Photo 3: View of Forest Stand 3 looking south (sample plot 3-2)

Forest Stand 4

Forest Stand 4 (8.0 acres) is a healthy stand situated in the valley of a perennial stream. The stand buffers the stream from runoff and provides stabilization for steep slopes across the valley. The stand is in a mid-successional stage of development and is characterized by medium hardwood trees in the 12-19.9" dbh size class. At the sample plot locations, herbaceous plant cover is absent. The ground is generally covered in leaf litter and woody debris. There were no invasive species observed in the plot areas. Forest Stand 4 appeared to provide relatively high quality wildlife habitat based on the presence of the stream channel within the stand and the width of riparian cover. The riparian zones extend approximately 150 feet or greater to each side of the stream.

Northern red oak, white oak, and chestnut oak (*Quercus montana*) are dominant trees in Forest Stand 4. Co-dominants include red maple, tulip poplar, black gum, and American holly (*Ilex opaca*). Understory cover is relatively high, in part because of mountain laurel (*Kalmia latifolia*) shrubs in the eastern portion of the stand. Seven (7) specimen trees were recorded in the stand area. The average basal area for Forest Stand 4 is 50 square feet per acre, and the stand supports approximately 150 trees per acre.

Large portions of Forest Stand 4 are situated on steep slopes, and soils underlying the stand are highly erodible. The primary soil map units are Croom gravelly loam (3-8% slopes) and Croom gravelly loam (15-25% slopes). Croom gravelly loam (15-25% slopes) is classified as having a severe hazard of erosion. Careful management of the soil during construction is recommended by the USDA-NRCS.

Photo 4: View of Forest Stand 4 looking west (sample plot 4-1)

Forest Stand 5

Forest Stand 5 is a mid-successional forest situated in a small valley with moderate to steep slopes. The stand extends beyond the limits of the study area; within the study area limits the stand area is 0.7 acres. Based on observations of drift deposits, an ephemeral stream channel courses through the bottom of the valley. Canopy cover at sample plot points ranged from 50-75%. Wildlife habitat provided by the stand appeared to be limited. The stand is bordered by roadways to the west and to the south. Also, the total area of the forest (including contiguous forest outside of the study area) as seen on aerial imagery is small.

Trees in the 20-29.9" dbh size class were commonly observed within the stand. Dominant species include northern red oak, tulip poplar, and white oak. Understory trees were also commonly observed. Species include red maple, black gum, pignut hickory (*Carya glabra*), sassafras (*Sassafras albidum*), and dogwood (*Cornus florida*). A total of six (6) specimen trees were recorded within the stand. Herbaceous and shrub cover is low, with a high percent of cover comprised of invasive species. Japanese stiltgrass and Japanese barberry are dominant. Based on the sample plot data, the average basal area of the stand is 60 and the stand supports 160 trees per acre.

Small portions of the stand are situated on steep slopes. The soil map units underlying the stand is Croom gravelly loam (3-8% slopes). According to the USDA-NRCS, the soil is well-drained and is not hydric.

Photo 5: View of Forest Stand 5 looking west (sample plot 5-2)

Forest Stand 6

Forest Stand 6 is a mid-successional forest that encompasses 4.2 acres within the study area. An intermittent stream channel courses through the stand area from east to west. Trees in the stand are well established, and are commonly found in the 12-19.9" dbh size class. Canopy cover provided by trees is generally high and ranges from 50 to 100%. Shading results in minimal herbaceous groundcover; the ground is mostly covered in leaf litter. Outside of the study area the stand area continues to the Paint Branch stream corridor, a broad tract of undeveloped riparian forest land. Based on its connectivity to large tracts of mature forest, the wildlife habitat capacity at Forest Stand 6 is high. The Paint Branch corridor is mapped as Forest Interior Dwelling Species (FIDS) area by Maryland DNR.

Dominant trees in the stand consist of northern red oak, white oak, chestnut oak, and black gum. Understory species include American holly, pignut hickory, American beech (*Fagus grandifolia*), and serviceberry (*Amelanchier arborea*). Herbaceous plants are generally absent from the stand, but minimal growth of Japanese stiltgrass was observed in a few localized areas. Ten (10) specimen trees were recorded within the stand. The average basal area for Forest Stand 6 is 70 square feet per acre, and the stand supports approximately 205 trees per acre.

Land slopes moderately to the east at Forest Stand 6. The primary soil map units are Croom gravelly loam (3-8% slopes) and Croom gravelly loam (8-15% slopes). Both soils are considered well drained, and neither of the soils are listed as hydric.

Photo 6: View of Forest Stand 6 looking south (sample plot 6-1)

Forest Stand 7

Forest Stand 7 is a mid-successional forest that encompasses 1.7 acres within the study area. Trees in the stand are generally healthy. A large parking lot was recently constructed to the west of the stand, but no impacts were observed at the forest border. Dominant trees in the stand are commonly found in the 20-29.9" dbh size class. Canopy cover provided by trees is lowest among stands (57%) in part because needle-leaved trees (Virginia pine) are included among dominant species. Outside of the study area, Forest Stand 7 continues to the Paint Branch stream corridor. As part of a large contiguous forest that supports FIDS, the forest stand has a high capacity to support wildlife.

Dominant tree species in the stand are northern red oak, Virginia pine, and white oak. Overall, trees in the stand are diverse. The total number of tree species identified within sample plots was highest among the stands (11). The most common understory species are black gum, American holly, and pignut hickory. A total of two (2) specimen trees were recorded within the stand. Herbaceous plants are generally absent from the stand, but minimal growth of Japanese stiltgrass was observed in a few localized areas. The average basal area for Forest Stand 4 is 50 square feet per acre, and the stand supports approximately 160 trees per acre.

Land slopes gently to the south within the stand. The primary soil map units are Croom gravelly loam (3-8% slopes) and Croom gravelly loam (8-15% slopes). Both soils are considered well drained, and neither of the soils are listed as hydric.

