NPS Form 10-900-b
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United States Department of the Interior
National Park Service

National Register of Historic Places Multiple Property Documentation Form

This form is for use in documenting multiple property groups relating to one or several historic contexts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. For additional space use continuation sheets (Form 10-900-a). Type all entries.

A. Name of Multiple Property Listing

Grain Production Properties in Eastern Washington

B. Associated Historic Contexts

Grain Production in Eastern Washington

C. Geographical Data

Eastern Washington as defined by state boundaries on the north, south, and east, and on the west by the crest of the Cascade Mountains conforming to the western county boundary lines of Klickitat, Yakima, Kittitas, Chelan, and Okanogan counties, and specifically the grain growing regions of the Columbia Plateau.

☐ See continuation sheet

D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards for Planning and Evaluation.

Jacob E. Thorn — 7/28/88
Signature of certifying official — Date

Washington State Office of Archaeology & Historic Preservation
State or Federal agency and bureau

I, hereby, certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

for Patrick Andrus — 9/22/88
Signature of the Keeper of the National Register — Date

E. Statement of Historic Contexts

Discuss each historic context listed in Section B.

Introduction

Agricultural activity, in its many forms, profoundly shaped the landscape, built environment, and economic and social fabric of Eastern Washington. Since the pioneer era of the mid-19th century, a wide range of farm products has been raised, but grain crops (most notably wheat) proved most significant, forming the basis for a large scale agricultural economy. Indeed, by the late 19th century, the focus of wheat production in the Northwest had permanently shifted eastward to the Columbia Plateau. It has remained there ever since.

Background

Wheat, oats, barley, and other grains have been a staple of mankind for millennia; their intensive cultivation was a primary building block in the development of civilization. Grain was no less important to Washington's pioneers, who depended on it for more than just sustenance. Hard cash and coin were rare on the frontier, and little of it circulated through the economy in the early territorial period. Consequently, grain sometimes substituted as a medium of exchange in fledgling communities, much as gold dust served mining camps. Recognizing this fact, the Oregon Provisional Government in 1845 declared wheat (and some other agricultural products) legal tender at its market value in the Oregon Territory, which then included all of present-day Washington State.

Obviously, basic agricultural products such as grain and livestock were the farmer's main source of wealth on the frontier as well as the staff of life. Boiled wheat was a main food on the table, and roasted wheat grains, brewed in pots, served as a substitute for coffee, which often was unavailable. In addition, wheat is a durable commodity and of relatively low bulk, making for cost-efficient handling, storing, and shipping. Therefore, it was an ideal cash crop for selling to distant markets where demand was high.

Settlement of the Columbia Plateau came in a century of "agricultural revolution," when great changes in farming techniques swept through the world's vast grain belts. Washington pioneers in the mid-19th century plowed with single-bladed "foot burners," hand broadcasted seed during planting, and harvested with cradle scythes. In the 1870s and 1880s, simpler tools and implements were replaced by elaborate horse- and mule-powered machines of amazing complexity and diversity, requiring large crews of men to operate. Ironclad steam tractors, looking somewhat like off-track locomotives, also appeared in the last quarter of the 19th century. But the heyday of animal power came in the 1910s and 1920s when teams of as many as 32 horses or mules pulled great combines over steep hills. Gasoline- and diesel-engine tractors and caterpillars entered the scene, especially in the late 1930s, replacing dutiful horses and mules. And, finally, today huge wheeled tractors and self-propelled combines roll inexorably over all but the steepest inclines.

Changing developments in seed types, storage, fertilizers, pesticides, erosion prevention, and transportation likewise affected the evolution of Columbia Plateau agriculture. New technologies or equipment sometimes meant the modification, neglect, or elimination of some existing structures and the erection of new ones, according to prevailing needs. For example, new harvest combines in the early 1900s caused a sharp reduction in the labor force; the need for bunkhouses, dining halls, and hired hand housing was significantly reduced. More importantly, the exceptionally large horse barns of the Palouse country became obsolete when horse and mule farming passed from the scene in the late 1930s. On the other hand, numerous metal-sided pole barns have been built since the 1940s for housing and maintaining gasoline- and diesel-powered tractors and combines.

[x] See continuation sheet

Despite the changing shape of the built environment, Columbia Plateau farmers often have demonstrated an appreciation for the past, and many outmoded horse barns, granaries, and other structures still stand, though often neglected. As a result, Eastern Washington has a large number of significant properties remaining from every important phase of the area's agricultural history.

Organization of Multiple Property Documentation Form

The multiple property documentation form identifies one historic context--Grain Production in Eastern Washington--and several related but discrete property types, which are significantly associated with the context. The four property types are farmsteads, barns, conveyance systems (i.e. chutes, pipelines, rail trams, and bucket trams), and storage facilities (i.e. granaries, flathouses, and elevators). The context statement outlines general historic developments related to the theme. Discussions of property types include a description of physical characteristics, an evaluation of significance, and a template of registration requirements for each property type.

Historic Context

The Setting: The Columbia Plateau

Grain farming occurred on both sides of the Cascades, but by the late 19th century its main focus shifted to Eastern Washington where growing conditions were excellent. Even today, prime wheat land in the Palouse hills along the Washington/Idaho border has a higher per acre yield than Kansas, Iowa, or any other grain growing region in the United States. Whitman County, in particular, has led the nation in total output per county, producing 25 million bushels annually by the early 1970s.

The eastern Washington grain belt is in the treeless, mostly hilly Columbia Plateau, receiving from west to east between 8 and 20 inches of annual precipitation. The region's borders are the Cascade Range on the west, the Blue Mountains to the south, the Bitterroot Range on the east, and the Okanogan Highland to the north. This great grain belt centers in eastern Washington, but overlaps into adjoining parts of Idaho and Oregon.

The soils of the Columbia Plateau are largely fine-grained, yellowish-brown, extremely fertile loams ideal for "dry land" wheat farming techniques (i.e. without irrigation). These loess soils were deposited over millennia by prevailing southwesterly winds blowing across the Cascades and central Washington and Oregon.

Semi-arid sagebrush flats and lighter colored soils typify the drier western areas near the Columbia River and in the Big Bend and Horse Heaven Hills. To the east, rich semi-humid grasslands and dark fertile ground characterize the wetter Palouse hills along the Washington/Idaho boundary, as well as the rolling terrain of the Walla Walla area. Deep, rugged canyons of the Snake and Columbia rivers bisect the region's high basaltic plateaus.

Frequently described as treeless, the Columbia plain actually has some timber, including cottonwood, willow, and pine lining watercourses in the moister eastern and southern sections as well as in the Klickitat. The shortage of wood posed a problem for pioneers in most areas, however, and many families resorted to burning cow chips, sagebrush, or dried

wild sunflower roots in stoves. Firewood was frequently hauled from the forested ridges surrounding the Columbia Plateau. Log or sod cabins were rare; more typical were houses of plank construction made from lumber cut at sawmills in the peripheral mountains. Fencing a claim often cost as much in time and money as all the other structures combined.

Though this largely treeless region sears in heat and drought during long summers, lush clumps of native bunchgrass flourish everywhere. Most common is blue-bunch wheatgrass (normally just called bunchgrass), but there also are giant wild rye, Idaho fescue, and Sandburg bluegrass. After about 1725, large bands of Indian horses grazed on the bunchgrass plains, particularly south of the Snake River and in the Palouse. Derivation of the name for the famous spotted-rump Indian horse known as the Appaloosa came from the expression "a Palouse" horse. A little over a century later, pioneer cattlemen eagerly drove their herds onto this lush range.

Early frontiersmen never doubted that crops could thrive in the moist flats or "bottom land" next to streams. But when gazing upon the boundless dry hills, their common farming experience (derived in the much wetter conditions of Oregon's Willamette valley or in the Ohio Valley and other areas of the East) made them believe that no crop could grow on the waterless plateaus. They thought the rolling prairies simply were too dry, and thus suited only for livestock grazing.

It came as a great surprise when the "barren" hills in fact proved exceedingly fertile, despite the lack of summer rain. Wheat yields per acre would be the highest in the nation, if not the world, despite the fact that precipitation in the Columbia Plateau was lower than in most grain belts. Eventually, this revelation caused the U.S. Senate to order an investigation of "the rainless regions of Oregon and Washington" to explain the unexpected fertility. The Columbia Plateau's great productivity is no mystery, of course, but is due to ideal prevailing growing conditions and the scientific and technological advances of the farming industry.

Agriculture on the Frontier: The Early to Mid 1800s

First plantings of wheat in Eastern Washington occurred during the earliest phases of white settlement. Beginning in the 1810s and 1820s, American or British fur traders raised grain, vegetables, fruit, and livestock at Spokane House, Fort Walla Walla (originally named Fort Nez Perce), Fort Colvile, and probably other locations. Parallel developments occurred at posts west of the Cascades as well. Eventually, the Hudson's Bay Company (HBC) planted more extensive gardens along the lower Walla Walla and Touchet rivers. The site of one of these farms, southeast of present-day Walla Walla, came to be called "Hudson's Bay" by early American settlers.

By 1837, missionaries likewise tilled soil. Marcus Whitman, at Waiilatpu near present-day Walla Walla, grew crops for subsistence and tried converting free-roaming Indians into sedentary Christian farmers. In this, Whitman and other Protestant and Catholic missionaries generally failed. The missions, however, helped prove that crops thrived in the semi-arid regions east of the Cascades. By 1846, Henry Spalding at the Lapwai (Idaho) mission had come to the remarkable conclusion that grain grew well not only in the bottom lands but also on the rolling prairie upland. Practically everyone else at the time considered the high plateau to be nothing less than the Great American Desert. Spalding

soon was forced out of the region during the Cayuse War (1847-1850), however, and it was left to others to rediscover the fertility of the uplands many years later.

A legacy of the HBC and missionary period was that some Indian groups accommodated basic farming skills into traditional, semi-nomadic lifeways. Famous Yakima war chieftain Kamiakin kept gardens near the Catholic's Ahtanum Creek mission in the Yakima country (Kamiakin's Gardens, National Register, 1976.) Timothy, a Nez Perce headman, maintained crops and an orchard at Alpowa Creek on the Snake River. The Spokanes continued cultivating the soil after white traders abandoned Spokane House in the 1820s, and other Indian groups tilled ground elsewhere.
By mid century, a handful of former HBC men built farmsteads in the Colville, Spokane, and Walla Walla watersheds. Enough of them settled at the Walla Walla/ Touchet confluence to form a wilderness hamlet called French Town. One source notes that in 1855 there were 17 French Canadians, all ex-HBC men, residing in this scattered community adjacent to the abandoned Whitman Mission. Fifteen men had Indian wives, and there were 49 children.

