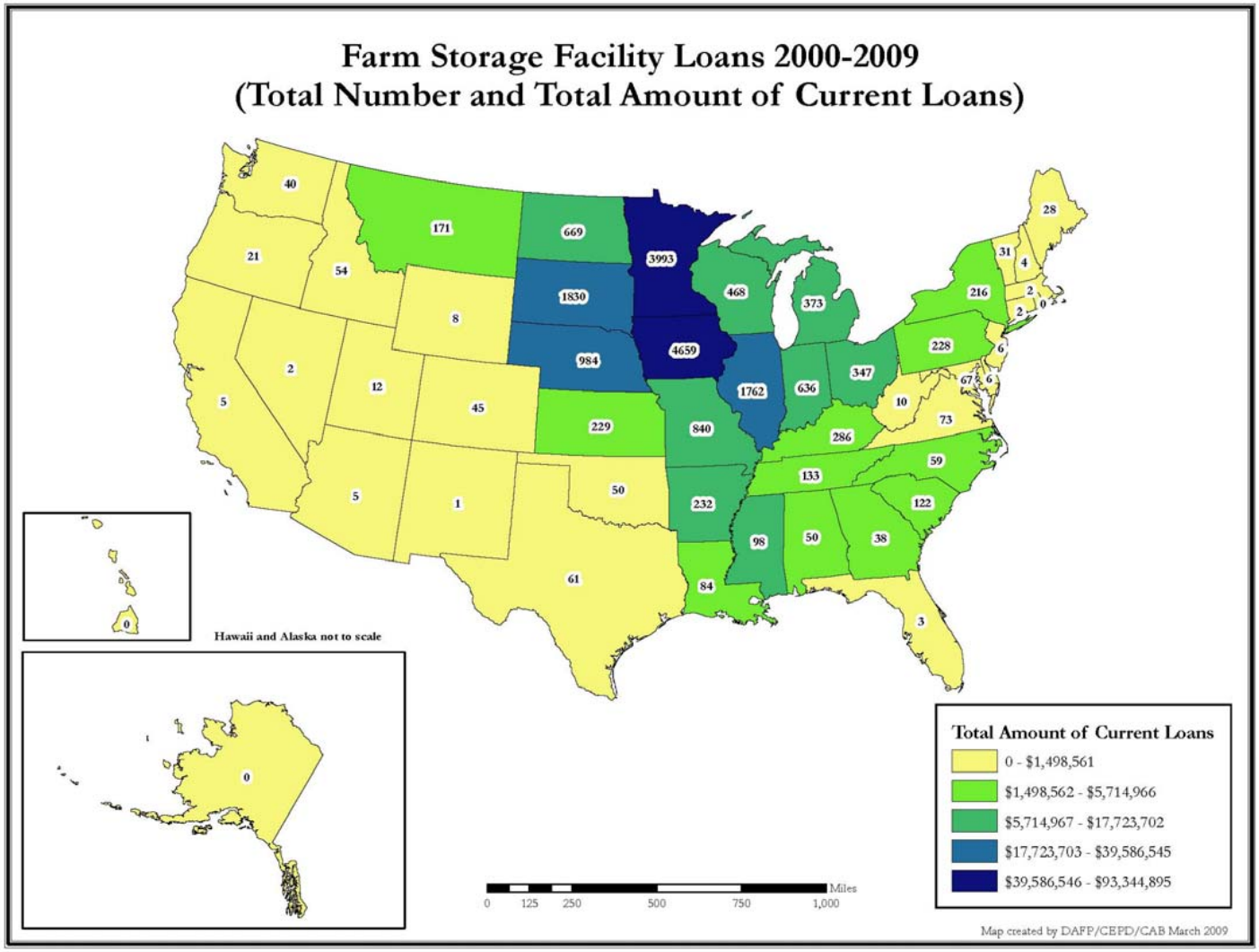

Figure 1.1-1. Total Number and Amount of FSFL Program Loans Approved Per State from 2000 to 2009

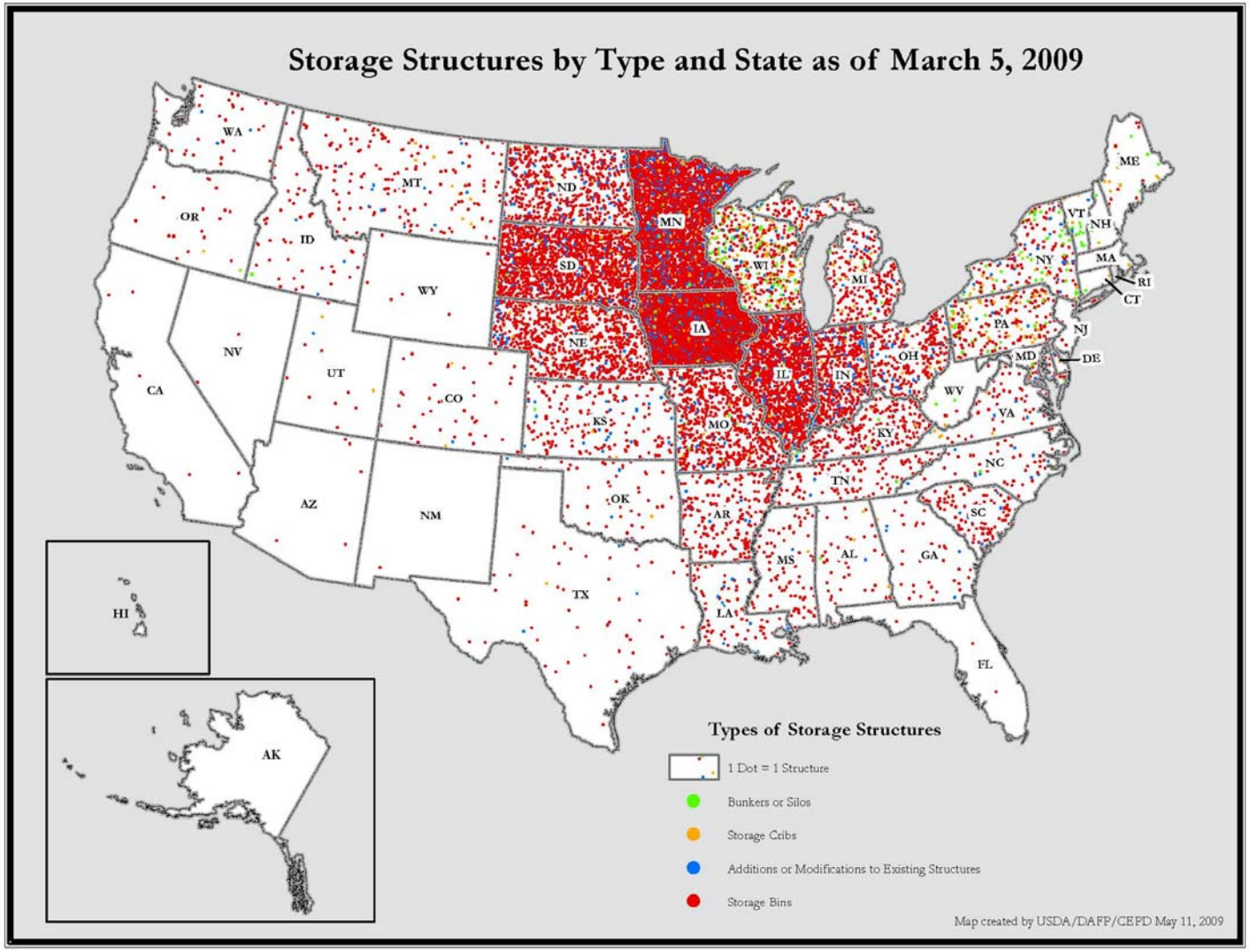

Figure 1.1-2. Storage Structures by Type and State as of March 5, 2009

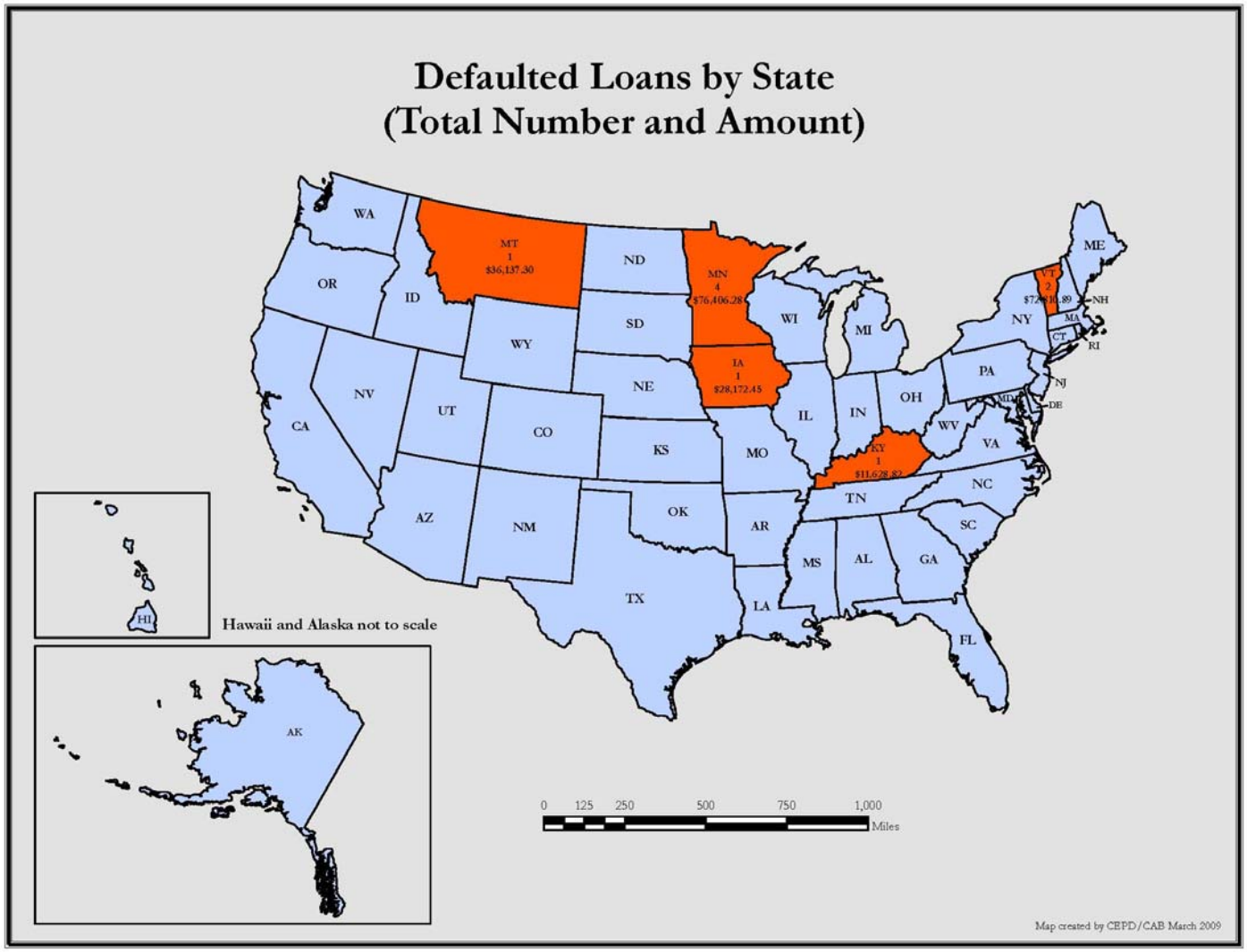

Figure 1.1-3. Total Number and Amount of Defaulted FSFL Program Loans per State from 2000 to 2009

1.2 ORGANIZATION OF THE PEA

This PEA assesses the potential impacts of the Proposed Action and the No Action Alternatives on potentially affected environmental and socioeconomic resources. Chapter 1 provides background information relevant to the Proposed Action, and discusses its purpose and need. Chapter 2 describes the Proposed Action and alternatives. Chapter 3 describes the baseline conditions (i.e., the conditions against which potential impacts of the Proposed Action and alternatives are measured) for each of the potentially affected resources. Chapter 4 describes potential environmental consequences on these resources. Chapter 5 includes analysis of cumulative impacts and irreversible and irretrievable resource commitments. Chapter 6 discusses mitigation measures. Chapter 7 is a list of the preparers of this document and Chapter 8 contains a list of persons and agencies contacted during the preparation of this document. Chapter 9 contains references. Appendix A present's public scoping comments received. Appendix B provides hay and cold storage building standards provided by most States' Cooperative State Research Education and Extension Service (CSREES). Appendix C presents terrestrial ecoregions of the U.S. Appendix D provides State laws governing release of hazardous substances. Appendix E lists regulations concerning refrigerant chemicals by state. Appendix F provides a list of refrigerant substitutes accepted by the Environmental Protection Agency (EPA).

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2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 PROPOSED ACTION

The Proposed Action is to implement changes to the FSFL Program as mandated in the 2008 Farm Bill, as well as adding eligible commodities and their appropriate storage structure facilities at the discretion of the Secretary as afforded by the 2008 Farm Bill provisions. Table 2.2-1 presents the changed provisions in comparison to the existing program.

2.2 DEVELOPMENT OF ALTERNATIVES

Scoping is a process used to identify the scope and significance of issues related to a Proposed Action while involving the public and other key stakeholders in developing alternatives and weighing the importance of issues to be analyzed in the PEA. Those involved in the scoping process include Federal, State and local agencies, interested non-governmental organizations, producers eligible for the program, and the public. Scoping can help to resolve any conflicts or concerns prior to making a decision to implement an action. FSA has conducted both internal and external scoping of the Proposed Action and preliminary alternatives.

2.2.1 Public Scoping

Public meetings were held in Kansas City, Kansas and Cleveland, Ohio in April 2009 to solicit input on the proposed changes to the FSFL Program prior to development of the PEA. FSA performed a density analysis of the FSFL Program participation to determine those areas that utilize the program the most and meetings were completed in the general vicinity of those areas, which were accessible by participants in the States with the most program participation.

Announcements of the scoping meetings were publicized in the Federal Register, State and county FSA offices, and posted on the FSA website. A public website was created to provide program information, scoping meeting locations and times, and an electronic form for submitting comments via the internet. A presentation was given at each meeting, followed by a comment/question period for attendees. Printed program information and comment forms were made available at the meetings, along with cards with the public comment website address. Both meetings were attended by the FSA National Environmental Compliance Manager and the National FSFL Program Manager and were recorded by a court reporter.

Table 2.2-1. Summary of Components of the Existing FSFL Program and the Proposed Action

Item	Current FSFL Program	Proposed Action
Eligible Commodities	Corn, grain sorghum, oats, wheat, barley, rice, soybeans, sunflower, seeds, canola, rapeseed, safflower, flaxseed, mustard seed, crambe, sesame seed, other oil seeds as determined and announced by CCC, dry peas, lentils, chickpeas, and peanuts.	Adds hay and renewable biomass commodities. The Secretary at his discretion proposes to add vegetables and fruits.
Eligible Structures and Equipment	• New conventional-type cribs or bins designed and engineered for whole grain storage • New oxygen-limiting and other upright silo-type structures designed for whole grain storage or other than whole grain wet storage • Re-manufactured oxygen-limiting storage structures built to manufacturer's design specifications using original manufacturer's rebuild kits • New structures that are upright, bunker-type, horizontal, or open silo structures with at least 2 concrete walls and a concrete floor, designed for whole grain storage or other than whole grain storage • New permanently affixed grain handling equipment determined by FSA to be needed and essential to the proper functioning of a grain storage system, with or without a loan for storage structures • Existing storage renovated according to FSA regulations without an increase in storage capacity.	Structures for storing hay and renewable biomass. It is proposed these structures must meet regional best management practices for construction according to acceptable guidelines established by Cooperative State Research, Education, and Extension Service or land-grant universities. The Secretary at his discretion proposes to add vegetables and fruits requiring cold storage facilities.

Table 2.2 -1. Summary of Components of the Existing FSFL Program and the Proposed Action (cont'd.)

Item	Current FSFL Program	Proposed Action
Eligible Structures and Equipment	• New electrical equipment, such as lighting and motors integral to the proper operation of grain storage and handling equipment, excluding installation of electrical service to the meter • New equipment to improve, maintain, or monitor the quality of stored grain • Safety equipment as required by CCC • New flat-type storage structures, including a permanent concrete floor and bulkheads, designed for and primarily used to store whole grain for the term of the loan.	
Loan Terms	Maximum loan terms 7 years	Maximum loan term is 12 years. At CCC's discretion, the loan term options for the principal amounts are: • $100,000 or less – term is 7 years • $100,000.01 - $250,000 – borrower can specify term of 7 or 10 years • $250,000.01 - $500,000 – borrower can specify 7, 10, or 12 years
Maximum Loan Amount	Maximum $100,000 per eligible entity	Maximum loan amount $500,000; no entity limit as long as borrower demonstrates a need and the financial analysis indicates ability to repay a loan for the requested amount.

Table 2.2 -1. Summary of Components of the Existing FSFL Program and the Proposed Action (cont'd.)

Item	Current FSFL Program	Proposed Action
Severance Agreements and Down Payments	Require severance agreements from any prior lien holders on the real estate parcel where the storage facility will be located unless a real estate mortgage is required on this parcel of land for the additional loan security. A down payment of 15% is required.	If a borrower increases the down payment by an amount determined by CCC, a severance agreement would not be required.
Partial Disbursement	No partial disbursements allowed. Payment is made only upon completion of the structure and inspection by FSA.	Borrower may request one partial disbursement and the final disbursement. At CCC discretion, the maximum amount of partial disbursement proposed is 50% of the projected and approved total loan amount, not to exceed $250,000, and is issued only for the portion of the project completed. The partial and final disbursements would be separate loans.
Loan Security	If the loan amount or the aggregate outstanding loan balance for the borrower exceeds $50,000, additional security is required which may include: • Mortgage on the existing real estate • Irrevocable letter of credit from a financial institution for the entire loan term • Lien on another parcel of land owned by the borrower if a lien on the underlying real estate is not feasible	Loan security is required on loans over $50,000 as: • A lien on the real estate parcel on which the storage facility is located • Other security acceptable to the Secretary • Borrower defined subparcel of real estate as security if the parcel is of adequate size and value to secure the loan, and is not subject to any other liens or mortgages that are superior to the lien interest of CCC

2.2.2 Scoping Issues

All comments received during the scoping process were recorded and categorized as applicable to the stated purpose and need for the Proposed Action, the Proposed Action itself, preliminary alternatives, and environmental resource areas. The comments were evaluated by FSA to determine the scope and significance of each issue and the depth at which it would be analyzed in the PEA. The scoping comments received have been summarized in a matrix provided in Appendix A.

2.3 RESOURCES ELIMINATED FROM ANALYSIS

CEQ regulations (§1501.7) state that the lead agency shall identify and eliminate from detailed study the issues which are not important or which have been covered by prior environmental review. The existing FSFL Program (7 CFR §1436.17) has been categorically excluded from NEPA unless a site-specific environmental evaluation determines there are extraordinary circumstances that could cause adverse environmental impacts from issuing a FSFL Program loan, which would require the preparation of an Environmental Assessment (EA). Form FSA-850 Environmental Evaluation and AD-1026 Highly Erodible Land Conservation and Wetland Conservation Certification must be completed prior to loan approval.

In accordance with §1501.7, resources eliminated from detailed analysis in this PEA are presented below.

2.3.1 Noise

Implementing the Proposed Action would not permanently increase ambient noise levels at or adjacent to the constructed storage facility or equipment. Noise from heavy equipment is common on farms where the facility would be located. The potential for increased noise levels associated with construction would be minor, temporary, localized, and would cease once the structure is completed.

2.3.2 Air Quality

The Proposed Action would not permanently impact either local or regional air quality. Temporary minor impacts to local air quality as a result of soil disturbance during construction of a storage facility would not differ measurably from those resulting from current continued use of the land for agriculture, and would not exceed ambient air quality standards. Since farm commodity storage structures would not result in impacts to the attainment, non-attainment, or maintenance status of any of the States' airsheds, this aspect of air quality under the Clean Air Act (CAA) has been eliminated from further study in this PEA. Certain chemicals utilized as refrigerants and preservative fumigants in cold storage facilities housing fruits and vegetables are regulated under the CAA; however, since these chemicals are hazardous to humans, they are analyzed under the Human Health and Safety section of this PEA.

2.3.3 Sole Source Aquifers

Sole source aquifers are underground water sources that provide at least 50 percent of the drinking water consumed within the overlying area. Construction of on-farm storage facilities do not have the potential to impact this resource, thus, sole source aquifers have been eliminated from further consideration.

2.3.4 Wetlands

Before any FSFL Program loan may be approved, the applicant must complete FSA Form AD-1026 Highly Erodible Land Conservation and Wetland Conservation

Certification. The form states the borrower would not use proceeds from any FSA farm loan, insured or guaranteed, or any USDA cost-share program, in such a way that might result in negative impacts to wetlands; therefore, wetlands have been eliminated from further analysis.

2.3.5 Coastal Zones

Congress passed the Coastal Zone Management Act of 1972 to establish the only national program to plan comprehensively for and manage development of the Nation's coastal land and water resources. Public access to coastal zones is protected under the Act. Federal actions that are likely to affect any land or water use or natural resource of the coastal zone must be consistent with the enforceable policies of a given State's Coastal Zone Management Plan as administered by that State. The requirement that FSFL Program funded storage facilities must be constructed in accordance with local zoning, land use plans, and building codes ensures compliance with the local Coastal Management Plan. This resource has therefore been eliminated from further analysis.

2.3.6 Prime and Unique Farmland

The Farmland Protection Policy Act of 1981 protects farmland defined as prime or unique from conversion to other uses and is administered by the National Resource Conservation Service (NRCS). In accordance with 1-EQ, FSA policy has exempted the following actions from requiring NRCS consultation under the Act: 1) the Proposed Action includes new facilities or improvements, but are for an agricultural purpose and affect only farmland; or 2) the Proposed Action involves renovating or repairing existing facilities, and the future use of these facilities remains unchanged from the original use of the facilities. Since construction and/or remodeling of an on-farm facility to store agricultural commodities produced by the farm falls under these two exemptions, prime and unique farmland has been eliminated from further analysis.

2.3.7 Environmental Justice

EO 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations was issued by President Clinton in 1994. The purpose of the Environmental Justice EO is to ensure that minority and low-income populations are not disproportionately adversely impacted by Federal actions. Farm storage facility loans have been authorized since 2000 and the 2008 Farm Bill re-authorizes the program through Fiscal Year 2012. The potential impacts of FSFL program to environmental justice populations have been evaluated consistent with a Civil Rights Impact Analysis (CRIA) completed by FSA. Implementing the changes to the FSFL, enacted by the 2008 Farm Bill and provisions at the discretion of the Secretary of Agriculture as described in the proposed action, do not introduce new impacts to environmental justice populations.

Increasing the maximum loan amount and length of the loan terms does not have the potential to disproportionately impact low income or minority populations. Adding hay, renewable biomass, and fruits and vegetables as eligible commodities opens the door

for producers who were not previously eligible for benefits under the current FSFL provisions and regulations.

Eligibility requirements for the program and the appeals process has not changed under the proposed action. Producers requesting FSFL funds may obtain assistance in completing loan applications and other required documents, such as the Promissory Note and Security Agreement, directly from the FSA Service Center in their state. Information about the program is published in the Federal Register, and its provisions will be announced by press release, website posting, and FSA newsletters, fact sheets, and/or other local media announcements. FSA State outreach coordinators implement their plans by communicating directly with each county office whose staff works directly with individual farmers and minority-based organizations to provide minority farmers information about all FSA programs and benefits.

The existing regulation (7 CFR §1436.19) stipulates that no recipient of a FSFL shall directly, or through contractual or other arrangement, subject any person or cause any person to be subjected to discrimination on the basis of race, religion, color, national origin, gender, or other prohibited basis and with respect to any aspect of credit transaction, CCC will not discriminate against any applicant on the basis of race, color, religion, national origin, sex, marital status, or age, provided the applicant can execute a legal contract. Nor will CCC discriminate on the basis of whether all or a part of the applicant's income derives from any public assistance program. Therefore, environmental justice has been eliminated from further analysis in this PEA.

2.3.8 Other Protected Resources

Loans under the FSFL Program are for construction of storage facilities of certain agricultural commodities produced on farms or may be secured by lands that are privately owned; therefore, there is no potential for impacts to National Natural Landmarks, Federal Wilderness or Wilderness Study Areas, National or State parks or forests, or wildlife refuges. Such facilities must be constructed in accordance with local land zoning, land use plans, and building codes and therefore do not have the potential to impact the National Wild and Scenic Rivers system. These other protected resources have therefore been eliminated from further analysis.

2.4 ALTERNATIVES SELECTED FOR ANALYSIS

2.4.1 No Action Alternative

Under the No Action Alternative, the current provisions of the existing FSFL Program would continue to be implemented. This alternative does not meet the purpose and need as described above, but is carried forward to provide a baseline against which the impacts of the Proposed Action can be assessed.

