DEPARTMENT OF ECOLOGY
State of Washington

# High Wind Fugitive Dust Mitigation Plan

## *For the Wallula $PM_{10}$ Maintenance Area, Wallula, Washington*

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# Publication and Contact Information

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Este Plan de Mitigación de presenta las fuentes y causas por las que los estándares de partículas de calidad de aire en y cerca de Kennewick y Wallula fueron excedidos. El plan incluye disposiciones para notificación pública y educación y estrategias para promover medidas para reducir la erosión del suelo de las tierras agrícolas. Para solicitar información en español favor de contactar a Laurie Hulse-Moyer, Programa de Calidad de Aire, al 360-407-6783.

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## *For the Wallula $PM_{10}$ Maintenance Area, Wallula, Washington*

Air Quality Program

Washington State Department of Ecology

Olympia, Washington

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# Acknowledgements

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# Acronyms and Abbreviations

AQI ..... NRCS Air Quality Initiative

AQS..... Air Quality System

BACM..... Best Available Control Measures

BCAA .....Benton Clean Air Authority

BMP ..... Best Management Practices

CFR ..... Code of Federal Regulation

CP3 ..... Columbia Plateau $PM_{10}$ Project

CRO .....Ecology Central Regional Office

Ecology ..... Washington Department of Ecology

EER .....Exceptional Events Rule

EPA..... U.S. Environmental Protection Agency

ERO..... Ecology Eastern Regional Office

EQIP.....Environmental Quality Incentives Program

FEM .....Federal Equivalent Method

FSA .....Farm Service Agency

HHH .....Horse Heaven Hills

KENMETA ..... Monitoring Station at Kennewick, Metaline Avenue

MPH ..... Miles per Hour

NAAQS .....National Ambient Air Quality Standards

NEAP .....Natural Events Action Plan

NRCS .....Natural Resources Conservation Service

NWS ..... National Weather Service

PM .....Particulate Matter

$PM_{10}$ ..... Particulate matter with an aerodynamic diameter of less than 10 micrometers

$PM_{2.5}$ ..... Particulate matter with an aerodynamic diameter of less than 2.5 micrometers

USDA ..... United States Department of Agriculture

WAC .....Washington Administrative Code

WMA ..... Wallula Maintenance Area

WMP ..... Wallula 2nd Ten Year $PM_{10}$ Maintenance Plan

WSU ..... Washington State University

# Differences Between Public Comment and Final Version

Ecology made several nonsubstantive, clerical, and formatting changes from the public comment version of this plan.

- Removed Appendices from main document to be accessed separately
- Moved Appendix A. Ecology Outdoor Dust Webpage Content into Appendix C Public Involvement and Comment Period Documentation
- Reordered Appendices making Appendix A Mitigation Plan Requirements, Report Index
- Changed internal references to reflect new order
- Added the following sentence to the end of Section 3.6, Public involvement and public comments: "*comments and Ecology response are in Appendix D"*
- Added Appendix D. Comment and Ecology Response to Comment
    - The Mitigation Plan was not changed based on the one comment we received because the area that the commenter was from was not the focus area of the Mitigation Plan. Ecology provided contact options for Adams County for the commenter.
- The following changes related to the date the high Wind Dust Prevention Workgroup will convene were corrected to align with the timeline in the Summary of Commitments:
    - Executive Summary, page *xii*: The sentence beginning:
        - We will begin planning for this workgroup late in 2018 with the goal to have the first meeting in early 2019.
        - Will be changed to:
            - We will begin planning for this workgroup late in 2018 with the goal to have the first meeting *in the third quarter of 2019.*
    - Similar changes were made to page 16.

# Executive Summary

The Wallula Maintenance Area (WMA) lies in eastern Washington just north of the Oregon border in the geographic region known as the Columbia Plateau. The former course particulate matter ($PM_{10}$) nonattainment area includes parts of Walla Walla and Benton counties, as well as a small portion of Lincoln County and Sacajawea State Park in Franklin County.[1]

Dust storms impact the Columbia Plateau.. The Columbia Plateau is highly susceptible to windblown dust because of its semi-arid nature and very fine soil. High winds caused by thunderstorms can overwhelm existing erosion control measures on agricultural lands and cause $PM_{10}$ levels to exceed the 24-hour $PM_{10}$ national ambient air quality standard.

The Washington State Department of Ecology (Ecology) identified farmlands southwest (Horse Heaven Hills) and northeast of Kennewick as the likely main sources of dust for the high wind dust events, also known as exceptional events.

An exceptional event is a natural or human-caused event that affects air quality and is not reasonably controllable or preventable.

Because of the number and frequecy of the high wind dust exceptional eents, the USEPA 2016 Exceptional Events Rule (EER) requires Ecology to prepare a $PM_{10}$ mitigation plan for the WMA. This plan fulfills the new requirement.

Ecology's plan is focused on mitigating emissions from farmlands that contributed to the $PM_{10}$ exceedances Kennewick caused by high wind.

The plan maintains public notification and education measures for high wind events that create dust. These include forwarding National Weather Service advisories with information on actions residents could take to protect their health.

Our website provides educational information on sources of dust and measures taken by agriculture to minimize dust creation. Measures to abate or minimize sources that contribute to exceedances include implementation and promotion of United States Department of Agriculture (USDA) voluntary conservation measures.

As part of our efforts to study and implement methods to mitigate dust, Ecology will convene a High Wind Dust Prevention Workgroup, made up of partners at local conservation districts and USDA offices. The workgroup will:

- Educate our partners about the impacts of high wind dust events and the regulatory importance of adequate controls on agriculture.
- Promote measures to minimize soil erosion from agricultural lands.
- Provide an opportunity to share resources with other agencies and agricultural partners.

[1] The area bounded on the south by a line from UTM coordinate, 5099975mN, 362500mE, west to 5099975mN, 342500mE, thence, north along a line to coordinate 5118600mN, 342500mE, thence east to 5118600mN, 362500mE, thence south to the beginning coordinate 5099975mN, 362500mE.

- Educate the public of control measure options and precautions to take during a high wind event.

Ecology started planning for this workgroup late in 2018 with the goal to have the first meeting in the third quarter of 2019.

Ecology commits to reviewing this plan every five years, or more often if there are more than three high wind dust exceptional events that cause exceedances that occur at the compliance monitor within any future three year period, (i.e., a violation of the 24-hour $PM_{10}$ NAAQS is confirmed).

# 1 Introduction

U.S. Environmental Protection Agency (EPA) finalized the revised Exceptional Events Rule (EER) on October 3, 2016. The EER requires the states named in the rule to prepare a mitigation plan. Areas with seasonal or repeat documented exceedances that submit three exceptional event demonstrations or initial notifications for three events of the same type and pollutant in the same area in a three-year period must submit a mitigation plan (EPA, 2016).

The Wallula Maintenance Area (WMA) lies in eastern Washington just north of the Oregon border in the geographic area known as the Columbia Plateau. The former nonattainment area (NAA) includes parts of Walla Walla and Benton counties, as well as a small portion of Lincoln County and Sacajawea State Park in Franklin County. The area measures 12 miles on a side for a total area of 144 square miles or 92,160 acres[2].

Ecology focused on mitigating the sources that contributed to the $PM_{10}$ exceedances at the compliance monitor caused by high wind events.

Mitigation Plan for the Wallula Maintenance Area: High wind dust events in Washington overwhelmed controls on agricultural lands, contributed to enhanced wind erosion, and caused the 24-hour $PM_{10}$ level to exceed the 1987 national ambient air quality standard[3] (NAAQS) of 150 µg/m$^3$ at the Kennewick, Metaline Road, (KENMETA)[4] monitor. This monitor was the official compliance monitor for the WMA and had exceedances due to known seasonal and historically documented events during the period under evaluation for the EER revision (January 1, 2013, through December 31, 2015).

An exceptional event is a natural or human-caused event that affects air quality and is not reasonably controllable or preventable. Washington State Department of Ecology (Ecology) also submitted Exceptional Event demonstrations for exceedances at Kennewick caused by four high wind events in 2013 and 2015. These factors triggered mitigation plan requirements for the WMA. EPA notified Ecology of the mitigation plan requirement for the WMA in the October 3, 2016 Federal Register notice that finalized the 2016 EER. See Figure 1 below for a map of the WMA and relevant monitors.

[2] The area bounded on the south by a line from UTM coordinate, 5099975mN, 362500mE, west to 5099975mN, 342500mE, thence, north along a line to coordinate 5118600mN, 342500mE, thence east to 5118600mN, 362500mE, thence south to the beginning coordinate 5099975mN, 362500mE.
[3] EPA, National Ambient Standards for Particulate Matter, 70 FR 3056, January 15, 2013
[4] Air Quality System site number 53-005-0002, POC 3