After mid-century, incoming American miners, soldiers, stockmen, and even packers and teamsters tilled ground for sustenance, mainly in the Walla Walla and Colville areas. In the early 1850s, hardly more than a dozen or so American settlers, mainly cattlemen, moved into the Walla Walla, Touchet, Tucannon, and lower Columbia valleys. Suddenly in 1855, perhaps 1,000 miners rushed eastward through gaps in the Cascades toward a gold strike at the Pend Oreille-Columbia confluence far to the northeast. About 200 got as far as Fort Colvile and not over 60 reached the mines when war broke out between the Americans and southern Plateau tribes. The miners and cattlemen quickly withdrew west of the Cascades.

Hostilities between soldiers and Indians spread across the Columbia Plateau during the Yakima War (1855-1858). In December 1855, an important battle occurred at French Town when Oregon Territorial Volunteers grappled for several days with Walla Walla, Cayuse, and allied warriors. The conflict appears to have ended the fledgling French-Canadian farming community, though some of the settlers apparently reclaimed lands later.

Indian-white hostilities hardly ceased before pioneer farmers returned to cluster around the U.S. Army's Fort Walla, established at the present site of Walla Walla in 1856. This new post was 30 miles east of the much older HBC post of the same name standing at the Walla Walla-Columbia confluence. In the same year, Fort Simcoe was located in the Yakima country, and in 1859, troops built Fort Colville near present-day Colville. The U.S. Army's Fort Colville stood 15 miles southeast of the HBC's Fort Colville, which had been established on the Columbia in 1825. Soon American farmers came to cluster around these posts, joining the small number of retired HBC homesteaders in the region.

In the early 1860s, a series of gold strikes occurred in Idaho, eastern Oregon, central British Columbia, and western Montana. The Columbia-Snake corridor, from Portland through Walla Walla, was a primary route to the gold fields, which swarmed with 20,000 to 25,000 wealth seekers in the decade. Commerce stirred to life, as the inpouring population demanded food and supplies. Colville and especially Walla Walla farmers quickly responded, selling foodstuffs in the diggings.

New settlers staked homestead claims in the Walla Walla lowlands and valleys, while regarding the hillsides and plateaus as too dry and thus unsuited for crops. Then in

1864, to everyone's surprise, some Walla Walla area farmers successfully harvested grain in the rolling uplands. It was probably the most significant discovery in Washington's agricultural history, but apparently the names of the men who did the planting went unrecorded. It is known, however, that one farmer sowed 50 acres on hilly terrain in the fall of 1863, and harvested 33 bushels per acre from the same in the following summer. Most settlers continued plowing bottom land for a time, but widespread "dry land" farming of the broad uplands was rapidly approaching. Farsighted observers now recognized wheat as the new gold, more long lasting and valuable than the mineral wealth of the mining districts, which by the late 1860s was declining.

Access to National Markets: The Railroads Arrive, 1880s

The mines, military communities, and fledgling towns created local markets for grain farmers, but sustained agricultural growth and prosperity could only come when the Columbia Plateau became effectively tied into the national marketplace. Meanwhile, the Northwest remained cut off from most supplies and manufactured goods available in the East. Nor did farmers have effective means to get their products out.

A transcontinental railway was the obvious answer, but in the 1860s the Civil War exhausted the nation's resources. Besides, California, because of its relatively large population, had first priority in getting a railroad. The first transcontinental line was completed to San Francisco Bay in 1869. In the 1860s and 1870s Northwest farmers could do little more than wait for the coming of the tracks.

Beginning in the late 1870s, nearly 80 ships a year hauled Columbia Plateau grain from Portland, Oregon, to England, California, or the East, but high transportation costs cut too deeply into small profit margins. It was time consuming and difficult for the region's farmers to haul their wheat to faroff steamboat landings on the Snake and Columbia. Hauling grain by sternwheeler down the Columbia to Portland was particularly costly, due to the labor-intensive unloading and reloading of freight at the railroad portages around Celilo Falls and Cascade Rapids.

Farmers' wishes finally were answered in the early 1880s when the Northern Pacific and the Union Pacific built separate railways to the Pacific Northwest. Numerous branch lines quickly spread across the Columbia Plateau.

In the next three decades, Northwest agriculture expanded and diversified, and was altogether transformed to a degree unimaginable in the early settlers' wildest dreams. Not only did the railways haul produce out, mainly to Columbia River and Puget Sound ports, but immigrant coaches from the East brought in vast numbers of new farmers to stake claims in the Columbia Plateau. Before this time, settlers in Eastern Washington had come mainly from western Oregon, but railroads brought immigrants from the East and Midwest, Canada, northern and western Europe, and the Pacific slope. Washington's urban areas likewise grew rapidly, which further stimulated food production. By the end of this remarkable three-decade period, Washington's population in 1910 was 15 times greater than it had been in 1880. Railroad promoters and regional boosters were quick to compare the Columbia Plateau to such famous wheat belts as the steppes of Russia, the volcanic regions of Sicily, and the fertile plains of north China.

The Land Is Settled: Late 1860s to Early 1900s

In the late 1850s and early 1860s, homesteading in the Columbia Plateau was focused south of the Snake River in the Walla Walla, Touchet, and Tucannon watersheds. The mid 1870s saw the beginning of the great wave of migration to the Palouse hills north of the Snake, which coincided with the establishment of steamboat landings on the river. Through the 1880s, farmers continued to be drawn to the moister, more fertile southern and eastern portions of the Columbia Plateau. When these areas filled up by the early 1890s, immigration shifted westward to the drier, less rich Big Bend and Horse Heaven Hills. The northern Big Bend was somewhat moister and thus more fertile than the southwestern Big Bend, which was far too dry and never saw much immigration. In neighboring Idaho, the rich Camas Prairie country remained largely unplowed until 1895, when the Nez Perce Indian Reservation was opened by allotment.

During this period, land claims averaged 160 acres, the maximum amount allowed by homestead and pre-emption rules. Acreage could be added through other government provisions, however, such as the Timber Culture Act, the auctioning of unneeded state school lands, and other lesser known or utilized programs. Thousands of setlers acquired farms by purchasing railroad-owned lands at reasonable rates. The U.S. Congress had granted alternate sections to the Northern Pacific as a subsidy for building the first, and very costly, northern transcontinental railway. Thus, the Northern Pacific rivaled the government as a landholder with vast acreage to sell in the Columbia Plateau. Other privately owned companies dealing in large scale land speculation were a rarity except in the Big Bend.

Some grain was grown in the Colville country and elsewhere in the Okanogan Highland in this period, but developments on the Columbia Plateau far outweighed the relatively limited grain production in other areas of the state. The general pattern of settlement in the Columbia Plateau is outlined in the chart below.

Date	Event (Area)
late 1850s	Walla Walla Valley becomes the cradle of Columbia Plateau agriculture (Walla Walla County).
1860s-1870s	Migration continues to the greater Walla Walla area and to the Touchet (Dayton) and Tucannon watersheds (Walla Walla, Columbia, and Garfield counties); beginning of settlement north of the Snake River in the Palouse hills (Whitman and Spokane counties).
1880-1881	Terrible winter weather delivers a devastating blow to the open range livestock industry; main agricultural interest shifts overwhelmingly to grain production.
1881-1883	First northern transcontinental railway (the Northern Pacific) completed; Union Pacific system soon follows.

1880s	Great numbers of homesteaders stake claims in the eastern Palouse (particularly eastern Whitman and southeastern Spokane counties; also Columbia, Garfield, and Asotin counties). Beginning of settlememt in the Big Bend (Lincoln and Adams county). The most fertile portions of the Columbia Plateau are settled by the end of this period.
"Panic of 1893"	Immigration slowed by nationwide economic depression.
late 1890s-early 1900s	Settlement resumes in drier, less fertile localities in the western Palouse (western Whitman and Spokane counties), the Big Bend (Adams, Lincoln, Franklin, Douglas, and Grant counties), and the Horse Heaven Hills country (Benton, Klickitat and Yakima counties). High rate of failure for these farmers after only a few years particularly in the Horse Heaven and western Big Bend areas.
1914	Outbreak of World War I in Europe; settlement of the Columbia Plateau wheat districts of Oregon, Idaho, and Washington completed by this time.

Economic Maturity: Turn of the Century and World War I

By the late nineteenth century, Columbia Plateau grain production was fully integrated into the national market system and subject to the ups and downs of economic cycles. A prosperous boom period coincided with the spread of settlement in the 1880s, only to be followed by the Panic of 1893, which caused farm prices to plummet drastically. Across the nation, both rural and urban localities came on hard times. The settlement of less desirable parts of the Columbia Plateau slowed significantly during this period, particularly in the Big Bend and Horse Heaven Hills.

With returning prosperity at the turn of the century, farming became profitable again, though this did not prevent most homesteaders in the drier western sections of the Columbia Plateau from going bust after just a few years. It became clear that 160 acres could not sustain a family in the less fertile Horse Heaven Hills, Big Bend, and western Palouse, where far more farmers were defeated than made good. Those who survived consolidated nearby holdings, until more successful farms of several hundred acres became common. Naturally, many unwanted farmsteads were abandoned during this period.

It was far different in the fertile arc of the eastern Palouse and the rolling terrain south of the Snake. Here prosperity was a given, though farms had less acreage than the consolidated holdings farther west. Population density was significantly greater, and the large number of substantial, well-built barns and other farm structures reflected greater wealth.

Farmers planted barley and oats as alternate crops to wheat in some of the moister upland sections; draft animals were fed the oats and the barley was used in brewing. Wheat, however, remained by far the dominant grain on the Columbia Plateau, as attested by these figures for the 1909 crop taken from the 1910 U.S. Census (cited in Meinig 1968, pp. 439-41):

District	Proportion of Total Grainland	
	Wheat	Other Grains
Oregon, Klickitat, Horse Heaven	90.5%	9.5%
Walla Walla	77	23
Camas Prairie (Idaho)	42	58
Palouse	73	27
Big Bend	94	6

The overwhelming reliance on wheat as the major cash crop encouraged the adoption of large horse- and mule-powered machines to cover extensive areas of land. Work animals pulled cultivators, gang and walking plows, harrows, weeders, drills, hay racks, mowers, binders, headers, wagons, header boxes, sleighs, and other technologically advanced equipment being produced by a competitive and innovative American implement industry. After the turn of the century, massive combines pulled by 24 to 32 horses became a common site at harvest time.