2.4.2 Proposed Action Alternative

The Proposed Action Alternative is to implement changes to the FSFL Program as mandated in the 2008 Farm Bill, as well as adding eligible commodities and their

appropriate storage structure facilities at the discretion of the Secretary as afforded by the 2008 Farm Bill provisions. Appendix B summarizes building standards offered by certain land grant universities and CSREES for hay and/or cold storage type on-farm storage facilities.

3.0 AFFECTED ENVIRONMENT

3.1 BIOLOGICAL RESOURCES

3.1.1 Definition of the Resource

Biological resources include animal and vegetative species that compose the habitats and ecosystems in which they are found. For this analysis, biological resources are divided into the following categories: vegetation, wildlife, and protected species. Vegetation and wildlife refer to the plant and animal species, both native and introduced, which characterize a region. Protected species refers to federally threatened and endangered species and their designated critical habitat, both of which are protected under the Endangered Species Act (ESA). Critical habitat for threatened or endangered species is defined as a specific geographical area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection (U.S. Fish and Wildlife Service [USFWS] 2009a).

3.1.2 Affected Environment

3.1.2.1 Vegetation and Wildlife

The geographic scale of the lands affected by the FSFL Program changes, as provided for in the 2008 Farm Bill, encompasses the entire U.S. and its territories; hence, a great variety of terrestrial and aquatic plant and animal species may be affected by the Proposed Action Alternative. Given the national scale of FSFL Program and the programmatic level of this analysis, it is not feasible to list all of the species that may be present on lands eligible for enrollment, but broad generalizations based upon the organizing principle of terrestrial ecoregions can be made. Ecoregions are areas of relatively homogenous soils, vegetation, climate, and geology, each with associated wildlife adapted to that region. The major terrestrial ecoregions of the continental U.S. and common wildlife species as described by Bailey *et al*. (1995) are briefly summarized in Appendix C.

3.1.2.2 Protected Species

The USFWS is the lead agency governing terrestrial and fresh water threatened and endangered species and National Oceanic and Atmospheric Administration (NOAA) Fisheries regulates marine threatened and endangered species. Federal agencies proposing activities that could potentially affect a protected species must consult with the USFWS and NOAA. Since the FSFL Program has no potential to affect marine species, this discussion is limited to protected species under USFWS jurisdiction. Protected species often have very specific living conditions based on their reproductive requirements. A total of 1,272 protected species have been determined to be threatened and endangered within the U.S. and its territories (Table 3.1-1). Of these, 534 listed species have designated critical habitat (USFWS 2009b).

Table 3.1-1. Protected Species within the U.S.

Species Group	Number of Threatened or Endangered Species	Number of Species with Designated Critical Habitat
Birds	90	25
Mammals	70	26
Amphibians	25	10
Reptiles	37	11
Fishes	110	61
Insects/Arachnids	69	35
Clams/Snails/Crustaceans/Corals	126	40
Plants	745	335
TOTAL	**1,272**	**543**

Source: USFWS 2009a, USFWS 2009b.

3.2 WATER RESOURCES

3.2.1 Definition of the Resource

Freshwater is necessary for the survival of most terrestrial organisms, and is required by humans for drinking and agriculture, among other uses; however, less than one percent of Earth's water is in the form of freshwater that is not bound in ice caps or glaciers. The Water Pollution Control Act of 1972, or Clean Water Act (CWA), Safe Drinking Water Act, and the Water Quality Act are the primary Federal laws that protect the nation's waters. The principal law governing pollution of the nation's surface water resources is the CWA. The CWA utilizes water quality standards, permitting requirements, and monitoring to protect water quality. The EPA sets the standards for water pollution abatement for all waters of the U.S. under the programs contained in the CWA but, in most cases, gives qualified States the authority to issue and enforce permits.

For this analysis, water resources include surface water quality (including lakes, rivers, and estuaries), groundwater, and floodplains.

Surface water as defined by the EPA are waters of the United States and are in rivers, streams, creeks, lakes, and reservoirs supporting everyday life through uses such as drinking water and other public uses, irrigation, and industrial uses. Of all the water used in the U.S. in 2000 (about 408 billion gallons per day), about 74 percent came from fresh surface water sources (U.S. Geological Survey 2008). Surface runoff from rain, snow melt, or irrigation water, can affect surface water quality by depositing sediment, minerals, or contaminants into surface water bodies. Surface runoff is influenced by meteorological factors such as rainfall intensity and duration, and physical factors such as vegetation, soil type, and topography.

Floodplains are defined by the Federal Emergency Management Agency (FEMA) as those low lying areas that are subject to inundation by a 100-year flood, a flood that has a one percent chance of being equaled or exceeded in any given year. Activities within a floodplain have a potential to affect the flooding of lands downstream of the activity. Based on EO 11988, Floodplain Management, Federal agencies are required to avoid, to the extent possible, adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development.

Groundwater is the water that flows underground and is stored in natural geologic formations called aquifers. It is ecologically important because it sustains ecosystems by releasing a constant supply of water into wetlands and contributes a sizeable amount of flow to permanent streams and rivers (FSA 2003). In the U.S. more than 50 percent of water consumed daily, approximately 50 billion gallons, is groundwater. More than two-thirds of this amount is used for irrigation, and the remainder is used for drinking water and other domestic uses.

3.2.2 Affected Environment

3.2.2.1 Surface Water Quality

Surface water quality is determined by the natural, physical, and chemical properties of the land that surrounds the water body. The topography, soil type, vegetative cover, minerals, and climate, all influence water quality. When land use affects one or more of these natural physical characteristics of the land, water quality is almost always impacted. These impacts may be positive or negative, depending on the type and extent of the change in land use. Agricultural practices have the potential to substantively affect water quality due to the vast amount of acreage devoted to farming nationwide and the great physical and chemical demands that agricultural use has on the land. The most common types of agricultural pollutants include excess sediment, fertilizers, animal manure, pesticides and herbicides.

Normal, routine, and continuous agricultural activities such as plowing, cultivating, and harvesting crops, maintenance of drainage ditches, and construction and maintenance of irrigation ditches, farm or stock ponds, and farm roads in accordance with best management practices (BMPs) are exempt from CWA permitting requirements.

3.2.2.2 Floodplains

Floodplains are the lowlands adjacent to rivers and streams that are subject to flooding. Flooding occurs when water bodies receive a greater volume of water than they can handle at one time. This usually occurs in the early spring during snowmelt or heavy rains. Floodplains hold the excess water allowing it to release slowly into the river system and seep into groundwater aquifers. Floodplains also give time for sediment to settle out of floodwaters, thereby removing some of it from the rivers and streams. Floodplains often support important wildlife habitat and are frequently used by humans as recreation areas. They are also usually very fertile making them desirable farm lands.

The largest river and floodplain system in the U.S. is associated with the flat, low-lying floodplain of the Mississippi River that is dependent on the flooding continuum of the river. The Mississippi River floodplain consists of more than 30 million acres. Floodplains provide flood and erosion control, help maintain water quality, and contribute to sustaining groundwater levels. Floodplains also provide habitat for plant and animal species, recreational opportunities, and aesthetic benefits.

3.2.2.3 Groundwater

Groundwater use has many societal benefits. It is the source of drinking water for about half the nation and nearly all of the rural population, and it provides over 50 billion gallons per day in support of the Nation's agricultural economy (USDA 2003). Groundwater contamination occurs when man-made products such as gasoline, oil, road salts and chemicals get into the groundwater and cause it to become unsafe and unfit for human use. Some of the major sources of these products, called contaminants, are storage tanks, septic systems, hazardous waste sites, landfills, and the widespread use of road salts, fertilizers, pesticides and other chemicals.

3.3 SOIL RESOURCES

3.3.1 Definition of the Resource

The geographic scale of the lands affected by the FSFL Program changes, as provided for in the 2008 Farm Bill, encompasses the entire U.S. and its territories; therefore, for the purposes of this analysis, soil resources include all soil orders within the U.S. and its territories.

Soils are a natural body made up of weathered minerals, organic matter, air and water (Brady and Weil 1996). This body of inorganic and organic matter is home to a wide variety of fungi, bacteria, arthropods, herptofauna, and mammals as well as being the growth medium for terrestrial plant life. Soil plays a key role in determining the capacity of a site for biomass vigor and production (physical support, air, water, temperature moderation, protection from toxins, and nutrient availability). Soils also determine a site's susceptibility to erosion (by wind and water), and its flood attenuation capacity. A soils' nutrient supplying capacity directly affects the health and reproduction rate of wildlife through the plants grown on the land, therefore influencing animal carrying capacity. Soil resources vary in texture, depth, and organic matter. Soil texture refers to mineral particle size. Mineral particle sizes are broadly classified as sand, silt, clay or a combination of the three main textures. Sand is the most coarse (largest) particle size, silt is intermediate, and clay is the finest (smallest) particle size. Soil texture and organic matter levels directly influence soil shear strength, nutrient holding capacity, and permeability.

Soils are formed mainly by the weathering of rocks, the decaying of plant matter, and the deposition of materials such as chemical and biological fertilizers that are derived from other origins. Soil taxonomy was established to classify soils according to the relationship between soils and the factors responsible for their character (NRCS 1999).

Soil taxonomy has ordered soils into four levels of classification, the highest being the soil order. Table 3.3-1, Soil Order Descriptions, provides information on the soil orders in the United States.

3.3.2 Affected Environment

Soil resources are greatly influenced by factors such as climate, soil properties, vegetative cover, and erodibility potential. Soil erosion is a naturally occurring event and the erosion rates are relatively slow; however, human activity can greatly accelerate the rate of erosion. Poor farming practices, loss of vegetation through deforestation, over-grazing and the maintenance of agricultural land are some of the factors that make soils more susceptible to erosion. “Erosion removes the topsoil first, which is the layer with the highest organic matter content and where the most biological activity occurs. Once this nutrient rich layer of soil is gone, plant growth decreases and erosion increases significantly” (FSA 2003).

Soils susceptible to erosion are identified using the Erodibility Index (EI). The EI provides a numerical expression of the potential for a soil to erode based on factors such as topography and climate. The index value is derived from the Revised Universal Soil Loss Equation (RUSLE) for water erosion, and the Wind Erosion Equation for wind erosion. Highly erodible lands (HEL) are those with an index value of eight or higher (FSA 2003; NRCS 2008b). Applicants must comply with the highly erodible land conservation provisions of Title II of the 2008 Farm Bill to be an eligible borrower under the FSFL Program.

Figure 3.3-1 presents a USDA map depicting HEL with an EI greater than or equal to eight on cropland in the U.S. The most highly erodible soils are primarily in the Midwest and Northern Plain States, in areas that lie within the Mississippi and Missouri rivers watershed. A list of soils considered highly erodible are developed and maintained on a county level by NRCS.

Table 3.3-1. Soil Order Descriptions.

Alfisols	A dark surface horizon mineral soil, similar to mollisols however, lacking the same level of fertility and more acidic.
Andisols	Soils of recent volcanic origin having cinders and volcanic glass. Typically found in the northwest and in Alaska.
Aridisols	These soils are found in the arid regions of the US. Typically high in calcium, Magnesium, potassium and sodium. The soils have an alkaline pH.
Entisols	This soil order is relatively un-weathered. These soils have no diagnostic horizon development. Often found on floodplains, glacial outwash areas and other areas receiving alluvial materials.
Gelisols	Soils formed in very cold climates. Soils have permafrost within 100 cm (40 inches) of the surface.
Inceptisols	Soils of the humid and sub humid region. Weathering has created minimal diagnostic differentiation in the soil column.
Histosols	Soils high in organic carbon. Dark surface profile. Often associated with wetlands.
Mollisols	Dark colored mineral soils developed under grassland conditions. Rich in nutrients, very fertile. Associated with America's corn belt.
Oxisols	The most highly weathered soil order. These soils are found in the tropics and sub-tropics. They are acidic and low in basic plant nutrients.
Spodosols	These soils have undergone significant weathering. Organic carbon, aluminum and often iron has been translocated to a lower horizon referred to a spodic horizon. These soils are acidic and may have deleterious levels of aluminum in the subsoil.
Ultisols	Highly weathered soils found in hot, moist regions. Typically acidic and low in available nutrients.
Vertisols	Soils having significant amounts of expanding clay content. Soils typically crack when dry and swell when wet.

Source: Brady 1990

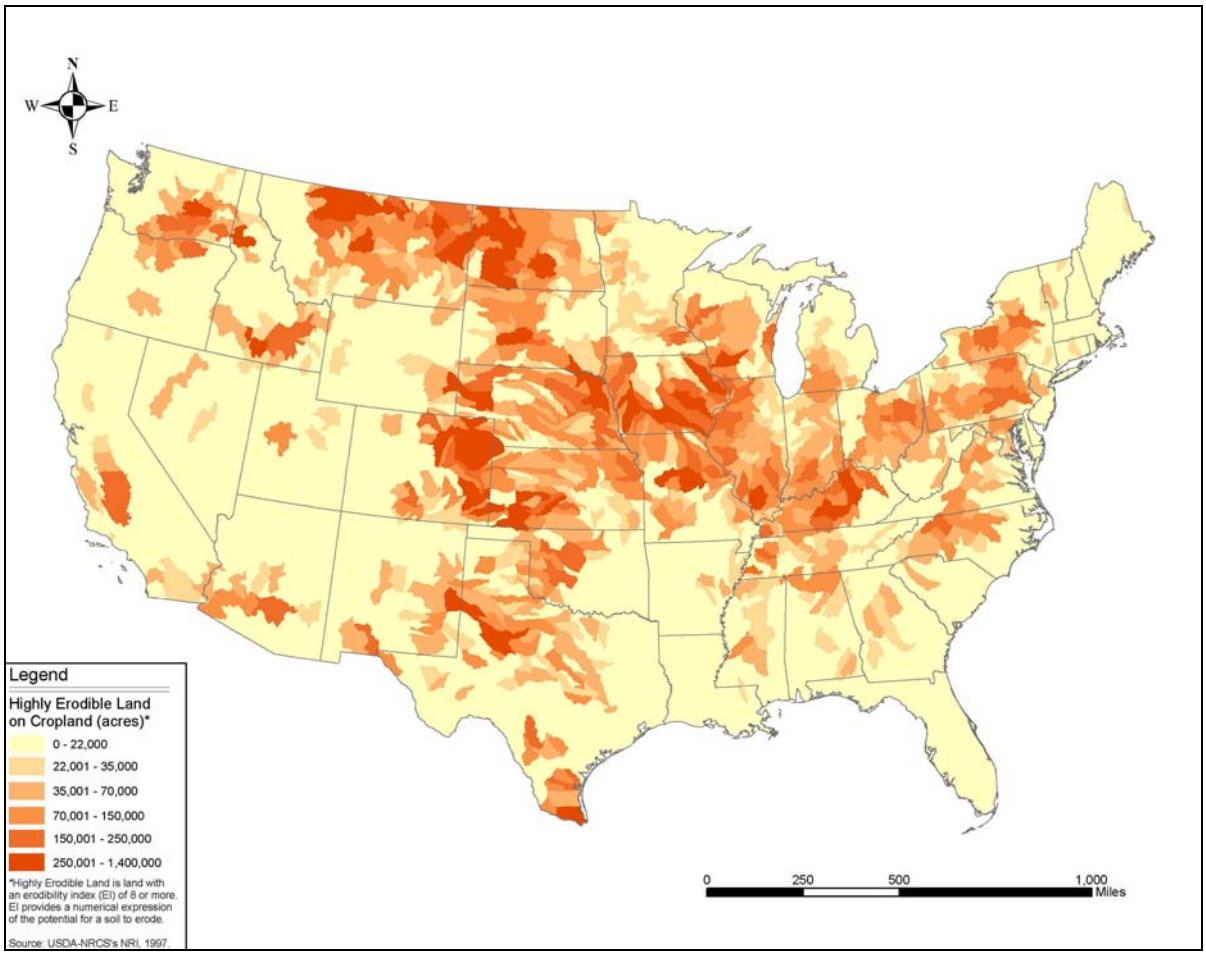

Figure 3.3-1. Highly Erodible Land on Cropland in the U.S. (by watershed) (USDA FSA 2003: 2-6).

3.4 CULTURAL RESOURCES

3.4.1 Definition of the Resource

Cultural resources can consist of prehistoric and historic districts, sites, buildings, structures or objects that may be archaeological, architectural or traditional cultural properties. Historic cultural resources are generally at least 50 years of age or older, although some may achieve historic significance in more recent times. Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) and its implementing regulations (36 CFR §800) requires federal agencies to take into account effects on historic properties in advance of approving any activity that has the potential to affect the historic qualities of the resource, and to provide the Advisory Council on Historic Preservation and the State Historic Preservation Officer (SHPO) or Tribal equivalent (THPO) an opportunity to comment prior to implementing the proposed program or project. Historic properties are those cultural resources that are determined

eligible for the National Register of Historic Places (National Register or NRHP). The National Register program as managed by the National Park Service (NPS), lists historic sites that are important on a national, State, or local basis. Sites determined eligible for the list and those actually listed are afforded protection under Section 106, and owners of listed sites are eligible for preservation grants and tax deductions. Archaeological cultural resources are the physical remains of past human behavior, such as prehistoric settlements and rock art, historic trash piles, or the foundations of historic homesteads. Architectural resources are standing buildings or structures such as bridges, historic roadways, or a residence. Traditional cultural properties (TCP) hold importance or significance to Native Americans or other ethnic groups in the persistence of traditional culture. For example, these may include traditional plant gathering areas, areas associated with sacred traditions such as mountain tops, or an ethnic neighborhood.

To be eligible for the NRHP, a cultural resource must retain integrity of location, design, setting, materials and workmanship, feeling and association, and meet one or more of the following criteria:

- association with events that have made a significant contribution to the broad patterns of our history;
- association with the lives of significant persons in our past;
- embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- yield or may be likely to yield, information important in history or prehistory.

3.4.2 Affected Environment

3.4.2.1 Archaeological Sites

People have occupied most regions of the U.S. for the last 13,000 years and during that time the residue from their camps, homes, and activities are contained in the thousands of archaeological sites that exist in each state. Types and numbers of sites vary through time and from one region of the U.S. to another. The earliest sites, known as Paleoindian sites, are the fewest in number, both because they are the oldest and the residues at their sites have not preserved well, and because their populations were generally small. Paleoindian people lived relatively mobile lifestyles, moving to new camps when game to hunt or other resources such as plant foods, wood, or water around their existing camps were nearly exhausted. This general hunter-gatherer lifestyle persisted in some regions of the U.S. through historic times although food preferences, forms of shelter, language, and other aspects of individual groups varied. Its longevity as a way of life indicates that this was a successful lifestyle. The residue in the camp sites or special activity areas (i.e., areas where plant bulbs were cooked, reeds gathered for baskets, etc.) of the sites of hunters and gatherers is often limited indicating groups were usually small and limited to one or a few families. Larger campsites of hunters and gatherers are known, however. Some large campsites represent places where people came together either for events or for a season; others represent hunters

and gatherers who lived in large communal groups. During the eighteenth century, Spanish visitors to Comanche camps in the Texas Panhandle reported small camps with a few tipis but camps with several hundred tipis and over a thousand people present were more frequently seen (Kavanagh 1986). Although the Comanche moved their campsites with some frequency, the hunters and gatherers who occupied the coasts of the Pacific Northwest resided in relatively permanent villages beginning as early as 1800 years ago. The fish, game, and plants along the coast and in the inland valleys of the Northwest provided ample food to allow them to reside in one place.

Prehistoric villages were common in many other parts of the U.S. The people in these villages still hunted, but they largely relied on cultivated crops of corn, squash, beans, and native plants they encouraged to grow near their fields. Some villages were small, consisting of only a few houses, while others, such as Cahokia—a large mound and village site located eight miles east of St. Louis where 10,000 people resided—were quite large. When Europeans arrived in North America, they documented people living in camps of Native American hunters and gatherers as well as villages. Over time, as the U.S. grew, farmers, ranchers, traders, miners, and others left their residue in campsites, homesteads, mines, battlefields, and settlements. Those that were abandoned are today's historic archaeological sites.

While historic and prehistoric sites are found in all environmental settings, they are often found close to dependable water sources. Cahokia, for example, was built on the terrace above Cahokia Creek, a tributary of the Mississippi, and many other villages and towns were built in similar terrace settings. In the dry Southwest, pueblos and villages are also often situated along river terraces or near seeps, springs, or other places where water could be obtained. The large Comanche camps seen in the 18th century were situated along reliable water sources to provide adequate water for both humans and horses. Early historic settlement patterns tended to mirror the Native American patterns until modern techniques of well drilling, canal systems, and other technologies allowed settlement away from water bodies.

3.4.2.2 Architectural Resources

Architectural resources refer to the built environment including houses, barns, outbuildings, silos, bridges, roads, irrigation systems, canals, dams, and other man-made structures. Generally, these resources must be at least 50 years of age to be considered eligible for inclusion in the National Register. Older architectural resources may no longer be used for their original purpose. Bridges that were once part of a county or State road system may now be located in a pasture or field and used by a farmer, and a structure that was once a horse barn may now be used for storage. Like archaeological sites, architectural resources are found in all environmental settings.

3.4.2.3 Traditional Cultural Properties

TCPs that are eligible for inclusion in the National Register are those associated with the beliefs or cultural traditions of an existing community. Such beliefs or traditions are part of the history of the community and they are important in holding the community

together. When places or structures are seen by the community to embody those traditions, those places are traditional cultural properties and may be eligible for listing on the National Register. They include, but are not limited to, locations to host traditional dances, mountain tops where ceremonies are performed, or an African Methodist Episcopal church on a country road that is a place of gathering for the rural community.

3.5 EXISTING ENVIRONMENT – SOCIOECONOMICS

3.5.1 Definition of the Resource

Socioeconomic analyses generally include detailed investigations of the prevailing population, income, employment, and housing conditions of a community or Region of Influence (ROI). The socioeconomic conditions of a ROI could be affected by changes in the rate of population growth, changes in the demographic characteristics of a ROI, or changes in employment within the ROI caused by the implementation of the proposed action.

Socioeconomic resources within this document include general agricultural characteristics associated with number of farms, primary field crops, and existing on-farm and off-farm storage, including refrigerated storage capacity.

3.5.2 General Agricultural Characteristics

3.5.2.1 Number of Farms & Land in Farms

Between 1997 and 2007, the number of farms in the United States declined 0.5 percent (USDA 2009). Most farm categories declined from 1997 to 2007, with the number of acres in farms declining 3.4 percent, the average size of farms declining by 3.0 percent, the amount of cropland declining by 8.7 percent, and the amount of harvested cropland acreage declining by 2.9 percent (*Ibid.*). The average market value of land and buildings increased approximately 90.2 percent for the average value per farm and approximately 95.7 for the average value per acre (*Ibid.*). Farm production expenses also showed an increase, of approximately 52.8 percent over the decade. When compared by type of farm, the most number of farms fall within the small family farm – residential or lifestyle farm (36 percent) (Table 3.5-1). Farms with an average size of over 1,000 acres account for approximately 18 percent of the number of farms in the United States.

The 2007 Census of Agriculture specifically identified organic producers finding 18,211 farms having organic sales totaling more than $1.7 billion. The Census of Agriculture identified 20,437 farms using organic production methods on approximately 2.6 million acres (USDA 2009). Of the farms with sales, approximately 82.2 percent of the farms produced some type of non-livestock crop (Ibid.). The 2007 Census of Agriculture also identified the number of farms producing vegetables for fresh market, those producing both citrus and non-citrus fruits, nuts, and berries. Table 3.5-2 identifies the number of farms and amount of acreage under these types of farms.

Table 3.5-1. Number of Farms, Land in Farms, and Average Size of Farms by Farm Typology (2007).

ITEM	Total	Small Family Farms					Large family farms	Very large family farms	Nonfamily farms
		Limited resource farms	Retirement farms	Residential/ lifestyle farms	Farming occupation/ lower sales	Farming occupation/ higher sales			
Farms (number)	2,204,792	308,837	456,093	801,844	258,899	100,126	86,551	101,265	91,177
Farms (percent)	100	14	21	36	12	5	4	5	4
Land in farms (acres)	922,095,840	42,419,764	89,580,775	121,143,585	87,190,445	104,081,344	123,024,138	211,224,012	143,431,777
Average size of farm (acres)	418	137	196	151	337	1,040	1,421	2,086	1,573

Source: USDA 2009.

Table 3.5-2. Types of Farms, Number of Farms, and Acreage (2007).

Type of Farm	Number of Farms	Percent of Total Farms	Acreage	Percent of Total Acreage in Farms
Organic-All Types	20,437	0.9	2,577,418	0.3
Vegetables for Fresh Market	62,495	2.8	2,623,427	0.3
Non-Citrus Fruits	72,757	3.3	2,176,511	0.2
Citrus Fruits	15,658	0.7	1,005,806	0.1
Berries	25,894	1.2	203,022	0.0
Nuts	39,480	1.8	1,857,179	0.2

3.5.2.2 Rural Population Trends

The USDA Economic Research Service (ERS) found that by 2006 non-metro counties in the United States accounted for a population of approximately 50.2 million persons (approximately 16.8 percent of the total United States population (ERS 2008, U.S. Census Bureau [USCB] 2008). The general trend in these counties was a decline in the population with over 51 percent of the non-metro counties experiencing population declines of approximately 0.5 percent per year from 2000 to 2006.