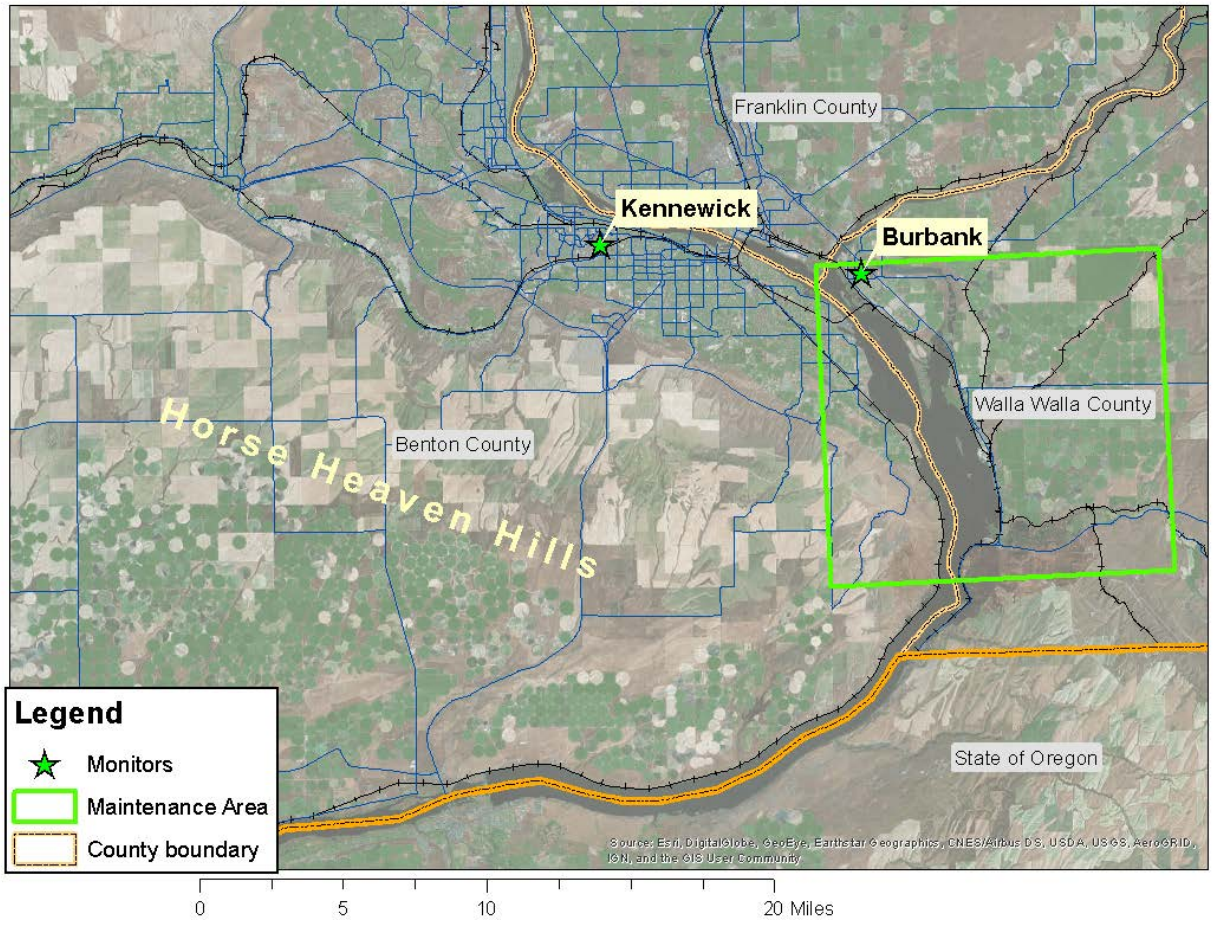


**Figure 1: Wallula Maintenance Area, monitoring sites, counties and HHH**

Compliance Monitors: Ecology operated ambient air compliance monitors in various areas at different times to track compliance with the federal $PM_{10}$ standard for the WMA.

For a short time, to evaluate an alternate location for the monitor, there were three monitors in the maintenance area (Wallula Farm, Wallula Port and Burbank). The Burbank monitor was the compliance monitor for the WMA from 12/25/2002 through 12/31/2011. Later, Ecology identified that the Burbank and Kennewick monitors measured the same air mass and Kennewick could represent the WMA well during normal weather conditions.

When high winds blow, the WMA is not generally impacted by dust. KENMETA was the compliance monitor for the WMA, located in Kennewick outside the WMA, from 2012 through 2017. Ecology removed the monitors previously located inside the maintenance area with EPA permission.

In 2017, Ecology reinstalled the Burbank monitor. In the 2018 Annual Ambient Air Monitoring Network Plan,[5] Ecology requested the Burbank monitor remain as a permanent part of the monitoring network, be redesignated to a State and Local Air Monitoring Station (SLAMS) and represent the WMA. EPA approved this request in their August 13, 2018 letter to Ambient Air Monitoring Coordinator, Jill Schulte. The Burbank monitor data represents the WMA starting January 1, 2018.

Exceedances: Exceedances are most common in the summer and late fall months. The majority of the high wind dust events originate and pass over the agricultural area known as the Horse Heaven Hills (HHH) in eastern Washington. Less frequently, winds come from the NE, and pass over agricultural lands from that direction. Figure 2 shows the WMA and part of the HHH.

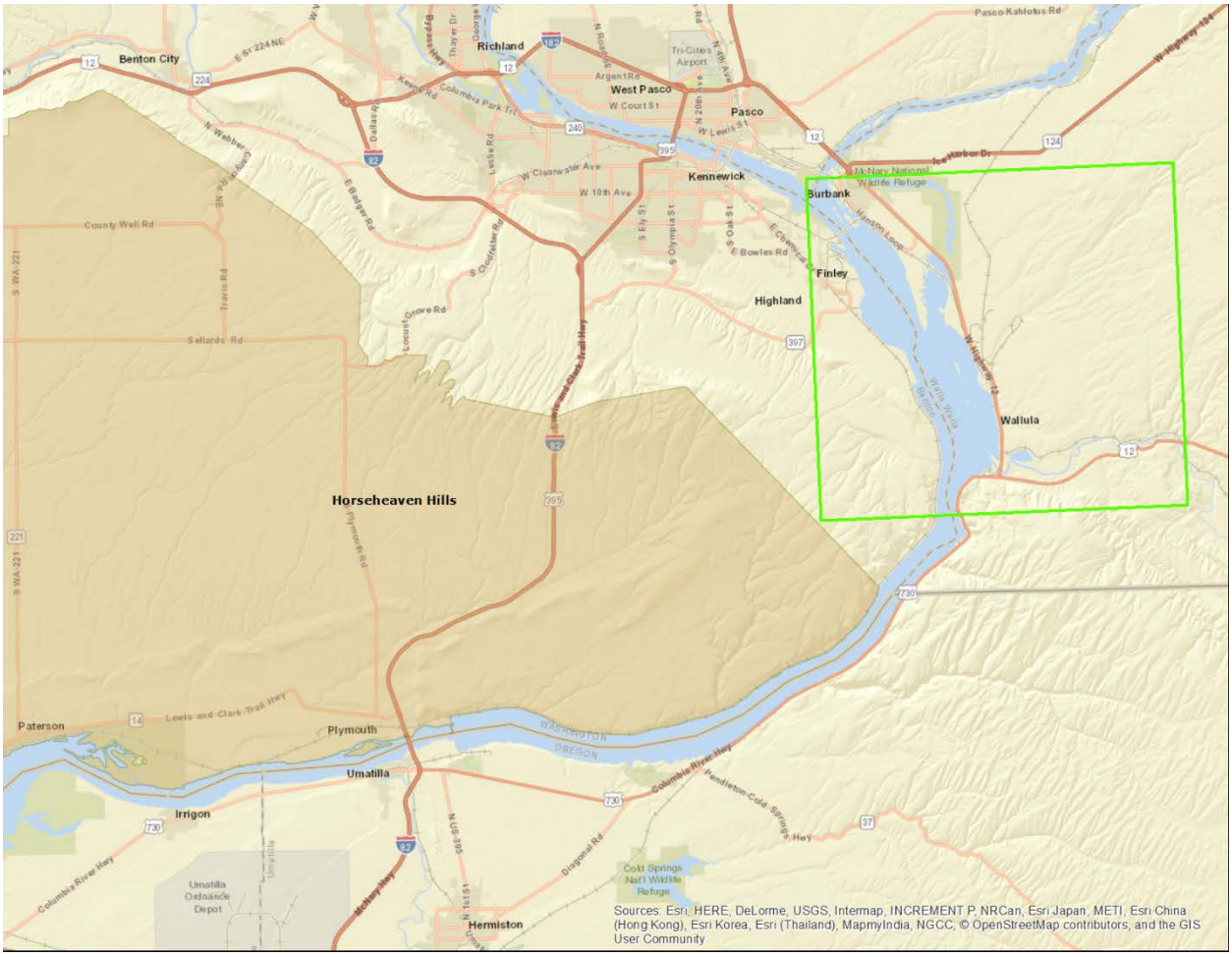


**Figure 2: Map of HHH (partial) and WMA, 2018**

Exceedances at Kennewick: Table 1 below summarizes the $PM_{10}$ exceedances at KENMETA caused by high wind events since 2013, and shows concentrations, maximum wind speed, and

[5] Ecology, 2018 Ambient Air Monitoring Network Plan, June 2018, <https://fortress.wa.gov/ecy/publications/SummaryPages/1802019.html>

wind direction. The table also notes which exceedances Ecology submitted demonstrations to EPA.

**Table 1: Summary of $PM_{10}$ exceedances at KENMETA due to high wind dust events, 2013-2015.**

| Exceedance Date | 24-hr $PM_{10}$ ($\mu g/m^3$) | Source Area Max 1-hr Average Wind Speed (mph) | Wind Direction | Status |
|---|---|---|---|---|
| **09/15/2013** | 227 | 55.7 | SW | Submitted Exceptional Event Demonstration |
| **10/28/2013** | 224 | 32 | NE | Submitted Exceptional Event Demonstration |
| **11/02/2013** | 620 | 38.0 | SW | Submitted Exceptional Event Demonstration |
| **01/11/2014** | 216 | 31.0 | SW | Flagged as Suspected Exceptional Event |
| **08/14/2015** | 589 | 54.0 | SW | Submitted Exceptional Event Demonstration |
| **10/30/2015** | 208 | 29.6 | SW | Flagged as Suspected Exceptional Event |
| **11/17/2015** | 331 | 32.0 | SW | Flagged as Suspected Exceptional Event |

Ecology considered whether wildfires, agricultural burning, or industrial upsets contributed to the air pollution exceedances at Kennewick. We determined that contributions from these sources was minimal.

Exceedances at Burbank: Since 2003, Burbank and Kennewick shared only two exceedances dates — 4/27/2004 and 4/9/2007 — from their overlapping operating periods, until the wildfires in September 2017. More recently, on April 27, 2018, Kennewick measured 204 $\mu g/m^3$ while Burbank measured 68 $\mu g/m^3$.