A similar scale of grain growing operations occurred in California's San Joaquin and Sacramento valleys in the 1870s and 1880s, but diversification, irrigation, and fruit growing caused those wheat districts to decline in importance. By 1905 or earlier, eastern Washington surpassed California as the main wheat growing region on the Pacific Slope. Along with the Dakotas and Kansas, the Columbia Plateau became one of the three major grain belts in the nation. As of 1910 wheat farming was well established in all districts of the Plateau, distributed accordingly: (from Meinig 1968, p. 432)

District	Approximate Proportion of Total Wheat Production
Oregon, Klickitat, Horse Heaven	20%
Walla Walla (Umatilla through Asotin counties)	26
Camas Prairie (Idaho)	9.5
Palouse	22.5
Big Bend	22
	100%

Real prosperity continued in more fertile and well-watered sections and was accelerated with a great increase in demand brought on by the outbreak of World War I (1914-1918). Grain, at high prices, was sold to England, Italy, the Azores, South America, China, Japan, the Philippines, and elsewhere. Prosperity in the Columbia Plateau was at a high level, seldom equalled before or since.

Depression, 1920s-1930s; and Revival, 1940s and After

Following the boom times of the first two decades of the 20th century, farmers looked confidently to the future, but prices fell unexpectedly in the 1920s--a prelude to even greater depression in the 1930s. European nations had revived their agricultural sectors after World War I, while sharply cutting back on American farm imports. Consequently, wheat prices dropped drastically, a situation exacerbated by surpluses from the United States, Canada, Australia, Argentina, and other world grain belts. All aspects of agriculture suffered in the era.

Despite a global glut, Columbia Plateau farmers held on, particularly those using good business sense and fortunate enough to own good land. Still, even in the fertile Palouse, some farmers were forced out. In Whitman and Walla Walla counties, for instance, 15 growers lost farms in 1921, more than 20 in 1922, and 45 in 1923. Competitiveness and efficiency encouraged consolidation of smaller holdings into larger units. The 160 acre farm became antiquated, and by 1925 the average wheat grower in Whitman County cultivated 414 acres. For some farmers barely managing to hold on through the 1920s, the end came during the Great Depression of the 1930s. Drought played a partial role during that period also, mainly in the Big Bend.

Full revival came with greatly increased demand for wheat during World War II, the Korean War, and the prosperous 1950s and following decades. International exports were exceptionally profitable in the 1960s and early 1970s. But agricultural trends are cyclical, and, after four decades of unprecedented prosperity, the wheat industry once again faced depression in the 1980s. The root cause of this modern agricultural crises really is a familiar theme from years gone by: overproduction resulting in falling prices and low demand in both the nation and the world.

Evolution of Farming Technology: Mid Nineteenth Century

Early farmers used horses, mules, or oxen to pull homemade or imported plows to break or scratch the virgin sod. Thickets of wild rose, knee-high wild sunflower, and, in places, sagebrush, proved difficult to eradicate. An early practice was to burn off the native grasses and shrubs before the initial turning of the soil.

That was the era of the infamous "foot burner"--a single furrow, metal-blade plow pulled by teams of two and sometimes three work animals. The implement's wooden framework had a pair of back handles that were grasped by the farmer, who walked behind holding the reins. A typical "foot burner," with a single steel blade, also was called a single bottom plow. Double bottom plows (two blades and six horses), triple bottom plows (three blades and eight horses), and occasionally even four bottom plows (four blades and sixteen horses, used only on flat terrain) also were utilized, breaking two or three times as much sod as the single furrow plow. The larger implements had a seat for the operator.

Roots, sod, and shrubs were broken up, torn to pieces, and generally pulverized by continued plowing or harrowing. Harrows were heavy implements holding teeth or upright disks. Pulled by work animals, repeated dragging over plowed ground prepared the seedbed. In the earliest days, planting was done simply by hand broadcasting, whereby a man with a

seed sack over a shoulder walked down the furrows or rode in the back of a wagon while randomly scattering seed for germination. Soon, horse-drawn mechanized seeders replaced the old hand broadcasting methods, and in turn were replaced by drills that dug small furrows and dropped in the seed.

Irrigation occasionally was used, but it soon became obvious that it was unneeded. Grain grew abundantly with relatively little care. Planting occurred at two different times of year. "Winter wheat," sowed in autumn, grew a few inches high before winter weather caused it to go dormant. Growth resumed with the return of warm weather; harvesting occurred in late summer. "Spring wheat," on the other hand, was planted in springtime, grew just through the summer, and was threshed in autumn. These practices continue today with winter wheat yields normally higher than spring wheat. Similarly in the 1870s, winter wheat averaged 45 bushels per acre as opposed to just 22-1/2 bushels for spring wheat.

The "dryland" farming methods commonly adopted in the Columbia Plateau entailed deep initial plowing, followed by frequent cultivation to retard moisture flow by capillary action. Each year, fields were tilled as much as 6, 8, or 10 times, creating a "dust mulch" to preserve a maximum amount of moisture in the soil. That remained a common practice until the 1930s, when it became obvious that the technique allowed too much wind and water erosion. (In modern times, contour plowing and modern equipment and methods have only partially alleviated erosion problems.)

Most fields were left unplanted, or fallow, in alternate years to retain nutrients and moisture in the soil. Known as summer fallowing, this practice entailed plowing and tilling, but, of course, no planting. In the eastern Palouse, summer fallowing frequently was done every third year, while in the other two years oats and barley were planted in succession with wheat. Particularly in the drier areas, the need to conserve moisture and control weeds in fallow ground was critical and led to the development of the most important cultivator, the rod weeder. Perfected shortly after 1900, the rod weeder consisted of a metal frame to which was attached a square metal rod that rotated just under the surface of the ground, severing weeds from their roots. Fallow acreage remained a common site in the Columbia Plateau until the late 1940s, when chemical fertilizers appeared, allowing planting every year.

Harvest came in late summer and early autumn. In the early 19th century, some Indians, fur traders, and other frontier farmers probably threshed grain by the ancient means of flailing. A flail was an implement consisting of a free-swinging stick loosely fixed to the end of another, longer stick that served as a handle. Grain stalks were laid on a flat surface and beaten by hand with the flails. By this slow, laborious means, grain was broken out of the husk. Running horses over cut wheat was another more common method of threshing.
In the mid-19th century, hand-held cradle scythes commonly were used to cut grain during harvest. With a sweeping motion, the scythe's steel blade severed swaths of grain stalks, and the attached cradle-like framework allowed the field hands to drop the loose bundles of stalks evenly on the ground, making it easier to pick up for threshing. Horses normally were run over the stalks spread out in the barnyard to complete the harvesting process.

These simpler tools and techniques soon were discarded for up-to-date horse and mule drawn equipment of various types becoming available by the 1870s, if not earlier. The only

limitations were transportation costs--it was difficult and expensive to have farm implements hauled from the East by wagon or sailing ship. As a result, local blacksmiths, artisans or farmers themselves custom manufactured much of the needed equipment.

Grand Era of Animal-Powered Technology: 1880s to 1930s

The coming of the railroads in the 1880s allowed farmers to acquire the latest and biggest farm machines. By the 1880s, multiple hitchings of large teams to elaborate machinery became a striking feature of the Columbia Plateau, to a degree uncommon in wheat producing areas elsewhere. Draft animals, particularly horses, were utilized in all aspects of farming from plowing, to seeding, to harvesting. Horses generally were medium sized, of Thoroughbred, Clydesdale, or Indian pony (Cayuse) ancestry. Mules likewise were present, in lesser numbers, but had certain advantages over horses. Mules would not overdrink or overeat on torrid days, and generally stood heat better. They would work at a more regular pace, were more manageable in large teams, and would not work themselves to the point of collapse. Horses, on the other hand, pulled faster, did not tire as easily, and were stronger.

Gigantic self-propelled steam tractors, up to 12 feet high and weighing 15 to 25 tons, were a common (and unforgettable) sight at harvest time in the 1880s, 1890s, and the first decade of the new century. These metal-lug wheeled tractors sometimes pulled implements over level ground, but proved impractical in the hilly terrain of most of the Plateau. The iron giants never gained wide acceptance for plowing, but instead were commonly used during harvest at stationary threshing sites. Separators or harvesters, having no power of their own, were driven by long rubber belts running from steam tractors. Coal, wood, kerosene, or straw burned in their iron bellies, and horse-drawn wagons, mounted with 400 to 500 gallon tanks, supplied water to the boilers.

Horse-powered binders and headers reaped the standing wheat at harvest time. Binders were less expensive than headers and had certain characteristics well suited for smaller farms. A very small crew could operate a binder, which cut grain stalks, whether ripe or not, and bundled it for later threshing.

Headers, on the other hand, were far more commonly used, especially on larger acreage. These grain mowing machines were designed to be pushed from behind by horses, thus the standing grain out front would not get trampled. Headers cut off about 10 inches of wheat stalk and ripe head. A built-in conveyor system then dropped the wheat stalks into special wagons, called "header boxes," being driven alongside. The boxes of these unique wagons were high on the left side, low on the right. Filled "header box" wagons proceeded to a threshing station, where self-propelled steam tractors powered belt driven separators or threshing machines. An efficient pulley system dumped the load from the "header box" into the thresher. Then grain was broken from the husks, bagged in burlap sacks, loaded on wagons, and hauled to railroad sidings or steamboat landings.

Clearly, harvesting at the turn of the century required large numbers of men and work animals to operate a wide variety of implements and vehicles. Harvesting was expensive, labor intensive, and complicated. Consequently, the agricultural implement industry soon built a revolutionary new machine called a "continual" harvester, or "combine," which did cutting, threshing, and bagging in one operation.

Combines originally were developed in the 1880s for the flat "bonanza" wheat farms of central California. As early as 1891, the Holt Company of Stockton, California, designed a special "sidehill" machine with a leveling device for the rolling Columbia Plateau. Early combines were cumbersome and expensive, however, and a rarity in Eastern Washington until about 1906, when new improved machines appeared. By the 1910s and 1920s, they were in wide use, eliminating most of the "old fashioned" harvest equipment and up to 80% of the men formerly needed at threshing time.

By 1909, the Idaho National Harvester Company of Moscow, Idaho, had established a reputation for producing a smaller, more efficient combine that resembled a push-binder, cut just a six-foot swath, and required only two men and four horses to harvest 15 acres a day. Slightly larger combines cutting 10-foot swaths needed three men and 14 horses. Both of these relatively small combines were popular in the eastern Palouse where farms were generally smaller and the hills steeper than in the western drier areas. The large, heavier combines, when used in this sloping terrain, were known as "horse-killers" for good reason.

Animal power remained at the forefront, especially with some of the new larger combines being pulled by 24 to 32 horses or mules. Ironically, the massive self-propelled steam tractors no longer were needed at harvest time and passed from the scene. Huge teams pulling gigantic implements remained a unique feature of Columbia Plateau agriculture during the first third of the twentieth century. Something of an anachronism in a modern age, they were a sight once seen and never forgotten. The great horse and mule team combines were a fitting climax to more than a hundred years of animal-powered farm technology in the Columbia Plateau.