3.5.2.3 Primary Field Crops

The 2003 National Resources Inventory indicates that approximately 368 million acres within the United States is cultivated cropland and 58 million acres is uncultivated cropland. In 1992, those figures were 334 million acres of cultivated cropland and 47 million acres of uncultivated cropland. Table 3.5-3 illustrates the amount of acreage planted to primary field crops that would utilize storage facilities between 2003 to 2008 with projections to 2017, along with harvested acres of those crops, and production (USDA National Agricultural Statistics Service [NASS] 2009, USDA Interagency Agricultural Projections Committee [IAP] 2008). As shown in the table, the amount of acreage planted in the specific crops increased in general from 2003 to 2008. Table 3.5-4 identifies the approximate annual percent change during the period, as well as an average percent change.

3.5.2.4 Dedicated Biomass Energy Crop Production

Dedicated biomass energy crop production is still in its infancy, but given the changing dynamics in assistance programs to generate long-term interest and sustainability of production, dedicated biomass energy crop production is anticipated to increase. With the increase in production, there will be a commensurate increasing need for storage of materials until transportation to a biomass conversion facility is required. In 2007, the United States produced 3.6 quadrillion British thermal units (Btu) of energy from biomass, with the majority from wood wastes or byproducts (U.S. Department of Energy [USDOE] 2009). In the USDOE report, *Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply* (2005), indicated a potential for new biomass energy crops to produce, at a moderate crop yield, 164.1 million dry tons per year, which would need new storage capacity. This does not include any Title I crops, which are currently eligible for the existing FSFL Program.

3.5.2.5 Existing On-Farm and Off-Farm Storage

As indicated by Tables 3.5-3 and 3.5-4, production in the selected crops showed an average positive percent change during the period from 2003 to 2008. With increased production of grain stocks, there is an increased need for storage of those stocks, both short-term and longer-term. Table 3.5-5 illustrates the approximate capacity of on-farm storage and off-farm rated storage facilities, grain stocks as of December 1 of each year,

and on-farm hay stocks. Both on-farm and off-farm storage have increased just under two percent per year during the period. Between 2003 to 2008, on-farm storage capacity increased approximately 9.3 percent, while off-farm storage increased by approximately 10 percent. Capacity of off-farm storage increased, while the number of facilities declined by approximately 7.9 percent. The 2007 Census of Agriculture found that approximately 309,000 farms had on-farm storage capacities in 2007, a decline of approximately 10.8 percent from the 2002 Agricultural Census data (USDA 2009a). Though the number of farms having on-farm storage declined, the storage capacity increased by approximately 14.1 percent (USDA 2009a). The average on-farm storage capacity increased approximately 28.5 percent to an average capacity of 36,633 bushels per farm (USDA 2009a). Grain stocks account for an average during the period of 69.0 percent of the on-farm storage capacity and approximately 66.0 percent of the off-farm storage capacity. Other stored items include oilseed crops, not stored as oil, and pulse crops. These estimates exclude facilities that only store rice, peanuts, tobacco warehouses, seed warehouses, storage facilities that handle only dry edible beans, other than chickpeas, and oilseed crushers processing only cottonseed or peanuts.

3.5.2.6 Refrigerated Cold Storage

The USDA found that as of October 1, 2007 there were 2,609 refrigerated warehouse facilities in the United States (NASS 2008a); approximately 1,500 (57.5 percent) of those facilities were general storage, while the remainder were dedicated to apple and pear storage. Of the general storage, approximately 47.2 percent was in private or semi-private storage with public storage facilities accounting for approximately 52.8 percent of the total general storage (*Ibid.*). Most general storage facilities had capacity of less than 0.5 million cubic feet (32.4 percent of general storage) with private storage accounting for 75.9 percent of the general storage facilities within this size category (*Ibid.*). Between 1989 and 2007, gross capacity in public storage facilities increased 77.2 percent to 2,506 million cubic feet of gross space (*Ibid.*). Private and semi-private storage increased 30.1 percent to account for 1,506 million cubic feet of gross space by 2007 (*Ibid.*). By 2007, general storage facilities composition was 23.5 percent of space in cooler-type and 76.5 percent of space in freezer-type storage. In apple and pear storage facilities the reverse was true, with 95.3 percent of space being cooler-type and 4.7 percent of space being freezer-type storage (*Ibid.*).

Table 3.5-3. Planted Acres, Harvested Acres, and Production of Select Storable Field Crops 2003-2008.

Crop Type	Planted Acres								
	2008	2007	2006	2005	2004	2003	Percent Change 2003-2008	USDA 2017 Projection	Percent Change 2008-2017
	(1,000 acres)								
Corn (Grain)	87,327	93,600	78,327	81,779	80,929	78,603	11.1%	92,000	5.4%
Sorghum (Grain)	9,420	7,486	6,454	6,522	7,712	8,284	13.7%	5,700	-39.5%
Oats	4,597	4,085	4,246	4,166	3,763	3,217	42.9%	3,800	-17.3%
Barley, All	5,348	4,527	3,875	3,452	4,018	4,234	26.3%	3,500	-34.6%
Wheat, All	63,457	60,433	57,344	57,229	59,674	62,141	2.1%	55,500	-12.5%
Soybeans	74,533	63,631	75,522	72,032	75,208	73,404	1.5%	68,000	-8.8%

Crop Type	Harvested Acres								
	2008	2007	2006	2005	2004	2003	Percent Change 2003-2008	USDA 2017 Projection	Percent Change 2008-2017
	(1,000 acres)								
Corn (Grain)	78,940	86,542	70,648	75,117	73,631	70,944	11.3%	84,600	7.2%
Sorghum (Grain)	7,798	6,517	5,736	4,937	6,792	7,271	7.2%	4,900	-37.2%
Oats	2,220	1,787	1,823	1,564	1,504	1,395	59.1%	1,600	-27.9%
Barley, All	4,727	4,021	3,269	2,951	3,502	3,767	25.5%	3,000	-36.5%
Wheat, All	56,586	51,011	46,810	50,119	49,999	53,063	6.6%	47,200	-16.6%
Soybeans	72,121	62,820	74,602	71,251	73,958	72,476	-0.5%	67,100	-7.0%

Table 3.5-3. Planted Acres, Harvested Acres, and Production of Select Storable Field Crops 2003-2008 (cont'd.).

Crop Type	Production								
	2008	2007	2006	2005	2004	2003	Percent Change 2003-2008	USDA 2017 Projection	Percent Change 2008-2017
	(1,000 bushels)								
Corn (Grain)	10,087,292	13,073,893	10,534,868	11,114,082	11,807,086	10,089,222	0.0%	14,660,000	45.3%
Sorghum (Grain)	411,219	453,606	392,739	276,824	497,445	472,342	-12.9%	345,000	-16.1%
Oats	144,383	115,695	114,859	93,522	90,430	88,635	62.9%	105,000	-27.3%
Barley, All	278,283	279,743	211,896	180,165	210,110	239,498	16.2%	210,000	-24.5%
Wheat, All	2,344,415	2,066,722	1,812,036	2,104,690	2,158,245	2,344,760	0.0%	2,135,000	-8.9%
Soybeans	2,453,845	2,585,207	3,188,247	3,063,237	3,123,686	2,453,665	0.0%	3,095,000	26.1%

Source: NASS 2009; USDA IAP 2008

Table 3.5-4. Annual Percent Change 2003-2008 for Planted Acres, Harvested Acres, and Production of Select Storable Field Crops.

Crop Type	2008-2007	2007-2006	2006-2005	2005-2004	2004-2003
	Percent Change in Planted Acres				
Corn (Grain)	-6.7%	19.5%	-4.2%	1.1%	3.0%
Sorghum (Grain)	25.8%	16.0%	-1.0%	-15.4%	-6.9%
Oats	12.5%	-3.8%	1.9%	10.7%	17.0%
Barley, All	18.1%	16.8%	12.3%	-14.1%	-5.1%
Wheat, All	5.0%	5.4%	0.2%	-4.1%	-4.0%
Soybeans	17.1%	-15.7%	4.8%	-4.2%	2.5%
Crop Type					
Corn (Grain)	-8.8%	22.5%	-5.9%	2.0%	3.8%
Sorghum (Grain)	19.7%	13.6%	16.2%	-27.3%	-6.6%
Oats	24.2%	-2.0%	16.6%	4.0%	7.8%
Barley, All	17.6%	23.0%	10.8%	-15.7%	-7.0%
Wheat, All	10.9%	9.0%	-6.6%	0.2%	-5.8%
Soybeans	14.8%	-15.8%	4.7%	-3.7%	2.0%
Crop Type					
Corn (Grain)	-22.8%	24.1%	-5.2%	-5.9%	17.0%
Sorghum (Grain)	-9.3%	15.5%	41.9%	-44.4%	5.3%
Oats	24.8%	0.7%	22.8%	3.4%	2.0%
Barley, All	-0.5%	32.0%	17.6%	-14.3%	-12.3%
Wheat, All	13.4%	14.1%	-13.9%	-2.5%	-8.0%
Soybeans	-5.1%	-18.9%	4.1%	-1.9%	27.3%

Source: NASS 2009

Table 3.5-5. Storage Capacity, Grain Stocks, and Hay Stocks (2003-2008).

	2003	2004	2005	2006	2007	2008
	(millions of bushels)					
On-Farm Storage Capacity	11,010	11,135	11,320	11,550	11,815	12,030
Off-Farm Storage Capacity	8,504	8,522	8,540	8,763	9,056	9,351
Off-Farm Storage Facilities (Number)	9,792	9,608	9,496	9,300	9,165	9,015
Grain Stocks On-Farm	6,804	8,245	8,402	7,666	8,105	8105
Percent of On-Farm Capacity in Grain Stocks	62%	74%	74%	66%	69%	67%
Grain Stock Off-Farm	4,912	5,576	5,937	5,766	6,187	6,187
Percent of Off-Farm Capacity in Grain Stocks	58%	65%	70%	66%	68%	69%
	(millions of tons)					
Hay Stocks On-Farm	111	114	105	96	104	ND

Source: NASS 2008b. Statistical Bulletin 1013. Stocks, of Grain, Oilseeds, & Hay Final Estimates 2003-2008; NASS 2009b *Grain Stocks* January.

3.5.3 Farm Balance Sheet and Existing FSFL Information

The balance sheet of the United States Farming Sector (2005 through forecast 2009 or 2009F) indicates that farm assets have been increasing at an annual average rate of 6.8 percent ($2.4 billion 2009F), while total farm debt has been increasing at an annual average rate of 3.0 percent ($0.2 billion 2009F) (ERS 2009). The majority of the increase in asset value is derived from real estate, accounting for approximately 86.2 percent of the farm assets ($2.1 billion of assets) with an annual average increase of approximately 7.8 percent. Real estate debt also plays a large role on the farm balance sheet ($0.1 billion of debt); accounting for approximately 51.9 percent of farm debt. The largest farm debt credits associated with real estate debt include the Farm Credit System (40.6 percent), commercial banks (37.1 percent), life insurance companies (10.8 percent), and individuals and others (9.4 percent). Farm storage loans account for approximately 0.1 percent of real estate debt. Overall, the largest creditors for farm debt include commercial banks (45.0 percent), Farm Credit System (34.9 percent), and individuals and others (12.0 percent). Table 3.5-6 illustrates the current FSFL Program Statistics for number of loans, amount of loans, and storage capacity constructed from those loans.

Table 3.5-5. Farm Storage Facility Loan Program Loans and Storage Capacity.

Year	Number of Loans	Requested Amount	Approved Amount	Storage Capacity
		(millions dollars)		(millions of bushels)
2000	1,946	$58.53	$58.24	56.61
2001	2,311	$78.89	$78.07	61.21
2002	1,433	$48.58	$48.37	36.62
2003	1,777	$58.86	$58.56	43.25
2004	1,660	$57.51	$57.26	42.13
2005	1,722	$65.19	$64.91	44.92
2006	2,385	$100.03	$99.70	76.59
2007	2,831	$140.87	$140.21	100.71
2008	2,515	$125.62	$125.33	79.67
Total	18,580	$734.08	$730.65	542.00

Source: FSA 2009

3.6 HUMAN HEALTH AND SAFETY

3.6.1 Definition of the Resource

Human health and safety for the purposes of this analysis are defined as both occupational hazards associated with the construction and operation of farm storage facilities and potential impacts to general human health and safety of people near operating facilities. The Occupational Safety and Health Administration (OSHA) program's purpose is to protect personnel from occupational deaths, injuries, or illnesses; OSHA standards (29 CFR) govern general safety requirements relating to farm storage facilities for general industry practices (§1910), construction (§1926), and agriculture (§1928). These standards include guidance for entry into areas in which a hazardous atmosphere may exist. Similarly, under Title VI of the Clean Air Act (CAA), the EPA is responsible for programs to protect the stratospheric ozone layer. Regulations in Section 608 of the CAA govern the recovery and recycling of refrigerants that are classified as ozone-depleting substances (ODSs) used in cold storage warehouses.

3.6.2 Affected Environment

3.6.2.1 Safety

Besides typical industrial risks (falling, electrocution, collisions with equipment, etc.), there are several specific potential safety risks associated with the operations of farm storage facilities depending on the facility type and function. Tractor accidents account for 51 percent of all agricultural related deaths. Tractor and machinery risks associated with horizontal silos include undercutting silage faces and collapse, tractor rollover on silage slopes, and collapse of silage from the top when equipment is used on top of the

silage too close to the face edge (Murphy and Harshman 2007). Other hazards include risk of entanglement in machinery parts. OSHA Standards 29 CFR §1928.51 Rollover Protective Structures, and §1928.57, Guarding of Farm Field Equipment, Farmstead Equipment, and Cotton Gins govern safety requirements for agricultural equipment. Vertical grain silos have the potential risk of grain explosions, fires, entrapment and suffocation. Grain silo accidents (suffocation from grain dust or silo gas) are second behind farm tractor accidents, accounting for 11 percent of agricultural related deaths (OSHA No Date). OSHA Standard 29 CFR §1910.272 Grain Handling Facilities provides guidance on the requirements for the prevention of grain dust explosions and fires, as well as other safety hazards associated with grain handling facilities. Many of the transitional and substitute refrigerants can pose an oxygen-limiting environment if concentrations are high enough (National Research Council 1996; DuPont 2008). OSHA standard 29 CFR §1910.146 outlines requirements for entry into confined spaces in which an oxygen-limited atmosphere may exist.

3.6.2.2 Hazardous Materials and Substances

For the purpose of this PEA, the solid and hazardous wastes expected are those generated during construction or renovation of storage facilities, and to a lesser extent those potentially generated during daily operations, and may include hydrocarbons (e.g. fuel, lubricants, etc.), paint, adhesives and cleaning compounds. There is also the potential for the generation of asbestos-containing materials (ACM) and lead-based paint (LBP) during renovation activities of existing storage facilities. Fumigants are substances used to control pest infestations for both pre- and post-harvest. Only three fumigants are authorized for use by the USDA: methyl bromide, sulfuryl fluoride, and phosphine. Methyl bromide is discussed under ozone-depleting substances; sulfuryl fluoride is used only for wood-damaging pests; and phosphine is broadly used for raw agricultural commodities, processed foods, animal feed, feed ingredients, and nonfood commodities (USDA 2008) Concerns over the improper handling and disposal of solid and hazardous wastes that pose a continuing threat to the environment and a danger to human health led to the enactment of the Resource Conservation and Recovery Act (RCRA) of 1976. The RCRA replaced the Solid Waste Disposal Act and authorized the EPA to provide for cradle-to-grave management of hazardous waste and set a framework for the management of nonhazardous municipal solid waste. Under RCRA, a waste is defined as hazardous if it is ignitable, corrosive, reactive, toxic, or listed by the EPA as being hazardous (EPA 2008a). The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and the Superfund Amendments and Reauthorization Act (SARA) of 1986 authorize the EPA to respond to spills and other releases of hazardous substances to the environment. It also authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. Title III of SARA authorizes the Emergency Planning and Community Right-to-Know Act (EPCRA), which requires facility operators with hazardous substances to prepare comprehensive emergency plans and to report accidental releases. EO 12856 (Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements, August 1993) requires Federal

agencies to comply with the provisions of EPCRA. Appendix D lists specific State guidance governing the release of hazardous substances into the atmosphere.

Substances that are deemed the most toxic are those that are stable enough to enter the body and decompose or destructively metabolize in a critical organ (EPA 2008b). Most chlorofluorocarbons (CFCs) are generally much more stable in the atmosphere than hydrochlorofluorocarbons (HCFCs) or hydrofluorocarbons (HFCs), and therefore generally have equal or greater toxicity. Tests of several of transitory and substitute refrigerants (HCFCs and HCFs) have determined that at high concentrations (at or above 20,000 parts per million [ppm]) these substances can cause cardiac sensitivity resulting in cardiac arrhythmia or arrest; yet have been determined not to be developmental toxicants or genotoxins (capable of damaging DNA) (National Research Council 1996; EPA 2008b). Additional tests are required to determine their carcinogenic potential. Another refrigerant with potential toxic effects is ammonia. Ammonia has several benefits over other refrigerants, yet is toxic at lower concentrations than HCFCs and HFCs (Fairchild and Baxter 1995). At low concentrations, ammonia is a skin and eye irritant, yet at higher concentrations ammonia can cause burns to the skin, eyes, throat and lungs, as well as death (Agency for Toxic Substances and Disease Registry [ATSDR] 2004).

3.6.2.3 Ozone-Depleting Substances

Some refrigerants and fumigants are classified as ODSs and may be used for commodity storage. Depletion of the stratospheric ozone layer increases the exposure of the earth's surface to damaging ultraviolet B (UVB) solar radiation, thus increasing the incidences of skin cancer and cataracts, as well as damage to crops (EPA 2009a). The EPA classifies ODSs as Class I or Class II controlled substances. The recovery and recycling of these substances in stationary refrigeration and air-conditioning are governed under Section 608 of the CAA; several States also have additional permitting and use guidelines for these compounds (Appendix E). Class I substances, CFCs, are those with the highest ozone depleting potential and have all been phased out in the U.S., except those given an exemption under the Montreal Protocol, none of which are now used as refrigerants. However, methyl bromide, which is used as an agricultural fumigant to treat a wide variety of harmful plant pests and fungi, is a Class I ODS with a current exemption (USDA 2008; EPA 2009a). Class II substances are HCFCs; these are transitional substances for Class I substances and are also scheduled for eventual phase out. Class II refrigerants are scheduled to be phased out beginning in 2010, and replaced with acceptable CFC substitutes (Appendix F). However, Class II refrigerants may still be used to service refrigeration equipment manufactured before 2010 and new refrigeration equipment may still be manufactured using Class II refrigerants until 2020. While the acceptable substitutes are not entirely risk free, the hazards of these substances (e.g. ozone depletion potential, flammability, toxicity, contribution to global warming, etc.) are less than those of Class I and II substances.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 BIOLOGICAL RESOURCES

Impacts to biological resources would be considered significant if implementation of a proposed action reduced wildlife populations to a level of concern, removed land with unique vegetative characteristics, or resulted in incidental take of a protected species.

4.1.1 Proposed Action Alternative

4.1.1.1 Vegetation and Wildlife

During storage structure construction, temporary negative impacts to vegetation could occur from site preparation. The existing vegetation would be replaced by the storage facility; however, BMPs would be implemented to minimize disturbance and soil compaction which could lead to secondary impacts on vegetation such as from potential soil erosion. In most cases, the storage facility would be constructed on non-agricultural portions of farms that have been previously disturbed. Prior to construction, a site-specific environmental evaluation would be completed that would identify any potentially unique vegetative characteristics that may require additional NEPA.

Temporary disturbances or displacement of wildlife could occur during construction of storage structures such as from the use of heavy machinery or increased human activity on the farm. This disturbance is temporary, localized, and would cease once the building is complete and it is likely that the wildlife would move back into the area.

No significant negative impacts to vegetation or wildlife are expected from implementation of the Proposed Action Alternative.

4.1.1.2 Protected Species

Storage structure construction would have the same potential impacts to protected species as those described for vegetation and wildlife. Unlike wildlife that can relocate and avoid disturbance, protected plants could be affected by site preparation and the alteration of habitat. As with the current program, a site-specific environmental evaluation is required prior to approval of a loan request. This evaluation would identify and protect any species on the endangered species list or critical habitat. If a species is present or suspected to be present, consultation with USFWS would be required to adequately assess the potential impacts to that species. If negative impacts to protected species or critical habitat are identified, it is not likely the location would be approved for storage facility construction. No significant negative impacts to protected species or critical habitat are expected from the Proposed Action Alternative.

4.1.2 No Action Alternative

4.1.2.1 Vegetation and Wildlife

Under the No Action Alternative, the FSFL Program would continue to be implemented as currently administered. Impacts to vegetation and wildlife under the No Action Alternative are the same as those outlined for the Proposed Action Alternative. Site specific environmental evaluation would be completed in accordance with 1-EQ (Revision 2) and would take into account the effects of the FSFL Program on vegetation and wildlife resources. No significant negative impacts to vegetation or wildlife are expected under the No Action Alternative.

4.1.2.2 Protected Species

FSA's policies and regulations do not permit authorization, funding, or implementation of any proposal that is likely to jeopardize the continued existence of any plant or wildlife species listed as endangered or threatened, or any proposal that is likely to destroy or adversely modify the habitats of listed species when such habitats have been determined critical to the species' existence, unless FSA has been granted an exemption under paragraph (h) of Section 7 of the ESA. FSA addresses potential effects on threatened and endangered species or critical habitat by completing a site-specific determination of effects for each loan request. Requests are denied if a potential to impact a protected species is identified. No significant negative impacts to protected species or critical habitat are expected from continued implementation of the current FSFL Program.

4.2 WATER RESOURCES

Impacts to water resources could be considered significant if implementation of the Proposed Action resulted in changes to water quality, threatened or damaged unique hydrologic characteristics, or violated established laws or regulations.

4.2.1 Surface Water Quality

4.2.1.1 Proposed Action Alternative

The Proposed Action Alternative is to implement changes to the FSFL Program as mandated in the 2008 Farm Bill, as well as adding eligible commodities and their appropriate storage structure facilities at the discretion of the Secretary as afforded by the 2008 Farm Bill provisions. Currently, the Secretary is proposing to authorize fruits and vegetables requiring cold storage.

Under the Proposed Action Alternative, the FSFL program has potential to generate impacts to water resources due to ground disturbing activities associated with the construction of new buildings or structures or the alteration of existing buildings or structures. Ground disturbing activities have the potential to increase erosion and runoff leading to increased sedimentation of nearby waters.

Surface water resources may be impacted by both point source and non-point source discharges of pollutants. Point source discharges are regulated through National Pollutant Discharge Elimination System (NPDES) permitting. Non-point source pollution is now considered to be the leading cause of water quality impairments in the nation. Non-point source pollution is not as readily quantifiable as pollution that is derived from point sources since it occurs through numerous diffuse sources. Rain water, snowmelt, or irrigation water can pick up and transport pollutants as it moves across land or paved surfaces, and these pollutants may ultimately be discharged into streams, lakes, oceans, and groundwater. Urban areas and agriculture are both considered to substantially contribute to non-point source pollution in surface waters. As rainfall or irrigation waters intercept pollutants in the landscape, these pollutants may be transported in contaminated runoff and enter streams, lakes, and oceans. Pollutants associated with agricultural areas typically include fertilizers, pesticides, fecal coliform, and sediments. Pollutants associated with FSFL Program eligible storage facilities include construction pollutants such as sediment, retrofit pollutants such as asbestos, and operational pollutants such as fumigants, used to control pest infestations.

Depending on the project location, water quality is regulated under State or local jurisdictions or if in Alaska, District of Columbia, Idaho, Massachusetts, New Hampshire, or New Mexico, by the EPA (EPA 2008). The project location may be adjacent to impaired waterbodies as identified by the Clean Water Act Section 303(d). These waterbodies may have water quality impairments such as nutrient, pathogens, low dissolved oxygen, sedimentation/siltation, and unknown toxicity. For projects that will impact areas greater than one acre, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared in order to obtain NPDES permit coverage for their storm water discharges. The SWPPP specifies BMPs that will prevent all construction pollutants from contacting storm water and with the intent of keeping all products of erosion from moving off site into receiving waters. Implementation of the SWPPP begins when construction begins, typically before the initial clearing, grubbing, and grading operations, since these activities can usually increase erosion potential on the site. Through the implementation of the SWPPP, these impacts to water resources would be localized and cease with the conclusion of land preparation and/or construction activities and would not be significant.