Ecology developed this mitigation plan to protect human health during high wind dust events in the area. This mitigation plan addresses the following requirements of the 2016 EER:

- Public notification and education programs for affected or potentially affected communities.
- Steps to identify, study, and implement mitigating measures, including approaches to address each of the following:
    - Measures to abate or minimize contributing controllable sources of identified pollutants.
    - Methods to minimize public exposure to high concentrations of identified pollutants.
    - Processes to collect and maintain data pertinent to the event.
    - Mechanisms to consult with other air quality managers in the affected area regarding the appropriate responses to abate and minimize impacts.
    - Public comment period for a minimum of 30 days for this initial mitigation plan.
    - Periodic review and evaluation process following the initial mitigation plan.

Appendix A provides the regulatory citation, requirements, and an index to show where in the document information on how Washington fulfills the requirements is located.

# 2 $PM_{10}$ Emission Sources and Source Area

Washington State University (WSU), Oregon State University, and USDA Agriculture Research Service (ARS) have studied Washington's Columbia Plateau for more than 30 years. The Columbia Plateau includes nearly 500 miles of the Columbia River, as well as the lower reaches of major tributaries, which include the Snake and Yakima rivers and their associated drainage basins.

Figure 3 shows the entire Columbia Plateau. This area is highly susceptible to windblown dust because of its semi-arid nature and its very fine soils. About 500 square miles of Benton County, which includes Kennewick, are in the Columbia Plateau.

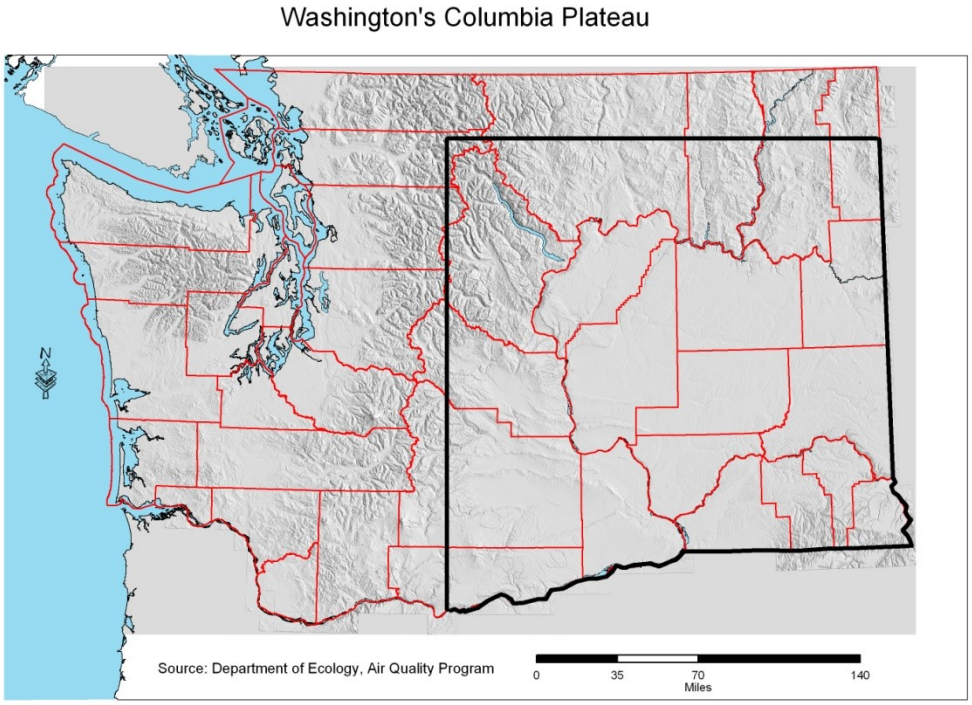


**Figure 3: Washington's Columbia Plateau**

South and west of Kennewick lie the HHH, a dominant feature of the area. The HHH rise abruptly from the Yakima Valley and then slowly drop to the southeast and gradually slope to the Columbia River on the south and the Cascades on the west.

Based on our knowledge of the land use and the soil conditions, review of the monitoring data, and other available evidence, Ecology concluded that the main source of the dust for the most recent high wind exceptional events recorded at Kennewick was the agricultural lands in the

HHH area. This is the source area for most of the historical exceedances at Kennewick and includes parts of Benton and Klickitat counties.

Ecology referenced the following documents in determining the $PM_{10}$ emission sources and source areas for previous high wind dust events at Kennewick:

- 2013 Exceptional Event Demonstration: $PM_{10}$ Exceedances due to High Winds at Kennewick for high wind events occurred on September 15, October 28, and November 2, 2013 (Ecology, 2016).
- Exceptional Event Demonstration for the August 14, 2015 $PM_{10}$ Exceedance due to High Winds at Kennewick, Washington (Ecology, 2017)
- Internal flagging memos for the high wind dust events occurred on January 11, 2014, October 30, 2015 and November 17, 2015 (Ecology, 2015) (Ecology, 2016).

The WMA is in nearby Walla Walla County. The WMP emission inventory shows that agriculture is the also the largest source of particulate matter for the WMA.

The following figure shows the HHH source area (full extent) and the WMA.

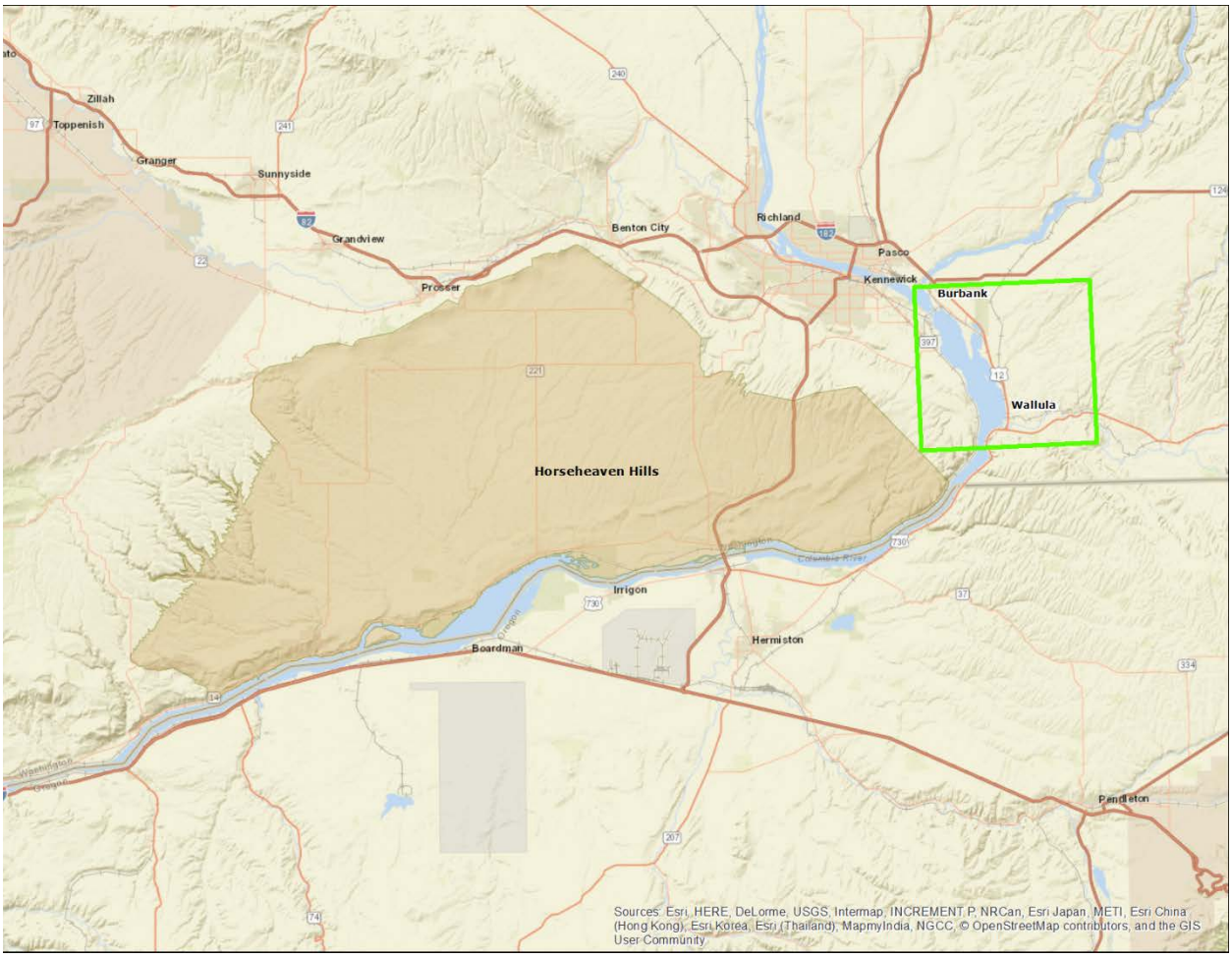


**Figure 4: Map of entire HHH and WMA, 2018**

Figure 5 shows that agricultural land use is dominant (pink: Agriculture, Pasture, and Mixed Environs) in the source areas.