Photo 7: View of Forest Stand 7 looking east (sample plot 7-2)

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APPENDIX A

FOREST STAND DELINEATION MAPS

APPENDIX B

SPECIMEN TREE TABLE

ID	Northing	Easting	Species	Size	Condition	Stand
1	498990.3039	1316310.234	White Oak	32.5	Good	1
2	498867.9504	1316293.265	White Oak	33.1	Good	1
3	498851.5129	1316328.774	White Oak	31.1	Good	1
4	498701.2566	1316288.168	American Elm	40.6	Good	n/a
5	498784.8199	1316189.696	N. Red Oak	32.4	Good	1
6	499276.1385	1316231.784	White Oak	30.4	Good	1
7	499257.9856	1315966.287	S. Red Oak	36.1	Good	1
8	499307.6074	1315950.089	S. Red Oak	56.7	Good	1
9	499437.8764	1316010.673	N. Red Oak	38.2	Good	1
10	499485.6281	1316015.56	S. Red Oak	37.5	Good	1
11	499518.5409	1316049.241	S. Red Oak	38.6	Good	1
12	499503.1164	1316073.099	S. Red Oak	33.5	Good	1
13	499433.8024	1316084.979	S. Red Oak	31.7	Good	1
14	499375.6209	1315885	Willow Oak	38.4	Good	n/a
15	498577.5385	1316319.075	Virginia Pine	32.5	Good	n/a
16	498553.6358	1316370.612	White Oak	31	Good	n/a
17	498567.9363	1316408.238	White Oak	34.7	Good	n/a
18	498540.7084	1316378.351	White Oak	31.1	Good	n/a
19	498491.4863	1316409.532	White Oak	33.5	Good	n/a
20	498514.0286	1316429.686	White Oak	37.5	Good	n/a
21	498746.6889	1316614.116	Pin Oak	31.1	Good	n/a
22	498370.8211	1316569.956	Sweet Gum	32.8	Good	n/a
23	498322.8508	1316558.753	Sweet Gum	30.9	Good	n/a
24	498253.6231	1316606.506	Willow Oak	42.6	Good	n/a
25	498205.0662	1316541.543	Tulip Poplar	42.7	Good	n/a
26	498230.1468	1316610.456	Willow Oak	44	Good	n/a
27	498291.9902	1316627.429	Willow Oak	46.3	Good	n/a
28	497998.1453	1316863.613	Willow Oak	36.4	Good	n/a
29	497987.9909	1316841.418	Willow Oak	51	Good	n/a
30	497941.2965	1316869.279	Sweet Gum	35	Good	n/a
31	497995.6466	1316702.51	Sweet Gum	30.6	Good	n/a
32	499639.4264	1317959.899	Tulip Poplar	47.9	Good	2

33	499667.8299	1317925.133	Tulip Poplar	32.6	Good	2
34	499626.8882	1318036.374	Tulip Poplar	31.6	Fair - Crown Dieback	2
35	499684.9234	1318075.757	Tulip Poplar	30.1	Fair - Crown Dieback	2
36	499665.3682	1318223.001	Red Maple	37.5	Good	2
37	499669.6501	1318317.863	White Oak	40.5	Good	2
38	499622.0953	1318320.517	Tulip Poplar	30.6	Good	2
39	499684.4054	1318369.527	White Oak	31.6	Good	2
40	499733.2838	1318461.964	White Oak	32.6	Good	2
41	499848.8089	1319078.752	Tulip Poplar	34.2	Good	2
42	499563.0349	1318417.86	Red Maple	31.6	Good	3
43	499564.6114	1318442.342	Red Maple	32	Good	3
44	499546.568	1318504.111	Tulip Poplar	34.8	Good	3
45	499579.1812	1319007.783	S. Red Oak	38.2	Good	3
46	499717.9867	1319220.984	S. Red Oak	38.6	Good	3
47	499424.6261	1319111.386	Tulip Poplar	31.4	Good	4
48	499192.9344	1318835.439	Tulip Poplar	31.7	Good	4
49	499099.9859	1318646.241	Tulip Poplar	34.3	Good	4
50	499122.8674	1318658.752	Tulip Poplar	30	Good	4
51	499063.8706	1318579.392	Tulip Poplar	30.8	Good	4
52	499144.0611	1319078.276	White Oak	37.2	Good	4
53	499812.3765	1319430.256	Tulip Poplar	38.7	Good	n/a
54	499852.6212	1319505.239	Northern Red Oak	30.2	Good	n/a
55	499278.5185	1319434.613	White Oak	35	Good	4
56	499304.0447	1319604.518	Northern Red Oak	33.4	Good	5
57	499339.8425	1319549.382	White Oak	32.2	Good	5
58	499376.1297	1319536.191	Northern Red Oak	34.8	Good	5
59	499400.4722	1319527.073	Northern Red Oak	34	Good	5
60	499482.1561	1319593.965	White Oak	30.8	Good	5
61	499527.6121	1319583.899	Northern Red Oak	34.6	Good	5
62	498407.4259	1319585.041	Northern Red Oak	33.1	Good	6
63	498754.8508	1319546.025	Northern Red Oak	30.1	Good	6
64	498731.168	1319554.216	Northern Red Oak	31	Good	6
65	498798.9874	1319714.041	Tulip Poplar	30.6	Good	6

66	498842.6887	1319635.526	Red Maple	33.6	Good	6
67	498810.0381	1319517.526	Red Maple	32	Good	6
68	498424.6589	1319485.032	N Red Oak	30.8	Fair Crown Dieback	6
69	498748.6713	1319260.925	Chestnut Oak	30.6	Fair Split Bark	6
70	498738.1603	1319243.528	Chestnut Oak	32.9	Good	6
71	498630.151	1319243.844	White Oak	32.9	Fair Cavity	6
72	498361.2821	1319459.418	White Oak	31.6	Good	7
73	498374.4291	1319288.575	Southern Red Oak	32.7	Good	7
74	498078.8726	1317053.449	Northern Red Oak	39.9	Good	n/a

APPENDIX C

FSD DATASHEETS

APPENDIX D

FOREST STAND SUMMARY SHEETS

MEMORANDUM OF AGREEMENT AMONG THE GENERAL SERVICES ADMINISTRATION, FOOD AND DRU G ADMINISTRATION, THE MARYLAND STATE HISTORIC PRESERVATION OFFICE, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE FOOD AND DRUG ADMINISTRATION CONSOLIDATION PROJECT AT WHITE OAK, MARYLAND

This Memorandum of Agreement (MOA) amends and replaces the Memorandum of Agreement, dated December 5, 2000, for the Food and Drug Administration consolidation Project at White Oak, Maryland. The effective date of this MOA is the latest date of execution by any signatory hereto.