For project areas of less than one acre in size, temporary and minor negative impacts such as soil erosion, sedimentation of waterbodies, and streambed scouring could occur. The use of BMPs such as temporary vegetation covers, erosion control fencing, erosion control blankets, and other similar measures would minimize these impacts. These impacts to water resources would be localized and cease with the conclusion of land preparation and/or construction activities and would not be significant. Therefore, no significant negative impacts to surface water quality are expected from implementation of the Proposed Action.

4.2.1.2 No Action Alternative

Under the No Action Alternative, the FSFL Program would continue to be implemented. Impacts to water resources under the No Action Alternative are the same as those

outlined for the Proposed Action Alternative. Depending on the size and location of the project area, a SWPPP may be required; however, for areas under one acre the use of BMPs would minimize these impacts. No significant negative impacts to surface water are expected from continued implementation of the FSFL Program as currently administered.

4.2.2 Floodplains

4.2.2.1 Proposed Action Alternative

Impacts to floodplains could occur if a project affects the flood regime of a body of water within the flood zone. Local governments participating in the National Flood Insurance Program (NFIP) are required to review proposed construction to determine if they are within identified floodplains, and if so, a development permit would be required prior to construction. Under the Proposed Action Alternative, FSFL funded storage facilities must meet local land planning, zoning ordinances, and building permit requirements. Federal agencies must demonstrate there is no significant encroachment on a floodplain and take steps to avoid or minimize any impact on floodplain function or values. No significantly negative impacts to floodplains are expected from implementation of the Proposed Action Alternative.

4.2.2.2 No Action Alternative

Under the No Action Alternative, the FSFL program would continue to be implemented as currently administered. Impacts to floodplains under the No Action Alternative are the same as those outlined for the Proposed Action Alternative. No significant impacts to floodplains are expected from continued implementation of the FSFL Program as currently administered.

4.2.3 Groundwater

4.2.3.1 Proposed Action Alternative

Under the Proposed Action Alternative, the FSFL program has potential to generate impacts to groundwater resources associated with the construction of new buildings or structures or the alteration of existing buildings or structures and use of refrigerants for cold storage facilities that if not contained have the potential to pollute groundwater. Construction and retrofit activities have the potential to increase on-site water use as well. Prior to construction, a site specific environmental evaluation would identify the potential for impacting groundwater. If potential impacts are identified, measures would be taken to avoid or minimize potential impacts. Compliance with applicable land use plans, zoning ordinances, and building permits would reduce potential impacts to groundwater. Further, compliance with existing laws, regulations, procedures, and guidelines for use of hazardous substances also reduces the potential for adverse impacts to groundwater. As construction impacts are short term, increased water use during construction would be temporary and cease when construction is complete.

Provided these measures are adhered to, there are no significant negative impacts on groundwater associated with the Proposed Action.

4.2.3.2 No Action Alternative

Under the No Action Alternative, the FSFL program would continue to be implemented. Impacts to groundwater resources under the No Action Alternative are the same as those outlined for the Proposed Action Alternative, except for the potential use of fumigants and refrigerants. No significant impacts to groundwater are expected from continued implementation of the FSFL Program as currently administered.

4.3 SOIL RESOURCES

Impacts to soils would occur if implementation of the proposed action resulted in permanently increasing erosion and stream sedimentation, or affected unique soil conditions.

4.3.1 Proposed Action Alternative

The Proposed Action Alternative is to implement changes to the FSFL Program as mandated in the 2008 Farm Bill, as well as adding eligible commodities and their appropriate storage structure facilities at the discretion of the Secretary as afforded by the 2008 Farm Bill provisions. Currently the Secretary proposes to allow fruits and vegetables requiring cold storage facilities.

Under the Proposed Action Alternative, the FSFL Program has potential to generate impacts to soil resources due to ground disturbing activities associated with the construction of new buildings or structures or the alteration of existing buildings or structures. Ground disturbing activities have the potential to increase erosion and runoff leading to increased sedimentation of nearby waters, and soil compaction. All FSFL Program loan applicants must comply with the highly erodible soils provisions of Title II of the 2008 Farm Bill and applicable land use and zoning ordinances and local building permits provisions. Prior to construction, a site specific environmental evaluation would be conducted in accordance with 1-EQ (Revision 2) (FSA 2009) to identify potential erosion problems or unique soil conditions. If permanent increased erosion potential is identified or unique soil conditions are permanently negatively impacted, it is not likely the location would be approved for construction.

Short term, localized disturbance to soils during implementation of the FSFL Program could include ground disturbing activities such as grading, leveling, and associated installation of storage structures. These activities may result in temporary minor increases in wind and water soil erosion on the construction site and the immediate surrounding area, and sedimentation of adjacent waterbodies. However, these impacts may be minimized or eliminated as discussed in Section 4.2, Water Resources, through the implementation of a SWPPP and/or BMPs such as installation of silt and erosion fencing, and not using heavy machinery under wet soil conditions. Therefore, impacts from implementation of the Proposed Action on soils are not expected to be significant.

4.3.2 No Action Alternative

Under the No Action Alternative, the FSFL Program would continue to be implemented as currently administered. Impacts to soil resources under the No Action Alternative are the same as those outlined for the Proposed Action Alternative. Depending on the size and location of the project area, a SWPPP may be required thereby mitigating potential impacts to soil resources. For project areas less than one acre, the use of BMPs would minimize potential impacts to soil resources.

4.4 CULTURAL RESOURCES

A significant effect on cultural resources listed in or eligible for listing in the National Register**Error! Bookmark not defined.** is one that alters the characteristics that make it eligible for the National Register. These adverse effects are described in 36 CFR §800.5, implementing regulations for Section 106 of the NHPA. In the case of an archeological site that is eligible under Criterion D for its research value (i.e., for its ability to yield information about prehistory or history), impacts from site preparation for storage building construction would be an adverse effect since the site would effectively be destroyed by earth moving equipment. If an NRHP eligible or listed storage structure is present in the area of potential effects, modification of the structure for additional storage capacity could affect its historic integrity, resulting in a significant adverse effect. If the eligible or listed property is a TCP that is a place out of doors rather than a structure, a significant adverse effect would be removal of the place (through site preparation for storage building construction) or removal of access to the place. Alteration of an existing structure or the construction of a new structure within an historic farmstead or landscape could also potentially be a significant adverse effect if the undertaking alters the setting, feeling and association that contribute to the important historic qualities of the farmstead or landscape.

4.4.1 Proposed Action Alternative

Under the Proposed Action Alternative, the potential general impacts of the FSFL Program on cultural resources include the destruction of both previously identified and unrecorded archaeological sites due to construction of the facility and land clearing activities; alterations to historic buildings and structures due to modification; and adverse effects to historic farmsteads or landscapes due to the construction of new buildings or structures or the alteration of existing buildings or structures. These potential impacts are similar to the existing program.

Prior to any ground disturbing activity, a site-specific environmental evaluation in accordance with FSA-850 Environmental Evaluation procedures would determine the potential for historic properties to be present in the proposed storage construction area of potential effects. If a survey is warranted, it would be conducted in accordance with Secretary of Interior Standards and/or by utilizing procedures in a State level agreement, if one exists. If no such resources are present, the Section 106 process is complete. If historic districts, sites, structures, or objects are present and are determined eligible for the National Register, FSA would determine in consultation with SHPO/THPO if they

would be affected by the proposed activities, and if adverse effects are found, measures taken to avoid such effects would be implemented. This consultation would be documented per 1-EQ (Revision 2) (FSA 2009) requirements. In accordance with 7 CFR §1436.17, no proposed FSFL Program action can be approved that has been determined to have significant impacts on cultural resources.

4.4.2 No Action Alternative

Under the No Action Alternative, the FSFL Program would continue to be implemented. Impacts to cultural resources under the No Action Alternative are the same as those outlined for the Proposed Action Alternative. Site-specific environmental evaluation would be completed in accordance with 1-EQ (Revision 2) (FSA 2009) in consultation with SHPO/THPO and would take into account the effects of the FSFL Program on cultural resources. Any proposed FSFL Program action that has an adverse effect on historic properties eligible for the NRHP would not be approved.

4.5 SOCIOECONOMICS

A significant impact to socioeconomic conditions can be defined as a change that is outside the normal or anticipated range of those conditions that would flow through the remainder of the economy and community creating substantial adverse effects. For small percentage changes in individual attributes, it would be unlikely that the changes would result in significant impacts at the total level of analysis (i.e., nationwide). Changes to the nationwide economy of greater than agriculture's normal contribution could be considered significant, as this could affect the general economic climate of other industries on a much greater scale.

Additional changes in demographic trends (i.e., population movements) would be considered significant if a substantial percentage of the population were to enter or leave a particular area based on the changing economic conditions associated with the alternatives, rather than projected changes or changes generated by economic activities as a whole.

4.5.1 Proposed Action Alternative

Under the Preferred Alternative the FSFL Program would be implemented per the 2008 Farm Bill provisions at the nationwide level, which would not result in significant socioeconomic impacts from implementing the program, but would create both economic and socioeconomic positive societal benefits. The FSFL Program is not a lender of last resort; therefore, borrowers from other sources would need to meet the terms and conditions sufficient to acquire a loan from a non-FSA lender (i.e., the Farm Credit System or commercial banks). The current FSFL Program has a default rate of approximately 0.04 percent, indicating the general creditworthiness of borrowers (FSA 2009). Data supplied by the FSA, indicates that the average size of a loan from the program is approximately $39,300 or 39.3 percent of the total cap limit per loan. Between 2000 to 2008 there has been an annual average growth rate in the number of loans of 3.3 percent with an approximate annual average increase in the total approved

amount for FSFL Program loans of 10.1 percent. The average size of the loan has been increasing at a rate of approximately 6.5 percent per year during the period.

The primary advantages for borrowers offered by FSFL Program are the lower interest rates available from the program and the potentially longer fixed rate terms than a traditional storage facility loan from a commercial bank or member of the Farm Credit System. The general changes to the program would allow for the construction of more storage capacity or the inclusion of additional fundamental components necessary for the full optimization of the storage facilities (i.e., handling and drying equipment) that may not have been available given the previous loan cap. Also, the 2008 Farm Bill changes to the FSFL Program increase the population size eligible for FSFL Program loans, which could be reasonably expected to foster new developments such as biomass energy generation or allow for more efficient marketing and distribution of non-traditionally stored crops.

This program would not be expected to increase farm debt loads beyond a reasonable level because the conditions for receiving a loan are highly dependent on creditworthiness, providing adequate capacity no more than demonstrably needed, and past cropping history to ensure that the program is being used for on-farm storage. The USDA projections for crop production to 2017 indicate that corn and soybean production would increase by substantial amounts. This increase in production and the potential uses for these crops would drive the need for additional on-farm storage to better allow principal operator management of marketing, timing, and distribution of product; therefore, providing mechanisms to allow hedging of the inherent risks associated with agricultural production activities. Also, the new eligible producers would allow expansion into new market sectors or to provide small, lifestyle farms better reach to their potential market for an extended length of time.

Given that FSFL is not a lender of last resort all participants in the program have the ability to obtain readily available financing from other sources, such as the Farm Credit System. If a producer chooses to construct or expand private storage facilities, that producer has decided that the fixed and variable costs associated with the structure provide an opportunity for a return on their investment. The FSFL Program may provide a more favorable interest rate and/or a longer fixed term period than the Farm Credit System; however, the financing terms may be more limited. Thereby, a producer must weigh all fixed and variable costs associated with a Farm Credit System loan, which may have a longer term, versus the FSFL, which may provide a lower interest rate with a shorter term. The expanded loan cap from $100,000 to $500,000 is likely to somewhat increase the average amount of loan generated from the FSFL Program. If the average loan percentage is extended from the current Program, than an average loan amount may be in the range of $196,500 (approximately 39.3 percent of the loan cap value); however, this size loan may be difficult for some producers to repay during the loan term provided by the FSFL Program. Longer terms may be available through the Farm Credit System, which will still hold the majority of farm real estate debt based on the current size of the portfolio and producer familiarity with the system.

The FSFL program between 2000 and 2009 has, on average, approved and funded 2,300 loans per year. Using the national farm balance sheet, comparative storage loans hold only 0.1 percent of the total real estate debt with the farm credit system holding 40.6 percent of real estate debt. Since 2003, on-farm storage capacity grew at an average of 1.8 percent per year, while off-farm storage capacity increased 1.9 percent. Off-farm storage capacity was increasing, while the number of facilities across the United States was declining, indicating economies of scale being developed in regional or localized aspects of the private industry. Throughout the United States, on-farm storage accounts for an average of 56.6 percent of all storage capacity, in some areas, such as Minnesota, on-farm storage can account for more than 70 percent of total storage capacity. From 2000-2008, storage facility loans in Minnesota accounted for approximately 21.2 percent of all FSFL Program loans made. This combined with the percentage of on-farm storage show that many producers in Minnesota have found that on-farm storage provides a greater return on investment for their business or provides them greater flexibility on marketing their product.

A demand has also been created for specialized storage, which could be more suitable for on-farm containment than combined containment at a private facility. Off-farm storage has been innovative in addressing these concerns to also provide greater opportunities for segregated storage. Excess demand for grain storage in the recent past has also contributed to increased on-farm storage capacity within the last decade. As agriculture becomes more technologically advanced and agricultural producers become a more integrated operation, there will be short-term fluctuations in employment opportunities at the local level. Economies of scale and integration of more aspects of the processing steps provide agricultural producers greater opportunities to collect a greater percentage of the overall value of a crop. This has been the general trend in agriculture; fewer farms, larger size, and more vertically integrated from planting, harvesting, transporting, finally to marketing their product.

Cumulatively, the FSFL program, based on the past performance, has not created a significant number of loans to producers for the construction of facilities during any one time period at the national scale. At the regional and local scale, FSFL may contribute to a greater number of facility loans; however, those producers could obtain those same loans from commercial sources. Additionally, the expansion of the program to include biomass crops and other non-traditional storage options (i.e., cold storage) provides greater access to all agricultural producers, which in turn will create positive societal benefits. Given the fluctuations inherent in crop production, storage capacity demand will fluctuate from season to season. Commercial storage enterprises will continue to have functions for the producer population in the long-term after equilibrium is reached where on-farm storage capacity demand has been met and the return on investment to construct new or expand existing facilities would be zero or negative.

Additionally, there would be no expected changes to the general population or service population within the United States from implementing this program. This program is highly site specific and is unlikely to generate significant changes to the construction or storage facility fabricators or component fabricators based on past use statistics. The

program is likely to generate new construction; however, it is likely that the construction would have been considered regardless of the changes in the program from the 2008 Farm Bill, with the exception of small cold storage, if allowed, and structures to store biomass.

4.5.2 No Action Alternative

Under the No Action Alternative, the FSFL Program would continue under the auspices of the conditions from the 2002 Farm Bill. The existing FSFL Program provides incentives for currently eligible producers to utilize the program. However, there would be minor adverse socioeconomic effects if the No Action Alternative is selected. Primarily, these effects would be felt among those producers currently not eligible under the program (i.e., biomass production and small fruit and vegetable producers requiring on-farm cold storage options). As such, this alternative could produce minor, negative socioeconomic effects to a portion of the population, but that effect would limited and site specific.

4.6 HUMAN HEALTH AND SAFETY

A significant impact to human health or safety could occur if an action violated established laws or regulations.

4.6.1 Proposed Action Alternative

The Proposed Action Alternative is to implement changes to the FSFL as mandated in the 2008 Farm Bill, as well as adding eligible commodities and their appropriate storage structure facilities at the discretion of the Secretary as afforded by the 2008 Farm Bill provisions. Under the Proposed Action Alternative, the FSFL program has potential to generate impacts to human health and safety due to activities associated with the construction of new types of storage buildings or structures or the alteration of existing buildings or structures, as well as the day-to-day operation of these facilities.

4.6.1.1 Safety

Construction and renovation activities have inherent risks such as falls, electrocution, collisions with equipment, etc. Likewise, day-to day operations of these facilities also come with some specific risks to human safety such as farm equipment rollover, grain silo accidents and the like. Implementing the proposed action would not result in significant negative impacts to safety if construction and renovation, and day-to-day operations of farm storage facilities comply with requirements outlined in OSHA Occupational Safety and Health Standards 29 CFR §1910 (General Industry), §1926 (Construction) and §1928 (Agriculture). Further, certain fixed and operational safety equipment and structures as required by CCC (i.e. ladders on silos) are eligible costs under the FSFL Program. Similarly, as long as precautions are taken as outlined in 29 CFR §1910.146 for entry into confined spaces with the potential for an oxygen-limited atmosphere; risk to safety is not significantly increased over the No Action Alternative for cold storage warehouses.

4.6.1.2 Hazardous Materials and Substances

Implementing the proposed action could generate hazardous wastes or consume hazardous materials. Hazardous materials utilized during construction or renovation activities would likely include fuels, paints, glues, asphalt materials, etc. Most of these materials would typically be consumed in their entirety with little waste generated requiring disposal. Renovation of existing storage facilities may generate ACM and LBP waste. Depending on the age of the existing storage facility, prior to renovation a site-specific environmental evaluation would be conducted in accordance with FSA Handbook: Environmental Risk Management for State and County Offices (2-EQ) (FSA 2009b) to determine whether ACM is present. Likewise, precautions for working in areas with the potential for the release of ACM and LBP caused by renovation activities are contained in 29 CFR §1910 and §1926. Any hazardous materials generated during the activities would be disposed of under the provisions of RCRA, as well as all applicable State and local regulations, reducing potential risks from these substances. After construction or renovations have been completed, farm storage facility operations are anticipated to use or generate very few, if any hazardous substances. And, because of the limited size and relatively short amount of time commodities would be stored in these facilities, fumigants would most likely not be necessary. As a result, there would be no substantial additional types or quantities of hazardous materials/wastes created or utilized.

At very high concentrations (20,000 ppm) the transitory and substitute refrigerants can be toxic, causing cardiac arrhythmia and arrest, while ammonia vapor refrigeration can cause irritation, burns and death at lower concentrations. However, concentrations at this level are generally found in confined spaces such as machine rooms and ducts without adequate ventilation where vapors are allowed to accumulate (National Institute for Occupational Safety and Health [NIOSH] 1979). The presence of ammonia can be easily determined due to its distinct odor, even at concentrations well below those known to have harmful effects (ADSTR 2004). Concentrations of HCFC and HFC refrigerants are not as easily detectable. Machine rooms containing refrigeration systems should be equipped with a continuous ventilation system or ventilation fans that begin to function when low oxygen levels or leaks are detected and refrigerant leak alarms (American National Standards Institute/ American Society of Heating, Refrigerating and Air-Conditioning Engineers [ANSI/ASHRAE] 1986; EPA 2006). Similarly, any area that can be considered a confined space where accumulation of refrigerants is possible should have entry controlled as outlined in OSHA Standard 29 CFR §1910.146. Provided equipment is properly installed in adequate facilities and safety requirements are adhered to no significant impacts to human health and safety are expected.

4.6.1.3 Ozone-Depleting Substances

Under the Proposed Action Alternative, the potential impacts of the FSFL Program include the increased use and potential release of Class II ODS refrigerants. The handling, recovery, and recycling of ODS refrigerants is managed in accordance with Section 608 of the CAA, as well as applicable State requirements (Appendix E) (EPA

2009a). As discussed in Section 4.6.1.2, long-term storage of commodities in these facilities would not occur, therefore the use of methyl bromide for fumigation would not be necessary. No significant negative impacts from ODSs are expected if they are handled in accordance with the provisions of Section 608 of the CAA for the recovery and recycling of refrigerants during the service, repair, or disposal of refrigeration equipment.

4.6.2 No Acton Alternative

Under the No Action Alternative, the FSFL Program would continue to be implemented as currently administered. Impacts to human health and safety under the No Action Alternative are similar to those outlined for the Proposed Action Alternative, except refrigerants used for cold storage of fruits and vegetables would not be utilized since they are not currently eligible commodities. Prior to renovation of existing storage facilities, a site-specific environmental evaluation would be conducted in accordance with 2-EQ (FSA 2009b) to determine the potential presence of hazardous materials and substances such as asbestos and LBP, and steps taken in accordance with existing laws, regulations, procedures and guidelines to minimize potential risks to humans and the environment from these substances. No significant negative impacts to human health and safety are expected from continued implementation of the FSFL Program as currently administered.

5.0 CUMULATIVE IMPACTS

5.1 DEFINITION

The cumulative impacts analysis in this PEA considers the potential environmental effects resulting from "the incremental impacts of the action when added to other past, present and reasonably foreseeable actions regardless of what agency or person undertakes such other actions" (40 CFR §1508.7). According to CEQ guidance, the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with the Proposed Action. The scope must consider geographic and temporal overlaps affected by the Proposed Action and other programs or projects. It must also evaluate the nature of interactions among these actions.

Cumulative effects most likely arise when a relationship exists between a Proposed Action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in proximity to the Proposed Action would be expected to have more potential for a relationship than those more geographically separated. Similarly, actions that coincide, even partially, in time tend to have the potential for cumulative effects.

The FSFL Program is designed to provide, through the FSA county offices, low-interest loans to eligible producers for constructing on-farm storage facilities for eligible commodities. The program scale is national and includes U.S. territories, and loans will be granted to individual eligible producers. For the purposes of this analysis, other Federal loan programs pertaining to storage facilities are the primary sources of information used in identifying past, present, and reasonably foreseeable actions.

5.2 PAST, PRESENT AND REASONABLY FORESEEABLE ACTIONS

In addition to the FSFL Program, there are other USDA programs that provide loans or financial assistance for on-farm storage facilities or improvements to farms. A brief overview of the relevant Federal loan programs relating to farm storage facilities is provided in Table 5.2-1.

Table 5.2-1. Federal Loan Programs Relating to Farm Storage Facilities.

Program	Summary
Sugar Storage Facility Loan Program (FSA)	Provides loans to processors of domestically-produced sugarcane and sugarbeets for the construction or upgrading of storage and handling facilities for raw and refined sugars. The planned storage facilities must meet certain structure and design requirements to be eligible for loans. The maximum loan term is 15 years, and loan amounts cover a maximum of 85% of the net cost of the applicant's needed storage (FSA 2007).
Biomass Crop Assistance Program (FSA)	Provides financial assistance to producers that deliver eligible biomass crops to designated biomass conversion facilities. Assistance covers costs for the collection, harvest, storage, and transportation of eligible materials. Costs for storage construction and operation are eligible for the program. Financial assistance payments are available to producers for up to two years, and producers may receive as much as $45 per dry ton of biomass (FSA 2009).
Direct Loan Program, Direct Farm Ownership Loans (FSA)	Direct farm and farm ownership loans provide farmers with assistance to purchase farmland, construct or repair buildings and other fixtures, and promote soil and water conservation. Loan terms may extend up to 40 years (FSA 2008a) but are temporary loans and must be refinanced with private or other loans when the borrower is financially able. The maximum loan amount is $300,000 (FSA 2008b). This loan program does not specifically allocate money to the construction or maintenance of storage facilities, but it does allow farmers to do so if required. Loan applicants must not be able to qualify for any other loan type.

5.3 CUMULATIVE EFFECTS ANALYSIS

All of the loan programs offered through USDA FSA for storage construction or renovations are voluntary and enrollment cannot be predicted. As indicated by Table 5.2-1, most of the Federal farm storage loan programs do not cover the commodities and storage structure types eligible for the FSFL Program. However, the Biomass Crop Assistance Program (BCAP) does provide for matching payments for the storage of eligible biomass material that is also an eligible commodity in the FSFL Proposed Action. The BCAP is a newly authorized program for which an Environmental Impact Statement is currently being completed. In addition, the CCC has published a Notice of Funds Availability in the Federal Register (Thursday June 11, 2009 Vol. 74 No.111) for the collection, harvest, storage, and transportation components of the program. Matching

dollar for dollar payments up to $45 per dry ton, including for storage of biomass upon delivery to a bioconversion facility, is authorized for a maximum two year period under BCAP. BCAP participants would be likely to apply to the FSFL Program for loans to construct on-farm storage facilities authorized for use under the BCAP and would subsequently receive BCAP assistance with the costs of storing biomass for up to a two year period within the stated funding limit of a maximum $45 per dry ton.

The Direct Loan Program and Direct Farm Ownership Loans provide assistance to farmers who wish to make general improvements to their farms. While this may include the construction of storage facilities similar to those provided for in the FSFL Program, it does not offer the same specifications, guidance, and direct support for the storage facilities built by loans from the FSFL Program. These loans are temporary and the borrower must refinance with private commercial lenders as soon as financially able.

Producers cannot apply for assistance for the same storage facility on the same land under multiple programs, reducing the potential for abuse of government funds. Further, temporal and geographic convergence of Federal farm commodity storage structure loans is limited due to the individual producer and commodity eligibility requirements of the individual programs, and their loan terms.