Gas, Diesel, and Electric Mechanization: Late 1930s to the Present

The wheat industry once again was revolutionized in the 20th century with the introduction of public electric utility systems and gasoline-engine tractors, caterpillars, and trucks. Those innovations were present early in the century, but did not become prevalent until the late 1930s.

Motor-driven augers and large, cribbed bulk tanks introduced after the turn of the century allowed grain to be handled and stored in bulk, but Plateau farmers, for a variety of reasons, continued to handle wheat in sacks. While gas-powered generators were installed in a few of the earliest cribbed elevators to power grain conveyance devices, most storage facilities awaited the arrival of rural electrification as a sufficient power source for driving electric auger motors. With wide-spread electrification in the 1930s, producers quickly converted to bulk handling, saving labor, time, and expense. With 61 percent of its farms electrified by 1939, Washington was second only to California in having the highest percentage of electrified farms in the country. Transportation devices, such as railroad grain cars, were by then available for shipping the bulk product.

Just after the turn of the century, the Holt Company pioneered innovations in harvesting methods that would later revolutionize that task on the Columbia Plateau. By adapting a gasoline motor for use in running the internal machinery of a combine, the company eliminated the large, heavy ground wheel on the older, heavier models. Combines became

easier to pull and their threshing machinery could run at an even speed independent of the rate of the machine's travel. In 1906 Holt produced the first gasoline-powered caterpillar tractor, the first of its kind usable in steep, hilly terrain like the Palouse.

Rural electrification allowed grain to be handled in bulk, rather than by the old labor-intensive sacking method. Machine-powered augers and bulk tanks had been introduced after the turn of the century, but Plateau farmers, for a variety of reasons, continued to handle wheat in bags. With electrification in the 1930s, however, producers finally switched in mass to bulk handling, saving time, labor, and expense.

Tractors and caterpillars gained wide acceptance only after improved models were introduced on the eve of World War II. The new machines worked faster, eliminated labor, and, unlike horses, required no care in winter or other times when not in use, and could operate at night. Horses and mules, now unwanted, were sold off wholesale to logging outfits and dealers from the South. Some unfortunate animals went to slaughter for hog feed. It was a difficult time for many farmers, who were attached to their horses and mules and had names for each one.

Modern mechanization meant that the day of small cash and small acreage wheat farming was doomed. Large capital investment and expansive holdings were required just to keep a farmer in the business. Yields increased as did competitiveness, with continuing improvement in machinery and techniques. The modern equipment of today requires only a third of the manpower needed to operate machines used during World War II.

Agriculture and Science: A Century of Development

Columbia Plateau farmers experimented with a wide variety of wheat seeds to find the types best suited for local conditions and needs. The list is a long one, since experimental seeds were constantly adopted over the years. Little Club, of Mediterranean vintage, was introduced as early as 1859, and widely used thereafter. Prominent types used in the late 1800s and early 1900s included Turkey Red (from Russia via Kansas), Jones Fife (a New York hybrid), Bluestem and Early Baart (from Australia), Fortyfold (from New York), Red Russian (from England), Salt Lake Club, Mediterranean Red, Jenkins, Crooked-Neck Club, and others. As some of the names indicate, these wheats originated in the widely scattered grain belts of the United States and the world.

By the early 20th century, the grain growing region of the Columbia Plateau had become divided into three "wheat belts" characterized by both rainfall and varieties of wheat. In the eastern zone where more precipitation fell (all too often as damaging early fall showers), Little Club, Fortyfold and Red Russian were the most preferred varieties. Fifteen to twenty inches of precipitation was common in the middle zone, where Little Club, Red Chaff, Jones Fife and Bluestem predominated. In the western zone, which received less than fifteen inches, Bluestem was the favorite with Turkey Red second in popularity.

At the turn of the century, various scientific agricultural agencies, particularly Washington State College (now Washington State University) developed and introduced specialized wheat types for the region. By the 1920s, new disease-resistant varieties appeared to counter destructive new fungi. In the 20th century alone, a series of 30 or more harmful smuts have invaded Columbia Plateau wheat fields. New seed types, usually

developed by WSU researchers, have been just as quickly developed to thwart the attackers. A roughly chronological list of disease-resistant wheats introduced since 1924 includes Ridit, Elgin, Elmar, Omar, Gaines, Nugains, Paha, Luke, Jacmar, and others. Interestingly enough, these strains provided genetic material that has revolutionized wheat production in modern-day Mexico, India, Pakistan, and other Third World counties.

A recent innovation of recent decades has been the planting of dry peas and lentils as alternate crops in the Palouse uplands. This development has been extremely successful. In the 1960s, for instance, the Columbia Plateau produced more than 90% of the nation's peas and lentils.

WSU scientists developed "soft white" types of wheat which are high in starch and low in protein, and grow extremely well in the Columbia Plateau. Today, the region is the nation's leading district for raising these starchy grains that are ideal for pastry, macaroni, noodles, and breakfast cereals. In recent decades, vast amounts of "soft white" wheat have been shipped to Japan, Korea, Taiwan, India, and elsewhere, making up a substantial part of Pacific Northwest exports.

Acreage left in summer fallow to replenish the soil was a common site in the Columbia Plateau until chemical fertilizers were introduced in the late 1940s. Since then, the application of modern fertilizers has eliminated fallowing on most farms, and crops now are planted on the land every year. Nitrogen, which is the most important nutrient for Columbia Plateau wheat fields, is literally extracted from the air at commercial plants. Known as anhydrous ammonia, it is the most common farm chemical and is produced by combining hydrogen from natural gas with nitrogen in the atmosphere. Special drill-like implements dragged across the fields inject the nitrogen fertilizer directly into the sod. Such agricultural engineering has produced wheat harvests as great as 100 bushels per acre in the most fertile lands of the eastern Palouse.

Not only are fallow fields less common today, but with the disappearance of horses amd mules, fences are no longer needed and have all but disappeared. Except for scattered farmsteads, towns, and roads, much of the rolling Columbia Plateau once again appears like the vast, unfettered landscape of a century ago. The western Big Bend, om the other hand, where so many homesteaders failed at the turn of the century, has been especially altered, in this instance by the highly successful Columbia Basin irrigation project. Since the 1950s, irrigation water from the Grand Coulee Dam and the Banks reservoir has transformed the sagebrush covered prairies into a region of lush, highly diversified agriculture.

F. Associated Property Types

I. Name of Property Type Farmsteads

II. Description

Pioneer Subsistence Homesteads

The limitations of frontier conditions were reflected in the small size and limited range of structures found on the typical pioneer farm of the 1860s to 1880s period (and persisting in the Big Bend and Horse Heaven Hills into the 1890s and the first years of the 20th century). Homesteads originally consisted of little more than a cramped cabin, a small barn and/or granary, perhaps an outhouse and shed, and wood or stone corrals and fencing. (Description continued on pp. F.2-F.4.)

III. Significance

From the outset of farming in Eastern Washington, farmsteads were the central focus of the grain growing industry. Farmers were not absentee landowners nor sharecroppers, but rather the directors of family-owned enterprises. While some homesteaders took up lands before marrying and some remained single, for the most part farming was a cooperative venture among husband, wife, sons and daughters, and other close relatives, all of whom lived on the farmstead. Occupation of the farm by the owners-operators reflected the manner in which most of the public domain was dispersed in the West, i.e. to individual claimants who filed and "proved up" on claims, rather than to land speculators and corporations. (The Northern Pacific Railroad also encouraged settlement by selling property from its enormous land grants to immigrants at reasonable rates.)

On the Columbia Plateau, rural farmsteads developed in essentially two stages: the initial pioneer homestead phase, followed closely by more extensive, commercially-oriented farming. The latter phase occurred only after the arrival of transcontinental railroads in the early 1880s. Prior to that time, farmsteads were largely subsistence- oriented, typified by two (Significance continued on p.F.5.)

IV. Registration Requirements

To be eligible for listing in the National Register, a farmstead must strongly convey its historic character in both physical and associative ways and must have documented significance when evaluated within the context of grain growing in Eastern Washington.

Pioneer Subsistence Homesteads

Small, rustic pioneer homesteading structures dating from the mid 19th century to the turn of the century are rare today--probably numbering just several dozen in Eastern Washington. The vicissitudes of time have left none of these homestead-era subsistence farmsteads in complete and original form with all features and buildings intact, but some individual, and often solitary, structural types still exist. Since none of these farmsteads are known to have remained entirely intact or unchanged, some alteration and decay is acceptable, but sufficient elements should remain to convey the historic functions and character of the farmsteads of the pioneer era. Ideally, grain fields themselves should be included as part of the "cultutral landscape" although changing uses and ownership may make such inclusion inpractical. (Registration Requirements continued on p.F.6-F.7.)

[X] See continuation sheet

[X] See continuation sheet for additional property types

G. Summary of Identification and Evaluation Methods

Discuss the methods used in developing the multiple property listing.

The Grain Production Properties in Eastern Washington Multiple Property Listing is a component of the Washington Office of Archaeology and Historic Preservation (OAHP) comprehensive preservation planning process which has identified broad themes or patterns in Washington history. Grain production in eastern Washington has been identified as a subtheme within the larger theme of state-wide agricultural history.

The multiple property listing of properties associated with grain growing in eastern Washington is based upon two studies sponsored by the Washington State OAHP: the RP3 Agriculture Study Unit completed by Glen Lindeman and Keith Williams in 1985 and the Historic Resources Survey of Whitman County conducted by Craig Holstine, Glen Lindeman, Keith Petersen, and Mary Reed in 1985 and 1986. The latter survey inventoried over 1300 historic properties, including the six here nominated.

Although only properties in Whitman County are nominated initially, the context statement and discussion of associated property types address grain growing and attendant structures in all of eastern Washington. The context and descriptive information are provided to apply to evaluation of similar property types within the defined geographic region.

[x] See continuation sheet

H. Major Bibliographical References

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[x] See continuation sheet

Primary location of additional documentation:

- [ ] State historic preservation office
- [ ] Other State agency
- [ ] Federal agency
- [ ] Local government
- [ ] University
- [ ] Other

Specify repository: _____

I. Form Prepared By

name/title Glen Lindeman and Craig Holstine, Historians
organization Archaeological & Historical Services date February 1988
street & number Eastern Washington University, MS168 telephone (509) 359-2239
city or town Cheney state Washington zip code 99004

Architectural character of all the structures was simple, basic and rustic. Structures consisted of logs or hand-hewn timbers, notched at the corners, or were of simple plank construction. Roofs were simple gable or shed types, composed of split wood shingles, poles and boards, tar-paper, or other cheap materials. Sod and stone construction sometimes was used. Rarely, adobe was utilized, such as at the Whitman Mission.