WHEREAS, the General Services Administration (GSA) has received $146 million in Federal appropriations to design and build Phase I and II and to design Phase III of a five phase consolidation of 2.3 million square feet of laboratory and office space for the Food and Drug Administration (FDA) in the greater Washington, D.C. area, including over 6,500 employees, on 130 acres of the former U.S. Navy property currently administered as the Federal Research Center by the General Services Administration (GSA) at White Oak in Silver Spring, Maryland, and will request additional funding to construct subsequent phases of the Project from 2002 through completion (Project); and

WHEREAS, the overall design of the Project including the placement of laboratories, office buildings, and support facilities associated with the Center for Drug Evaluation and Research (CDER), the Center for Devices and Radiological Health (CDRH), the Center for Biologics Evaluation and Research (CBER), Office of the Commissioner (OC), and Office of Regulatory Affairs (ORA), is governed by the FDA Consolidation Revised Master Plan submitted by GSA and FDA to the National Capital Planning Commission for review on June 6, 2002, (attached as appendix 1-A); and

WHEREAS, this undertaking, which is the Project, will be constructed according to the general plan included in the FDA Consolidation Revised Master Plan, dated March 8, 2002, as seen in Appendix 1-A; and

WHEREAS, GSA, in its role as a custodian of the Federal Research Center and manager is assuming historic preservation responsibilities on behalf of FDA under 36 CFR Part 800; and

WHEREAS, GSA has received a separate $10 million Federal appropriation to be used for demolition of buildings within the 130 acre Project area to facilitate construction of the Project; and

WHEREAS, GSA has determined that this undertaking will have an effect on the U.S. Naval Ordnance Laboratory (NOL) Historic District, a property that lies within the Federal Research Center and is eligible for inclusion in the National Register of Historic Places, and has consulted with the Maryland State Historic Preservation Office (MD SHPO) and the Advisory Council on Historic Preservation (Council) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, through additional research and consultation, the planted buffer (1200 feet in depth, from the center line of New Hampshire Avenue to the front of the closest building of the U.S. NOL Historic District), established in 1945 to protect the Naval Ordnance Laboratory from electronic and other incursion, and to protect the surrounding residential community from what was considered an industrial facility, is determined to be a contributing element within the U.S. NOL Historic District, GSA will determine the effect of future Project phases on this buffer, and if the effect is found to be adverse, continue the consultation process to avoid or minimize the Project's effect, if possible, on this contributing element within the historic district. As a result of the Master Plan revisions, two buildings will be located in the historic buffer to create a forecourt with the remaining portion of Building One (the remaining portion of Building One is represented in Appendix 1-B). This forecourt will provide a space for the location of the redesigned circle, outdoor garden in honor of WOL achievements, and flagpole. Consultation with the MD SHPO, the Council, FDA, WOLAA and LABQUEST has been conducted and is the basis for the revisions to this MOA; and

WHEREAS, a number of umbrella citizen and related historic preservation groups, including LABQUEST and the White Oak Laboratory Alumni Association, Inc. (WOLAA) have participated in the consultation and have been invited to concur in this MOA. The LABQUEST Resolution concerning the revised Master Plan is included in this amended MOA as Appendix 3; and

NOW THEREFORE, GSA, FDA, the MD SHPO, the Council, WOLAA and LABQUEST agree that the undertaking shall be administered in accordance with the following stipulations to satisfy GSA's and FDA's Section 106 responsibilities for all aspects of the Project.

STIPULATIONS

The GSA and the FDA will ensure that the following measures are carried out:

I. ADMINISTRATION

A. The GSA shall ensure that in completing the necessary provisions of this MOA that it will employ or contract with the appropriate qualified professionals who meet *The Secretary of Interior's Professional Qualifications Standards* at 36 CFR 61 (Professional Qualifications).

II. RETENTION OF CONTRIBUTING RESOURCES

The GSA will retain the following contributing resources: the remaining portion of Building One as depicted in Appendix 1-B, the fire station portion of Building 100, and the flagpole within a redesigned circle to be located in the new forecourt. It should be noted that the wings of Building One will be not be preserved and will be removed. It should also be noted that the front entrance of the remaining portion of Building One will be modified to provide a visitor's entrance from the basement underneath the current entry steps and decks. The main lobby of Building One will be preserved. The remaining portion of Building One and the Fire House portion of Building 100 are represented in Appendix 1-B.

III. RECORDATION

A. Prior to demolition or alteration of any of the contributing buildings in the NOL Historic District, the GSA shall ensure that each of these buildings are documented to Historic American Buildings Survey (HABS)/Historic American Engineering
(HAER) standards. The GSA will contact the National Park Service (NPS) to determine the level and kind of documentation required:

> Ms. Kathleen Catalano Milley, National Park Service, Philadelphia Support Office, U.S. Custom House, 200 Chestnut Street, 3rd Floor, Philadelphia, PA 19106

B. All documentation must be accepted by the NPS. The GSA will notify the Advisory Council and the MD SHPO of HABS/HAER documentation acceptance, prior to the demolition and/or alteration of the contributing buildings. Copies of the HABS/HAER documentation will be provided to the MD SHPO and to the Montgomery County Historical Society within thirty (30) days of acceptance of the HABS/HAER documentation by NPS.

IV. ARCHITECTURAL SALVAGE

A. Prior to implementation of Project activities involving the demolition of the wings of Building One and the demolition of Buildings 2, 3, and 4 (scheduled for demolition in 2002), and the demolition of Building 5 (scheduled for demolition in 2005), GSA shall determine whether any architectural or decorative elements, such as wood wall paneling, flooring, fireplace mantles, granite stairs and marble may be salvaged for possible re-use.

B. To determine which elements are salvaged, GSA will conduct an on-site inspection of Buildings 1, 2, 3, 4, and 5 with representatives of the MD SHPO to identify elements that may be potential candidates for salvage. The WOLAA has provided GSA and the MD SHPO with an updated candidate list of items to be

considered for architectural salvage. The previous and updated lists are provided in Appendix 4.

C. Prior to the implementation of this MOA it has been determined that such architectural elements do exist. The GSA will submit a salvage plan to the MD SHPO including an inventory of all the elements that it proposes to salvage, the manner in which they will be salvaged, and how they will be stored and eventually used. Within 20 days, the MD SHPO will provide its review comments in writing to the GSA. WOLAA and LABQUEST will be invited to review this plan and provide comments to GSA and WOLAA. GSA shall ensure that any elements that are removed are done so in a manner that minimizes damage. Following their removal, GSA shall further ensure that all salvaged elements are properly secured from vandalism and weather until such time as they can be used.