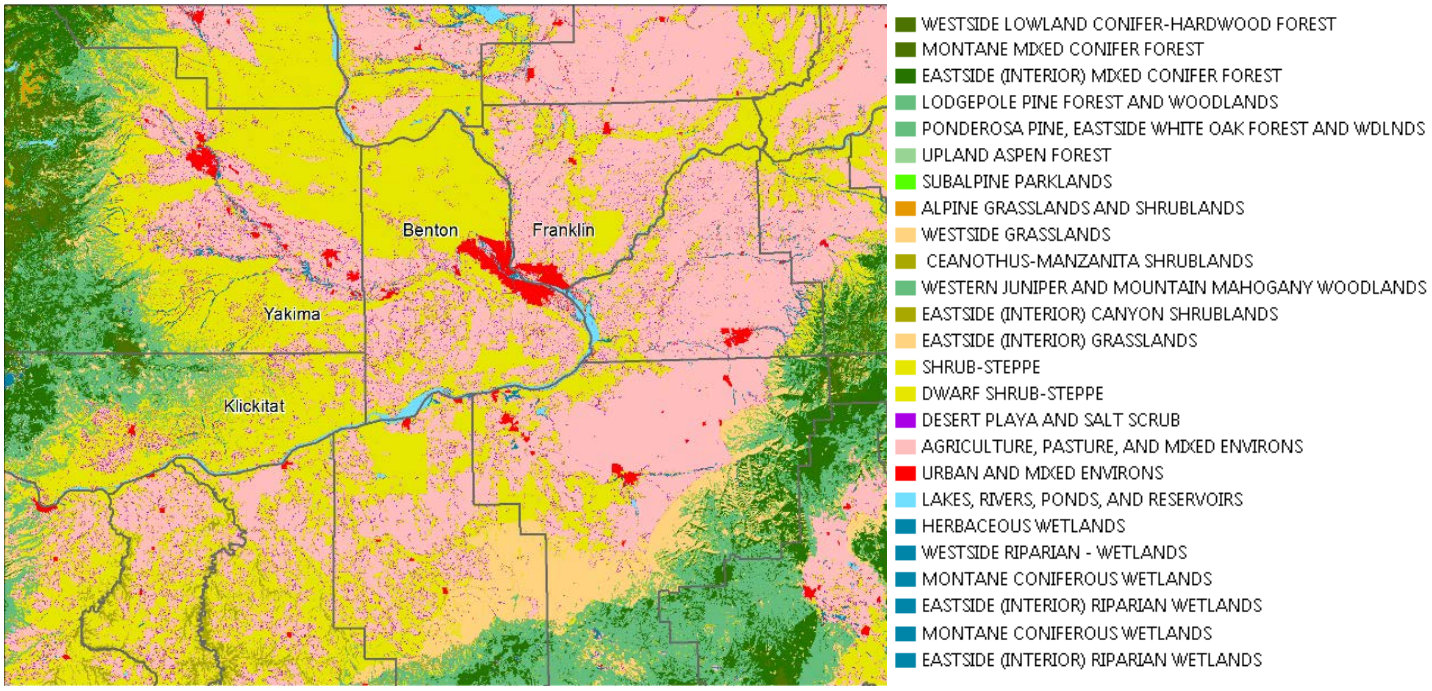


**Figure 5: Land use and land cover in the source area**

Figure 6 below shows the dry wheat operations (shaded in red) in all source areas, the HHH, the WMA, and Franklin and Adams Counties. The darker the red color, the greater the wheat planting frequency on each piece of land from 2008 to 2016.

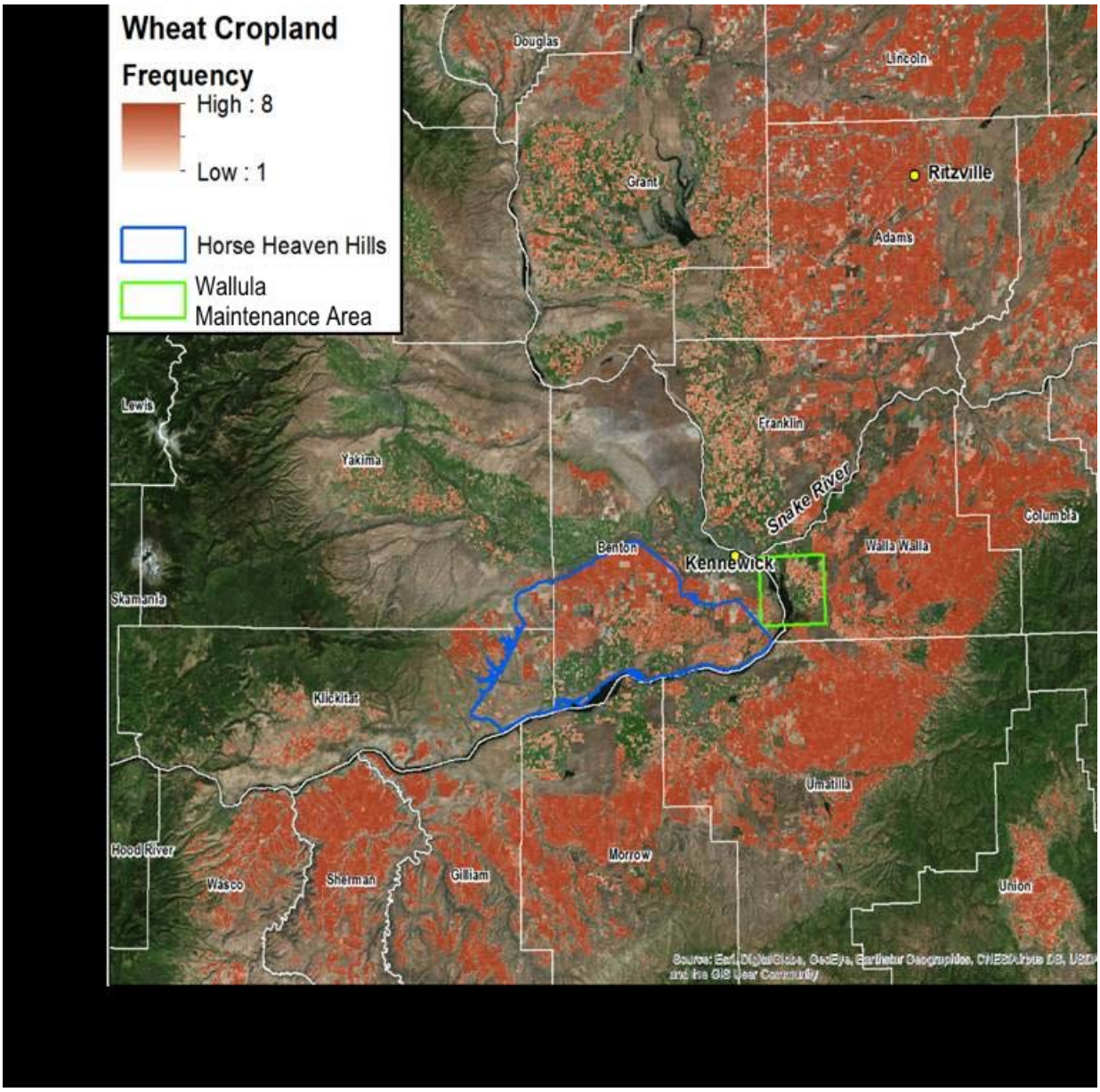


**Figure 6: Dry wheat operations with wheat planting frequencies, 2008-2016**

Ecology's Comprehensive 2014 County Emission Inventory shows that emissions from agricultural activities (tilling and harvest) are still the largest source of $PM_{10}$ in both the maintenance area and the HHH.

The 2014 WMP[6] Emission Inventory prepared for the draft Second Ten-Year Maintenance Plan shows that agricultural emissions from tilling and harvesting represent 39 percent of the pound per season day (July – October) of $PM_{10}$ emissions in the WMA. Point sources listed in the table with a potential to emit over 70 tons per year include Simplot and Boise Cascade operations. A close second, point sources represent 38 percent of the total, but these facilities have enforceable permit conditions or fugitive dust plans.

For Benton County, emissions from agriculture were second only to construction dust as shown in Table 2. (Ecology, 2018). Franklin County is omitted because the portion of Franklin County in the maintenance area is a state park (Sacajawea State Park).

**Table 2: Maintenance Area 2014 $PM_{10}$ by source type in each county portion, pounds and percent pounds per season day.**

| Source Type | Category | Benton, lbs. per season day | Benton, % lbs. per season day | Walla Walla, lbs. per season day | Walla Walla, % lbs. per season day | *Maintenance Area Total* |
|---|---|---|---|---|---|---|
| ***Point*** | ≥ 70 Tons PTE | 0 | 0% | 2,485 | 35% | *35%* |
| ***Point*** | < 70 Tons PTE | 66 | 1% | 140 | 2% | *3%* |
| ***Nonpoint*** | Ag. Burning | 0 | 0% | 0 | 0% | *0%* |
| ***Nonpoint*** | Ag. Tilling Dust | 247 | 4% | 2,133 | 30% | *34%* |
| ***Nonpoint*** | Ag. Harvesting Dust | 114 | 2% | 211 | 3% | *5%* |
| ***Nonpoint*** | Construction Dust | 393 | 6% | 307 | 4% | *10%* |
| ***Nonpoint*** | Paved Road Dust | 68 | 1% | 344 | 5% | *6%* |
| ***Nonpoint*** | Unpaved Road Dust | 343 | 5% | 104 | 1% | *6%* |
| ***Onroad*** | Mobile | 7 | 0% | 50 | 1% | *1%* |
| ***All Sources Total*** | | *1,238* | *19%* | *5,774* | *81%* | *100%* |

For more information about the $PM_{10}$ source areas in the HHH, see the exceptional event demonstrations listed in the above section, the Wallula 1st ten-year maintenance plan[7] or the Wallula 2nd ten year maintenance plan for $PM_{10}$ (estimated to be published in early 2019).

[6] The 2nd ten-year WMP is still in draft form. Will be submitted to EPA after reviews are completed and after a 30-day public comment period. Ecology will offer the public an opportunity to request a public hearing; if one is requested, Ecology will hold one.

[7] < https://fortress.wa.gov/ecy/publications/SummaryPages/0502008.html>

# 3 Mitigation Plan Components

The information provided below satisfies the requirements for mitigation plan components outlined in 40 CFR 51.930(b)(2) of the 2016 EER.

Mitigation plans components are:

- Public notification and education.
- Steps to identify, study and implement mitigating measures.
- Measures to abate or minimize contributing controllable sources.
- Methods to minimize public exposure to high concentrations.
- Processes to collect and maintain data.
- Mechanisms to consult with other air quality managers.
- Periodic review and evaluation, to include a public review of plan elements.
- Document draft plan available for minimum 30-day comment period.

Appendix A includes the regulatory references with more details on requirements.