Commercial Era Farmsteads

With the arrival of railroads in the 1880s, the Columbia Plateau was finally, and effectively, linked into the national marketplace. As a result, grain farming developed and expanded at a tremendous rate, deeply influencing the fabric of life in Eastern Washington. Rising prosperity and the demands of increased production caused a corresponding increase in the types, numbers, and sizes of structures found on the farm, as well as the utilization of technologically advanced materials and equipment. Rustic frontier architecture of the homesteading era quickly passed from the scene, to be replaced by newer, contemporary styles and structures.

Beginning in the last quarter of the 19th century and continuing well into the 20th century, the expanded farmstead included a wide range of structures:

House	Bunkhouse
Hired Hand's House	Smokehouse
Barn (Horse and Mule Barn)	Garage
Machine Shed	Windmill
Grain Dryer	Cistern
Grain Elevator	Tank House
Granary	Pole Barn
Machine Shop	Fuel Tank
Icehouse	Assorted Outbuildings (inc. chicken house, root cellar, hog house)

Not every farm had all of these features of course, and some types of structures were more common than others. Following are descriptions of some of the more essential buildings:

House--The farmhouse usually was the most prominent structure on the farm after the barn. In fact, the house and barn were, for the most part, the only farmstead buildings having any pretense of architectural styling. Farmhouses were built in all sizes, but frequently were quite large, often the result of additions added over the years. The architectural designs usually were similar to houses built in towns and cities during the same time period, and were often attributable to pattern books or mail-order plans. The work portions of the house (i.e., kitchen, laundry room, etc.), however, often were arranged so that the wife could observe the farmyard, driveway, and nearby road or highway. Washing facilities frequently were situated inside the back entrance, since that doorway led to the barnyard and was most often used.

Horse and Mule Barn, General Purpose Barn--These structures are the most common type of farm building remaining in Eastern Washington. Gambrel, "gothic", steeply-pitched gable, and round arch roofs were employed most frequently because large haylofts were needed to feed and maintain a dozen or more work animals throughout the year. Barns in the Columbia

Plateau tended to be larger on the average than barns used in other agricultural districts. A large horse and mule barn, for instance, might be as much as 80 feet long. Many of these structures reflected stylish architectural features, such as cupolas, stone foundations, and framed and hooded windows.

Granary--These were typically low, stout, gable-roofed structures, which held grain or livestock feed. Granaries were subjected to tremendous strain, especially at the floor and near the bottom of the walls, thus they were strongly built. Frequently, the walls consisted of stacked two-by-four planks. Sometimes, support beams were attached outside of the walls. The height of older granaries was seldom more than 12 feet. Modern conveyors, elevators, and other equipment, however, have made it possible to use bins standing 20, 30, or more feet high.

Machine Shed--These structures typically housed a wagon, buggy, binder, mower, plow, harrow, rake, drill, cultivator, combine, or other horse or tractor-drawn equipment. The machine shed usually was of simple board frame construction, stood one-story high, had a gable or shed roof, and possibly included a small shop at one end. Doorways and openings were sufficiently wide to allow the removal and return of implements. Concrete floors were preferred, but dirt or wood floors also were common.

Machine Shop--This building usually was of simple design, one-story high, and built to retain heat for use in the wintertime, but with sufficient windows for proper lighting. Often, the original homestead dwelling, an old garage too small for modern automobiles, or some other older structure was converted into a shop, as farm buildings consistently have been adapted to new uses. The shop might contain metal working equipment, grinder, emery wheel, wood working tools, etc.

Pole Barn, Open Shed--Modern pole barns, sheds, and prefabricated metal buildings have become common on farms since the 1940s, as motor-driven technology has replaced the older animal-powered machinery of bygone eras. These newer structures better meet the specialized needs of modern farming, and thus are replacing the picturesque, but outmoded, horse and mule barns and other outbuildings. Pole barns are relatively inexpensive, and are quickly and easily constructed. Their distinguishing feature is the specially-treated, rot-resistant poles, which are buried vertically in concrete or the ground, somewhat like fence posts. It is these poles that support the attached walls and roof. Modern pole barns usually are one-story high with simple gable roofs. The interior is clear of vertical posts, allowing free movement of even the largest farm machines. Modern wood, aluminum, and metal siding are widely applied on the walls and roof, and concrete floors are common, all of which makes for a strong and durable structure. Pole barns also were built in earlier times, but often with untreated poles cut on the farm. The timbers decayed quickly in the ground, and, consequently, the old-fashioned pole barn usually had a short life.

Small animal outbuildings (i.e. chicken house, hog shed, etc.): Typically, low frame structures with gable or shed roof, drop or clapboard siding, and wood frame windows. The dimensions of the structure, and its interior divisions, varied according to the type and number of animals to be housed.

Bunkhouse: Often located near the family residence, the bunkhouse provided temporary housing for the large work crews required to harvest and sack grain. Typically, the

bunkhouse was a one story frame structure with gable roof, clapboard or drop siding, and double-hung wood sash windows.

Farm Yard: The spatial arrangement of the farmstead generally reflected function and convenience, with domestic structures (including chicken coops, icehouses, bunkhouses, and garages) grouped around the farmhouse and large agricultural buildings (including granaries, storage sheds, and horse barns) clustered around the main barn. A farm yard garden was often located near the house, with small orchards nearby.

The changing form of the farmstead: The adoption of tractor-drawn equipment in the late 1930s, associated with a shift from bagged to bulk handling of grain, revolutionized the wheat industry by speeding up the harvesting process and cutting down on labor requirements. It also brought significant changes to the appearance of the farmstead. Large horse and mule barns were not needed, and, consequently, many were torn down or altered into machine sheds or shops. Corrals and fences likewise disappeared, and numerous other outbuildings that had been used by livestock were eliminated or rebuilt for other use. Metal-sided pole barns, open sheds, and other modern prefabricated structures were erected for the new machinery. Acreage per farm increased, since an individual now could cultivate more land with less effort. Ranches expanded and absorbed other farmsteads--consolidating them into larger entities and often razing the excess structures.

Today massive, self-propelled combines have become ever more efficient and further streamlined the harvest process. Correspondingly, the number of necessary outbuildings has dwindled to just a machine shop, shed or pole barn for housing and maintaining combines, tractors, and trucks.

or three compact rustic structures reflecting the inherent limitations of life on an isolated frontier. Improved transportation brought connections with distant markets and made the latest innovations in farm machinery readily available. The era of commercial farming was ushered in, and with it came the specialization that has made the Plateau one of the nation's leading grain producers.

That specialization is reflected in the expanded farmstead complexes found on most wheat farms in the region. Few of those retain complete assemblages of historic-era buildings, however, and those that do are worthy of documentation and preservation. It was these farmsteads that served as production center, nerve center, and cultural center of the vast wheat empire.

Commercial Era Farmsteads

There were literally thousands of large, fully developed farm complexes in Eastern Washington during the grand era of prosperity and growth, specifically the 1880s until the first decades of the 20th century. These farms currently comprise the vast core of the built environment in Eastern Washington's grain growing regions. Today, however, complete historic farmstead units with full integrity are relatively uncommon.

To be eligible for listing in the National Register, a farmstead must retain a preponderance of historic features, including the farmhouse, barns, sheds, fencing, and the like. Ideally, fields should be considered part of the farmstead if changing uses or disparate ownership has not precluded that. It should be noted, however, that historic fields are intermingled with, and often indistinguishable from, nonhistoric acreages. For example, the wheat fields of an original 160 acre farm may have become part of a nonhistoric holding of several thousand acres. In such cases, determining boundaries requires careful attention. In addition, crops have changed over the years, and a historic wheat field may now be planted to rape seed. If historic fields are altered, or cannot be distinguished from nonhistoric fields, farmstead boundaries should circumscribe only the structural complex.

The farmstead as a whole must retain the original spatial and functional relationship between the various built components, and the individual structures must retain integrity of scale, massing, roof shape, exterior cladding and trim, decorative features, and fenestration in order to convey their historic character. Many character-defining elements, such as cupolas, stone foundations, louvered vents, window rows, stanchions and other specialized grain and livestock facilities, are integral to the function of farmstead structures and eligible properties will retain these features. Alterations must be carefully evaluated to determine the impact to the significant character of the structures. Modifications to structures completed during the period of significance may reflect the evolution of farming technology and should be evaluated within that context.

Partial farmsteads, solitary farmstead structures, and buildings with altered interiors may be eligible if of exceptional age, outstanding architectural significance, or historical importance. Extensively altered or gutted barns and outbuildings, or other lesser, solitary features such as root cellars, fences, windmills, etc., normally should not be considered for listing in the National Register if they stand alone. Generally, isolated structures and features have lost their integrity of association and setting due to the absence of other original farmstead elements.

In recent decades, metal roofing and siding have been applied to many barns, granaries, and outbuildings. These kinds of structures are unheated and susceptible to weathering and decay, especially if the roof is deteriorated. Consequently, the life of many a barn and granary has been extended simply because of the addition of a modern metal roof.

Simply put, without metal roofs, there would be fewer historic barns and other outbuildings standing today. Traditional wood shingles are too costly for most farmers, and are less common. In years to come, as neglect and weathering continue to take a toll, roofing will be one of the most critical factors in the preservation of farm structures. Therefore, it

is recommended that metal roofing be considered a minor alteration having minimal effect on integrity.

On the other hand, structures on which the walls, as well as roofs, have been sheathed in metal usually are extensively altered, and normally should be treated as if integrity was seriously impaired. Unless there are unusual mitigating circumstances, these properties should not be eligible for the National Register.

Because location and setting are central to the character of historic farmsteads, moved properties normally are not eligible unless the property meets the criteria exceptions outlined by the National Register program. However, for subsidiary structures on a farmstead, it is not unusual to find structures, particularly of small size, moved within the farmstead complex and such a move will not jeopardize the integrity of the entire farmstead.

Modern additions to farmstead complexes, such as metal silos, pole barns, and fertilizer tanks, reflect the evolution of farming technology and should be considered as having minimal adverse effect upon integrity, unless their number, size, and prominence overwhelm the farmstead's historic character. Modern houses, however, significantly diminish the integrity of historic farmsteads.

Collapsed structures should not be considered as adversely affecting a farmstead's integrity unless, of course, the structure was a pivotal, character-defining element such as the main barn or house. Multiple razed or fallen buildings are likely to have seriously compromised the integrity of any farmstead.

I. Name of Property Type: Barns

II. Description

Barns are undoubtedly the most common type of farm structures remaining in Eastern Washington. Those in the Columbia Plateau tended to be larger on average than barns in other agricultural areas because of the need for many draft animals. A large horse and mule barn, for instance, could be as much as 80 feet long or longer.