V. DESIGN REVIEW

A. All design elements of the Food and Drug Administration Consolidation at White Oak will conform to the March 2002 revised master plan as seen in Appendix 1-A, with the understanding that specific design elements may be modified and/or refined over time.

B. GSA will submit to the MD SHPO the proposed design plans for all phases of the project to ensure that the design of the proposed buildings will be compatible with neighboring historic buildings in terms of their height, scale, massing, and materials.

C. GSA shall ensure that the rehabilitation of remaining portion of Building One including its exterior and interior, any new construction added to the building, and all site improvements surrounding the building will adhere to *The Secretary of the Interior's Standards for the Treatment of Historic Properties*. Key character-defining features, as more fully described in Appendix 2, will be retained "in situ." Appendix 2, Character-defining features, has been amended to include notes regarding the exclusion of elements that will no longer be retained due to the removal of the wings of Building One.

D. Prior to any alteration of Building One, GSA will prepare a Historic Building Preservation Plan (HBPP) reflecting these character-defining features, according to GSA's approach described in "Historic Building Preservation Plan – Comprehensive Building Report" (1992). GSA will ensure that the MD SHPO is invited to review and comment on the HBPP and will request comments from LABQUEST and WOLAA that will be forwarded to the MD SHPO.

E. GSA shall further ensure that the GSA's Project Architect will submit to the MD SHPO for its review and comment complete Project plans and specifications for the rehabilitation of the remaining portion of Building One including its exterior (which includes new entries at the sides and a new basement entry way for visitors under the front of the existing main entrance) and interior (which includes a memorial room for the WOL achievements), any new construction added to the building including plans for the redesigned entrance and canopy, all site improvements surrounding the remaining portion Building One, and the approved commemoration and interpretation plan referenced in stipulation VI.-B. GSA's Project Architect will submit such plans to the MD SHPO at the schematic and at the 30 percent design development levels of completion. GSA will also ensure that the MD SHPO is invited to participate in a multi-agency review of the design at the approximately 75 percent level of design development. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

F. GSA shall ensure that the exterior rehabilitation of the fire station portion of Building 100 will adhere to *The Secretary of the Interior's Standards for the Treatment of Historic Properties*. Prior to any alteration of the fire station, GSA will prepare a Historic Building Preservation Plan according to GSA's approach for the preparation of such reports, as referenced in Stipulation V. C above. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

G. GSA shall further ensure that the Project Architect will submit to the Maryland SHPO for its review and comment Project plans and specifications for the exterior rehabilitation of the fire station portion of Building 100. GSA's Project Architect will submit such plans at the schematic and at 30 percent design development levels of completion. GSA will also ensure that the MD SHPO is invited to participate in a multi-agency review of the design at the approximately 75 percent level of design development. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

H. GSA will also submit a copy of the proposed landscaping plan for the entire Project site to the MD SHPO for review and comment. The GSA will submit these plans for review and comment at a 30 percent and 75 percent level of design development. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

VI. COMMEMORATION AND INTERPRETATION/EDUCATION ACTIVITIES

A. Within one month of effective date of this MOA, the GSA shall form a committee to guide the development of a plan for the commemoration and interpretation of the history of the NOL and its personnel. At a minimum, the committee will include representatives of the following: GSA, FDA, the MD SHPO, LABQUEST, and the WOLAA.

B. Development of the commemoration and interpretation plan (Plan) will be guided by principles included in the National Register Bulletin "Telling the Stories: Planning Effective Interpretive Programs for Properties Listed in the National Register of Historic Places" (2000), the NPS's "Planning for Interpretation and the Visitor Experience" (1998), and the National Park Service's Director's Order # 28 "Cultural Resource Management Guideline" (1997). Components of this Plan will be passive, i.e. not staffed, rather than active (i.e., staffed). These components will be limited to indoor exhibits, exterior exhibits and signs, publications (e.g., brochures) and may include indoor exhibits, exterior exhibits and signs, publications (e.g., brochures), and electronic media (e.g., web page).

C. The GSA shall ensure that the Plan will be developed within three to six months of the affective date of the MOA. One portion of the Plan will outline how a commemorative area for the White Oak Laboratory personnel should be developed. The Plan will provide details about an outdoor garden and indoor memorial space, and about the number, type, and content of interpretive panels to be erected in the commemoration. The interpretive section of the Plan will outline how artifacts associated with the property, including salvaged architectural elements, tools, objects, and other historical source materials from the NOL Historic District along with the recordation photographs described in Stipulation III should be incorporated into an interpretive exhibit or exhibits. The Plan will also describe how information about the historic and architectural context of the NOL Historic District will be included in the interpretive exhibit or exhibits. The plan for an indoor memorial space will be prepared to include public access to the remaining portion of Building One.

D. The GSA shall ensure that the Plan incorporates recommendations about how related public education materials about the NOL will be developed including the The Legacy of the White Oak Laboratory book that was written by the White Oak History Corporation, published by the Naval Surface Warfare Center, Dahlgren Division, and printed by the Government Printing Office in 2000.

E. The GSA shall ensure that the Plan incorporates the recommendations of the committee such as in what buildings and spaces the commemorative exhibit or exhibits will be placed, what artifacts and other materials should be exhibited, and

exhibited, and how the public may gain access to the exhibit. GSA will coordinate the commemorative plan with other design programs, such as Art in Architecture.

F. The GSA shall notify the Council of the measures that will be taken to fulfill this stipulation and provide progress updates to the Council as work is completed.

G. The GSA shall ensure that the Plan will be installed prior to the completion of the Project.

VII. DISCOVERY

A. During the course of this undertaking, the GSA will ensure that the MD SHPO is informed of any newly identified potential historic properties discovered within the Project's area of potential effect during the construction. Potential historic properties are herein considered to be any building, structure, object, or archaeological site to which the National Register of Historic Places Criteria of Eligibility (36 CFR 60.4) has not already been applied. The GSA will not take any actions that would adversely affect such properties until such time as it has taken the following actions and resolved or mitigated all of its Section 106 responsibilities regarding such late-identified sites:

1. Upon notification that a potential historic site or object previously unidentified during the course of its Section 106 compliance has been identified within the undertaking's area of effect during the implementation of the undertaking, the GSA will undertake the steps outlined in 36 CFR 800.13(b through d) in order to ensure compliance with Section 106 of the National Historic Preservation Act.