No significant cumulative effects to biological, water, soil, socioeconomic, and human health and safety resources are expected from the Proposed Action if established laws, regulations, and agency provisions and guidelines are followed. The activities associated with the construction or renovation of a storage facility potentially could have short-term localized impacts to the human and natural environment; however, these impacts would be minimized through the use of BMPs and would cease once construction is complete. Long-term expected impacts to the human and natural environment are limited to destruction of vegetation and soil quality associated with the footprint of the constructed storage facility.

5.4 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effect that the use of these resources has on future generations. Irreversible effects primarily result from the use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. For the proposed action, no irreversible or irretrievable resource commitment is expected from the implementation of the proposed action. Table 5.4-1 summarizes cumulative effects.

Table 5.4-1. Cumulative Effects Matrix

Resource	Past and Present Actions	Proposed Action	Future Actions	Cumulative Effects
Biological Resources	Only minor adverse impacts to vegetation and wildlife associated with constructed storage facility building footprints would result from past and present actions. Short-term impacts to vegetation and wildlife resulting from site preparation and construction disturbances such as noise would occur, but are minimized by implementation of BMPs and are limited to the construction site. Site specific environmental evaluations would identify the potential presence of federally protected species and consultation with the USFWS would ensure continued protection of these sensitive resources.	Both short-term and long-term adverse impacts to vegetation, wildlife, and protected species are expected to be similar to those described for past and present actions. Compliance with applicable laws, regulations, provisions and guidance governing hazardous substance use would ensure adverse impacts to vegetation and wildlife remain minor from implementation of the proposed action. Site specific environmental evaluations would identify the potential presence of federally protected species and consultation with the USFWS would ensure continued protection of these sensitive resources.	Continued provision of loans for on-farm storage facility construction would result in only minor adverse impacts to biological resources if completed in accordance with applicable land use plans, zoning ordinances, building codes, laws and regulations, and BMPs minimizing impacts to vegetation are utilized.	Only minor adverse impacts to vegetation and wildlife resources are expected to result from the FSFL Program and similar USDA programs that provide loans for on-farm storage facility construction and alteration.

Table 5.4-1. Cumulative Effects Matrix (cont'd.)

Resource	Past and Present Actions	Proposed Action	Future Actions	Cumulative Effects
Water Resources	Only minor adverse impacts to water resources associated with constructed storage facility building footprints would result from past and present actions. Short-term impacts to water resources such as water quality degradation from point and non-point source pollution and soil erosion from site preparation and construction would occur, but are minimized by implementation of BMPs and/or SWPPP and are limited to the construction site.	Both short-term and long-term adverse impacts to water resources are expected to be similar to those described for past and present actions. Compliance with applicable laws, regulations, provisions and guidance governing water pollutants would ensure adverse impacts to water resources remain minor from implementation of the proposed action.	Continued provision of loans for on-farm storage facility construction or alteration would result in only minor adverse impacts to water resources if completed in accordance with applicable land use plans, zoning ordinances, building codes, laws and regulations, SWPPP and/or BMPs minimizing impacts to water resources are utilized.	Only minor adverse impacts to water resources are expected to result from the FSFL Program and similar USDA programs that provide loans for on-farm storage facility construction and alteration.
Soils	Only minor adverse impacts to soil resources associated with constructed storage facility building footprints would result from past and present actions. Short-term impacts such as wind and water soil erosion and sedimentation of adjacent waterbodies from	Both short-term and long-term adverse impacts to soil resources are expected to be similar to those described for past and present actions. Use of BMPs would ensure that impacts to soil resources remain minor from implementation of the proposed action.	Continued provision of loans for on-farm storage facility construction or alteration would only result in minor adverse impacts to water resources if completed in accordance with applicable land use plans, zoning ordinances, building codes, laws and	Only minor adverse impacts to soil resources are expected to result from the FSFL Program and similar USDA programs that provide loans for on-farm storage facility construction and alteration

Table 5.4-1. Cumulative Effects Matrix (cont'd.)

Resource	Past and Present Actions	Proposed Action	Future Actions	Cumulative Effects
Soils (cont'd.)	site preparation and construction would occur but are minimized by implementation of BMPs and/or a SWPPP and are limited to the construction site. Site specific environmental evaluations would identify potential erosion problems or unique soil conditions and would ensure continued protection of these sensitive resources.	Site-specific environmental evaluations would identify potential erosion problems or unique soil conditions and would ensure continued protection of these sensitive resources.	regulations, SWPPP and/or BMPs minimizing impacts to soil resources are utilized.	
Cultural	Past and present actions having the potential to adversely impact cultural can be avoided or minimized. Site specific environmental evaluations would identify historic properties and would ensure continued protection of these sensitive resources.	Both short-term and long-term adverse impacts to cultural resources are expected to be similar to those described for past and present actions. Compliance with applicable laws, regulations, provisions and guidance governing the protection of historic properties remain minor from implementation of the proposed action.	Continued provision of loans for on-farm storage facility construction or alteration would result in only minor adverse impacts to cultural resources if completed in accordance with applicable land use plans, zoning ordinances, building codes, laws and regulations.	Only minor adverse impacts to cultural resources are expected to result from the FSFL Program and similar USDA programs that provide loans for on-farm storage facility construction and alteration

Table 5.4-1. Cumulative Effects Matrix (cont'd.)

Resource	Past and Present Actions	Proposed Action	Future Actions	Cumulative Effects
Cultural		Site specific environmental evaluations and consultations with SHPO/THPO would identify potential historic properties and would ensure continued protection of these sensitive resources.		
Human Health and Safety	A site-specific environmental evaluation would be conducted in accordance with 2-EQ to determine the potential presence of hazardous materials and substances such as asbestos and LBP, and steps taken in accordance with existing laws, regulations, procedures and guidelines to minimize potential risks to human health and the environment from these substances.	Compliance with applicable laws, regulations, provisions and guidance governing the protection of human, health, and safety would ensure that the risks/adverse impacts remain minor from implementation of the proposed action. A site-specific environmental evaluation would be conducted in accordance with 2-EQ to determine the potential presence of hazardous materials and substances such as asbestos and LBP, and steps taken in accordance with existing laws, regulations,	Continued provision of loans for on-farm storage facility construction or alteration would result in only minor adverse impacts to human, health, and safety if completed in accordance with applicable land use plans, zoning ordinances, building codes, laws and regulations.	

Table 5.4-1. Cumulative Effects Matrix (cont'd.)

Resource	Past and Present Actions	Proposed Action	Future Actions	Cumulative Effects
Human Health and Safety (cont'd.)		procedures and guidelines to minimize potential risks to humans and the environment from these substances.		
Socioeconomics	Positive impacts to socioeconomic resources from past and present actions would result from providing low interest loans to producers for demonstrably needed on-farm storage of eligible commodities provides needed flexibility to maximize returns on their crops.	Positive impacts to socioeconomic resources are expected from the increase of the population size eligible for FSFL Program loans, which could be reasonably expected to foster new developments such as biomass energy generation or allow for more efficient marketing and distribution of non-traditionally stored crops	Continued provision of loans for on-farm storage facility construction or alteration aimed at increasing the population size of eligible borrowers or fostering new developments is expected to have a positive impact to socioeconomic resources similar to those described for the Proposed Action.	Positive long term cumulative impacts to socioeconomic resources are expected to have positive impacts similar to those actions described in the Proposed Action.

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6.0 MITIGATION MEASURES

6.1 INTRODUCTION

The purpose of mitigation is to reduce or eliminate potential negative impacts of the Proposed Action on affected resources. CEQ regulations (40 CFR §1508.20) state that mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

6.2 ROLES AND RESPONSIBILITIES

CEQ regulations state that all relevant reasonable mitigation measures that could alleviate the environmental effects of a Proposed Action must be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies. This serves to alert agencies or officials who can implement these extra measures, and will encourage them to do so. The lead agency for this Proposed Action is FSA.

6.3 MITIGATION RECOMMENDATIONS

The long-term negative impacts associated with implementation of the Proposed Action are expected to be minor. Short-term negative impacts would occur primarily during construction or renovation of an on-farm storage facility and are thus temporary and localized, and would cease when construction is completed. Prior to the construction approval, FSA would complete a site-specific environmental evaluation that would reveal any protected resources on or adjacent to the land proposed for storage facility construction or renovation. When sensitive resources such as protected species or cultural resources are present or in the vicinity of the proposed storage facility site, consultation with the appropriate regulatory agency would occur. Specific mitigation measures necessary to reduce or eliminate the potential localized negative impacts to those sensitive resources would be identified. If the environmental evaluation identifies species or critical habitat protected under ESA are potentially present, and the proposed construction activity on the land is determined to have negative impacts, it is not likely the site would be approved for construction of a FSFL Program facility. Activities may result in temporary localized impacts to water and soils during storage structure construction from potential increased erosion; however, they may be minimized and

mitigated through the implementation of BMPs such as using silt fencing, check dams, stockpiling topsoil and not using heavy machinery under wet conditions.

Human safety may be impacted during construction and operation of commodity storage structures however compliance with applicable OSHA regulations and use of BMPs for operating hazardous machinery minimize this potential. Hazardous substances such as pesticides, fuel, fumigants and refrigerants potentially impact human and animal health but are minimized by adherence to applicable regulations and established procedures and BMPs governing their use. A site-specific environmental evaluation would be conducted in accordance with 2-EQ to determine the potential presence of hazardous materials and substances, and steps taken in accordance with existing laws, regulations, procedures and guidelines to minimize potential risks to humans and the environment from these substances. Impacts to cultural resources are minimized by implementing measures that do not affect the integrity of historic properties or the qualities that make them eligible for the NRHP, such as meeting the Secretary of Interior Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (36 CFR §67).

7.0 LIST OF PREPARERS

Name	Organization	Experience	Project Role
John Bland, M.A. Senior NEPA Program Manager	Geo-Marine, Inc.	15 years	Quality Assurance
Susan Miller, M.A. Project Manager	Geo-Marine, Inc.	19 years	Project Management, Chapters 1 and 2, Mitigation, Editor
Brian Bishop, M.S. Environmental Scientist	Geo-Marine, Inc.	3 years	Human Health and Safety, Data Tables
Felicia Griego B.A. NEPA Analyst	Geo-Marine, Inc	4 years	Executive Summary, Water Resources, Soil Resources, Data Compilation
Lawanna Koch B.A. NEPA Analyst	Geo-Marine, Inc	7 years	Cumulative Summary, Biological Resources
Matthew Wryk B.S. GIS Manager/Analyst	Geo-Marine, Inc.	6 years	GIS Database Creation
Rae Lynn Schneider, M.P.P. Economist	Integrated Environmental Solutions	8 years	Socioeconomics
Elizabeth Magdycz NEPA Intern	Geo-Marine, Inc.		Data Compilation, References, Data Tables
Dave Brown Document Manager	Geo-Marine, Inc.	26 years	Document Formatting and Production

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8.0 LIST OF AGENCIES CONTACTED

Name	Organization
Proponent	
Matthew Ponish	National Environmental Compliance Manager, U.S. Department of Agriculture, Farm Service Agency, Washington D.C.
DeAnn Allen	FSFL Program Manager, U.S. Department of Agriculture, Farm Service Agency, Farm Programs, Washington D.C.
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APPENDIX A: PUBLIC SCOPING COMMENT MATRIX

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Appendix A: Public Scoping Comment Matrix

State	First Name	Last Name	Affiliation	Nature of Comment	Date Comment Received	Mode of Transmittal	Comment
North Dakota	Bart	Schott	Other	Proposed Action	4/14/2009	Scoping Meeting Transcript	Not all storage facilities are in a conducive location to be used by the farmers that need them. Stresses the need for additional storage by mid-summer 2009 and states that fall is entirely too late to be of use for the 2009 crop, especially since these measures were passed last year (2008). Stresses the importance of on-site crop storage for maximum quality of the crop as well as increasing profit for the farmer.
Kansas	Jere	White	Other	Proposed Action	4/14/2009	Scoping Meeting Transcript	Not enough storage for the amount and varieties of crop being produced. Farmers challenged not just by the timing of this issue but also by the lack of access to building materials and construction crews.
Washington, DC	Danita	Murray	Other	Socioeconomics	4/14/2009	Scoping Meeting Transcript	Appreciates efforts of the FSA to communicate requirements and information which will need to be addressed prior to the program's implementation. Concerned about the "partial disbursement" discussed

Appendix A: Public Scoping Comment Matrix

State	First Name	Last Name	Affiliation	Nature of Comment	Date Comment Received	Mode of Transmittal	Comment
							earlier that evening, meaning there are going to be two loans. Two payments required of those electing partial disbursement may have a negative effect on participation.
Maryland	Charles	Willett	Other	Proposed Action	4/15/2009	Scoping Meeting Transcript	Expresses the importance of expediting/accelerating this program and the opportunities it affords for growers to invest in new storage capacity.
Ohio	Anthony	Bush	FSFL Program Participant	Proposed Action	4/15/2009	Scoping Meeting Transcript	Stressed the urgency of initiating the program no later than mid-summer due to the time it takes to plan and build a new or remodel an old storage facility, including the capacity design, electric, gas, access, permitting, and zoning issues that may occur. Concerned about the quick timeframe (only 12 years) to pay back the half million dollar loan. Also, would like to see scales added to the program as they are an important part in helping his recordkeeping run smoothly.
California	Joanne	None given	Private Citizen	Proposed Action	4/7/2009	Website	Would like the program to be available for hay storage construction for the 2009

Appendix A: Public Scoping Comment Matrix

State	First Name	Last Name	Affiliation	Nature of Comment	Date Comment Received	Mode of Transmittal	Comment
							growing season, otherwise she would have to wait 2 years. Having a term of 12-15 years would reduce cash flow requirements to service the debts. Allowing other properties as collateral would enable her to obtain the FSFL loan.
Missouri	Brad	Hequembourg	FSFL Program Participant	Proposed Action	4/13/2009	Website	When do you think the study will be finished? When would we be able to apply for a loan on farm storage? We are at our limit under the old farm bill.
Michigan	Norman	Veliquette	Private Citizen	Proposed Action	4/19/2009	Website	Would like cherry pits to be determined an eligible commodity under the biomass provisions and entities other than growers must be eligible for the loans, i.e., those that "harvest" pits from the cherries.
Michigan	Bob	Reidy	Other	Proposed Alternatives	4/20/2009	Website	Would like cherry pits to be an eligible commodity under the biomass provisions. Requests the program allow these storage facilities be located at the site where the cherry pits are extracted on

Appendix A: Public Scoping Comment Matrix

State	First Name	Last Name	Affiliation	Nature of Comment	Date Comment Received	Mode of Transmittal	Comment
							the premises of cherry harvesting facilities.
Michigan	Neva	Veliquette	Private Citizen	Proposed Action	4/20/2009	Website	Would like cherry pits to be determined an eligible commodity under the biomass provisions and entities other than growers must be eligible for the loans, i.e., those that "harvest" pits from the cherries.
Iowa	SUKUP MFG. CO.	N/A	Other	Proposed Action	4/20/2009	Website	Would like the program to be available before August of 2009 and allow construction before final approval of the regulations.
Wisconsin	Jeremy	Lynch	Private Citizen	Proposed Alternatives	5/4/2009	Website	Supports allowing fruits and vegetables requiring cold storage as eligible commodity.
Michigan	Jim	Sluyter	Other	Proposed Action	5/11/2009	Website	Supports allowing fruits and vegetables requiring cold storage as eligible commodities.
Invalid Zip Code Provided	Mark	Ludwig	State or Local Government	Proposed Action	5/11/2009	Website	Supports expanding the loan program to cover both normal cold storage and controlled atmosphere cold storage which helps extend the fresh market season 60 days resulting in substantial increases in income.

Appendix A: Public Scoping Comment Matrix

State	First Name	Last Name	Affiliation	Nature of Comment	Date Comment Received	Mode of Transmittal	Comment
Minnesota	Bob	Zelenka	Other	Cumulative Impacts	5/11/2009	Website	The Minnesota Grain and Feed Association, which consists of commercial country grain elevators and feed mills is concerned about the cumulative impacts of FSFL on the commercial grain elevator sector and overall agricultural infrastructure. In Minnesota alone, there is now over 1.3 billion bushels of on-farm storage, compared to approximately 590 million bushels of commercial storage. FSFL eligible storage and on-farm grain dryers and cleaners, combined with the growth of semi-trailer ownership by producers are negatively financially impacting grain elevators. The FSFL should focus on storage for cellulosic crop storage and hay.
Illinois	Stephen	Tiwald	Private Citizen	Proposed Action	5/11/2009	Website	Supports fruit and vegetables as eligible commodities and cold storage facilities.
Wisconsin	John	Hendrickson	Private Citizen	Purpose and Need	5/11/2009	Website	Supports fruits and vegetables as eligible commodities, requests eligible facilities include walk-

Appendix A: Public Scoping Comment Matrix

State	First Name	Last Name	Affiliation	Nature of Comment	Date Comment Received	Mode of Transmittal	Comment
							in coolers, freezers, root cellars or other dry crop storage facilities.
Minnesota	Minnesota Corn Growers Association	N/A	Other	Proposed Action	5/12/2009	Website	Supports the revised program and requests that unnecessary barriers to access of the FSFL be removed. Requests the FSFL be operating for the 2009 crop. Urges FSA to not set loan term based upon dollar value of the loan but instead what is economically best for the given operation, especially important to young, beginning, and small and medium size producers. Make available the full range of options the agency is authorized by Congress to offer producers in the securitization of loans. Allow farm machinery or equipment to serve as security. Not requiring a severance agreement and allowing subparcels as security are critical to success of the program.
Virginia	USA Rice Federation	N/A	Other	Proposed Alternatives	5/13/2009	Website	Urge that the program is fully available to producers for the 2009 crop. Request the loan

Appendix A: Public Scoping Comment Matrix

State	First Name	Last Name	Affiliation	Nature of Comment	Date Comment Received	Mode of Transmittal	Comment
							term be set based on an operator's economic needs, especially beneficial for young and beginning or small and medium sized farmers and the interest rate charged for longer loan terms increase but the rule should not be more prescriptive than that. Allow all farm production to determine the necessary storage capacity in rent share arrangements, not just the landowner's share of the crop. New securitization provisions are critical to the program.
Minnesota	Brian	Greenslit	Private Citizen	Proposed Action	5/13/2009	Website	Requests speedy program implementation.
Ohio	Roy	Miller	Private Citizen	Proposed Action	4/21/2009	Letter	State Committees should not have the authority to enact procedure more restrictive or that includes additional costs required of the applicant than the national handbook. All loan applicants across the United States should be treated the same under federal programs.

APPENDIX B: FARM STORAGE FACILITY RECOMMENDATIONS FROM LAND GRANT UNIVERSITIES

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State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations

State	Source	Storage Recommendations	Citation
Alabama	The Alabama Cooperative Extension System	**Hay Storage:** Little information. Barn storage is a more effective storage method than outdoor storage, if outside storage is used elevate bales, orient rows north to south and downslope, leave three feet of space between rows, cover bales. **Cold Storage Warehouse:** No Information	Ball, D., 2000, Protecting Hay Saves Money: Alabama Cooperative Extension System, News Line, http://www.aces.edu (May 2009).
Alaska	University of Alaska Fairbanks Cooperative Extension Service	**Hay Storage:** A completely enclosed hay barn provides maximum protection for hay, followed by partially enclosed and unenclosed barns. Storage requirements determined by the length of time the hay will be stored, the frequency at which hay is purchased, the type and number of livestock being fed, and the number of acres in forage production. Space requirements usually range from 180 to 240 cubic feet per ton of dry hay. **Cold Storage Warehouse:** No Information	Quarberg, D., 1999, Hay Storage Management Considerations for Alaska: Alaska Cooperative Extension, http://www.uaf.edu/coop-ext (May 2009).
Arizona	University of Arizona Cooperative Extension	**Hay Storage:** No Information **Cold Storage Warehouse:** No Information	
Arkansas	University of Arkansas Cooperative Extension Service	**Hay Storage:** No barn storage information. Gives instructions to protect hay using plastic by either covering with plastic sheets, storing many bales in one long silage bag, completely wrapping each bale, or wrapping all by the flat ends of the bales in plastic and storing them end to end. **Cold Storage Warehouse:** No Information	2008, Hay Production and Storage. Chapters 18, 19- Southern Forages, http://bumperscollege.uark.edu/west/3113/lec.hay.htm (May 2009).

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
California	University of California Cooperative Extension	**Hay Storage:** Studies of hay stored uncovered, under a tarp, and under a roof found that hay stored under a roof maintained its quality for a longer period of time. **Hay Storage:** Hay should be stored (most to least desirable method) in buildings, on gravel pads under tarps, then on a gravel pads to decrease loss. **Cold Storage Warehouse:** No Information	Guerrero, J.N., Lopez, M.I., and Cervantes, M., 2005, Covering hay in the irrigated Sonoran Desert decreases heat damage: University of California, California Agriculture, http://calag.ucop.edu/0504OND/pdfs/Hay.pdf (May 2009). Merrill-Davies, M., Reduction of Hay Losses—Storing and Feeding: University of California Davis, cemodoc.ucdavis.edu/files/45603.doc. (May 2009).
Colorado	Colorado State University Cooperative Extension	**Hay Storage:** The CSU Extension provides building plans for four different types of covered, open-sided hay storage facilities, including a 54'6" by 80', 86' by 48', 24'6" by 60", and 26' by 60' with a 42" by 80" concrete pad. **Cold Storage Warehouse:** No Information	Colorado State University Extension. 2009. Farm Building Plans. http://www.ext.colostate.edu/pubs/blueprints/farmbuildings.html (May 2009) Colorado State University Extension. 2009. Livestock Feeding and Housing Plans. http://www.ext.colostate.edu/pubs/blueprints/livestockfeeding.html (May 2009).
Connecticut	Connecticut Cooperative Extension System	**Hay Storage:** No Information **Cold Storage Warehouse:** No Information	
Delaware	University of Delaware Cooperative Extension	**Hay Storage:** Store hay using a permanent structure or a plastic bale wrap system, depending on the individual farmer's cost-benefit ratio. **Cold Storage Warehouse:** No Information	Taylor, R.W., 1998, How Well Do You Treat Your Hay: University of Delaware Cooperative Extension, Weekly Crop Update, v. 6, no. 3, http://ag.udel.edu/rec/Update98/upd41098.html (May 2009).

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
Florida	University of Florida/Institute of Food and Agricultural Sciences Extension	**Hay Storage:** Pole Barns least expensive long term option for hay storage. No specific hay barn building recommendations provides outdoor storage recommendations. **Cold Storage Warehouse:** No Information	Carter, J., Maintain or Improve Stored Hay Quality, Electronic Date Information Source for UF/IFAS Extension, Publication #AN173, http://edis.ifas.ufl.edu/pdffiles/AN/AN18500.pdf (May 2009).
Georgia	University of Georgia Cooperative Extension	**Hay Storage:** Open sided barns should be oriented with the long side going east to west. Barns with one open side should face away from the prevailing wind. Barns should meet Southern Building Code requirements. Barns should have sidewalls and should be as open as possible in the gable ends. The eave height should usually be at least 14 ft. **Cold Storage Warehouse:** No Information	Worley, J. and W. Giwen. 1999. Economics of Farm Storage Buildings, The University of Georgia College of Agricultural and Environmental Sciences/Athens, Bulletin 1173, http://pubs.caes.uga.edu/caespubs/pubcd/B1173/B1173.html (May 2009).
Hawaii	University of Hawaii Office of Cooperative Extension	**Hay Storage:** No Information **Cold Storage Warehouse:** No Information	
Idaho	University of Idaho Extension	**Hay Storage:** Recommends hay storage in accordance with procedures outlined in two articles from New Jersey Agricultural Experiment Station. No specifics on hay storage facilities. **Cold Storage Warehouse:** No Information	Rutgers New Jersey Agricultural Experiment Station. 2008. Silage and Dry Hay Management. http://www.extension.org/pages/Silage_and_Dry_Hay_Management/print/ (May 2008). Rutgers New Jersey Agricultural Experiment Station. 2008. Hay Storage Losses. http://www.extension.org/pages/Hay_Storage_Losses/print/ (May 2009).

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
Illinois	University of Illinois Extension	**Hay Storage:** The only suitable dark location for hay storage is a barn; if hay must be stored outside, it should be in large bales, oriented north to south with flat ends touching, in a well-drained area, and elevated above the ground **Cold Storage Warehouse:** No Information	Lamczyk, M., 2006, Tips for Preventing Hay Storage Losses: University of Illinois Extension, Franklin County Agriculture News. http://web.extension.uiuc.edu/franklin/agnewscolumn/060614.html (May 2009).
Indiana	Purdue Extension	**Hay Storage:** Round hay bales should be stored using bale binding materials (plastic mesh wrap), inside storage, and tarps or covered stacks. **Cold Storage Warehouse:** No Information	Collins, M., 1999, Reducing the Risk of Rain-Damaged Hay: Purdue University, Purdue Forage Day. http://www.agry.purdue.edu/Ext/forages/rotational/articles/PDFs-articles/reducing-the-risk-of.pdf (May 2009).
Iowa	Iowa State University Extension	**Hay Storage:** Barn storage is the most economical method of hay storage. The Iowa Extension website provides building plans for four different types of hay storage facilities: **Cold Storage Warehouse:** No Information	Barnhart, S.K., 2007, Hay is a valuable commodity. Save money by limiting storage and feeding waste!: Iowa State University Extension, Integrated Crop Management, http://www.ipm.iastate.edu/ipm/icm/node/2612/print (May 2009). Iowa State University. 2009. Hay/Grain Storage Plans: MidWest Plan Service. http://www.public.iastate.edu/~mwps_dis/mwps_web/hy_plans.htm (May 2009).