Wheat farming could be lucrative, consequently many of the structures were expensive and occassional exhibited stylish architectural features, often most visible in barn roofs. Gambrel, "gothic" arch, high gable, and round arched types were employed most frequently because large hay lofts were required to feed and maintain a dozen or more work animals throughout the year. Roofs frequently were topped with ventilating cupolas, which were decorative as well as functional. The volume of heat rising from the bodies of the animals created a natural convection system, keeping air circulating constantly throughout the structure. Many of the barns had hay hoods or wind-deflecting gable extensions above the loft doors. Barns were variously constructed of a frame of heavy timbers or studs, with board siding and post and pier or stone foundations. Barns typically housed grain and storage bins, equipment, wagons or trucks, as well as stanchions and stalls for work horses, mules and dairy cows. Stalls usually extended along the outside walls leaving the middle of the barn open for exercising animals. Pens for calves, sheep, hogs and other animals were also common in most barns. A harness room or workshop was frequently present as well.

Mules and especially horses were the most expensive farm animals and the most susceptible to diseases. They required clean, dry, well-ventilated and relatively dust-free quarters. Dirt floors were thought to be less healthy for the animals than wood or concrete, leading many farmers to install the latter when financial circumstances permitted. Horses are powerful, active and restless animals that can cause much damage with kicks, gnawing, stomping, and pawing. Interior facilities for horses were especially stout and solidly constructed with heavy-gauge materials, lacking sharp edges that could cause injuries. Horse stalls were usually half-again as wide as cow stalls. A horse barn could also contain brood mare stalls, isolated stalls for stallions, standing stalls for harness horses, and possibly a carriage or wagon room.

Round Barns

Although rectangular barns of various roof types comprise the overwhelming majority everywhere, round, octagonal, and polygonal barns make up perhaps less than one tenth of one percent of the total number of historic barns. The unusually-shaped structures likewise are extremely rare in Washington, and relatively few of those constructed in historic times have survived. Most were erected in the 1910s when round and polygonal barns were widely discussed in farm trade journals, though others date from before or after that decade. They are scattered throughout the agricultural regions of the state, and generally housed dairy and beef cattle, horses, mules, and other livestock. And, like rectangular barns, they were used for hay, grain, and equipment storage. But the relatively small doors on round barns precluded those structures from being used for parking large farm vehicles, however.

III. Significance

The barn is and always has been a pivotal structure on a wheat farm. Perhaps unlike today, in the formative era of wheat farming the barn was often the most prominent building on the farm, frequently even more architecturally imposing than the house. While functional necessities were always primary considerations, barn styles nevertheless varied more radically than rural house styles and seem to have been more representative of individual taste and self expression.

Rectangular Barns

Some barns in Eastern Washington are not unlike those on the west side of the state, and they generally reflect similar uses: as dairy barns, or as feed storage and shelter facilities for a mixed variety of livestock likely to be present on small, diversified farms. The significantly larger, older barns located on wheat farms in Eastern Washington, however, reflect the specialized requirement of maintaining large numbers of draft animals for plowing and harvesting extensive acreages, especially on steep, hilly terrain. The enormity of the structures conveys a sense of the special demands of that bygone technology which involved storing motive power (draft animals) and fuel (hay and other feeds) under one roof.

Round Barns

Round barns were comparatively rare in Washington as in other parts of the country, and they are more rare today than in earlier times. Their poor preservation may be due in part to an inherent shortcoming of their construction: the entire building is threatened when any single rib of the roof or portion of a wall deteriorates or is damaged. The unique construction generally precludes piece-meal replacement of most vital structural elements and has resulted in the rapid disappearance of most round barns in the state in only the last few years. Particularly in Eastern Washington, heavy snow accumulations on roofs of weakened, leaning round barns can quickly bring about structural failure and collapse. Rectangular barns, on the other hand, can be repaired more easily, and may in fact remain standing even if most of a wall is removed. Such stability is not present in round barns where the forces of tension and compression are centered on interdependent, mutually-supporting roof ribs.

Proponents claimed that round barns were more convenient for storing, feeding, and cleaning, and required less materials to build than rectangular barns of similar size. Critics, however, noted that round and polygonal barns could not be enlarged, were dark at the center, had less loft space, and occupied more ground than rectangular barns of the same capacity. Few carpenters had the skills or experience needed to build and repair round barns, especially the roofs whose greater surface area demanded more maintenance. Costs were greater too, since round barns required more feet of track for overhead hay and grain carriers, and all of the equipment and materials had to be specially adapted to accommodate curves.

IV. Registration Requirements

Rectangular Barns

To be eligible for listing in the National Register, a rectangular barn must convey its historic character through structural and associative integrity, and must have documented historical significance within the context of wheat growing in eastern Washington.

Large horse and mule barns, measuring roughly 70 to 80 feet long, are uniquely associated with Eastern Washington grain growing and may be eligible because of historical associations and architectural character. The exterior must retain integrity of design, original materials and fenestration patterns, and decorative features such as cupolas, hay hoods, framed windows, boxed cornices (some with returns), and stone foundations. Altered or closed-in doorways or windows are not acceptable. The only allowable alteration would be the addition of new roofing material such as composition shingles and metal sheeting. The interior must retain all of its original features, such as stalls, pens, stanchions, and hay mow. Several dozen of these great horse barns may be National Register eligible in Whitman County alone.

Rectangular barns of any size or class normally are not eligible if most or all decorative features on the facade were removed, if exterior walls are covered or replaced by metal sheeting, if interior furnishings are gutted, if large doorways for motorized equipment have been cut into the walls, if original windows and passageways have closed, or if walls have been knocked out and the structure has been redesigned to serve as a cattle feeding shed.

Round Barns

Virtually all historical round or polygonal barns remaining in Eastern Washington are probably eligible for inclusion in the National Register primarily for their architectural character. Most or all of the original facade should be extant, including original materials, decorative features, and integrity of design. Some metal or other modern siding does not completely destroy integrity. Interior alteration, if present, normally should be considered as having only a partial adverse impact on integrity.

Although the number of historic large round barns is very limited, there are numerous small round barns of little prominence lacking distinctive styling and features, are of more recent vintage, and usually consist of cheap materials such as scrap lumber, plywood, and metal sheeting. Without some other qualifying characteristics, those structures normally should not be considered eligible for lisitng in the National Register.

I. **Name of Property Type:** Grain Storage Facilities

II. **Description**

Grain storage facilities during the period of significance consisted overwhelmingly of three basic forms: granaries, flathouses, and cribbed elevators. Perhaps more than any other property type, the three varieties directly reflect building function. More importantly, flathouses and cribbed elevators reflect radically different technologies associated with nearly every phase of the grain industry.

Granaries

Granaries are found predominantly on dairy and livestock farms, although some stand on grain farms as well. They are used primarily for storage of feed grains for livestock and seed grains for future crops. Those on wheat farms dating from the period of significance more than likely held considerable quantities of oats for use as feed for the many draft animals surely present on any farm of extensive acreage.

Typically granaries are low, stout, gable or shed-roofed structures with cribbed walls of stacked two-by-four planks providing the strength to withstand pressure exerted by heavy loads of grain. Occasionally heavy beams are visible around the outside walls for added support. On some of the oldest granaries, the bins were situated below a ramp from which a wagon-load of grain could be dumped. Others stood above wagon level, but seldom more than twelve feet in height, or about as high as a man could scoop grain up from a wagon into a storage bin. Later, motor-driven conveyor belts with attached scoops, called "elevators" or "legs," made larger bins ca. 20 to 30 feet high feasible.

Flathouses

Nearly all the flathouses that remain in Eastern Washington stand adjacent to operating or abandoned railroad grades. Those that once stood at steamboat landings on major waterways (primarily the Columbia and Snake rivers) have all disappeared along with shorelines inundated by hydroelectric projects.

Design, materials, and workmanship of flathouses were never elaborate. Rough-sawn one-by-twelve inch boards affixed to a timber frame in board-and-batten or flush-board fashion were the most common materials used in wall construction. Fenestration was simple and limited if present at all. Gable roofs without trim or dormers were standard. Because of the immense weight of wheat sacks stacked several high, floor components tended to be the most durable materials found in flathouses. Heavy floor planks rested on strong joists supported at frequent intervals by concrete or one-foot-square timber foundation piers. The piers suspended the floor about four feet or more off the ground, bringing it to a level flush with railroad cars into which the wheat sacks were loaded. A length of 150 feet and width of 50 feet was not unusual.

Cribbed Elevators

The term "elevator" can be applied to both the building and the device used to transport grain vertically into storage bins within the buildings. To avoid confusion, the

transporting devices will here be referred to by their common appellation "legs," and the buildings themselves as "cribbed elevators." The latter term reflects their method of construction and distinguishes older elevators from more modern varieties of metal and concrete materials.

Cribbing is a form of construction referring to, in the case of grain elevators, the practice of laying 2 by 8 inch boards flat atop one another to form a wall capable of withstanding tremendous pressures exerted by large quantities of bulk grain. Crib construction is generally used throughout the portion of the building housing grain storage bins. Flush-board, board-and-batten, or shiplap can be found as siding on other parts of the structures. Shiplap was used as weather-resistant siding over the cribbing itself on some of the older elevators. Sheet metal has been added for the same purposes in recent years.

Attached to one side (usually the front) of an elevator is the scale house, from which operation of the building was controlled. Wooden or earthen ramps lead into the scale house from two opposite sides, allowing wagons and trucks to drive up onto the raised floor, be weighed, dump their grain loads, and proceed out the other side without having to turn around or reverse direction. Scales were mounted in the floor near the pit into which grain was dumped. Before modern hydraulic units became standard equipment in grain trucks, a similar device controlled by a so-called "mercury switch" lifted the fronts of wagons and trucks, forcing the grain (hauled in bulk form) from the vehicle bed into the pit. Most of the old mercury switches were later replaced by air hoists installed in the floor. Adjacent to the dumping bay was the elevator office where weights were recorded and the bookkeeping for the entire operation was done.

From the pit, grain was elevated to the very top of the building for distribution into storage bins. That feat was accomplished by a so-called "leg," consisting of a canvas or rubberized belt about 10 inches wide to which were attached metal cups about four inches deep and five inches wide. A gas-powered generator supplied electricity for lighting and for the leg belt motor until the advent of rural electrification in the 1930s. Encased in a wooden shaft, the leg transported grain to the headhouse on the top floor of the elevator 100 feet or higher above the pit. There grain moved by force of gravity from the so-called throat into the distributing spout, which funneled grain to different spouts leading to various storage bins throughout the elevator. An operator turning a heavy metal wheel on which were marked bin numbers (in a manner similar to dialing a rotating-disk telephone) on the elevator's ground floor controlled the movement of the distribution wheel and thereby controlled the destination of grain to be stored.

A typical elevator dating to the early twentieth century contained about twenty cribbed storage bins of different capacities. Depending upon the building's size, as much as 80,000-90,000 bushels of grain could be stored in its bins. The incredible weight of that much grain caused at least some elevators to sink about one foot into the ground when loaded to maximum capacity. The scale house, with its scales, dump pit, and wagon/truck ramps, had to remain stationary and could not rise and fall as the bins were loaded and unloaded. For that reason, it was attached to the elevator by overlapping beams that allowed the scale house to remain in place yet attached to the rising and sinking elevator.