## 3.1 Public notification and education programs

The Exceptional Events Rule requires a mitigation plan to include public notification and education programs for affected communities. The following subsections outline the early notification and education efforts for high wind events for the Kennewick area.

With these notices and education efforts, the general public— especially vulnerable populations such as; children, persons with respiratory issues, and the elderly— may take appropriate precautions to minimize exposure from dust impacts.

Ecology's existing, continuing, and new planned steps include:

- Public Notification and Education Programs
    - National Weather Service Warnings and Advisories
- Ecology Air Quality Notifications, education efforts, programs and methods to minimize public exposure
    - Ecology existing, continuing steps
        - Monitoring website.
        - Ecology dust warning procedure.
        - Annual news release.
        - Informational webpage.
        - Continue Ecology's participation in annual South Central Natural Resources Conservation Service (NRCS) Workgroup.
    - BCAA existing, continuing steps – notification and education efforts.
    - Ecology planned new steps.

- Develop a new High Wind Dust Public Notification and Education Listserv or Text Message Service.
- Develop a High Wind Dust Prevention Workgroup.
- Coordinate with Washington State Department of Health (DOH) on public notification and education.

## 3.1.1 National Weather Service warnings and advisories

The National Weather Service (NWS) issues warnings and advisories to provide notice of predicted high wind dust events and are likely to be the first reports to reach the media. Often radio stations will feature these reports as part of the news, particularly when wind speeds elevate quickly. Public health departments, local clean air agencies, Ecology, and other agencies may also issue warnings based on these alerts.

## 3.1.2 Ecology notifications, education efforts, programs, and methods to minimize public exposure

Ecology's Air Quality Program developed the following methods to provide education and notifications of these events to the public.

### 3.1.3 Ecology existing, continuing steps

**Monitoring website:** Ecology monitors the air for dust in some areas of Washington. The Washington State monitoring network system webpage (Ecology, 2015) contains current air quality conditions. The public can access this webpage that features monitors with near "real - time" air quality data for a number of monitoring sites throughout the state. Each color-coded monitor shows the current local air quality conditions.

**Ecology dust warning procedure:** Ecology developed an internal dust warning procedure to use social media to notify the public of impending events expected to affect air quality and public health.

While Ecology relies heavily on National Weather Service (NWS) high wind and hazardous weather outlook warning systems to alert the public, Ecology air quality atmospheric scientists (forecasters) also monitor weather conditions for potentially dangerous and unhealthy dust storms. Often high winds can develop quickly, but if time allows, Ecology will issue warnings to amplify NWS messages and provide advance warning to those in affected areas.

Ecology updates the dust warning procedure every year. A summary of the procedure is as follows:

- Ecology forecasters monitor weather conditions and other organizations' warnings (e.g., NWS) and other staff may notify forecasters.
- Ecology forecasters evaluate risk of air quality impacts and work with Communications Managers at Headquarters.
- Ecology Headquarters Communication Managers will issue news releases or public notification on social media to alert the public, if time allows before an event occurs.

The public dust warnings include health statements on what residents can do to minimize their exposure to high concentrations of particulate matter.

**Annual news release:** In the 2003 Natural Events Action Plan (NEAP) update, Ecology agreed to prepare an annual news release that combines dust season wind notification and a health message.

Ecology has issued annual news releases or posted blogs nearly every year since 2003. The 2017 blog, "Wet weather and dust. Wait, what?"[8], posted on April 24, 2017; the 2018 blog, "Dust Wars"[9], posted April 19, 2018.

**Informational webpage:** Ecology also developed a windblown dust page for the website, and continues to post air quality data (Ecology, 2003). The educational information on health effects, precautions, and actions residents may take to reduce their exposure to dust is on Ecology's outdoor dust management webpage[10]. Portions of the web page as of November 2018 are provided in Appendix C as examples of how Ecology is fulfilling the requirements of the EER.

Ecology alerts and webpage outlines health effects of dust and recommended actions people can take to protect themselves during times of elevated particulate matter levels.

The webpage also has information about

- Where and when dust storms occur in Washington.
- Further options to mitigate dust.
- Wind events on the Columbia Plateau. A link is provided so residents can sign up for high wind notifications issued by the NWS.

The public can access Ecology's updated Windblown Dust brochure (Ecology, 2012) through the webpage as well.

**Continue Ecology's participation in annual South Central Natural Resources Conservation Service (NRCS) Local Working Group:** In the late 80s, when the Wallula area became a $PM_{10}$ nonattainment area, Ecology staff worked closely with agricultural groups to develop strategies to achieve and maintain compliance with the standard. Since then, Ecology has attended nearly every annual South Central NRCS workgroup meeting to promote and encourage additional measures to minimize particulate matter from soil erosion on agricultural lands.

The South Central NRCS workgroup includes members from Central and Eastern Klickitat, Benton, North & South Yakima, and Underwood conservation districts (CDs), as well as other state agencies[11]. These CDs cover most of the HHH, the source area for high wind dust events that cause exceedances at Kennewick.

This workgroup provides recommendations to the state NRCS office for resource concerns ranking and funding prioritization. Ecology participates in these annual meetings to:

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[8] <http://ecologywa.blogspot.com/2017/04/wet-weather-and-dust-wait-what.html>
[9] <https://ecologywa.blogspot.com/2018/04/dust-wars.html>
[10] < https://ecology.wa.gov/Air-Climate/Air-quality/Air-quality-targets/Outdoor-dust-management>
[11] Washington Association of Conservation District areas < http://www.wadistricts.org/district-directory/ >

- Report the status of $PM_{10}$ exceedances, exceptional event demonstrations and, compliance with the $PM_{10}$ NAAQS at Kennewick.
- Emphasize the importance of the South Central workgroup recommendations to keep wind soil erosion prevention a top priority.
- Promote increased participation in USDA conservation programs that prevent soil erosion.

Ecology will continue our involvement in dust prevention education by attending the South Central NRCS workgroup meeting to support their activities to promote dust prevention, as opportunities arise.

Sponsored CRP field trip in Eastern Klickitat County: May 30, 2017, Ecology contributed funds to support Eastern Klickitat County Conservation District (EKCD)'s Conservation Reserve Program (CRP) field trip since CRP is one of the main control measures for agriculture fugitive dust. The United States Department of Agriculture-Farm Service Agency (USDA-FSA) staff reviewed the criteria for maintaining a qualifying CRP stand for producers in the area. Ecology staff also attended this event and presented the air quality benefits of CRP and low soil disturbance farming options.

## 3.1.4 BCAA existing, continuing steps—notification and education efforts

Benton Clean Air Agency (BCAA) is responsible for enforcing air quality laws and regulations in Benton County, which includes Kennewick and most of the HHH source area. BCAA staff monitor meteorological conditions and work closely with local media to ensure public notification of potential and actual blowing dust.

On a daily or hourly basis as conditions warrant, BCAA keeps alert for potential blowing dust using weather forecasts and other tools provided by the National Weather Service and Washington State University.

Agency staff scans the media releases for notifications. If BCAA determines the media has not alerted the public, BCAA issues their own press release to make the public aware of blowing dust potential. BCAA shares information from their daily analysis with Ecology when conditions impact air quality.

BCAA's Windblown Dust webpage outlines sources of outdoor dust, rules, and policies to safeguard their residents from fugitive dust.

### 3.1.5 Ecology planned new steps

**Develop a new High Wind Dust Public Notification and Education Listserv or Text Message Service:** By the end of the first quarter of 2019, Ecology will develop a High Wind Dust Public Notification and Education Listserv or Text Message Service (e.g., phone app) to send out messages to the public and producers in Kennewick and the surrounding area, including the Wallula Maintenance Area, to include:

- High wind dust warning/notifications.
- Information on measures to reduce wind erosion.

- Health and safety information to prevent harm from high wind dust.

The potential audience is local residents and farmers. Ecology will work with our agricultural partners to identify the best way to reach farmers. Ecology will begin to develop a communication and outreach plan to carry out the Listserv or Text Message Service task upon submittal of this mitigation plan. We intend to launch this listserv or text message service sometime during the usual dust season (June through October) in 2019.

**Develop a High Wind Dust Prevention Workgroup:** Ecology plans to convene a High Wind Dust Prevention Workgroup. Late in 2018, after submission of this plan, Ecology will begin developing a project and communication plan to carry out the development and implementation of this workgroup.

Ecology will charge the workgroup with educating agricultural partners, producers, and the public about the need to minimize sources of dust during high wind events. In addition, the workgroup will focus on next steps to continue to promote conservation measures that minimize soil erosion and explore what steps we might take before or during high wind events to abate sources. The workgroup core members will include representatives from:

- Ecology (Headquarters, Eastern Regional Office and Central Regional Office)
- Benton Clean Air Agency (BCAA)
- Conservation Districts
- Others as appropriate

This workgroup will:

- Promote measures to abate or minimize contributing controllable sources of identified pollutants.
- Provide a platform for partnership and sharing resources with other regulatory agencies and agriculture partners.
- Educate our partners concerning air quality impacts of high wind dust events and the importance of proper control measures on agriculture sources.
- Educate and notify the public of control measure options and precautions they might take during a high wind event.
- Fulfill the EER requirement to consult with other air quality managers.

Ecology intends to convene the workgroup in the third quarter of 2019.

**Coordinate with Department of Health (DOH) on public notification and education:** Ecology has historically worked with DOH closely on public notification and education to prevent impacts from wildfire events. Upon submittal of this mitigation plan, Ecology will start to coordinate with DOH on public notification and education in case of high wind dust events. Ecology will include the coordination in the communication and outreach plan. The possible aspects include, but are not limited to:

- DOH adds high wind outdoor dust ($PM_{10}$) information to DOH Air Quality webpage.

- DOH helps Ecology improve health message information on our Outdoor Dust webpage and future high wind dust notifications.
- Ecology updates the existing high wind notification procedure to include DOH so the two agencies coordinate for future notifications.