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
Kansas	Kansas State University Research and Extension	**Hay Storage:** Storage method depends on annual rainfall: western and northern Kansas are suitable locations for outdoor storage, while eastern and southern Kansas should use barn storage. Pole barns are the best type of barn to use, and the size and number of walls are determined on a case-by-case basis **Cold Storage Warehouse:** The type of facility depends on the function desired. Structure size is dependent on type and amount of produce to be stored. Structure alternatives include wood pole and post construction, steel buildings, concrete block, and walk-in prefabricated cooler. In all the alternatives, a slab floor is required. The thermal insulation for the proposed storage facility must be cost effective and adequate for the proposed storage. Structure should be located in areas with the required infrastructure (e.g. electricity, water, drainage, etc.)	Taylor, R., Blasi, D., and Dhuyvetter, K., 1995, Large Round Bale Hay Storage: Kansas State University, Farm Machinery and Equipment, MF-1066, http://www.oznet.ksu.edu/library/ageng2/MF1066.PDF (May 2009). Flores, R.A. and K.L.B. Gast. 1992. Postharvest Management of Commercial Horticultural Crops, Storage Construction: Fruits and Vegetables. Cooperative Extension Service, Manhattan, Kansas. Postharvest Management of Commercial Horticultural Crops
Kentucky	University of Kentucky Cooperative Extension Service	**Hay Storage:** Several options: pole barns (post-frame), hoop barns, and renovated tobacco barns. Referenced material provides detailed instructions. **Cold Storage Warehouse:** No Information	Overhults, D. and J.R. Bicudo. 2005. Hay Storage Structure: University of Kentucky, http://www.bae.uky.edu/ext/Presentations/HayStorage/Hay_31003.pdf (May 2009).
Louisiana	The Louisiana State University Agricultural Center Cooperative Extension Service	**Hay Storage:** Recommends a 24' X 70' enclosed structure designed to store hay or other farm produce or equipment. Referenced material provides building plans. **Cold Storage Warehouse:** No Information	Louisiana State University Agricultural Center Research and Extension. 2005. Hay Storage Barn. http://www.agctr.lsu.edu/NR/rdonlyres/0BE41A9A-2BB3-42F7-A0E2-1D426A18A81B/12174/5775HayStorageBarn1.pdf (May 2009).
Maine	University of Maine Cooperative Extension	**Hay Storage:** No Information **Cold Storage Warehouse:** No Information	

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
Maryland	Maryland Cooperative Extension	**Hay Storage:** Hay shed/pole barn may be used to store higher quality hay, while lower quality hay is better stored outdoors on gravel (or another elevated surface). **Cold Storage Warehouse:** Recommends root cellars as a low cost alternative to refrigerated storage facilities. Only store crops that can be adequately stored in cellars. Consider cellar location, temperature and humidity for types of crops and length of storage.	Groover, G., 2009, What Does that Bale of Hay Really Cost?: University of Maryland, http://www.garrett.umd.edu/Agnr/TriStateHayfolder/hay%20cost.pdf (May 2009). Poole, T.E. 2003. Root Cellars: Post-harvest treatment and low-cost storage of produce. Fact Sheet 803. Maryland Cooperative Extension.
Massachusetts	University of Massachusetts Extension	**Hay Storage:** No Information **Cold Storage Warehouse:** No Information	
Michigan	Michigan State University Extension	**Hay Storage:** Recommend a permanent roof cover for hay storage. Other options are plastic bale wrap or gravel pads. **Cold Storage Warehouse:** Recommend cold cellars for storage of root crops. Refrigeration may or may not be used to supplement the effectiveness of the facility.	Michigan State University. 2008. Store Round Bales Properly to Reduce Waste, UP Ag Connections, v. 13, no.1, http://www.maes.msu.edu/upes/newsletters/January_2008.pdf (May 2009). Biernbaum, J. 2009. Cold Cellars for Year-Round Local Food and Farming. Michigan State Univ.
Minnesota	University of Minnesota Extension	**Hay Storage:** Recommend an enclosed hay barn or one with a south-facing open walled barn. Barns should have two to three feet of space above the bales for stacking room, proper ventilation to prevent moisture buildup, and sufficiently strong walls to support the hay bales. Bales should be stacked on end. **Cold Storage Warehouse:** Limited guidance, recommending temperature requirements for cold storage of onions.	Bisek, R., 2007, Round Hay Bale Storage: University of Minnesota, Northwest Research and Outreach Center, Cropping Issues in Northwest Minnesota, v. 4, no. 12, http://www.nwroc.umn.edu/Cropping_issues/2007/Issue12/08_16_07_no5.htm (May 2009). Fritz, V.A., C.J. Rosen, C.B. Tong, and J.A. Wright. 2002. Yellow Storage Onions. Regents of the University of Minnesota.

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
Mississippi	Mississippi State University Extension Service, Coordinated Access to the Research and Extension System	**Hay Storage:** MSU Coordinated Access to the Research and Extension Service (cares) website provides building plans for four different types of hay storage facilities: **Cold Storage Warehouse:** No Information	2008, Storage Facilities: Mississippi State University Extension Service, Mississippi Agricultural and Forestry Experiment Station, http://msucares.com/pubs/plans/books/storage.html (May 2009).
Missouri	University of Missouri Extension	**Hay Storage:** At a minimum store bales on well drained areas, placed in rows in the same direction as the prevailing winds, space rows at least 3 ft apart. Hay storage barns: provide a minimum of 16 feet of eave height clearance. Allow 250 cubic feet of storage per ton of small square bales and 310 cubic feet per ton for large round bales. Or, allow 30 square feet of floor space per ton if stacked two-high or 20 square feet per ton if stacked three-high. Consider ventilation when designing the barn. Consider placing the barn in an area where it can be used as a winter windbreak from the north and west for livestock **Cold Storage Warehouse:** No Information	Henning, J.C. and H.N. Wheaton. 1993. Making and Storing Quality Hay. University of Missouri Extension Service. http://extension.missouri.edu/publications/DisplayPub.aspx?P=G4575. (June 2009) Schultheis, B. 2009. Sizing and Siting Hay Barns. University of Missouri Outreach and Extension, Ag Engineering Edge. http://extension.missouri.edu/webster/ag-edge/forage/haybarn-size.html (May 2009).
Montana	Montana State University Extension Service	**Hay Storage:** No Information **Cold Storage Warehouse:** No Information	
Nebraska	University of Nebraska Cooperative Extension	**Hay Storage:** The best option for hay storage is storage in a hay shed, a partially used machine shed, an unused corn crib, or any other shelter with a roof. **Cold Storage Warehouse:** No Information	Anderson, B., 2000, Proper Hay Storage: University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, Beef Cattle Production, http://beef.unl.edu/stories/200005260.shtml (May 2009).

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
Nevada	University of Nevada Cooperative Extension	**Hay Storage:** No Information **Cold Storage Warehouse:** No Information	N/A
New Hampshire	University of New Hampshire Cooperative Extension	**Hay Storage:** Hay should be stacked on a pallet and stored in a room with a door and the door closed. **Cold Storage Warehouse:** No Information	Chapman-Bosco, L., Conroy, D., Barney, D., 2008, Barn Safety: University of New Hampshire Cooperative Extension, http://extension.unh.edu/resources/files/Resource000881_Rep927.pdf (May 2009).
New Jersey	Rutgers New Jersey Agricultural Experiment Station, Cooperative Extension	**Hay Storage:** Hay barns should be constructed with at least two feet of room above the top of the stacked bales to allow air circulation, and walls must be strong enough to support the weight of the stacked bales. **Cold Storage Warehouse:** Recommends two types of cold storage facilities for apples, common and controlled atmosphere. Common storage regulates temperature and humidity for short-term storage (4-5 months) while controlled atmosphere reduces oxygen and maintains lower temperatures.	Kluchinski, D., 1997, Proper Hay Storage Reduces Losses: Rutgers Cooperative Extension at the New Jersey Agricultural Experiment Station, Plant and Pest Advisory, Field Crops/Livestock Edition, http://njaes.rutgers.edu/pubs/plantandpestadvisory/1997/fc0626.pdf (May 2009). Rutgers New Jersey Agricultural Experiment Station. 2008. Apples: the Cold, Hard Facts. http://www.njfarmfresh.rutgers.edu. (June 2009)
New Mexico	New Mexico State University Cooperative Extension Service	**Hay Storage:** No Information **Cold Storage Warehouse:** No Information	
New York	Cornell University Cooperative Extension	**Hay Storage:** Recommends hay storage structures outlined by Virginia, Kansas, Kentucky extension services, and Ontario Ministry of Agriculture. The Ontario reference recommends storage barns with no walls (western Canada), three solid walls with an open front to be closed with a curtain, or solid walls with large, off-center doors. **Cold Storage Warehouse:** No Information	Choiniere, Y., and Munroe, J. 1993. Guidelines for Hay Storage in Ontario, Ministry of Agriculture, Food, and Rural Affairs, Factsheet, http://www.omafra.gov.on.ca/english/engineer/facts/93-005.htm (May 2009).

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
North Carolina	North Carolina Cooperative Extension	**Hay Storage:** Round hay bales can be economically stored using plastic wrap, net wrap, reusable tarps, bale sleeves, or a permanent hay storage structure. If stored outside, they must be on a well-drained site; use poles, pallets, tires, crushed rock, or other material to break the contact with the wet soil and to provide air space between the bottom of the bale and the soil surface. Storage barns or shelters are most ideal for protecting hay from the weather, but hay that must be stored outside can be safely stored as well **Cold Storage Warehouse:** No Information	North Carolina A&T State University Cooperative Extension. 2005. Making Hay. http://vance.ces.ncsu.edu/index.php?page=news&ci=FIEL+3 (May 2009). North Carolina A&T State University Cooperative Extension. 2009. Hay Storage and Feeding Losses. http://robeson.ces.ncsu.edu/content/Hay+Storage+and+Feeding+Losses (May 2009).
North Dakota	North Dakota State University Extension Service	**Hay Storage:** No hay barn building recommendations. Recommends hay bales be densely packed, placed on a well-drained location, located away from trees, placed end-to-end on a slope, and oriented north to south. Also recommends that hay be stored inside if marketed or stored for more than one season. **Cold Storage Warehouse:** No Information	Gaebe, R., Lardy, G., and Hoppe, K. 2000. Minimizing Hay Losses and Waste: NDSU Agriculture and University Extension, AS-1190. http://www.ag.ndsu.edu/pubs/ansci/range/as1190w.htm (May 2009).
Ohio	Ohio State University Extension	**Hay Storage:** Hay storage pads may be constructed using Flue Gas Desulfurization (FGD) material The Midwest Plan Service website provides building plans for four different types and sizes of hay storage facilities: **Cold Storage Warehouse:** No Information	Butalia, T., Dyer, P., Stowell, R., and Wolfe, W. No Date. Construction of Livestock Feeding and Hay Bale Storage Pads Using FGD Material: Ohio State University Extension and the College of Engineering at The Ohio State University, Fact Sheet. http://ohioline.osu.edu/aex-fact/0332.html (May 2009). Midwest Plan Service. 2009. Hay/Grain Storage Plans. http://www.public.iastate.edu/~mwps_dis/mwps_web/hy_plans.htm (May 2009).

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
Oklahoma	Oklahoma Cooperative Extension Service	**Hay Storage:** Store hay in barn (dimensions depend on diameter and length of bales) that doesn't require interior roof-supporting poles, or store hay outside in round bales with flat ends touching and round ends not touching. Store on some sort of platform and cover tops of bales Recommends enclosed barns with no more than one side open to minimize dry matter loss. In Oklahoma, the open side should face east. Buildings should have a two foot space between tops of bales and eaves and should be sized according to bale size and weight and stacking method. **Cold Storage Warehouse:** No Information	Ball, D., Bade, D., Lacefield, G., Martin, N., and Pinkerton, B. 1993. Minimizing Losses in Hay Storage and Feeding: Oklahoma State University. http://alfalfa.okstate.edu/pub/haystorag.pdf (May 2009). Huhnke, R. No Date. Round Bale Hay Storage: Oklahoma Cooperative Extension Service, BAE-1716. http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-1772/BAE-1716web.pdf (May 2009).
Oregon	Oregon State University Extension Service	**Hay Storage:** Hay at 12% moisture should be stored in a barn with a well-maintained roof. Higher moisture hay should be stored outside, off the ground, and covered. **Cold Storage Warehouse:** No Information	Fransen, S.C., and Hackett, M.R. 2001. Haymaking on the Westside: WSU Farm and Food Connections Team, Farming West of the Cascades. http://cru.cahe.wsu.edu/CEPublications/eb1897/eb1897.pdf (May 2009).
Pennsylvania	Penn State Cooperative Extension and Outreach	**Hay Storage:** Recommends the use of flat storages, which are usually concrete bottom bins with wooden, steel, or concrete walls to contain the stored material. Several of these bins may be located next to each other in a special open-sided building (commodity shed or bulk storage building). Bins may also be built as part of a hay barn or other storage shed. **Cold Storage Warehouse:** No Information	Tyson, J.T., and Graves, R.E. 1996. Bulk Storage: Penn State College of Agricultural Sciences, Cooperative Extension, Agricultural and Biological Engineering H 75. http://www.uwex.edu/ces/dairymod/feed/documents/BulkStorage.pdf (May 2009).
Rhode Island	University of Rhode Island Cooperative Extension	**Hay Storage:** No Information **Cold Storage Warehouse:** No Information	

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
South Carolina	South Carolina Cooperative Extension (based on Clemson University and South Carolina State University)	**Hay Storage:** Store hay in barn (dimensions depend on diameter and length of bales) that doesn't require interior roof-supporting poles, or store hay outside in round bales with flat ends touching and round ends not touching. Store on some sort of platform and cover tops of bales. **Cold Storage Warehouse:** No Information	Ball, D., Bade, D., Lacefield, G., Martin, N., and Pinkerton, B. 1993. Minimizing Losses in Hay Storage and Feeding: Clemson University. http://www.clemson.edu/psapublishing/PAGES/AGRO/hay.pdf (May 2009).
South Dakota	South Dakota State University Cooperative Extension Service	**Hay Storage:** No specific barn storage recommendations other than hay sheds can reduce hay losses by as much as 75%. However, it does give detailed instructions on how to properly store hay outside. **Cold Storage Warehouse:** No facility recommendations, only provides temperature requirements by produce type.	Durland, B., and Pohl, S. 2002. Don't Lose Scarce and Expensive Hay Through Storage or Feeding: SDSU Cooperative Extension Service, Extension Extra, ExEx 1001. http://agbiopubs.sdstate.edu/articles/ExEx1001.pdf (May 2009). South Dakota Cooperative Extension Service. 2008. Storage of Fresh Garden Vegetables. South Dakota State University College of Family and Consumer Sciences South Dakota Cooperative Extension Service.
Tennessee	The University of Tennessee Agricultural Extension Service	**Hay Storage:** Highly recommends barn storage over other types of storage and gives an example drawing of a 48' long and 18' high hay storage barn. If barn storage not possible, they recommend storage options in this order: stacked and tarped on rock pad, stacked and tarped on tires or pallets, plastic sleeve, net wrap, and outside uncovered. **Cold Storage Warehouse:** Website provides design specifications for fruit storage facility.	McKinley, T.L., Economic Comparisons of Hay Storage Methods: The University of Tennessee Extension. http://economics.ag.utk.edu/extension/forage/Economic%20Comparison%20of%20Hay%20Storage%20032008.pdf (May 2009).

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
Texas	Texas Cooperative Extension Service	**Hay Storage:** Store hay in barn (dimensions depend on diameter and length of bales) that doesn't require interior roof-supporting poles, or store hay outside in round bales with flat ends touching and round ends not touching. Store on some sort of platform and cover tops of bales. **Cold Storage Warehouse:** No Information	Ball, D., Bade, D., Lacefield, G., Martin, N., and Pinkerton, B. 1993. Minimizing Losses in Hay Storage and Feeding: Texas A&M University. http://foragesoftexas.tamu.edu/pdf/haystorag.pdf (May 2009).
Utah	Utah State University Cooperative Extension	**Hay Storage:** Only provides recommendations for the building of barns and provides links to four barn suppliers. **Cold Storage Warehouse:** No Information	Small Acreage: Barns, Utah State University Cooperative Extension. http://extension.usu.edu/smac/htm/barns (May 2009).
Vermont	University of Vermont Agriculture Extension	**Hay Storage:** Directed to the Cornell University Cooperative Extension,- uses recommendations for New York. **Cold Storage Warehouse:** No Information	
Virginia	Virginia Cooperative Extension	**Hay Storage:** Recommends hoop barns and pole barns, or open-ended barns oriented from east to west or three-sided barns oriented away from prevailing wind. **Cold Storage Warehouse:** No Information	Groover, G. 2003. Hay Storage Alternatives—Barns: Virginia Cooperative Extension, Farm Business Manage Update. http://pubs.ext.vt.edu/news/farm-business-management-update.html (May 2009). Gay, S.W. and Grisso, R. 2009. Planning for a Farm Storage Building: Virginia Cooperative Extension, Publication 442-760. http://pubs.ext.vt.edu/442/442-760/442-760.html (May 2009).
Washington	Washington State University Cooperative Extension	**Hay Storage:** Hay at 12% moisture should be stored in a barn with a well-maintained roof. Higher moisture hay should be stored outside, off the ground, and covered. **Cold Storage Warehouse:** No Information	Fransen, S.C., and Hackett, M.R. 2001. Haymaking on the Westside: WSU Farm and Food Connections Team, Farming West of the Cascades. http://cru.cahe.wsu.edu/CEPublications/eb1897/eb1897.pdf (May 2009).

State Land Grant University Hay Storage and Cold Storage Warehouse Recommendations (cont'd)

State	Source	Storage Recommendations	Citation
West Virginia	West Virginia University Extension Service	**Hay Storage:** Store hay in round bales in a pole barn or in plastic. **Cold Storage Warehouse:** No Information	Rayburn, E.B. 1992. Round Bale Storage: West Virginia University Extension Service, Forage Management, pp.5760-5761. http://www.wvu.edu/~exten/infores/pubs/crops/trim5760.pdf (May 2009).
Wisconsin	University of Wisconsin Cooperative Extension	**Hay Storage:** Store hay in barn (dimensions depend on diameter and length of bales) that doesn't require interior roof-supporting poles, or store hay outside in round bales with flat ends touching and round ends not touching. Store on some sort of platform and cover tops of bales. **Cold Storage Warehouse:** No Information	Ball, D., Bade, D., Lacefield, G., Martin, N., and Pinkerton, B. 1993. Minimizing Losses in Hay Storage and Feeding: University of Wisconsin Cooperative Extension. http://www.uwex.edu/ces/forage/pubs/haystorage.pdf (May 2009). Saxe, C. 2006. Big Bale Storage Losses; how different options stack up: University of Wisconsin Cooperative Extension. http://www.uwex.edu/ces/crops/uwforage/BigBaleStorage-FOF.pdf (May 2009).
Wyoming	University of Wyoming Cooperative Extension Service	**Hay Storage:** No Information **Cold Storage Warehouse:** No Information	

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APPENDIX C: U.S. TERRESTRIAL ECOREGIONS

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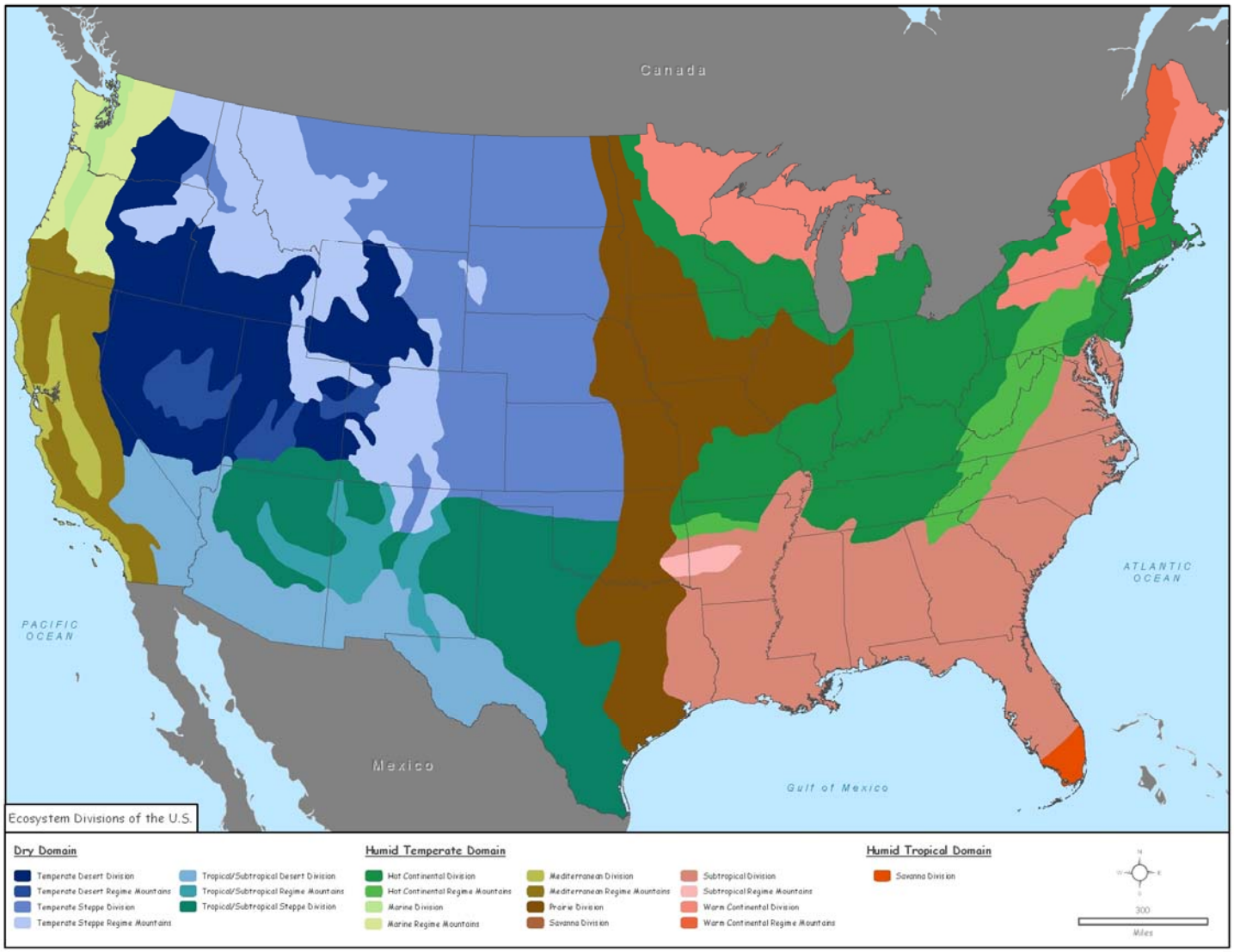

Ecoregion Divisions of the United States (Bailey et al. 1995).