In the early days of wheat farming, grain brought to elevators in bulk form contained considerable amounts of foreign materials. The grain earmarked to be sacked and sold for seed would be run through a machine known as a "clipper," which eliminated extraneous matter, including kernels of other types of grains. Most of the old elevators contained clippers, usually situated on the second floor below the storage bins. By the 1940s more sophisticated combines were cleaning grains in the fields, and most clippers were removed from elevators.

Other equipment in early grain elevators is, for the most part, still in use. The spouts funneling grain to storage bins and railroad cars have not changed over the years. Wooden stairs, ladders, and so-called "man lifts," or crude pedestrian elevators operating on a system of counter weights, are still used in most of the older buildings for reaching the upper floors. Scales have been replaced and moved outside the old scale houses due to the tremendous increase in grain truck size. Although modern equipment has no doubt replaced some of the original apparatus in nearly all the buildings, grain elevators continue to function very much in the manner they have since the turn of the century.

III. Significance

Granaries

The oldest known building standing in the state is the Fort Nisqually Granary at Fort Defiance Park in Tacoma. Constructed in the 1840s, it far outdates any similar structures likely to remain in Eastern Washington. Most extant granaries in Eastern Washington were probably built in the early 20th century, although a very few may date to as early as the 1880s.

Granaries are sometimes found on some of the oldest subsistence farms in the state, but more often they are associated with dairy or livestock farms. Generally they were used for storage of feed and seed grains; those located on wheat farms in Eastern Washington served that function, and on very rare occasions may have been used for storage of commercial grain or grain for domestic consumption. Farmers disliked storing grain they intended to sell on the commercial market because it dried out and lost weight, whereas when left in sacks the wheat retained moisture, therefore more weight and profits. In recent years granaries in Whitman County have been used for temporary commercial grain storage when shortages of trucks during harvest prevented farmers from hauling crops to elevators.

Flathouses

Flathouses are today the most vivid visual reminders of the era of sack grain technology. The structures reflect aspects of the grain industry that have changed drastically within the last fifty years. Methods of harvesting, handling, transporting, and marketing grains, particularly wheat, have all changed since the advent of bulk grain technology, leaving flathouses obsolete and in various stages of disrepair.

For at least a half century in the Pacific Northwest, grain was handled and stored in burlap sacks, usually weighing about 100 pounds each. Farmers sacked the grain in the field before hauling it by wagon to shipping points in towns, at railroad sidings, or along rivers served by steamboats. At those grain handling points, farmers sold their grain to

warehouses usually affiliated with large milling and exporting companies, the largest of which were the Interior Warehouse Company, Kerr Gifford and Company, Pacific Coast Elevator Company, Puget Sound Warehouse Company, and Seattle Grain Company. Some of the warehouses were owned by local companies or farmers' cooperatives.

The warehouses maintained by the various companies were more popularly known as "flathouses," the elongated single story frame buildings still seen standing along every rail line ever built through grain country. By 1910 there were more than 400 flathouses on the Columbia Plateau, most situated adjacent to railroads which had by then penetrated every important grain growing district. One noted scholar (Donald Meinig) has estimated that once all the rail lines had been completed, most farmers were less than five miles from a grain handling/shipping point. That close proximity allowed the grower to haul several wagon loads per day to points linking the farmer and his produce to distant international markets.

For a number of reasons, the Pacific Northwest lagged behind the rest of the country in converting from storing and handling grain in sacks to bulk methods. One financial consideration was based upon the tested truth that sacked wheat retained more moisture and weighed more than bulk grain, thereby earning more for the grower when value was assessed by weight. A more important reason remained the limited availability of devices for transporting grain in bulk form: ships sailing around Cape Horn hauled only sacked grain, because companies would not insure bulk grain for fear that it would shift dangerously in rough seas. A further limitation were the very few railroad cars at that time fitted for hauling bulk grain. Sacked grain also prevented wheat infected with smut, a fungus especially problematic in the Columbia Basin, from mixing with healthy batches. In addition, the unusual variety of wheats grown in close proximity in the Pacific Northwest and the differences in price paid for each strain required keeping them separate from one another.

The preeminence of sack grain technology in the region for over half a century produced two distinctive building types: large horse barns and flathouses. Wherever a shipping point existed along an artery of transportation, a flathouse was built. Many of those points served as the focus for rural social life where there might also have stood a school or church. Because the flathouse was likely to have been the largest building for miles around, many served as makeshift community halls in which were held dances and other social events. But their primary function was to shelter, albeit temporarily, the sacks of commercial wheat that were to these lands what sacks of gold dust were to frontier mining camps.

Cribbed Elevators

A significant factor in the shift to bulk grain handling in the Pacific Northwest was the completion of the Panama Canal in 1914. Ships bound for Europe no longer had to round the stormy seas off Tierra del Fuego, alleviating the fears of insurance companies who then began insuring grain shipped in bulk. Earlier the last of the transcontinental railroad lines built through the Pacific Northwest, the Chicago, Milwaukee, St. Paul and Pacific (popularly known as the Milwaukee Road), boosted bulk handling by encouraging construction of grain elevators along its line. That line passed through northern Whitman County and the center of Adams County, bisecting some of the Plateau's most productive wheatlands.

Perhaps not surprisingly, some of the earliest elevators on the Plateau were erected along the Milwaukee Road, which was completed in 1909. But even earlier a few elevators handling bulk grain had been constructed adjacent to the Oregon Railway and Navigation Company line to the south in Whitman County. Obviously the railroads were providing cars suited for hauling bulk grain (they had been doing just that for many years in the Midwest), yet the Northwest remained wedded to sack grain harvesting and marketing methods into the 1930s. Cribbed elevators predating the massive shift to bulk grain technology are significant representatives of the early signs of momentous changes to come in the industry.

IV. Registration Requirements

Granaries

Isolated granaries standing alone apart from other associated farm structures are not normally eligible for National Register listing in the context of this nomination unless they can be demonstrated to be significantly associated with the subsistence stage of pioneer agriculture. Those built before the turn of the century (presumably used for storing feed on commercial wheat farms) and bearing exceptional structural integrity may be eligible, but those built after the turn of the century probably would not be eligible, except as contributing elements on an historic farmstead possessing the necessary characteristics for eligibility.

Flathouses

As a result of the region's long dependence on sack grain technology, many flathouses remain in the wheatlands of Eastern Washington but their preservation is poor in nearly every instance. Those in the best condition have often been refurbished for use as vehicle or equipment storage warehouses. In a few rare cases, interior walls have been added and exterior bracing been installed for converting some flathouses to bulk grain storage. Sacked seed grains are still stored in some of the buildings; but probably the majority are abandoned or used very little, giving them minimal chance for lengthy survival.

Flathouses that may be eligible for the National Register must have a strong association with the history of grain production and must retain significant amounts of physical integrity, particulary in their roofline and appearance of their outer walls. The addition of metal sheeting as weather protection should be acceptable on the roof but the walls should retain historic materials and appearance. Doors and windows may be boarded or replaced in some places, but the basic pattern and configuration should be readily apparent. Interior alterations are presumed to have occurred and should not be considered as destroying integrity.

Cribbed Elevators

Most grain elevators predating the 1930s and retaining significant amounts of structural integrity are candidates for inclusion in the National Register because of their historical importance. In addition to historical associations, an eligible elevator must retain integrity of scale, massing, roof line, fenestration, and substantial amounts of the original exterior wall cladding in order to convey its historic character. Sheet metal

added to the roof is almost universal and should not be considered a complete loss of integrity. However, it should be considered unacceptable for all original wall surfaces, be they shiplap over cribbing or the cribbing itself, to be covered by sheet metal. Interior integrity should be present in original floor plan, flooring, wall materials, and at least some of the historic-era equipment. Alterations and additions must be evaluated in light of the structure's overall character. Of course, modifications completed during the period of significance may reflect technological evolution and actually enhance the elevator's potential eligibility. The presence of an adjacent flathouse bearing the necessary registration requirements would tend to heighten the sense of historical development and increase the potential eligibility of both structures.

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United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

I. Name of Property Type: Grain Conveyance Systems

II. Description

Grain farmers utilized chutes, pipelines, rail trams, and bucket trams to move grain down steep, 2000-feet-deep canyon walls to steamboat landings and railroad sidings in the Snake and Columbia watersheds. A dozen or more of these long, linear features were erected along the Snake in Whitman and Garfield counties and in the Washington-Idaho border area. Others, apparently in lesser numbers, were located on the Columbia near Waterville (western Douglas County) and perhaps elsewhere. Dating from the late 1800s and early 1900s, some of these unique devices remained in service until World War II.

Grain chutes were square wooden pipes, frequently metal-lined, which lay on the ground or stood on wooden trestles. Metal pipelines were built in similar fashion. A rail tram was a complicated gravity-powered cable and tram car system running on tracks and trestles. Bucket trams, likewise gravity-powered, had sack-carrying buckets or arms attached to a continuous, steel cable suspended from towers or poles. Rail and bucket trams operated in similar fashion to ore trams in mining districts.

These systems measured between several hundred feet to more than a mile in length, and some were combined features (e.g., a chute at the top and a bucket tram toward the bottom). Flathouses, cabins, brake drum sheds, and other structures often stood at the top, whereas docks, wharf boats, railroad sidings, and warehouses were located far below on the canyon floor.

The first grain chute--a four-inch-square wooden pipe, 3200 feet long--was constructed on the Snake River's southern wall at Moxwai (now Knoxway) Canyon in 1879 in what is now Garfield County. It was designed and built by local settler and entrepreneur Major Sewell Truax, who already was known for surveying Idaho's Lolo Trail and constructing Dr. Dorsey Baker's famous "strap iron" railroad near Walla Walla. By 1881, just two years after Truax erected his grain chute, others were operating in Garfield County at Kelley Bar, Illia, and opposite Wawawai. This was in a section of canyon where only a few steep, extremely difficult roads snaked down to the river. In fact, the focus of the development of this spectacular grain conveyance technology appears to have been in this 15- or 20-mile stretch of the Snake River, where canyon walls are highest and steepest.

Soon, similar devices appeared on the north side of the Snake in Whitman County: at Rim Rock Plateau in Yakawawa Canyon by 1883 (today, traces of a wagon road on top of Rim Rock Plateau indicate the upper end of this former grain chute); at Truax in 1885; at Nisqually John Canyon (also later known as Indian Siding) in 1887; at Steptoe Canyon (date unknown); and there were others of less renown, which may not have run the full distance to the river.