## 3.2 Mitigation methods

The EER requires a mitigation plan outlining steps to identify, study and implement mitigating measures. The following subsections provide Ecology's mitigation approaches to reduce high wind dust in and around the Kennewick (HHH source) area.

These efforts to educate farmers and coordinate with agricultural partner agencies to implement appropriate measures to minimize soil erosion will effectively protect public health from exceedances or violations of the $PM_{10}$ standard during future high wind dust events in the area.

### 3.2.1 Measures to control $PM_{10}$ emissions

This section provides information on the types of control measures implemented to minimize wind erosion and fugitive dust from agriculture activities throughout the Columbia Plateau. The Washington portion of the Columbia Plateau includes most of the eastern Washington counties.

Ecology acknowledges that the appropriate way to control dust from agricultural sources is by using conservation measures and incentive programs identified and managed by the United States Department of Agriculture (USDA). Conservation programs are federal programs. Agricultural sources in the HHH and WMA have access to and can apply for the same incentive funding for soil erosion prevention methods as producers in the Columbia Plateau.

Ecology is focusing mitigation efforts on the HHH since dust from agricultural lands in this area are most commonly the source of $PM_{10}$ for the exceedances at Kennewick during high wind events. (See Section 2).

Although some high winds and dust may have come from Oregon agricultural sources, Oregon producers have access to the same federal conservation programs as Washington. Ecology will concentrate on Washington sources. Ecology works to minimize and abate the impacts of high wind events by encouraging and supporting increased participation in these programs that implement soil erosion minimization practices.

**USDA-NRCS conservation measures:** USDA-NRCS, previously known as the Soil Conservation Service, has an over 80-year history and is the recognized expert in managing soil erosion from agriculture lands.

Since the agency was formed, conservation research has shown that keeping crop residues on the soil surface and reducing or eliminating tillage are effective for reducing soil erosion. NRCS emphasizes these conservation measures for both post-harvest and during fallow for reducing agricultural soil erosion and windblown dust in the Pacific Northwest (Papendick & Moldenhauer, 1995).

According to USDA's National Agronomy Manual, the NRCS bases conservation practices to reduce wind erosion on the following principles (USDA-NRCS, 2011):

- Establish and maintain adequate vegetation or other land cover, including crop residue.
- Reduce unsheltered distance along the wind erosion direction.
- Produce and maintain stable clods or aggregates on the land surface.
- Roughen the land with ridge and/or random roughness.
- Reshape the land to reduce erosion on knolls where converging wind flow causes increased velocity and shear stress

***Conservation Title Programs:*** The USDA offers many programs to producers. These incentive-based, voluntary financial assistance programs are designed to treat natural resources concerns. The two most prevalent programs in eastern Washington are the USDA Farm Service Agency's (FSA) Conservation Reserve Program (CRP) and the NRCS Environmental Quality Incentives Program (EQIP).[12]

Federal Farm Bills have funded these Conservation Title Programs since 1985 and their participation fluctuates depending on funding levels and crop prices. These agricultural producers who implement conservation practices keep the soil protected and dust out of the air.

These programs help agricultural producers adopt conservation practices to reduce soil erosion, improve soil health and reduce air quality concerns. Conservation practices included in these programs are recognized as Best Management Practices (BMPs) for controlling agriculture soil erosion and windblown dust.

Ecology identified these Conservation Measures as Best Available Control Measures (BACM) in the 2003 NEAP and are recognized as BMP by NRCS for agricultural dust sources. More details on these NRCS Title programs are as follows.

Producers in the eastern HHH in Klickitat County use another EQIP conservation measure, Forage and Biomass, to convert crop land to permanent cover that land owners can use for grazing, haying, or other biomass production. The permanent plant cover anchors the soil and prevents wind erosion.

*Conservation Reserve Program*: Historically, CRP has been the most used conservation program on the Columbia Plateau. The FSA administers CRP with technical support from the NRCS and other partners. Producers enrolled in CRP remove environmentally sensitive agricultural land from production and plant with cover vegetation to control soil erosion, improve the water quality, and enhance wildlife habitat.

*NRCS Environmental Quality Incentive Program (EQIP[13]):* EQIP is a voluntary program that provides financial and technical assistance to eligible agricultural producers to address soil,

[12] NRCS and FSA programs have audit provisions that check whether landowners have implemented or maintained the conservation practices properly. A violation of these provisions can put producer's eligibility at risk for most NRCS and FSA programs.

[13] <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/eqip/?cid=stelprdb1044009>

water, air and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner (USDA-NRCS, 2017).

Producers receive assistance after they implement the practices and activities identified in their EQIP plan, and after NRCS certifies they meet the practice standards. EQIP contracts are typically three years.

EQIP programs incentivize residue and tillage conservation practices because they are consistent with soil erosion prevention principles by increasing crop residue and/or surface roughness.

The following is a comparison of different types of tillage:

- Conventional tillage: producers leave less than 15 percent soil surface covered by previous year's crop residue following harvesting.
- Reduced tillage: Producers leave between 15 and 30 percent residue cover on the soil. This may involve the use of a chisel plow, field cultivators, or other implements. Many practices can leave 50 percent or more cover. Reduced-till limits tillage and the soil-disturbing activities before planting, and manages plant residue year-round.
- Conservation tillage: To qualify as full conservation tillage, producers must leave at least 30 percent residue.
- No-till: Producers plant crops directly through vegetative cover or crop residue of the previous year's crop and aim for 100 percent soil cover year round. Using any form of tillage disqualifies the land for true no-till.

**NRCS Air Quality Initiative***:* The EQIP Air Quality Initiative **(**AQI) is a National Initiative funded under the EQIP program and initiated in Washington in 2014 (USDA-NRCS, 2014). This program provides technical and financial assistance to qualified operations in select counties to implement reduced till (mulch till), no till, direct seeding practices, etc., among other air resource concerns.

This Initiative made additional funding available, beyond the normal EQIP funding. Producers in Benton, Klickitat, Adams, Franklin and Walla Walla County are eligible to apply for the AQI funding under the $PM_{10}$ Category.

The AQI focuses on a number of air quality issues and has efforts to focus on $PM_{10}$ that is mechanically generated by actions that disaggregate the soil on the crop and pastureland.

**Compliance audits for NRCS and FSA conservation programs***:* NRCS and FSA programs have audit provisions that check whether land owners have properly implemented and maintained the conservation practices. A violation of these provisions can put a producer's eligibility at risk for most NRCS and FSA programs. (Vilsack, 2014).

A conservation compliance plan or program specifies the minimum residue cover required to protect the soil. USDA Risk Management Agency (RMA), FSA and NRCS require producers with highly erodible land (HEL) have a conservation plan or program.

NRCS conducts random compliance reviews annually to verify whether the producer has the specified amount of surface residue necessary to protect the field from wind erosion. Producers

with HEL must agree to plant or produce an agricultural commodity with an NRCS approved conservation plan or system to keep substantial reduction of soil loss. FSA spot checks operations with contracts for CRP to see that the field meets the standard for ground cover.

### 3.2.2 Local Conservation Districts conservation measures

Local conservation districts carry out additional natural resource management programs in their areas.

Districts work closely with landowners and operators to help them manage and protect land and water resources. Their efforts often carry air quality benefits to prevent soil erosion and reduce fugitive dust from agriculture lands. Recent efforts to identify, study and implement measures to abate and minimize agricultural sources are explained below:

**Recent Benton-Franklin Conservation District funded trials:** Benton Conservation District (Benton CD) contracted with local producers in 2016 to test the stripper header conservation measure.

Harvesting with a stripper header strips the grains from the wheat heads and leaves tall (up to 10") stubble on the ground. This reduces wind soil erosion and increases moisture retention. Benton CD will document its impact on yield for the 2016/2017 crop (Benton CD, 2016). The potential economic benefits may attract other producers to consider using the stripper header.

As shown in the following picture taken by Benton CD, by comparing the field with no stubble to the taller stubble left by the stripper header, you can see the taller stubble reduced wind velocities and kept the snow from blowing onto the road (Wendt, 2017). This demonstrates that the tall stubble left by the stripper header can effectively reduce wind-blown dust from agricultural land.


**Figure 7: Effectiveness of stripper header to reduce wind erosion**

Franklin CD partnered with WSU in testing two prototype deep furrow conservation drills (Benton-Franklin CD, 2016). This drill provides up to a 40 percent reduction in wind erosion. The deep furrow conservation drills were designed for direct seeding and mulch-till conservation methods all with one drill. These prototype drills successfully seeded through large amounts of residue from previous crops. The demonstrated economic benefits will attract the producers in cost sharing for this new equipment. The two manufacturers have continued making modifications to improve their prototypes with the goal of creating a model that they can produce commercially.

In the interim, a Franklin County producer has successfully modified an existing *CASE IH Flex Hoe Air Drill* ™ to act as a direct seed / conservation deep furrow drill. The producer has modified the opener so that he can plant the seed early and deep to reach existing moisture. Like the existing hoe drills, this allows him to plant in late August/early September, reaching deep moisture, as opposed to waiting until there is sufficient shallow moisture from late fall rains. The new opener design works so well that Franklin CD knows of seven more drills in the area that have been modified to add the new openers. The main challenge to overcome to convert to this type of drill is monetary; the estimated transition cost is $250,000 per operation. The deep furrow drill prototype is shown in Figure 8 below (photo credit: Samantha Crow, WSU Lind Research Station).

**Figure 8: Deep furrow conservation drill prototype**

**Klickitat County NRCS and Conservation District efforts:** In eastern Klickitat County, NRCS provides funding for producers to implement “Forage and Biomass Planting” (Practice 512), which is planting permanent grass cover for grazing purposes. This practice can prevent wind erosion with permanent cover (for the life of the contract).

Klickitat County began receiving EQIP contracts for no till and reduced till practices in 2015. Beginning in 2015, the local work group gave equal consideration to producers who convert from conventional tillage to permanent grass cover as those who convert from conventional

tillage to direct seeding. This made it possible for Klickitat County producers to qualify for EQIP contracts for no till/reduced till. Even though Klickitat county producers did not have measures in place under contract for the no till or reduced till practices at the time of the 2015 exceptional event, cattle producers had "Forage and Biomass Planting" in place to address the same air quality concern of soil erosion from wind.