2. In accordance with 36 CFR 800.13(b), the identification of additional, late-identified historic resources discovered during the implementation of the undertaking does not require the GSA to stop work on the overall undertaking, but to make reasonable efforts to avoid or minimize harm to the property until the requirements of 36 CFR 800.13 are met.

VIII. DISPUTE RESOLUTION

A. If the MD SHPO objects within 30 days to any plans and documents required pursuant to the terms of this MOA, the GSA shall consult with the MD SHPO and other Parties to resolve the objection. If the GSA determines that the objection cannot be resolved through consultation, the GSA shall forward all documentation relevant to the dispute to the Council. Within 30 days after receipt of pertinent documentation, the Council will either:

1. Provide the GSA with recommendations, which the GSA shall take into account in reaching a final decision regarding the dispute; or

2. Notify the GSA that it will comment pursuant to 36 CFR Part 800.6(b), and proceed to comment. Any Council comment provided in response to such a request will be taken into account by the GSA in accordance with 36 CFR Part 800.6(b)(2) with reference to the subject of the dispute.

3. Any recommendations or comment provided by the Council will be understood to pertain only to the subject of the dispute; the GSA's responsibility to carry out all actions under this MOA that are not the subject of the dispute will remain unchanged.

IX. REVIEW OF PUBLIC OBJECTIONS

A. At any time during implementation of the measures stipulated in this MOA, if any objection to any such measure or its manner of implementation be raised by a member of the public, LABQUEST, or WOLAA, the GSA shall take the objection into account, notify the MD SHPO of the objection, and consult as needed with the objecting party, the MD SHPO, and the Council to resolve the objection.

X. MONITORING AND REPORTING

A. The MD SHPO may monitor any activities carried out pursuant to this MOA and the Council may review any activities if requested. The GSA will cooperate with the MD SHPO and the Council if they request to monitor or to review Project files or visit Project sites for activities at specific Project sites.

B. The GSA shall provide the MD SHPO, LABQUEST, and WOLAA with a report that summarizes activities carried out under the terms of this MOA six (6) months from the effective date of the MOA's execution and again at one (1) year from the effective date of execution. Thereafter, the GSA shall provide the MD SHPO, LABQUEST and WOLAA with an annual report until completion of the Project. Reports shall include information regarding preservation activities, information on any public objections and their status, any other activities undertaken pursuant to this MOA, and information on overall project funding and construction phases.

XI. RECORD KEEPING

A. The GSA shall maintain records of all activities undertaken pursuant to this MOA which shall become part of the Environmental Review Record for the Project including:

1. All records related to the selection of professionals who perform the work stipulated in the provisions of this MOA, in order to clearly document adherence to the Professional Qualifications (36 CFR 61);

2. All records of correspondence and findings letters provided by the MD SHPO to the GSA;

3. All records indicating all mitigation measures taken in accordance with the provisions of this MOA;

4. All records related to consultations GSA has with the MD SHPO and/or the Advisory Council following the ratification of this MOA;

5. All records of public comments received during public hearings and written or telephonic comments received from the public at all other times; and

6. All of the above records shall be maintained for a minimum of three (3) years after completion of the Project and shall be made available to the general public and additional parties with a demonstrated interest in the undertaking upon request during this time frame.

XII. AMENDMENTS

A. Any party to this MOA may request that it be amended or modified, whereupon the GSA, the SHPO, and the Council will consult in accordance with 36 CFR Part 800.6(c) (7) & (8) to consider such revisions.

B. Any resulting amendments or modifications shall be developed and executed among GSA, FDA, the MD SHPO, the Council, LABQUEST, and WOLAA in the same manner as this MOA.

XIII. TERMINATION

FDA, GSA, the Council and the MD SHPO may terminate the MOA by providing thirty (30) days notice to the other Parties, provided that the Parties to the MOA will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.

XIV. FAILURE TO COMPLY WITH THIS AGREEMENT

In the event that the GSA does not carry out the terms of this MOA, the GSA will comply with 36 CFR Parts 800.4 through 800.6 with regard to individual undertakings covered by this MOA.

XV. SUNSET

Provisions of this MOA will be carried out from the date of execution of this MOA through completion of the FDA Consolidation.

XVI. COMPLIANCE WITH 106

Execution of this MOA by the GSA, FDA, the MD SHPO, and the Council, and the implementation of its terms by GSA, evidence that GSA and FDA have afforded the Council an opportunity to comment on the proposed FDA Consolidation Project and its effects on historic properties, that the GSA and FDA have taken into account the effects of the proposed Project on historic properties, and that GSA has complied with Section 106.

GENERAL SERVICES ADMINISTRATION

By: _____
Anthony E. Costa
Assistant Regional Administrator

Date: 2 July 202

FOOD AND DRUG ADMINISTRATION

By: _____
Jeffrey M. Weber
Senior Associate Commissioner for Management and Systems

Date: 7/2/02

MARYLAND STATE HISTORIC PRESERVATION OFFICE

By: _____
J. Rodney Little
Maryland State Historic Preservation Officer

Date: 7-3-02

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____
John Fowler
Executive Director

Date: 7/10/02

CONCURRING PARTIES

LABQUEST

By: M. J. Levin
Meyer J. Levin
Date: 7/02/02

WHITE OAK LABORATORY ALUMNI ASSOCIATION, INC

By: James Trost
M. John Tino
Date: 7/2/02

APPENDIX 1

- **A. Revised Master Plan (May 2002)**
- **B. Site Plan depicting the Remaining Portion of Building One and the Fire Station Portion of Building 100**

APPENDIX 2

- **Character-Defining features-amended**

APPENDIX 3

- **LABQUEST Resolution**

APPENDIX 4

- **WOLAA updated candidate list for architectural salvage**
- **WOLAA original candidate list for architectural salvage**

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US Food and Drug Administration Headquarters 2018 Master Plan

Draft Air Quality Technical Report

Prepared by the US General Services Administration

In cooperation with

The US Food and Drug Administration

GSA

February 2018

FDA U.S. FOOD & DRUG ADMINISTRATION

APPENDIX D – Air Quality Technical Report

Table of Contents

List of Figures

List of Tables

1.0 Introduction

The US General Services Administration (GSA) is currently consolidating the US Food and Drug Administration (FDA) headquarters facilities at the Federal Research Center at White Oak (FRC) in Silver Spring, Maryland. The FDA headquarters currently encompasses a 130-acre piece of the FRC, now known as the FDA Campus. Due to new Congressional mandates, FDA is projecting an increase in employees and campus support staff at the FDA Campus. Therefore, the purpose of the proposed action is to provide a Master Plan to accommodate future growth and further consolidate FDA operations. The Master Plan would provide a framework for development at the FRC to accommodate an approximate 18,000 FDA employees and support staff over a 20-year period.