Chutes were not entirely satisfactory since the grain often was ground up or seared during its rapid descent. Pipelines or metal- or glass-lined wooden chutes with jogs every few yards worked better, slowing the flow of wheat, but labor costs remained very high because grain had to be dumped out of burlap gunnysacks at the top of the chute and then bagged again at the bottom.

More sophisticated and cost efficient mechanisms--bucket and rail trams--soon appeared, allowing wheat to remain in the bag during hauling. A mile-long bucket tram was erected at Interior, one mile below Wawawai in Whitman County. It operated from 1901 until 1938. Upriver, the Judkins bucket tram, with a 2-1/2-mile-long cable, replaced a grain chute at Kelly Bar in 1893 and continued in service until 1929.

Another impressive new facility was the Mayview Tramway, constructed in Garfield County in 1891. It proved to be the most intricate and long-lasting of all, running tramcars over nearly a half-mile of rails and trestles for more than a half-century. It appears to have been the only rail tram on the Snake River in Washington, but at least one other stood on a tributary in nearby Idaho. Throughout this period, in fact, advances in grain conveying technology in eastern Washington were mirrored by similar developments in the Clearwater-Snake wheat district of neighboring Idaho.

Other grain conveying devices stood in the Columbia River canyon above Wenatchee, though development here seems to have lagged somewhat behind that on the Snake. Many Douglas County farmers faced the same kind of obstacles--deep, steep canyon walls with tortuous, difficult wagon roads down to the river. A facility that Waterville farmers utilized was the Orondo Tramway, near Corbaley Canyon. Operating from 1902 to 1910, this bucket tram, with its towers and overhead cable, lowered grain a vertical distance of 1700 feet. It also hauled lumber, building supplies, and coal. Another facility, the Keane Pipeline, stood on the Columbia near Rock Island. Constructed by James E. Keane in 1908-1910, it consisted of 2600 feet of 6-inch galvanized pipe supported by wooden trestles, plus about 500 feet of tramway at the bottom. It successfully served the Badger Mountain locality until 1941, when a grass fire destroyed the trestles.

Today, none of the systems remains in complete form. Changing technology made the systems obsolete, and salvage, weather, and vandalism have diminished the abandoned structures. The kinds of properties which do survive may include (at best) such elements as 1) a long, well-defined graded cut in a canyon wall where a tram or chute once was located, 2) a continuous cable complete with buckets laying on a ridge line, also, perhaps with tower remnants, or 3) partially collapsed but basically complete grain bins and loading ramp with remnants of grain chutes on the ground. The somewhat extensive research and inventorying that has been accomplished to date indicates that these types of remnants are probably the only significant remnants of these systems to survive, and the best preserved are likely to yield important data to scholars of the region's agricultural economy.

III. Significance

In steep sections of the Snake and Columbia river canyons, it was difficult, time-consuming, and costly for wagons to haul grain from the high plateau down the steep, winding roads to steamboat or railroad facilities at the river's edge. Going downhill was less of a problem, since wagons had breaking devices, but coming back up, even with empty wagons, was very hard on horses or mules (even motorized trucks in the 1920s and 1930s had a difficult time on some of these treacherous roads). Consequently, local farmers and wheat merchants became home-grown inventors and built ingenious conveying devices to get grain out to market. These chutes, pipelines, and rail and bucket trams reflected the remarkable resourcefulness and adaptability of this class of pioneer.

After some trial and error, most of the devices were successful and several operated for decades. Though occupying a small role in grain transportation history as a whole, they represented economic salvation to farmers in areas where canyons were nearly insurmountable obstacles. Conveyance devices played a prominent role in the agri-cultural history of specific localities, mainly the Snake River corridor in Whitman and Garfield counties, and the Columbia River Canyon of the northwest Columbia Plateau.

The historic grain conveyance devices were largely adapted to the long-standing custom of transporting and storing wheat in two-bushel sacks (each weighing 130 pouds or more). Consequently most of these facilities became obsolete in the late 1930s when the use of modern roads and grain elevators caused a revolutionary switch to handling grain in bulk rather than by bag. Bulk handling methods were faster, cheaper, and more efficient, and the improved roads and trucks bypassed or made short work of the deep canyons than had formerly posed such obstacles. The last of the aging pipelines and trams were shut down forever.

Never numbering more than perhaps a couple dozen, these unique devices are among the rarest of any structures in the Eastern Washington Grain Production theme. The most significant and representative examples of these features deserve protection.

IV. Registration Requirements

It is fairly certain that just one or two dozen historic grain conveying devices of any type (and no complete "systems") will be identified in Eastern Washington. None have operated in decades, nor do they remain today in complete or unaltered form. Range fires, decay, and board and metal salvagers have all taken a toll. Consequently, most elements of the systems have disappeared, and the flathouses, depots, docks, and other structures that formerly stood at the canyon bottom are universally gone, due to the cessation of steamboat service, the removal of railroad lines, the creation of dam reservoirs, and the ravages of time.

Fragments of several systems do reflect significant original elements including original grading, structures, chutes, and/or machinery, though in a broken-down, dilapidated condition. None, however, remain intact. Realistically, even the best preserved properties are in ruinous condition, siginificant because they are rare examples and are likely to yield information about an outmoded technology.

Because none of the systems is well preserved, properties eligible for the National Register will be those which 1) preserve significant elements of a historic conveyance system, sufficient to convey a strong sense of how the total system operated; 2) retain a significantly greater amount of physical features than other identified systems; 3) are strongly associated with the history of grain production; and 4) are likely to yield important information about the technology of grain conveyance systems of the period. As such, properties must be evaluated under Criterion A (association with historic events).
In the unlikely event that a full scale grain conveying device is found in a complete and unaltered state, it should be considered eligible for the National Register (under Criterion C, association with a type of construction)) even if its historical association with persons and events is not as strong as others.

Since there were only a dozen or so grain conveying devices in Eastern Washington, it may be practical here to describe three of the most significant and/or intact properties that research and inventorying indicates are among the best extant resources of the type in the state. Both the Mayview rail tram and the Interior bucket tram are noteworthy because of their important historical associations and visible structural remains. The Canyon grain chute, on the other hand, is by far the best preserved grain conveying device yet inventoried in Eastern Washington, but, ironically, it was not very successful when in operation. These are the sites that all others in this property type can be measured against.

One of the better preserved ruins, relatively speaking, is the Mayview Tramway site on the south side of the Snake River in Garfield County. This especially elaborate and efficient tramway was one of the longest-operating and most successful grain conveying devices in the Columbia Plateau. Constructed in 1891, it functioned for more than a half-century, until the early 1940s.

It originally consisted of metal tracks and wooden trestles, on which ran two rail cars attached to a 4800 foot loop of steel cable extending from the top of the canyon to the river. A receiving yard and system of feeder tracks and carts were located at the canyon rim, where grain sacks were loaded by hand into the rail cars. As one of the loaded cars descended on the cable, pulling the other empty car upward, the cable's speed was controlled by a breaking device in a covered platform at the top. The tracks separated halfway up the canyon wall, allowing the two cars to pass each other. After the car was lowered a vertical distance of 1800 feet, the grain sacks were unloaded and stored in a warehouse prior to shipment.

Today, much of the Mayview Tramway is gone, including the cars, cable, rails, warehouse feeder tracks and carts, breaking drums, most of the loading/breaking platform, and other structures. Still present and clearly visible on the canyon wall, however, is the especially impressive, 1/2-mile-long, graded railway cut, with piles of collapsed trestle timbers in it. As such, it is by far the most readily visible remnant of any conveying device in the Snake River Canyon. Also still present is part of a wooden platform at the canyon rim. The tramway grade is a substantial feature that will resist the erosive effects of the elements for many years to come, and it has become something of a historical landmark to local residents and visitors alike.

A few miles downstream from the Mayview facility stand the remains of the Interior Bucket Tramway (on the north side of the Snake, one mile below Wawawai). Constructed in the 1901, it was one of the most successful bucket trams of all, and operated until 1938. A warehouse at the river's edge was removed in 1940, and the machinery in the brake house at the top was salvaged as scrap metal during World War II, but otherwise the facility was largely left intact.

Though now abandoned and extensively deteriorated, it is the most complete wheat bucket tram remaining in Whitman County and, probably, Eastern Washington. Still present at the canyon rim are foundations and collapsed remains of the numerous structures that once stood there (brake house, flathouse, cook shack, etc.). Most impressive, however, are the still extant two mile-long continuous steel cable, with its attached bucket arms, and approximately 27 wooden towers. The cable and towers extend the full distance down the

ridge to the river. Most of the towers have collapsed, but about a third yet stand, with the cable running through the pulley wheels on the crossbars.

The Canyon grain chutes and bins were built in about 1920 in the dry, sagebrush-covered, southwest corner of Whitman County. The feature does not stand on the Snake, but rather in the deep canyon of a tributary known as Alkali Flat Creek. The facility operated poorly when it was used in the 1920s and again in the late 1930s and early 1940s. The steep chutes seared and did not control the grain, some of which blew out across the hill-side, while the remainder hit the railroad storage car with sufficient force to cause damage. These problems were only partially solved.

Thus the Canyon Grain Chute was only marginally successful, but setbacks were frequent in the development of these unique devices. It is, however, by far the best preserved grain conveying device known in the Snake River region of Eastern Washington. Still stand-ing are a large dumping platform, an impressive wooden crib with five large grain storage compartments, and five metal-lined wooden chutes extending from the crib compartments to a larger main chute, which continues on down the hillside. The stone foundation on which the red-painted crib stands is quite substantial. A warehouse and the railroad tracks formerly located on the canyon floor have been removed. The Canyon facility is somewhat deteriorated, particularly the wagon ramp, but nothing has been removed and, all in all, its relative good state of preservation is extremely exceptional for these kinds of rare structures.

If in the future other currently unknown or unvisited properties are found to be as intact and significant as these three sites, they too should be considered for listing in the National Register.

Property types selected for discussion represent a broad range of historic functions. The four discrete property types identified were chosen for their functional diversity and significance within the developed context. Farmsteads have always been the focus of farming activity in the region. They usually include a barn, and in fact, because of structural durability and occasional outstanding architectural character, the barn is often the last original building remaining on the farmstead. For that reason barns have been chosen as a separate property type. Grain storage facilities represent historical stages of development that have been eclipsed by modern technology. Although other property types associated with the theme have not been included, those discussed are the most important and most representative of the grain growing industry during the period of historical significance. That period spans the lengthy era from replaced draft animals as the primary motive power in agriculture. The momentous change occurred roughly 50 years ago, and thus all properties associated with the historic theme and period of significance have now achieved the usual National Register age requirement for eligibility.

Although the standard National Register criteria were used in the initial evaluation of the properties nominated, specific standards of integrity were developed from survey information and historical literature for evaluation of the various property types. Those specialized standards vary according to property type.

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