Klickitat county producers purchased or rented GPS guidance systems through cost share from NRCS or the local CD to accurately and precisely cover large areas with fertilizer or pesticides (Meagher, 2017). This technology significantly improved efficiency and reduced the fuel consumption and fertilizer overlapping. The GPS guidance systems makes conservation tillage practices economically viable through gained efficiencies. This increases the incentive to change from conventional tillage to reduced or no-till operation. This system also reduces the number of passes over the fields, which also reduces soil erosion.

Some Klickitat county producers were able to participate in the low income loan program offered by Spokane County Conservation District and convert from conventional to direct seeding operations (Meagher, 2017).

### 3.2.3 Washington NEAP

The Columbia Plateau Windblown Dust Natural Event Action Plan (NEAP) (Publication 03-02-014) contains USDS/NRCS-approved Best Management Practices (BMPs) for agriculture activities on the Columbia Plateau and includes the HHH, Franklin, and Adams Counties, the source area for exceedances at Kennewick.

The WMA includes Burbank and surrounding unincorporated areas in Walla Walla, Benton, and Franklin counties, and is also included in the NEAP. EPA approved the NEAP into the SIP as part of the Wallula Maintenance Plan in 2005.

Washington completed the original NEAP in 1998, updated the NEAP in 2003, reported in 2007 for 2006, and the NEAP remains in effect. The 2003 NEAP includes the original 1998 plan as Appendix C. Ecology included the 2006 Status Report (March, 2007) in the 2013 Exceptional Event Demonstration as Appendix H. The NEAP and its updates:

- Highlighted the extensive research done on the soil and conservation methods and documented when conditions could overwhelm controls.
- Defined agricultural BACM as USDA Conservation Title Programs supplemented by implementation of incentive-based wind erosion conservation practices.
- Determined that around 70 percent of producers in Columbia Plateau counties were using BACM.

When developing the NEAP, Ecology relied on the NRCS Field Office Technical Guide for adoption of conservation practices and the Columbia Plateau Wind Erosion /Air Quality Project (CP3) for conservation practice research. These resources provided a fundamental basis for well proven conservation practices and region-specific BMPs for reducing wind soil erosion.

### 3.2.4 Washington State rules

Washington's Fugitive Dust and Fugitive Emission rules, (WAC 173-400 (9)), were effective on September 20, 1993 and approved into Washington's State Implementation Plan (SIP) by EPA on June 2, 1995. (Chapter 173-400 WAC, 2016) WAC 173-400-030 and 173-400-040 define fugitive emissions and fugitive dust and require sources to take reasonable precautions to prevent fugitive dust/emissions. Other efforts by Ecology and other agencies to prevent more soil erosion are described in the Sections below.

### 3.2.5 Ecology prevent soil erosion grant

Since agricultural lands in the HHH are the largest source contributing to exceedances at Kennewick during high wind events, Ecology is focusing on encouraging adoption of more soil erosion preventing conservation measures in this area.

Ecology allocated part of the 2017-2019 biennium Ecology Prevent Nonattainment funding to promote conservation measures to reduce soil erosion in the HHH during high wind events.

Starting in summer 2017, Ecology worked with Benton Conservation District to develop a one-time grant of $163,000 to provide incentive funding for producers in Benton, Franklin, and Klickitat counties. The purpose of this grant is to implement approved conservation measures to minimize soil disturbance on lands with CRP contracts expiring in September 2018, not scheduled for reenrollment.

In fall 2017, Ecology met with conservation districts for Benton, Franklin, and Klickitat counties as well as wheat growers associations to promote this grant. The producers may only use the grant funds to convert mulch till, rather than conventional tillage methods. The Benton CD will report on particulate matter emissions reduced, compared with emissions from conventional farming practices.

### 3.2.6 BCAA fugitive dust policies and rules

In Benton County, BCAA has their own fugitive dust and emissions rules, Urban Fugitive Dust Policy and dust provisions in Benton Clean Air Agency Compliance Manual.

*Benton Clean Air Agency Fugitive Dust and Emissions rules*: BCAA Regulation 1, Article 4 contains BCAA fugitive dust rules. EPA adopted these rules into the SIP on 11/17/2015 (80 FR 71695). BCAA amended these rules on April 28, 2017 and added:

- Definitions for agricultural activities, agricultural land, and good agricultural practices.
- Project notification requirements to promote quick response primarily for construction sites dust issues.
- Agricultural particulate matter emissions provision to establish and enforce good agricultural practices.

These amendments of the BCAA fugitive dust rules strengthened enforceability towards agricultural fugitive dust.

*Urban Fugitive Dust Policy* (BCAA, 2017)*:* BCAA has an active dust enforcement program in their Urban Fugitive Dust Policy.

The agency has one full-time person dedicated to dust control. BCAA provides dust control enforcement for Benton County and the cities in Benton County (Kennewick, Richland, Prosser, Benton City, and West Richland).

Local planning departments refer construction applicants to BCAA for guidance on dust control and, depending on the scale of the project, BCAA may require the contractor to submit a dust control plan. That plan may become part of an enforceable Compliance Order.

BCAA responds to complaints about dust moving off property and works with the property owner or contractor to mitigate the dust. Generally, BCAA promptly remediates sites with dust control issues.

BCAA expects property owners or contractors to implement practices in the Urban Fugitive Dust Policy. If responsible parties do not follow these practices and someone observes dust leaving the property, BCAA issues a warning and begins other enforcement actions. BCAA may issue penalties under certain circumstances.

*Benton County Clean Air Agency Compliance Manual* (BCAA, 2017): This manual includes policies and procedures for dust sources inspections and enforcement in Benton County. The BCAA Board of Directors adopted a new compliance manual in April 2017 and added "Appropriate Compliance Response for Dust from Agricultural Operations" section. This new section provided additional guidance on how to evaluate whether agriculture operations are following good agricultural practices prior to issuing any notices of violation.

The agriculture related amendments in both BCAA rules and Compliance Manual primarily focus on addressing fugitive dust issues from agriculture tillage and vineyard conversion. The dust typically only occurs when soil is disturbed and exposed during conversion to vineyard, which is short term. The new vineyards are irrigated by drip systems and, once established, cover the soil with plants. This reduces the chance of fugitive dust after conversion.

The new BCAA rules and policies allow the agency to request the agriculture operation to provide information of their good agriculture practices and project timeline. This information assists with informing the complainant and enforcing the fugitive dust rule.

### 3.2.7 Ecology's letters of support for promoting conservation measures

Ecology provided letters of support to improve funding levels for conservation measures on agriculture sources. Ecology will take steps to continue this effort to promote conservation measures to abate or minimize soil erosion, reducing the amount of particulate matter in the air, and minimizing public exposure.

*Letter of Support for CRP:* In an effort to support the implementation of soil erosion prevention measures, Ecology sent a letter to the head of the Secretary of Agriculture, Sonny Purdue in December 2017. The letter requested USDA to work with Congress to restore the CRP funding level in 2018 Farm Bill (See Appendix B). In the letter, Ecology also stated the importance of

CRP in conserving and improving soil health, and protecting both air and water quality in Washington state.

*Letter of Support for Air Quality Initiative*: Beginning in 2014, Ecology provided technical advice and letters of support to Washington NRCS for their application to receive funds under the USDA National Air Quality Initiative (NAQI) approved as part of the 2014 Farm Bill. Ecology advised NRCS on areas at risk for exceeding the NAAQS and provided letters of support for Washington NRCS to obtain national funding under this Initiative in of the last four years.

## 3.3 Process to collect and maintain data

Ecology evaluates and analyzes $PM_{10}$, $PM_{2.5}$, wind speed, and wind direction for high wind events. The processes to collect and maintain these data are described as follows:

Ecology monitoring stations collect $PM_{10}$, $PM_{2.5}$, wind speed, and wind direction data and telemeter hourly to Ecology's central database.

Ecology collects $PM_{10}$ data with Federal Equivalent Method (FEM) monitors and $PM_{2.5}$ data with both FEM monitors and non-regulatory correlated nephelometers. The raw data are at 1-minute resolution, with the exception of FEM $PM_{2.5}$ data, which are only available at hourly resolution.

**Table 3: Dates, equipment and frequency of monitoring at Burbank and Kennewick**

| Dates | Equipment | Frequency |
|---|---|---|
| **Burbank, Maple Street - AQS site id no.: 53-071-0006** | | |
| 12/25/2002 – 12/31/2006<br>6/1/2004- 12/31/2011<br>**8/16/2017 –to present** | SA1200<br>R&P 1400a TEOM<br>**R&P 1400a TEOM** | every 3 days<br>Continuous<br>**Continuous** |
| **Kennewick, Metaline Road -AQS site id no.: 53-005-0002** | | |
| 1994-2006<br>**2004 to present*(2018)** | SA1200<br>**R&P 1400a TEOM** | Every 3 days<br>**Continuous** |

Ecology's Quality Assurance Unit validates the hourly average wind data and submits to EPA's Air Quality System (AQS) 75 days after the end of the month in which Ecology collects the data.

For $PM_{10}$ and $PM_{2.5}$, the Quality Assurance Unit validates the data and submit to AQS within 90 days after the end of the month in which Ecology collects the data.

Ecology's central database retains hourly average data indefinitely. Ecology's central database retains diagnostic data and 1-minute average data in the central database for nine months and then automatically deletes them. In the event of exceedances due to exceptional events or other unusual circumstances, Ecology manually downloads and retains 1-minute data on a network drive.

Filter-based monitor results are reported on EPA's Air Data website (EPA, 2015) as well as air quality statistics, and specific monitor information.

## 3.4 Mechanisms to consult with other air quality managers

Ecology consults with NRCS and Conservation Districts in the source area to encourage the adoption of the appropriate methods to minimize soil erosion from agricultural activities. These programs and efforts are described in Section 3.2, Mitigation methods.