The proposed action assessed in this document is the implementation of a Master Plan for FDA, to include the following:

- Development of approximately 1.5 million gross square feet (GSF) of office space to support FDA's mission for a total of up to 6,717,734 GSF;
- Parking would be provided at ratio of 1 space for every 1.8 employees (1:1.8) for a total of 10,987 parking spaces for FDA employees and campus support staff;
- Visitor parking would be increased from 1,000 to 1,615 parking spaces; and
- The East Loop Road would be reconfigured to allow for ease of access into and out of the FDA Campus.

This air quality technical report has been prepared by Straughan Environmental, Inc. for the GSA. It assesses and reports the potential air quality impacts resulting from proposed development at the FDA Campus. GSA has proposed three alternatives to accommodate the additional staff at the FDA Campus under this Master Plan. Figure 1-1 shows the project location.

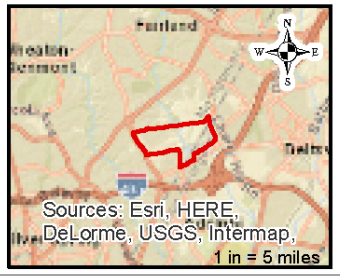
The Environmental Impact Statement (*Environmental Impact Statement for U.S. Food and Drug Administration Headquarters located at the Federal Research Center (FRC), White Oak in Silver Spring, Maryland)* fully describes the project alternative selection process. Each project alternative proposes different development scenarios that achieve the needed square footage and facilities. Each project alternative concentrates new development on the north and east sides of the existing FDA Campus. The development scenarios are included in Figure 1-2. Alternative A would include 1,548,238 GSF of development, Alternative B would include 1,592,391 GSF of development, and Alternative C would include 1,515,052 GSF of development. Development proposed for each alternative would accommodate additional 6,832 employees and project-associated plans for traffic improvements (Stantec 2017) would be identical across alternatives.

In accordance with the guidelines set forth by 23 CFR Part 771, 49 CFR Part 622, the Clean Air Act (CAA U.S.C. Title 42, Chapter 85, 1970, as amended 1990), and the National Environmental Policy Act (NEPA), an air quality analysis is necessary to document the existing air quality conditions in the vicinity of the FDA FRC and to evaluate the potential changes that would occur as a result of the development of the action alternatives. According to the Metropolitan Washington Council of Governments (MWCOG), air quality in the vicinity of the FDA Campus and in the region, which is influenced primarily by transportation-related mobile sources, predominantly motor vehicle traffic on adjacent roadways, has been steadily improving in recent decades (MWCOG 2017).

The air quality analyses considered the potential effects of the FDA Campus expansion on air-sensitive residential, institutional, and recreational facilities near the FDA Campus. The mobile source air quality analysis considered the effects of air pollutant emissions generated due to added commuter trips on the area roadways and the stationary source air quality analysis considered the effects of air pollutant emissions from power and electricity generation at the Central Utility Plant associated with the three Master Plan development alternatives (Alternative A, B, and C), in addition to emission sources at the Air Force/Arnold Engineering Development (AEDC) Complex. This report also considers construction, indirect, and cumulative effects.

Figure 1-1
Project Location Map

0 1,500 3,000 6,000 Feet



White Oak FDA Campus
U.S. Food and Drug Administration Headquarters 2017 Master Plan