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
Humid Temperate Domain	*Warm Continental Division*	Part of the humid temperate domain, this division is located from the continental interior to the east coast. The New England lowlands have low relief, but rolling and morainic hills, drumlins, eskers and outwash plains are typical of the area. Elevations range from sea level to 2,400 ft.	This area is transitional between boreal and broadleaf deciduous forests. Part of it contains mixed stands of a few coniferous species (white pine, eastern hemlock, and eastern red cedar) and a few deciduous species (mainly yellow birch, sugar maple, and American beech).	Short-tailed weasel (ermine), snowshoe hare, black bear, striped skunk, marmot, chipmunk, jumping mice, beaver, muskrat, badgers, and striped ground squirrels and ptarmigan. Many bird species migrate south during winter. Summer residents include the white-throated sparrow, northern junco, and yellow-bellied sapsuckers.
	>Warm Continental Regime Mountain	The Adirondack Mountains make up the New England Highlands along with broad valleys and numerous swamps and lakes. Elevations range from 500 to 4,000 ft .and a few isolated peaks are higher than 5,000 ft.	Valley regions contain hardwood forest (sugar maple, yellow birch, beech, and hemlock). Low mountain slopes support mixed forest of spruce, fir, maple, beech, and birch. Above the mixed forest, pure stands of balsam fir and red spruce occur. Alpine meadow occurs above the timberline.	This community contains many of the species that occur in the warm continental division. The alpine tundra region has unique fauna such as longtail shrews, boreal (southern) red-backed vole, gray-cheeked thrush, spruce grouse, and gray jay.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	Hot Continental Division	This landscape is south of the warm continental climate in the Humid Temperate Domain. This division includes the Appalachian Plateau, New England Lowlands, Mid-Atlantic Coastal Plain, Piedmont Plateau, East-Central Drift, Ozark Highlands, and the Eastern Interior Uplands and Basins. Low rolling hills, dissected plateaus, and basins are found in Tennessee and Kentucky. Sedimentary formations in the Appalachian Plateau are nearly horizontal, but are so elevated and dissected that the landforms are mostly hilly and mountainous. Elevations range from sea level (Coastal Plain) to 3,000 ft (Appalachian Plateau).	Vegetation in this division is winter deciduous forest, dominated by tall broadleaf trees. The eastern broadleaf province is described as oak-hickory. The Appalachian mountain valleys support mixed oak-pine forest, Above the valley lies the Appalachian oak forest dominated by white and black oak, Above this forest, the northeastern hardwood forest is composed of birch, beech, maple, elm, red oak, basswood, hemlock and white pine. Spruce-fir forest and meadows are found on the high peaks of the Alleghany and Great Smoky Mountains. Lower layers of small trees and shrubs are weakly developed. In spring, a luxuriant ground cover of herbs quickly develops, but is greatly reduced after trees reach full foliage and shade the ground.	Whitetail deer, black bear, bobcat, gray fox, raccoon, gray squirrel, fox squirrel, eastern chipmunk, white-footed mouse, pine voles, shorttail shrew, and cotton mouse. Bird populations are large. Turkey, ruffed grouse, bobwhite, and mourning doves are game birds. The most abundant breeding birds include cardinals, tufted titmouse, wood thrush, summer tanager, red-eyed vireo, blue-gray gnatcatcher, and Carolina wren.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	>Hot Continental Regime Mountains	Low mountains and open valleys make up the central Appalachian Highlands. Elevations range from 300-6,000 ft and are higher to the south. The Ozark Highland is an area of low dissected mountains with altitudes up to 2,000 ft. Valleys are narrow, with steep sides and gradients.	The valleys of the southern Appalachian Mountains support a mixed oak-pine forest that resembles its counterpart on the coastal plain. Appalachian oak forest lies above the valley and is dominated by a dozen species each in the black and white oak group. Above the oak forest is a northeastern hardwood forest, composed of birch, beech, maple, elm, red oak, and basswood. The Ozark Highlands support and oak-hickory forest with overstory species of red oak, white oak, and hickory. Shortleaf pine and eastern red cedar inhabit disturbed sites, shallow soils, and south and west facing slopes.	The southern limit of distribution of many northern forest mammals coincides with the boundaries of this regime. Many species are limited to scattered areas at higher elevations due to spruce-fir die-off. Black bear and white-tail deer are common. Abundant populations of several species of birds occupy the upper elevations of the boreal and hardwood forests. Areas with understory components of azaleas and rhododendrons host worm-eating warblers.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	Subtropical Division	Part of the Humid Temperate Domain, this division occupies the Southeastern US, Atlantic and Gulf Coast plains, and the lower Mississippi floodplains. Flat or gentle sloping plains encompass 50-80% of the Piedmont and Gulf Coastal Plains. In the Outer Coastal Plain over 50% of the area is gently sloping. The region contains numerous streams, marshes, swamps, and lakes.	Climax vegetation of the southeast is medium-tall broadleaf deciduous and needleleaf evergreen trees. At least 50% of the stands are made up of loblolly pine, shortleaf pine, and other pine species. Common associates include oak, hickory, sweetgum, blackgum, red maple, and winged elm. The temperate rainforest of the outer coastal plain has climax vegetation of evergreen-oak and magnolia forest. Bald Cypress and gum dominate inland swamps and lakes. Pecan, eastern sycamore, American elm and roughleaf dogwood inhabit the Mississippi River floodplains. Much of the sandy coastal region of the US is covered by second-growth forests of longleaf, loblolly, and slash pines. The West Gulf Coast is bordered by salt marshes characterized by the marsh grass *Spartina.* Lianas and epiphytes are common.	Fauna vary with the age and stocking of timber stands, percent of deciduous trees, proximity to openings, and presence of bottom-land forest types. Whitetail deer, cottontail rabbits, raccoon and fox are widespread. The eastern wild turkey, bobwhite, and mourning dove, warblers, white-eyed vireo, wood duck, yellow-billed cuckoo, and Louisiana waterthrush occur throughout. Nine-banded armadillos are frequently encountered in this region.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	>Subtropical Regime Mountains	This division is comprised of the Ouachita Mixed Forest - Meadow Province/Ouachita Highlands. Sedimentary rocks were compresses to form folds with ridges with maximum elevation of 2,700 ft. The folds and the mountains trend east-west.	This area supports oak-hickory-pine forests. Primary overstory species are southern red oak, black oak, white oak, and hickories. Shortleaf and loblolly pine provide 40% of the cover. Hardwoods populate the rich bottom lands of the valleys while pines populate the poorer lands.	Bird and mammal species are similar to those found in the surrounding southeastern mixed forest. One amphibian, the Ouachita dusky salamander, is found exclusively in the province's rocky, gravelly streams.
	Marine Division	Situated on the Pacific coast between latitudes 40 and 60 N. The pacific lowland mixed forest occupies a north-south depression between the Coast Ranges and the Cascade Mountains. Elevations range from sea level to 1,500 ft. The province includes isolated hills and low mountains.	Principles trees are western red cedar, western hemlock, and Douglas fir. In interior valleys, the coniferous forest is less dense along the coast where maple, ash, and black cottonwood are located. Prairies support open stands of oak broken up by Douglas fir. Indicator species are Oregon white oak and Pacific madrone.	Mule deer are the most common mammal. Chief predators are the mountain lion and bobcat. Gray squirrels, wood rats, rabbits and fox. Ruffed grouse are found in thickets. Periodically abundant acorn crops attract flocks of band-tailed pigeons, acorn woodpeckers, and mountain quail.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	>Marine Regime Mountains	The Cascade Range rises 5,000 ft above sea level along the coast and from 8,000-9,000 ft in the interior. The mountain range is dominated by a volcano that reaches higher elevations. The area is bordered by a narrow coastal plane.	Conifer forests of Douglas fir, western red cedar, western hemlock, grand and silver fir, Sitka Spruce, and Alaska cedar. Shrubs grow exceptionally well and are impenetrable in some places. Conifers dominate the region except in riparian zones where broadleaf species such as black cottonwood and red alder. Timberline varies from 7,700 - 10,000 ft and above this is an alpine zone covered with shrubs and herbs.	Common large mammals include elk, deer, mountain lion, bobcat, and black bear. Typical small mammals include mice, Douglas squirrels, Townsend chipmunks, red tree voles, and wood rats. A variety of birds and the Pacific tree frog and Pacific giant salamander live in the region's moist and cool forests.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	Prairie Division	Part of the humid temperate domain, prairies are typically associated with continental, mid-latitude climates that are designated as subhumid. This division occupies a broad belt extending from Texas northward to southern Alberta and Saskatchewan. Temperature characteristics correspond to those of adjacent humid climates, forming the basis for two types of prairies: temperate and subtropical.	Forest and prairie mix in a transitional belt on the eastern border of the division. Grasses dominate prairie vegetation with the most prevalent being bluestem. Vegetation in temperate prairie is forest-steppe, characterized by intermingled prairie, groves, and strips of deciduous trees. Trees are commonly found near streams and on northfacing slopes. Cottonwoods are found in floodplains. The subtropical prairie parkland is dominated by medium to tall grasses and a few hardy tree species. Post oak and blackjack oak dominate the cross timbers regions of Oklahoma and Texas.	Mink and river otter are indicative of riverine forests. Thirteen-lined ground squirrels and blacktail prairie dogs are commonly seen on the prairie. Birds of riverine forest include the belted kingfisher, bank swallow, spotted sandpiper, and green-backed heron. Upland birds include the horned lark, eastern meadowlark, and mourning dove. White-tailed deer and nine-banded armadillo are abundant.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	Mediterranean Division	Located on the Pacific coast between latitudes 30 and 45 N. the Mediterranean division is the transition zone between the dry west coast desert and the wet west coast. The land area includes the discontinuous coastal plain, low mountains, and interior valleys adjacent to the Pacific Ocean from San Francisco to San Diego.	The coastal plain and valleys of southern California have sagebrush and grassland communities. The central valley of California is composed of introduced annual grasses after overgrazing, farming, and fire destroyed native species. The redwood is characteristic on seaboard slopes in northern California.	Intensive agricultural development has changed the fauna of the grasslands. Larger species have been eliminated or pushed into the hills. Small rodents and rabbits remain and mule deer live in bushy areas. Streams and rivers are used by anadromous fish. The spotted owl can be found in old-growth and second-growth redwood forest. A variety of shore birds and waterfowl occur in the coastal part of the province.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	>Mediterranean Regime Mountains	This area in California and Oregon covers the southernmost portions of the Cascade Mountains, the northern Coast range, the Klamath Mountains, and the Sierra Nevada. The western slope of the Sierra Nevada's rises gradually from 2,000 - 14,000 ft. The eastern slope drops abruptly to the Great Basin floor. The mountains of southern California are steep; elevations range from 2,000 - 8,000 ft.	Most low hills are covered by chaparral or close growing evergreen shrubs. On higher slopes digger pine and blue oak dominate. The montane zone lies between 2-6 thousand ft in the Cascades, 4-7 thousand ft in the central Sierras, and 5-8 thousand ft in the south. The most important species are ponderosa, Jeffrey, Douglas fir, sugar pine, white fir, red fir, and incense cedar. Vegetation in the California coastal range is dominated by chaparral and sclerophyll forest.	The common large mammals in this division are mule deer, mountain lion, coyote and black bear. Common rodents mentioned previously occur here. Small mammals peculiar to chaparral are Merriam chipmunk, California Mouse, and kangaroo rats. Common birds are mountain quail, Cassin's finch, Hammond's flycatcher, Lincoln's sparrow, Audubon's warbler, pine siskin, Oregon junco, blue goose, sapsuckers and wild chickadees. Screech owls, pygmy owls, gray owls and Cooper's hawk are common birds-of-prey.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
Dry Domain	*Tropical/Subtropical Steppe Division*	Part of the Dry Domain, this division contains shrub-steppe, plateaus, and plains located from the horn of Texas, through Oklahoma and inland to the four corners region. Generally, steppes are transition zones between deserts and semiarid landscapes.	Vegetation composition is conspicuous with arid grasslands and xeric shrubs at lower elevations and pygmy forests at higher elevations. Vegetation at lower elevations grows in clumps or open stands, but seldom covers the ground completely leaving many bare areas. Several pinion and juniper species are found at middle elevations surrounded by vegetation found at lower elevations (sagebrush, yucca, saltbush, rabbitbrush and more). Ponderosa pine and Douglas fir carpet moist canyons and cottonwood dominates riparian areas.	White-tail and mule deer, pronghorn, coyote, and bobcat occupy all available habitats/landscape. The fox squirrel is hunted in wooded areas along streams. Several rodent species exploit available habitats along with hares, rabbits, gray fox, ringtail, and skunks. Many bird species inhabit the area year round while several migrate here in summer or winter. Rattlesnakes and lizards also live here.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	>Tropical/Subtropical Steppe Regime Mountains	The majority of this landscape contains steep foothills and mountains, but some deeply dissected high plateaus occur here. Elevations range from 4,500 - 10,000 ft, with some mountain peaks reaching 12,600 ft. In many areas, relief is higher than 3,000 ft. Isolated volcanic peaks rise to considerable heights in the northwest.	Lower elevations are characterized by mixed grasses, chaparral bush, oak-juniper and pinion-juniper woodlands. At about 7,000 ft open forests of ponderosa pine appear with pinion and juniper occupying southern slopes. Douglas fir replaces pinion and juniper at about 8,000 ft. Aspen and limber pine are also common in this area.	The most common large mammal is the mule deer. Predators include mountain lions, coyotes, and bobcats. Deer mice, longtail weasels, porcupine, golden-mantled ground squirrel, Colorado chipmunk, red and Abert squirrels, wood rats, pocket gophers, longtail voles, and cottontail rabbits. Common bird species are the northern pygmy owl, olive warbler, red-faced warbler, hepatic tanager, mountain bluebird, pygmy nuthatch, white-breasted nuthatch, Mexican junco, Steller's Jay, red-shafted flicker and Rocky Mountain sapsuckers. Goshawks and red-tail hawks are present. Short-horned lizards are the only lizards found here.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	Tropical/Subtropical Desert Division	Parts of the Dry Domain, located south of the Arizona-New Mexico Mountains are the continental deserts. Deserts including the Chihuahuan, Mojave, Colorado, and Sonoran are characterized by plains from which isolated mountains and buttes rise abruptly. The Rio Grande, Pecos, and Colorado Rivers, and their larger tributaries, are the only perennial water sources available.	The region is characterized by dry-desert vegetation, a class of xerophytic plants that are widely dispersed and provide negligible ground cover. In dry periods, visible vegetation is limited to small hard-leaved or spiny shrubs, cacti, or hard grasses. Many species of small annuals may be present, but they appear only after the rare but heavy rains have saturated the soil. In the Mojave-Sonoran Deserts (American Desert), plants are often so large that some places have a near-woodland appearance. Well known are the treelike saguaro cactus, the prickly pear cactus, the ocotillo, creosote bush, and smoke tree. However, much of the desert of the Southwestern United States is in fact scrub, thorn scrub, savanna, or steppe grassland. Parts of this region have no visible plants; they are made up of shifting sand dunes or almost sterile salt flats. Some isolated mountains are high enough to carry a belt of pinion, juniper, Douglas fir, and white fir.	Pronghorn antelope and mule deer are the most widely distributed game animals. Whitetail deer inhabit parts of Texas. The collared peccary or javelina resides in southern parts of the area. Predators include coyote, bobcat, and several hawk, eagle, and owl species. Blacktail rabbits, desert cottontails, kangaroo rats, wood rats and other small rodents compete with domestic herbivores for browse. Common birds include: black-throated sparrows, roadrunners, thrashers and raven. Several quail species occupy the area. Reptiles include numerous species of snakes and lizards.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	Temperate Steppe Division	Located in the Dry Domain, this division contains the Rocky Mountain Piedmont, Upper Missouri Basin Broken Lands, Palouse grassland of Washington and Idaho, and the High Plains and Central Lowlands between the Prairie Parkland and the 104th meridian, from the Canadian Border through Oklahoma.	The vegetation transitions from mixed tall and short grass prairie in the east to mainly short grass in the west. The Great Plains grasslands east of the Rockies have scattered trees and shrubs. Many species of grasses and herbs grow in the Prairies. The Palouse grasslands resemble the Great Plains, but contain no shrubs. Woody vegetation is rare except in cottonwood floodplains.	Pronghorn is the most abundant large mammal, but mule and whitetail deer are common. Lagomorphs, prairie dogs, and other small rodents are preyed upon by coyote and other avian predators. The thirteen-lined ground squirrel and prairie dogs are preyed upon by badgers. Two bird species are unique to short grass prairies east of the Rockies; the mountain plover and McCown's longspur.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	>Temperate Steppe Regime Mountains	Located in the dry domain, this regime is in the southern, middle and northern Rocky Mountains. The Rocky Mountains are as high as 14,000 ft. Several sections have intermontane depressions ("parks") with floors as low as 6,000ft. Ranges in central Idaho are formed by granite intrusions called the Idaho Batholith, with altitudes ranging from 3,000 to 7,000 ft. The Black Hills have domal uplifts with an exposed core of Precambrian rock.	The Rocky Mountains are tallest in the southern region. They are characterized by the absence of trees in the tundra and dominated directly below by Englemenn spruce and subalpine fir. At lower elevations lies the montane zone with its characteristic ponderosa pine and Douglas-fir. At lower elevations the foothills have a growth of shrubs, of which, mountain-mahogany and several scrub oak species are conspicuous. In the middle Rocky Mountains below the subalpine zone Douglas firs are the climax dominant, with grand fir associates west of the continental divide. Below this, ponderosa pine is the dominant with lodgepole pines and grasses growing in basins. Sagebrush-steppe dominates the lower slopes of the mountains. In the northern Rocky Mountains, mixed evergreen-deciduous forest predominates, with Douglas fir and cedar-hemlock-Douglas fir being the two types of forest.	Large mammals in this division include black bear, deer, elk, mountain lion, and bobcat. Smaller mammals include squirrels, mice, rats, and lagomorphs. Familiar birds are hawks, jays, chestnut-backed chickadees, red-breasted nuthatches and owls. Harney Peak, in the Black Hills province is inhabited by mountain goats recently introduced into the region.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	Temperate Desert Division	The Temperate deserts are located in the intermountain regions between the Pacific coast and Rocky Mountains. Temperate deserts climates support sparse xerotypical shrubs such as sagebrush. Recently, semi desert shrub vegetation has invaded areas of the western US that were formerly grasslands.	Sagebrush dominates at lower elevations, but other important plants are antelope bitterbrush, shadscale, saltbush, rabbitbrush, blackbrush, and Gambel oak. Greasewood and saltgrass are the only plants that grow in salt-saturated environments. In plots protected from fire, grasses typical of the Palouse grassland or mixed-grass steppe become dominant. Above the sagebrush belt lays a woodland area dominated by Pinion and Juniper. Wet valley bottoms and riparian areas contain willows and sedges, cottonwood, and non-native tamarisk.	Common large mammals that live here are pronghorn, mule deer, mountain lion, bobcat and badgers. Sagebrush provides ideal habitat for pronghorn and white-tailed prairie dogs. Small rodents (squirrels, mice, rats) and jackrabbits are common. Bird species range from common species like Jays and owls to-specialized species such as the sage sparrow and sage thrasher. Reptiles include sagebrush lizard, horned lizard, and prairie rattlesnake.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	>Temperate Desert Regime Mountains	This province covers the highest areas of the Great Basin and Colorado Plateau. No perennial lakes occur; streams are rare and usually ephemeral. Ranges rise steeply and are mainly composed of folded and faulted sedimentary rock. Many linear mountain ranges reach altitudes of 13,000 ft.	Sagebrush dominates at lower elevations, but other important plants are antelope bitterbrush, shadscale, saltbush, rabbitbrush, horsebrush, and Gambel oak. All tolerate salt to some extent, but greasewood and saltgrass are the only plants that grow in salt-saturated environments. Pinion and juniper woodlands occupy lower mountain slopes. Ponderosa pine lies on exposed slopes above the pinion and juniper woodlands. Douglas fir typically grows in sheltered locations. Engelmann spruce are in subalpine landscapes.	Sagebrush shrublands provide ideal habitat for pronghorn antelope and whitetail prairie dog. Many species of birds are found in sagebrush ranging from burrowing owls to sage sparrow and sage thrasher. American kestrel, ferruginous hawk, and golden eagle prey on jackrabbits. Collared lizards are also common.
Humid Tropical Domain	*Savanna Division*	Part of the Humid Temperate Domain this divisions covers the landscape in Southern Florida and the Florida Keys. Elevation ranges from sea level - 25 ft. The low coastal plain contains large areas of swamps and marshes, with low beach ridges and dunes. Streams, canals and ditches drain directly into the ocean. Hammocks rise a few feet above the surrounding area in the interior.	Twenty percent of the area is covered by tropical moist hardwood forest. Cypress forests are extensive and mangrove is widespread along the eastern and southern coasts. Within grasslands, hammocks contain groves of medium to tall broadleaf evergreen trees. Mahogany, redbay, and several palmettos are common.	Slight changes in water levels in the Everglades influences habitats and fauna. Mammals include the Florida panther, whitetail deer, black bear, bobcats, and marsh and swamp rabbits. Manatees inhabit estuaries and interlacing channels. Numerous species of birds inhabit the area and the American alligator is a year-round resident.

U.S. Terrestrial Ecoregion Description

	Division	General Description	Vegetation Species	Animal Species
	>Savanna Regime Mountains	Located in Puerto Rico, the easternmost peaks of a partly submerged mountain range is composed of Cretaceous and older rocks with granite intrusions. East-west ridges and peaks form the backbone of the island. Local relief is considerable with steep slopes. Elevations range from sea level to the highest peak in the Cordillera Central at 4,400 ft.	Most of Puerto Rico is under cultivation, but some rainforest remains. Forest trees include mahogany, ebony, mamey, tree ferns, tree ferns, sierra palm and mango.	Puerto Rico does not have any large wild animals. Along with native bats and lizards, the introduced mongoose and rats compose the majority of the island's vertebrates. The coqui is a distinctive frog. Considerable coral and sport fishes abound in coastal waters.

APPENDIX D HAZARDOUS SUBSTANCE RELEASE PERMITS BY STATE

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State	Permit	Link
Alabama	ADEM Admin. Code r. 335-3-14-.xx	http://www.adem.state.al.us/regulations/Div3/Div3%201-09.pdf
Alaska	Title 18 Chapter 50 - 18 AAC 50.560. General minor permits	http://www.legis.state.ak.us/cgi-bin/folioisa.dll/aac/query=[jump!3A!2718+aac+50!2E560!27]/doc/%7B@71837%7D/hits_only?
	Current Air Quality Control Regulations 18 AAC 50, Effective November 9, 2008	http://www.dec.state.ak.us/regulations/pdfs/18%20AAC%2050.pdf
Arizona	Title 18 Environmental Quality, Chapter 2, Department of Environmental Quality, Air Pollution Control, Articles 3, 4, and 5	http://www.azsos.gov/public_services/Title_18/18-02.htm
	Article 2 - State Air Pollution Control §49-426 Permits; duties of director; exceptions; applications; objections; fees	http://law.justia.com/arizona/codes/title49/00426.html
Arkansas	Regulation 18 Arkansas Air Pollution Code	http://www.adeq.state.ar.us/regs/files/reg18_final_090125.pdf
	Regulation 19 Regulations of the Arkansas Plan of Implementation for Air Pollution Control	http://www.adeq.state.ar.us/regs/files/reg19_final_090125.pdf
	Regulation 26 Regulations of the Arkansas Operating Air Permit Program as revised	http://www.adeq.state.ar.us/regs/files/reg26_final_090125.pdf
California	California Air Resources Board Local Air Districts	http://www.arb.ca.gov/capcoa/roster.htm
	California Health And Safety Code Section 39660	http://law.onecle.com/california/health/39660.html
	Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006	http://www.arb.ca.gov/cc/docs/ab32text.pdf
Colorado	Colorado Air Pollution Prevention and Control Act, 25-7-101 Title V Operating Permit Program	http://www.cdphe.state.co.us/ap/Titlev.html
	Colorado Air Pollution Prevention and Control Act, 25-7-101 Article 7 Air Quality Control	http://www.michie.com/colorado/lpext.dll/cocode/2/42d91/451b2/4524a?fn=document-frame.htm&f=templates&2.0#
Connecticut	Regulations of Connecticut State Agencies (RCSA) Title 22a Section 22a-174-1 to 22a-174-200 Abatement of Air Pollution	http://www.ct.gov/Dep/cwp/view.asp?a=2684&q=322184&depNav_GID=1619
Delaware	Title 7 Natural Resources and Environmental Control 1100 Air Quality	http://regulations.delaware.gov/AdminCode/title7/1000/1100/1102.pdf

State	Permit	Link
	Management Section 1102 Permits	
	Title 7 Natural Resources and Environmental Control 1100 Air Quality Management Section 1103 Ambient Air Quality Standards	http://regulations.delaware.gov/AdminCode/title7/1000/1100/1103.pdf
Florida	Florida Administrative Code Chapter 62-204 Air Pollution Control General Provisions	http://www.dep.state.fl.us/air/rules/fac/62-204.pdf
	Florida Administrative Code Chapter 62-210 Stationary Sources General Requirements	http://www.dep.state.fl.us/air/rules/fac/62-210.pdf
Georgia	Rules for Air Quality Control Chapter 391-3-1 Rule .03 Permits	http://www.georgiaair.org/airpermit/downloads/aqrules/airrules20080911.pdf
Hawaii	Hawaii Administrative Rule Title 11 Chapter 60.1 Air Pollution Control	http://hawaii.gov/health/environmental/air/cab/environmental/air/cab/CABrules/11-60-1.pdf
Idaho	58.01.01 - Rules for the Control of Air Pollution in Idaho	http://adm.idaho.gov/adminrules/rules/idapa58/0101.pdf
Illinois	Title 35, Subtitle B, Chapter 1, Subchapter a, Part 201, Permits and General Provisions	http://www.ipcb.state.il.us/documents/dsweb/Get/Document-11908/
Indiana	Title 326 of the Indiana Administrative Code	http://www.in.gov/legislative/iac/T03260/A00020.PDF?
Iowa	567—22.1(455B) Permits required for new or existing stationary sources	http://www.legis.state.ia.us/aspx/ACODocs/DOCS/3-11-2009.567.22.pdf
Kentucky	Kentucky Administrative Regulations TITLE 401 ENERGY AND ENVIRONMENT CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION Chapter 52 Permits, Registrations, and Prohibitory Rules	http://www.lrc.state.ky.us/kar/TITLE401.HTM
	401 KAR 52:020. Title V permits	http://www.lrc.state.ky.us/kar/401/052/020.htm
	401 KAR 52:030. Federally-enforceable permits for nonmajor sources.	http://www.lrc.state.ky.us/kar/401/052/030.htm
	401 KAR 52:040. State-origin permits	http://www.lrc.state.ky.us/kar/401/052/040.htm
Louisiana	Louisiana Administrative Code, Title 33 Environmental Regulatory Code Part III. Air (LAC 33:III.Chapter 7)	http://yosemite1.epa.gov/r6/Sip0304.nsf/dc994a1edbcf32c08625651c00552ed8/de54167f80a50246862568e7006bb4ac!OpenDocument