Ecology coordinates with BCAA, Ecology CRO and ERO, and EPA for high wind dust exceptional event demonstration work and development of this mitigation plan.

Consultation with other air quality managers will also occur at the High Wind Dust Prevention Workgroup, to convene in 2019. We outlined the details and how this group will identify, study and implement mitigating measures in Section 3.

Ecology will continue to work closely with agriculture agencies, including local conservation districts and USDA to promote conservation measures and coordinate for mitigation plan and EE demonstration development.

## 3.5 Periodic review and evaluation processes

The 2016 EER requires Ecology to provide a minimum of 30-day public comment period for the initial mitigation plan and directs the state to specify a periodic review schedule and describe their evaluation process.

## 3.6 Public involvement and public comments

Ecology provided a 30-day public comment period as required by the EER. Ecology sought to reach stakeholders that include agricultural partners, county and city governments, and residents of the source areas. Ecology submitted any comments received with this initial plan. For each comment received, Ecology explained any changes made to the plan, or provide an explanation why we did not make a change. Public Involvement and Comment Period Documents are in Appendix C; comments and Ecology response are in Appendix D.

## 3.7 Subsequent periodic review and evaluation processes

Ecology commits to the following review schedule for this mitigation plan.

Following the initial plan submission, Ecology will review and evaluate the implementation and effectiveness of the mitigation plan every five years, unless:

- Particulate matter related rulemaking affects this mitigation plan, or
- There are more than three high wind dust exceptional events that cause exceedances to occur at the compliance monitor within any future three year period, (i.e., a violation of the 24-hour $PM_{10}$ NAAQS is confirmed).

Then:

- Ecology will evaluate, update and consider whether to strengthen the mitigation plan at an earlier time.

Ecology will solicit comments on the effectiveness of the plan from all interested stakeholders, as listed in the above subsection. Ecology will review and evaluate the plan from the following aspects:

- Effectiveness of the public notification and education process.
- Conditions that result in $PM_{10}$ NAAQS violation in the area.
- Implementation status of the control measures.
- Outcomes of the air quality consultation process.

Ecology will solicit feedback from all stakeholders for any subsequent review.

# 4 Summary of Commitments

The following table summarizes Ecology commitments, including estimated time period and specific tasks. The section and/or page number in the report is in parenthesis.

**Table 4: Summary of Ecology mitigation plan commitments**

| Tasks (section or page) | Time period |
|---|---|
| Begin High Wind Dust Prevention Workgroup development and initiation. (16 ) | First Quarter 2019. |
| Coordinate health message for dust warnings, education with Department Of Health. (16) | Begin in the first quarter of 2019, to be ready for 2019 dust season. |
| Develop and promote individual listserv or other notification method for high wind warnings for educational purposes, to promote health and safety, and encourage methods to reduce wind erosion. (15) | Begin development after submittal of plan.<br>Targeting the end of first quarter 2019 for launch or in time for 2019 dust season. |
| Continue annual educational preseason dust warning. (13 ) | Annually, Spring. |
| Continue high wind warnings with social media or news releases. (13 ) | As needed during dust season. |
| Convene the High Wind Dust Prevention Workgroup. (16) | Third Quarter 2019. |
| Plan five year assessment: when review begins, elicit comments from all stakeholders on the effectiveness and need for revision of the plan. (26)<br>Update the mitigation plan if needed. | Beginning in September 2022.<br>If modified, submit on or before September, 2023. |

# Bibliography


BCAA. (2017). *Benton Clean Air Agency Compliance Manual.*

BCAA. (2017). Regulation 1 Article 4 General Standards for Particulate Matter.

Benton CD. (2016). *Stripper Header Demonstration Project.* Kennewick.

Benton-Franklin CD. (2016). *Deep Furrow Conservation Drill.* Kennewick .

Chapter 173-400 WAC. (2016). GENERAL REGULATIONS FOR AIR POLLUTION SOUR.

Ecology. (1998). *Natural Events Action Plan for High Wind Events in the Columbia Plateau.* Lacey: Ecology.

Ecology. (2003). *Columbia Plateau Windblown Dust Natural Events Action Plan (NEAP).* Lacey: Ecology.

Ecology. (2012, April). *Windblown Dust*. Retrieved from Ecology: https://fortress.wa.gov/ecy/publications/publications/0402009.pdf

Ecology. (2015). *Request for Exceptional Event Flagging for Kennewick's January 2014 exceedance.* Lacey: Ecology.

Ecology. (2015). *Washington's Air Monitoring Network.* Retrieved from Ecology: https://fortress.wa.gov/ecy/enviwa/

Ecology. (2016). *2013 Exceptional Event Demonstration-PM10 Exceedances due to High Winds at Kennewick.* Lacey: Ecology.

Ecology. (2016). *Request for Exceptional Event Flagging for Kennewick's 2015 exceedances.* Lacey: Ecology.

Ecology. (2017). *Exceptional Event Demonstration for the August 14, 2015 PM10 Exceedance due to High Winds at Kennewick, Washington.* Lacey: Ecology. Retrieved from https://fortress.wa.gov/ecy/publications/SummaryPages/1702015.html

Ecology. (2018). *Comprehensive 2014 County Emission Inventory.* Lacey: Ecology. Retrieved from https://ecology.wa.gov/Air-Climate/Air-quality/Air-quality-targets/Air-emissions-inventory

EPA. (2007). Treatment of Data Influenced by Exceptional Events. In *72 F.R.* (pp. 13560-13581).

EPA. (2015). *Air Data: Air Quality Data Collected at Outdoor Monitors Across the US.* Retrieved from EPA: https://www.epa.gov/outdoor-air-quality-data

EPA. (2016). Treatment of Data Influenced by Exceptional Events. In *81 F.R. 68216, 40 CFR 51.930(i)* (pp. 68216-68282).

Gekosky, R. (2014, August 8). Re: Air Quality Acres. Spokane, WA.

Gertsch, T. (2017, June 14). RE: Conservation Reserve Program - HEL signup. Goldendale, Washington.

Habets, B. (2015, January 30). Re: Controls Analysis. WA.

Hamilton, R. (2014, December 11). Re: Auditing Consequences. WA.

Hamilton, R. (2014, October 12). Re: CRP Compliance Checks. WA.

Kocher, A. (1916). *Soil Survey of Benton County.* Field Operations Bureau of Soils.

Meagher, L. (2017, May 4). *Re: HI from Sunny Klickitat County*.

Meagher, L. (2017, May 8). RE: HI from sunny Klickitat County fill in? . Goldendale, WA.

NASS, U. (n.d.). Retrieved from https://agr.wa.gov/FP/Pubs/docs/2016WSDACropDistributionMetadata.pdf

NWS Pendleton. (2015). *Blowing Dust Advisory* . Kennewick.

NWS Pendleton. (2015). *Wind Advisory.*

NWS Spokane. (2015). *Dust Storm Warning.*

Papendick, R., & Moldenhauer, W. (1995, May). Crop Residue Management to Reduce Erosion and Improve Soil Quality. *USDA-ARS COnservation Research Report Number 40*.

RCW 7.48.305. (2009). Agricultural activities and forest practices—Presumed reasonable and not a nuisance—Exception—Damages.

RCW 70.94.640. (2005). Odors or fugitive dust caused by agricultural activities consistent with good agricultural practices exempt from chapter.

Saxton, K., Chandler, D., & Schilinger, W. (1999). Wind Erosion and Air Quality Research in the Northwest U.S. Columbia Plateau: Organization and Progress. *D.E. Stott, R.H. Mohtar and G.C. Steinhardt (eds). 2001. Sustaining the Global Farm*, 766-770.

USDA. (2016, March). *About USDA – A Quick Reference Guide.* Retrieved from USDA Website: https://www.usda.gov/sites/default/files/documents/about-usda-quick-reference-guide.pdf

USDA-FSA. (2012, February). *Conservation Reserve Program - Highly Erodible Land Initiative (Continuous Sign-Up) Fact Sheet*. Retrieved from USDA-FSA: https://www.fsa.usda.gov/Internet/FSA_File/crp-hel_initiative.pdf

USDA-FSA. (2013, February). *Conservation Reserve Program Fact Sheet*. Retrieved from USDA-FSA: https://www.fsa.usda.gov/Internet/FSA_File/crpfactsheet0213.pdf

USDA-FSA. (2015). *FSA Handbook-Acreage and Compliance Determinations 2- CP (Rev. 15) Amend. 73.* Retrieved from https://www.fsa.usda.gov/Internet/FSA_File/2-cp_r15_a88.pdf

USDA-NRCS. (2011). *National Agronomy Manual.*

USDA-NRCS. (2014). *Air Quality Initiative* . Retrieved from USDA-NRCS: http://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=stelprdb1246608&ext=pdf

USDA-NRCS. (2017). *Conservation Stewardship Program*. Retrieved from USDA-NRCS: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/csp/

USDA-NRCS. (2017). *Environmental Quality Incentives Program*. Retrieved from USDA-NRCS:

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/eqip/?cid=stelprdb1044009

USDA-NRCS. (2017). *Highly Erodible Land Conservation Compliance Provisions Webpage.* Retrieved from USDA-NRCS: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/alphabetical/camr/?cid=nrcs143_008440

Vilsack, T. (2014, July 22). *Press Release: USDA Reminds Farmers of 2014 Farm Bill Conservation Compliance Changes* . Retrieved from USDA: https://www.usda.gov/media/press-releases/2014/07/22/usda-reminds-farmers-2014-farm-bill-conservation-compliance-changes

Wendt, H. (2017, January 12). RE: Follow up on Conservation Measures call. Kennewick, WA.

# Appendices

## Appendix A. Mitigation Plan Requirements, Report Index

## Appendix B. Letter of Support to Secretary of Agriculture

## Appendix C. Public Involvement and Comment Period Documentation

## Appendix D. Comment and Ecology Response