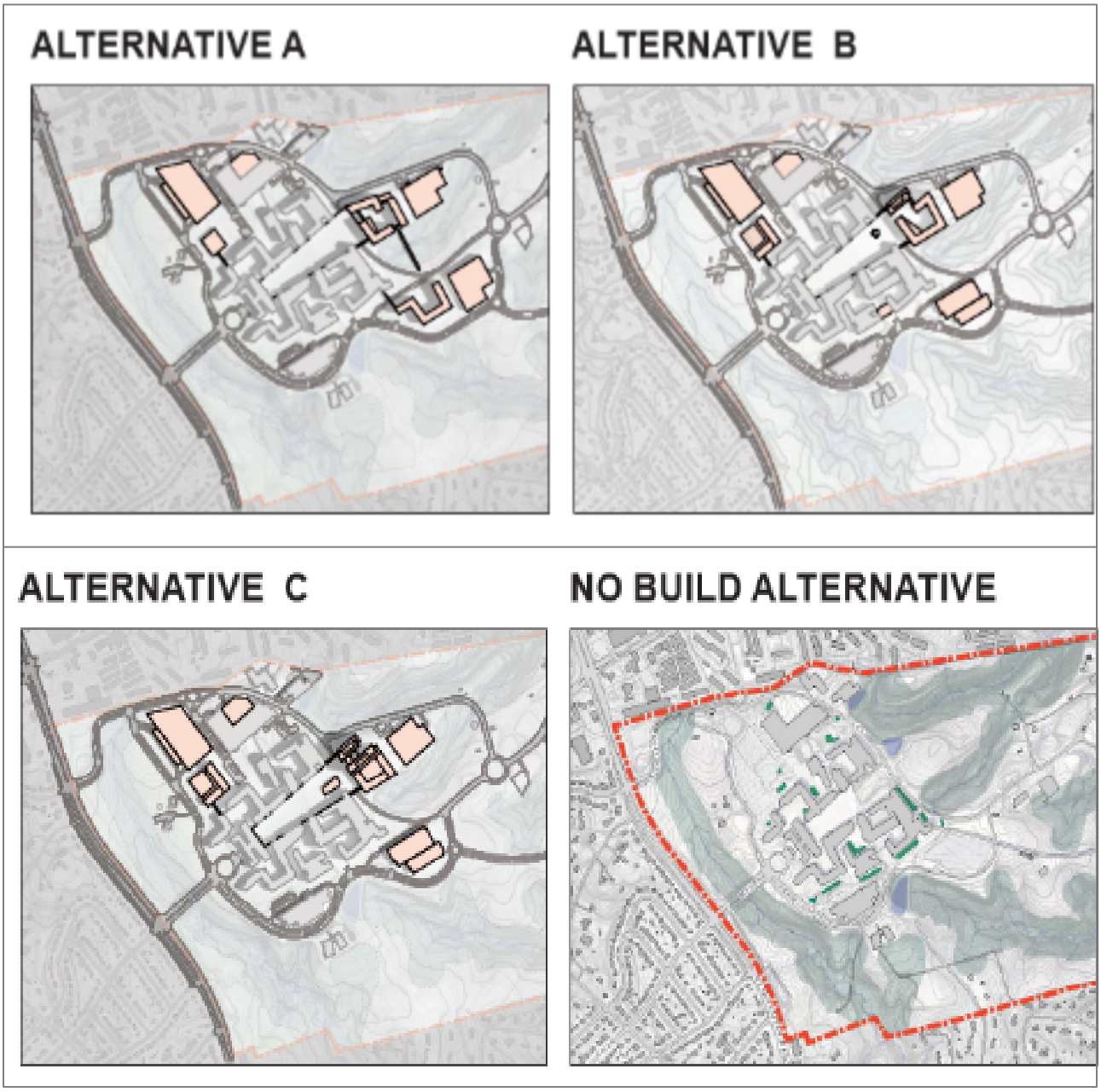


Figure 1-2. Draft Development Alternatives

White Oak FDA Campus

US Food and Drug Administration Headquarters 2018 Master Plan

2.0 Affected Environment

The FDA Campus is located in White Oak, Maryland, which is primarily a residential suburb of Washington, D.C. Major arterial roadways including US 29 and MD 650 are located north and west of the campus and minor arterials and collector roads such as Cherry Hill Road and Powder Mill Road are located to the north and east. See Figure 1-1. Most roadways are on bus transit routes and provide sidewalks for pedestrians/bus riders. Nearby shopping and business centers are generally located in the vicinity of major interchanges such as the White Oak Shopping Center located at US 29 and MD 650 and Westech Business Park located at US 29 and Cherry Hill Road.

2.1 National Ambient Air Quality Standards

The CAA authorizes the US Environmental Protection Agency (EPA) to develop National Ambient Air Quality Standards (NAAQS) for certain air pollutants (criteria pollutants) deemed harmful to public health and the environment. EPA has set both primary and secondary standards. The primary standards protect public health including sensitive populations such as asthmatics, children, and the elderly. The secondary standards protect the public welfare, including protection against reduced visibility and damage to crops, animals, vegetation, and buildings. The criteria pollutants include nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), particulate matter ($PM_{2.5}$/PM_{10}), and lead (Pb). The standards are given as pollutant concentrations such as parts per million (ppm), parts per billion (ppb), and micrograms per cubic meter of air (µg/m3). The concentration standards for each of these criteria pollutants are presented in Table 2-1.

Table 2-1. National Ambient Air Quality Standards

Pollutant	Primary/Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)	primary	8 hours	9 ppm (10 mg/m^3)	Not to be exceeded more than once per year
		1 hour	35 ppm (40 mg/m^3)	
Lead (Pb)	primary and secondary	Rolling 3-month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)	primary	1 hour	100 ppb (188 µg/m^3)	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	primary and secondary	1 year	53 ppb (2)	Annual Mean

Table 2-1. National Ambient Air Quality Standards

Pollutant		Primary/Secondary	Averaging Time	Level ($100\ \mu g/m^3$)	Form
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	primary	1 year	$12.0\ \mu g/m^3$	Annual Mean, averaged over 3 years
		secondary	1 year	$15.0\ \mu g/m^3$	Annual Mean, averaged over 3 years
		primary and secondary	24 hours	$35\ \mu g/m^3$	98^{th} percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	$150\ \mu g/m^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb (4) ($196\ \mu g/m^3$)	99^{th} percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm ($1300\ \mu g/m^3$)	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.
(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Source: National Ambient Air Quality Standards Table

2.2 National Ambient Air Quality Standard Attainment Status

Areas where concentrations of criteria pollutants are below the NAAQS are designated by EPA as being in "attainment" and areas where a criteria pollutant level exceeds the NAAQS are designated as being in "nonattainment." Ozone (O_3) nonattainment areas are categorized based on the severity of nonattainment: marginal, moderate, serious, severe, or extreme. CO

and PM_{10} nonattainment areas are categorized as moderate or serious. The Washington DC-MD-VA Region, which includes the FDA FRC, is designated as a marginal nonattainment area for O_3 under the 2008 8-hour standard (MWCOG 2007)[1]. The Washington DC-MD-VA region is designated as in attainment of the NAAQS for all other criteria pollutants.

2.3 Air Quality Monitoring Data

The Maryland Department of the Environment (MDE) operates 25 air quality monitoring sites throughout the state of Maryland. These monitoring sites measure ground-level concentrations of criteria pollutants, and pollutant concentrations from monitoring sites is available from EPA's AirData website (https://www.epa.gov/outdoor-air-quality-data). The closest air monitoring station to the study area is located 5.75 miles from the FDA Campus in Beltsville, Maryland. Ambient O_3 data recorded from this monitoring station from 2014 to 2016 are presented in Table 2-2 below. Exceedances of the O_3 8-hour standard were reported during each year – once in 2014, five times in 2015, and four times in 2016.

Table 2-2. Ambient Air Quality Data for O_3, 2014-2016

AQS Site 24-033-0030, HU-Beltsville, 12003 Old Baltimore Pike, Beltsville, MD					
Pollutant	**Averaging Time**	**Form**	**2014**	**2015**	**2016**
Ozone (O3) [ppm]	8-hour	Second Highest	0.066	0.082	0.074
		Third Highest	0.066	0.081	0.074
		Fourth Highest	0.065	0.072	0.07
		First Highest	0.071	0.088	0.078
		# of Exceedances	1	5	4
Source: EPA AirData, AQS Site ID 24-033-0030, Interactive Map of Air Quality Monitors					

2.4 General Conformity

Section 176(c) of the CAA prohibits Federal entities from taking actions in non-attainment or maintenance areas which do not conform to the State Implementation Plan (SIP) for the attainment and maintenance of the NAAQS. In November 1993, the EPA promulgated the General Conformity Regulations (58 FR 63214) to ensure that Federal actions do not cause or contribute to new violations of the NAAQS, do not worsen existing violations of the NAAQS, and do not delay attainment of the NAAQS. The General Conformity regulations ensure that all

[1] In 2015, the region attained the 2008 ozone standard and the Metropolitan Washington Council of Governments (MWCOG) and the National Capital Region Transportation Planning Board (NCR TPB) is in the process of requesting redesignation to "attainment" status and is developing a Maintenance Plan to demonstrate how attainment will be maintained (NCR TPB 2017).