State	Permit	Link
	LAC 33:III Chapter 21. Control of Emissions of Organic Compounds LA § 2103. Storage of Volatile Organic Compounds (Large Tanks)	http://www.maine.gov/sos/cec/rules/06/096/096c115.doc
Maine	Major and Minor Source Air Emission License Regulations	http://www.dsd.state.md.us/comar/26/26.11.02.02.htm
Maryland	Title 26 Department of Environment PART 2 - SUBTITLE 11 Permits, Approvals, and Registration (26.11.02.02 - General Provisions)	http://www.mass.gov/dep/service/regulations/310cmr06.pdf
Massachusetts	310 CMR 6.00: Ambient Air Quality Standards	http://law.justia.com/michigan/codes/mcl-chap324/mcl-324-5506.html
Michigan	NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT (EXCERPT) Act 451 of 1994 § 324.5506 Operating permit	http://www.state.mi.us/orr/emi/admincode.asp?AdminCode=Single&Admin_Num=33601201&Dpt=EQ&RngHigh=
	Michigan Rule 336.1201 - Permits to Install	https://www.revisor.leg.state.mn.us/data/revisor/rule/current/7007/7007.0150.pdf
Minnesota	Minnesota Administrative Rules 7007.0150 Permit Required (Part 70 Permit)	http://www.deq.state.ms.us/mdeq.nsf/pdf/Main_APC-S-6/$File/APC-S-6,%20Title%20V%20Permit%20Regs,%20Amended%20December%2029,%202000.pdf?OpenElement
Mississippi	APC-S-6 Air Emissions Operating Permit Regulations for the Purposes of Title V of the Federal Clean Air Act	http://www.epa.gov/region07/programs/artd/air/rules/missouri/chap6.htm
Missouri	Missouri Department of Natural Resources Division 10 -- Air Conservation Commission Code of State Regulations (CSR) 10-6.065 Operating Permits - Air Quality Standards, Definitions, Sampling and Reference Methods, and Air Pollution Control Regulations for the State of Missouri	http://www.deq.mt.gov/dir/legal/Chapters/CH08-01.PDF
Montana	Clean Air Act of Montana. Air Quality, Title 75	http://www.deq.mt.gov/dir/legal/Chapters/Ch08-toc.asp
	Administrative Rules of Montana Title 17, Chapter 8. Air Quality	http://www.epa.gov/region7/programs/artd/air/rules/nebraska/t129ch05.pdf

State	Permit	Link
Nebraska	Title 129 - Nebraska Air Quality Regulations, Chapter 5 - Operating Permits	http://des.nh.gov/organization/commissioner/legal/rules/documents/env-a100-4800toc.pdf
New Hampshire	Env-A 100-4800 Rules Governing the Control of Air Pollution	http://des.nh.gov/organization/commissioner/legal/rules/documents/env-a600.pdf
	Env-A 600: Statewide Permit System	http://www.state.nj.us/dep/aqm/Sub1.pdf
New Jersey	Title 7, Chapter 27 Air Pollution Control Subchapter 1 General Provisions (N.J.A.C. 7:27-1)	http://www.state.nj.us/dep/aqm/Sub16.pdf
	Title 7, Chapter 27 Air Pollution Control Subchapter 16 Control and Prohibition of Air Pollution by Volatile Organic Compounds (N.J.A.C. 7:27-16)	http://www.nmcpr.state.nm.us/nmac/_title20/T20C002.htm
New Mexico	TITLE 20 - ENVIRONMENTAL PROTECTION, CHAPTER 2, AIR QUALITY (NMAC - New Mexico Administrative Code)	http://www.nmcpr.state.nm.us/nmac/parts/title20/20.002.0070.htm
	Title 20, Chapter 2, Part 70 Operating Permits (NMAC 20.2.70)	http://www.state.nj.us/dep/aqm/Sub22.pdf
	Title 7, Chapter 27 Air Pollution Control Subchapter 22 Operating Permits (N.J.A.C. 7:27-16)	http://www.dec.ny.gov/regs/4303.html
New York	Subpart 201-3 Exemption: Feed and grain milling, cleaning, conveying, drying and storage operations including grain storage silos, where such silos exhaust to an appropriate emission control device, excluding grain terminal elevators with permanent storage capacities over 2.5 million U.S. bushels, and grain storage elevators with capacities above one million bushels.	http://www.dec.ny.gov/regs/4302.html
	Subpart 201-4: Minor Facility Registrations	http://www.dec.ny.gov/regs/4301.html
	Subpart 201-5: State Facility Permits	http://www.dec.ny.gov/regs/13539.html
	Subpart 201-6: Title V Facility Permits	http://www.leg.state.nv.us/NAC/NAC-445B.html
Nevada	NAC Chapter 445B Air Controls; Class I Operating Permits 445B.287-3497	http://daq.state.nc.us/rules/rules/secQ0100.pdf

State	Permit	Link
North Carolina	SUBCHAPTER 02Q - AIR QUALITY PERMITS PROCEDURES SECTION .0100 - GENERAL PROVISIONS	http://www.legis.nd.gov/information/acdata/pdf/33-15-01.pdf
North Dakota	Article 33-15 Air Pollution Control	http://www.epa.state.oh.us/dapc/regs/3745-31/3745_31.html
Ohio	Ohio Administrative Code (OAC) Chapter 3745-31	http://www.epa.state.oh.us/dapc/regs/3745-31/3745-31-02f.pdf
	Ohio Administrative Code (OAC) 3745-31 Permit-to-Install and Operate	http://www.epa.state.oh.us/dapc/regs/3745-77/3745_77.html
	Ohio Administrative Code (OAC) 3745-77 Title V Permit Rules	http://www.deq.state.ok.us/rules/100.pdf
Oklahoma	TITLE 252. DEPARTMENT OF ENVIRONMENTAL QUALITY CHAPTER 100. AIR POLLUTION CONTROL	
		http://arcweb.sos.state.or.us/rules/OARs_300/OAR_340/340_216.html
Oregon	Divison 216 Air Contaminant Discharge Permits	http://arcweb.sos.state.or.us/rules/OARs_300/OAR_340/340_214.html
	340-214-0200 through 340-214-0220 Emissions of VOCs and NOx from sources in ozone nonattainment areas	http://www.dep.state.pa.us/DEP/DEPUTATE/airwaste/aq/regs/apca.pdf
Pennsylvania	Title 35 - Health and Safety, Chapter 23 - Air Pollution “AIR POLLUTION CONTROL ACT" Act of 1959, P.L. 2119, No. 7.87	http://164.156.71.80/WXOD.aspx?fs=7780d840f80b0000800000450000045&ft=1
	Title V Permit 2700-PM-AQ0010	http://164.156.71.80/WXOD.aspx?fs=7780d840f80b0000800000400000040&ft=1
	State Permit 2700-PM-AQ0013	http://www.dem.ri.gov/pubs/regs/regs/air/air29_07.pdf
Rhode Island	AIR POLLUTION CONTROL REGULATION NO. 29 OPERATING PERMITS (R.I. Gen. Laws § 42-17.1-2(s) and 23-23)	http://www.scdhec.net/environment/baq/docs/regs/index.aspx
South Carolina	Regulation 61-62 - Air Pollution Control Regulations and Standards	http://www.scdhec.net/administration/library/CR-004162.pdf
	AAQS-Ambient Air Quality Standards SC R.62.5, Standard , Conditional Major Permit, SC R.61-62.1 Section II(G), Title V SC R.62.70, etc.	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=34A-1-56
South Dakota	South Dakota Codified Law 34A-1	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:36

State	Permit	Link
	Administrative Rules of South Dakota 74:36	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:36:04
	Administrative Rules of South Dakota 74:36.04 OPERATING PERMITS FOR MINOR SOURCES	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:36:05
	Administrative Rules of South Dakota 74:38.05 OPERATING PERMITS FOR PART 70 SOURCES	http://www.state.tn.us/sos/rules/1200/1200-03/1200-03-09.pdf
Tennessee	Tennessee Code: Title 68: Chapter 201 (Air Quality Act) Chapter 1200-3-9 CONSTRUCTION AND OPERATING PERMITS	http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=106&rl=261
Texas	Texas Administrative Code Rule 106.261 Facilities (Emission Limitations)	http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=30&pt=1&ch=106&rl=261
	Texas Administrative Code Rule 106.261 Facilities (Emission and Distance Limitations)	http://le.utah.gov/~code/TITLE19/htm/19_02_010901.htm
Utah	The Utah Air Conservation Act (Title 19, Chapter 2 of the Utah Code) 19-2-109.1. Operating permit required -- Emissions fee -- Implementation	http://www.rules.utah.gov/publicat/code/r307/r307-101.htm
	Rule R307-101. General Requirements	http://www.rules.utah.gov/publicat/code/r307/r307-415.htm
	Rule R307-415. Permits: Operating Permit Requirements.	http://www.anr.state.vt.us/air/docs/apcregs.pdf
Vermont	Vermont Air Pollution Control Regulations	https://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+10.1-1322
Virginia	Virginia Code § 10.1-1322 Air Pollution Control Board Permits	http://apps.ecy.wa.gov/permithandbook/permitdetail.asp?id=51
Washington	Access Washington Environemtnal Permit Handbook Air Operating Permit	http://apps.leg.wa.gov/RCW/default.aspx?cite=70.94.161
	RCW 70.94.161 - Operating permits for air contaminant sources — Generally — Fees, report to legislature	http://www.ecy.wa.gov/pubs/wac173401.pdf
	Chapter 173-401 WAC Operating Permit Regulation	
West Virginia	WV Code, Chapter 22-5-1 et seq. - WV Air	http://www.legis.state.wi.us/statutes/Stat0285.pdf

State	Permit	Link
	Pollution Control Act	
Wisconsin	Wisconsin Statute s. 285.60	http://legisweb.state.wy.us/statutes/titles/Title35/T35CH11.htm
Wyoming	35-11-206. Operating permit requirements and conditions	http://deq.state.wy.us/aqd/stnd/BART%20Rule_CLEAN%20FINAL10-10-06_CompChap.pdf
	Wyoming Air Quality Standards and Regulations (WAQS&R) Chapter 6, Permitting Requirements	

APPENDIX E: STATE REGULATIONS ON REFRIGERANTS MATRIX

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State Regulations on Refrigerants

State	Regulation	Location
Alabama	No State-specific guidance found	
Alaska	18 Alaska Administrative Code 50.326(e.14)	18 AAC 50.326(e.14) (2004), http://www.legis.state.ak.us/cgi-bin/folioisa.dll/aac/query=!22o!7Aone+depleting!22/doc/%7B@72007%7D?.
Arizona	Arizona Revised Statutes § 41-2169	ARS § 41-2169 (Justia 2006), http://law.justia.com/arizona/codes/title41/02169.html.
Arkansas	No State-specific guidance found	
California	California Health and Safety Code Part 9 Sections 44470-44474	California Health and Safety Code 9 §§ 44470-44474 (Justia 1995), http://law.justia.com/california/codes/hsc/44470-44474.html.
Colorado	Colorado Revised Statute 25-7-105.11(a-h)	Colorado Revised Statute § 25-7-105.11(a-h) (Michie's Legal Resources 2008), http://www.michie.com/colorado/lpext.dll?f=templates&fn=main-h.htm&cp=.
Connecticut	Connecticut Code § 22a-194d	Connecticut Code § 22a-194d (Justia 2006), http://law.justia.com/connecticut/codes/title22a/sec22a-194d.html.
Delaware	7 Delaware Administrative Code 1141.2.3.7	7 DE Admin. Code 1141.2.3.7 (2009 through April 11), http://regulations.delaware.gov/register/april2009/final/12%20DE%20Reg%201333%2004-01-09.htm#P9_220.
Florida	Florida Administrative Code Chapter 62-281	F.A.C. 62-281 (1996), http://www.dep.state.fl.us/air/rules/fac/62-281.pdf.
Georgia	Follows regulations set by the national EPA	Georgia Environmental Agency (personal correspondence, June 4, 2009). (404-657-5947)
Hawaii	Hawaii Revised Statute § 444-17.18 -19	H.R.S. §§ 444-17.18,19 (2009 through February 9), http://hawaii.gov/dcca/main/hrs.
Idaho	Follows regulations set by the national EPA	K. McClintock (Environmental Protection Agency Region 10 office) (personal correspondence, June 8, 2009) (206-553-2143).
Illinois	No State-specific guidance found	
Indiana	Indiana has no state specific regulations regarding ozone-depleting substances but instead refers to EPA policy laid out in the Clean Air Act, as indicated by Indiana Administrative Code 326 IAC 22-1-1	326 IAC 22-1-1 (2004), http://www.in.gov/legislative/iac/T03260/A00220.PDF?&iacv=iac2008.
Iowa	Follows regulations set by the national EPA	Environmental Protection Agency Region 7 office (personal correspondence, June 4, 2009). (913-551-7003)
Kansas	Kansas Administrative Rule 28-19-304	K.A.R 28-19-304 (2006), http://www.kdheks.gov/air-permit/forms/Overview.pdf.

State Regulations on Refrigerants (cont'd)

State	Regulation	Location
Kentucky	Kentucky refers to EPA policy in 40 C.F.R. 82 in regards to ozone-depleting substances (under 401 Kentucky Administrative Regulations 52:020)	401 KAR 52:020 (2009 through February 6), http://www.air.ky.gov/NR/rdonlyres/C038B420-4C92-4C52-B66E-F409E392850F/0/V07022R2Final_2609.pdf.
Louisiana	No State-specific guidance found	
Maine	Maine Air Rules Chapter 152 Section 3(I)	Maine Rule 06-095c152 § 3(I) (2005), http://www.maine.gov/dep/air/regulations/airegs.htm.
Maryland	Follows regulations set by the national EPA	Environmental Protection Agency Region 3 office (personal correspondence, June 4, 2009). (1-800-633-6101)
Massachusetts	310 Code of Massachusetts Regulations 7.25:14	310 CMR 7.25(14) (1996), http://www.mass.gov/dep/service/regulations/310cmr07.pdf.
Michigan	Michigan Compiled Laws Section 336.104	Mich. Comp. Laws § 336.104 (Justia 1977), http://law.justia.com/michigan/codes/mcl-chap336/mcl-336-104.html
Minnesota	Minnesota Code § 116.7	Minnesota Code § 116.7 (Justia 2005), http://law.justia.com/minnesota/codes/114c/114c-116.html.
Mississippi	Mississippi defers to Federal regulations regarding Freon, chlorofluorocarbons, and other ozone-depleting compounds	Freon, Chlorofluorocarbons, and Other Ozone Depleting Compounds (2007). Mississippi Department of Environmental Quality. 3 June 2009 http://www.deq.state.ms.us/MDEQ.nsf/page/Air_FreonChlorofluorocarbonandOtherOzoneDepletingCompounds?OpenDocument.
Missouri	Missouri Revised Statute § 643.400	Mo. Rev. Stat § 643.400 (2008), http://www.moga.mo.gov/statutes/chapters/chap643.htm.
Montana	Follows regulations set by the national EPA	M. Dehart (Environmental Protection Agency Region 8 office) (personal correspondence, June 8, 2009). (303-312-6205)
Nebraska	Nebraska Administrative Code § 128.2.009.11	Neb. Admin. Code § 128.2.009.11 (2007), http://www.deq.state.ne.us/RuleAndR.nsf/390ed3941b29c12f8625682c006210e9/bd10e3e5c301894f86256647006e513b?OpenDocument&Highlight=0,chlorofluorocarbon.
Nevada	No State-specific guidance found	
New Hampshire	New Hampshire Code of Administrative Rules § Env-A 4103.06	NH Code Admin. R. § Env-A 4103.06 (2005), http://des.nh.gov/organization/commissioner/legal/rules/documents/env-a4100.pdf.
New Jersey	Follows regulations set by the national EPA	J. Cardile (personal correspondence, June 8, 2009), New Jersey\Re (154161654) WWW Comments For EPA Region 2.txt.
New Mexico	No State-specific guidance found	
New York	New York Code, Environmental Conservation Article 38 §§ 38-0101 - 38-0111	New York Code §§ 38-0101 - 38-0111 (Justia 1992), http://law.justia.com/newyork/codes/environmental-conservation/idx_env0a38.html.

State Regulations on Refrigerants (cont'd)

State	Regulation	Location
North Carolina	General Statute §§ 130A-309.80, 130A-309.85	G.S. §§ 130A-309.80, 130A-309.85 (1993), http://www.ncleg.net/EnactedLegislation/Statutes/HTML/BySection/Chapter_130A/GS_130A-309.80.html.
North Dakota	Follows regulations set by the national EPA	M. Dehart (Environmental Protection Agency Region 8 office) (personal correspondence, June 8, 2009). (303-312-6205)
Ohio	Ohio Code Title 37 § 3704.15	37 Ohio Code § 3704.15 (Justia 1979), http://law.justia.com/ohio/codes/orc/jd_370415-c1f7.html.
Oklahoma	No State-specific guidance found	
Oregon	Oregon Administrative Rule 340-260	OAR 340-260 (2009 through May 15), http://arcweb.sos.state.or.us/rules/OARs_300/OAR_340/340_260.html
Pennsylvania	Pennsylvania Code § 403.42.c.4.vii	034 PA Code § 403.42.c.4.vii (2004), http://www.pacode.com/secure/data/034/chapter403/s403.42.html
Rhode Island	Rhode Island Code § 23-18.10	Rhode Island Code § 23-18.10 (Justia 2005), http://law.justia.com/rhodeisland/codes/title23/23-18.10.html.
South Carolina	South Carolina Code of Regulations 61-107.279	SC ADC 61-107.279 (1995), http://www.scstatehouse.gov/cgi-bin/query.exe?first=DOC&querytext=CFC&category=Regs&conid=4749613&result_pos=0&keyval=173#OCC3.
	South Carolina Code of Regulations 61-107.12	SC ADC 61-107.12 (1999), http://www.scstatehouse.gov/cgi-bin/query.exe?first=DOC&querytext=ozone%20depleting&category=Regs&conid=4749666&result_pos=0&keyval=171.
South Dakota	South Dakota Administrative Rule 74:27:13:17.15	SDR 74:27:13:17.15 (1993), http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:27:13:17.
Tennessee	Follows regulations set by the national EPA	J. Waynick (Environmental Protection Agency Region 4 office) (personal correspondence, June 4, 2009). (615-532-0109)
Texas	No State-specific guidance found	
Utah	Follows regulations set by the national EPA	M. Dehart (Environmental Protection Agency Region 8 office) (personal correspondence, June 8, 2009). (303-312-6205)
Vermont	Air Pollution Control Regulations, Subchapter IX, § 5-921	Air Pollution Control Regulations, Subchapter IX, § 5-921 (2007), http://www.anr.state.vt.us/air/docs/apcregs.pdf .
	10 Vermont Code 23 § 574	10 Vermont Code 23 § 574 (Justia 1990), http://law.justia.com/vermont/codes/title10/section00574.html.

State Regulations on Refrigerants (cont'd)

State	Regulation	Location
Virginia	Virginia Code § 10.1-1424.1	Virginia Code § 10.1-1424.1 (Justia 1992), http://law.justia.com/virginia/codes/toc1001000/10.1-1424.1.html
Washington	Washington Revised Code RCW 70.94.970	RCW 70.94.970 (1991), http://apps.leg.wa.gov/RCW/default.aspx?cite=70.94.970
West Virginia	West Virginia Code of State Rules 45-13.2.20.f	45 CSR 13.2.20.f (2009 through April 30), http://www.wvsos.com/csrdocs/pdfdocs/45-13.pdf.
Wisconsin	Wisconsin Administrative Code Chapter Natural Resources 488	Wis. Adm. Code NR 488 (2005), http://www.legis.state.wi.us/rsb/code/nr/nr488.pdf.
Wyoming	As stated in Permit No. 3-0-136-2A, Wyoming Air Quality Standards and Regulations Chapter 6 Section 3 defers regulation of ozone-depleting substances to 40 CFR Part 82	WAQSR Chapter 6 § 3 (2006), http://deq.state.wy.us/AQD/Title%20V%20Operating%20Permits/3-0-136-2-A.fin.pdf.

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APPENDIX F: ACCEPTABLE SUBSTITUTE REFRIGERANTS IN COLD STORAGE WAREHOUSES TABLE

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Acceptable Substitute Refrigerants for Class I ODS in Cold Storage Warehouses

Substitute (Name Used in the Federal Register)	Trade Name	Refrigerant Being Replaced	Retrofit/New
HCFC-22		12, 502	R, N
Ikon A		12	R, N
Ikon B		12	R, N
THR-02		12	R, N
HFC-134a		12	R, N
HFC-227ea		12	N
R-401A, R-401B	MP-39, MP-66	12	R, N
R-402A, R-402B	HP-80, HP-81	502	R, N
R-404A	HP-62	502, 12, 500	R, N
R-406A	GHG	12, 500	R
R-407A, R-407B	Klea 407A, 407B	502	R, N
R-408A (HCFC Blend Epsilon)		502	R
R-411A, R-411B		12, 500, 502	R, N
R-507	AZ-50	502	R, N
Free Zone (HCFC Blend Delta)	Free Zone / RB-276	12	R, N
Freeze 12	Freeze 12	12	R, N
FRIGC FR-12 (HCFC Blend Beta)	FRIGC FR-12	12, 500	R, N
GHG-X4	GHG-X4, Autofrost, Chill-it	12, 500	R, N
GHG-X5	GHG-X5	12, 500	R, N
GHG-HP (HCFC Blend Lambda)	GHG-HP	12	R, N

Acceptable Substitute Refrigerants for Class I ODS in Cold Storage Warehouses (cont'd)

Substitute (Name Used in the Federal Register)	Trade Name	Refrigerant Being Replaced	Retrofit/New
G2018C	G2018C	12, 500, 502	R, N
Hot Shot	Hot Shot, Kar Kool	12, 500	R, N
HCFC-22/HCFC-142b		12	R, N
THR-04	THR-04	502	R, N
FOR12A	FOR12A	12	R, N
FOR12B	FOR12B	12	R, N
SP34E	SP34E	12	R, N
Ammonia Vapor Compression		all	N
HFC-134a/HBr (92/8) as the primary heat transfer fluid in secondary-loop equipment		12, 502	N
Evaporative/Desiccant Cooling		all	N
Pressure Stepdown		all	N
Self-chilling cans using CO 2		12, 500, 502	N
R-407C	Suva 407C, Klea 407C	502	R, N
R-420A	Choice R-420A	12, 500	R, N
RS-24 (2002 formulation)		12	R, N
R-421B	Choice R421B	12, 502	R, N
R-426A	RS-24	12	R, N
R-422C	ICOR XLT1	502	R, N
R-428A	RS-52	502	R, N
KDD6	KDD6	12	R, N

Acceptable Substitute Refrigerants for Class I ODS in Cold Storage Warehouses (cont'd)

Substitute (Name Used in the Federal Register)	Trade Name	Refrigerant Being Replaced	Retrofit/New
R-410A, R-410B	AZ-20, Suva 9100, Puron		N
THR-03			N
ISCEON 59, NU-22, R-417A	Isceon 59, NU-22		R, N
R-407C	Suva 9000, Klea 66		R, N
R-507, R507A	AZ-50		R, N
Ammonia Vapor Compression			N
Ammonia Absorption			N
R-404A	HP62		R, N
Self-Chilling cans using CO 2			R, N
RS-44 (2003 formulation)		22	R, N
ISCEON 79	ISCEON 79		R, N
R-421B	Choice R421B	22	R, N
R-422D	ISCEON MO29	22	R, N
R-424A	RS-44	22	R, N
R-426A	RS-24	22	R, N
KDD5	KDD5	22	R, N
R-434A	RS-45	22	R, N
R-428A	RS-52	22, 22 blends including R-402A, -403B, -408A, AND -411B	R, N
R-125/290/134a/600a (55.0/1.0/42.5/1.5)	ICOR AT-22	22	R, N
R-422B	XAC1, NU-22B	22	R, N
R-422C	XLT1	22, 402A, 402B, 408A	R, N
R-407A	KLEA 60, KLEA 407A	22, 22 blends including R-401A, -401B, -402A, and -402B	R, N

Source: EPA 2009b