Federal actions not covered by the Clean Air Act's Transportation Conformity regulations conform to the State Implementation Plan (SIP) for achieving the NAAQS.

2.5 Greenhouse Gas Accounting and Reporting

The White House Council on Environmental Quality (CEQ) provides guidance for federal agencies on consideration of greenhouse gas (GHG) emissions in NEPA reviews. CEQ provides a reference point of 25,000 metric tons of CO_2-equivalent ($MTCO_2e$) emissions on an annual basis (CEQ 2014). Below this number, GHG emissions quantitative analysis is generally not warranted unless quantification below that reference point is easily accomplished. The CEQ guidance was rescinded on March 28, 2017 by Executive Order, "Presidential Executive Order on Promoting Energy Independence and Economic Growth." However, GSA hasn't yet promulgated new regulations to guide the consideration of GHG emissions in NEPA reviews.

2.6 Greenhouse Gas Emission Reduction Act

The state of Maryland passed the Greenhouse Gas Emission Reduction Act in 2009. The regulation, administered by MDE, requires the state to develop and implement a plan to reduce GHG emissions by 2020 to a point that is 25% below 2006 emissions. The plan, released in 2012 and updated in 2015, encourages reductions in GHG emissions through a variety of incentive programs targeting the public and private sector. These programs focus on increasing energy efficiency using existing technologies, identifying ways to transition to new energy sources, and stimulating further technological development to reduce GHG emissions.

3.0 Environmental Consequences

New development associated with the expansion of the FDA Campus has the potential to affect air quality in three ways:

- Increased emissions from existing stationary sources of pollutants such as turbines, generators, and boilers contained within the Central Utility Plant;
- Increased vehicular traffic to the site, which raises vehicle emission levels near the site, and possibly in the region; and
- Generation of airborne dust during construction.

The purpose of this evaluation is to identify and quantify the potential direct, indirect, and cumulative emissions air quality impacts related to the proposed development and operation of the 2018 FDA FRC Proposed Action Alternatives as well as the No Action Alternative. For this analysis, the emission inventories of mobile and stationary sources for each alternative were evaluated for conformity with the Washington Metropolitan Region SIP.

The FDA Headquarters Campus currently contains 3,766,605 GSF of existing building space and accommodates 10,247 employees.

3.1 Proposed Action and No Action Alternatives

Three alternatives have been proposed that represent different development scenarios for the FDA Campus. All three alternatives result in approximately 1.5 million square feet of additional building space to serve 6,832 additional employees, for a total employee population of approximately 18,000. The Proposed Action Alternatives include:

- **No Action Alternative:** The No-Action Alternative includes the existing built environment at the FRC. Under the No-Action Alternative, FDA would continue its current operations at the FRC and the actions proposed in this EIS would not be taken. Specifically, under the No-Action Alternative the number of employees and support staff would not increase. Although this would not induce additional air pollutant emissions, there would be vehicular traffic increases from predicted general growth in the vicinity of the FDA Campus.
- **Alternative A:** Under Alternative A, the FDA Campus would develop an additional 1,548,238 square feet of building space. This would include five new office buildings ranging from two to 10 stories; three to four new parking garages; a Communications Center would be placed with the new buildings on the eastern end of the campus; and a Conference Center would be placed on the northwest quadrant and existing main campus.
- **Alternative B:** Under Alternative B, the FDA Campus would develop an additional 1,592,391 square feet of building space. This would include four new office buildings

ranging from 2 to 20 stories; three to four new parking garages; a Communications Center would be placed with the new buildings on the eastern end of the campus; and a Conference Center would be placed on the northwest quadrant and existing main campus.

- **Alternative C:** Under Alternative C, the FDA Campus would develop an additional 1,515,052 square feet of building space. This would include five new office buildings ranging from 2 to 14 stories; three to four new parking garages; a Communications Center would be placed with the new buildings on the eastern end of the campus; a Conference Center would be placed on the northwest quadrant and existing main campus; and a free-standing dining facility would be constructed on the plaza.

Traffic projections are identical for each of the proposed build alternatives (Alternatives A, B, and C).

3.2.1 Mobile Source Analysis

3.2.1.1 CO Hot Spot Modeling

The mathematical model used to predict CO concentrations in CO hot spot modeling is the EPA's CAL3QHC dispersion model. The CAL3QHC dispersion model predicts CO or other inert pollutant concentrations from motor vehicles traveling near roadway intersections. The model requires emissions and traffic data (such as volumes, level of service and signal timing) to estimate CO concentrations near air quality sensitive receptors. The CAL3QHC model focuses on CO concentrations at intersections because idling vehicles result in the highest localized CO concentrations. Intersections with the worst level of service and highest traffic volumes represent the worst-case air pollutant dispersion scenarios.

3.2.1.2 CO Hot Spot Modeling Methodology

This CO Hot Spot analysis was prepared in accordance with guidance set forth by EPA in *User's Guide to CAL3QHC Version 2: A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections* (EPA 1995). Because traffic projections are identical for each of the Proposed Action Alternatives, the mobile source analysis simply identifies Action and No Action scenarios. The Action scenario includes anticipated effects of Alternatives A, B, and C.

The steps taken to perform the analysis of CO Hot Spot concentrations included the following:

- Identify the worst-case Action and No-Action Alternative intersections;
- Identify the modeling receptor locations;
- Determine the background CO concentrations from the nearest air quality monitoring station;
- Estimate the regional emission rates using the EPA's Motor Vehicle Emission Simulator (MOVES) Version 2014a model;

- Predict the 1-hour average CO concentrations using CAL3QHC;
- Calculate the 8-hour average CO concentration using the 1-hour average concentration and the EPA's recommended persistence factor; and
- Compare the final CO concentrations to the 1-hour and 8-hour NAAQS for CO to determine if any exceedance would occur.

The CAL3QHC guidance recommends placing modeling receptors in areas of expected maximum 1-hour and 8-hour CO concentrations, in places where the general public has continuous access (such as public sidewalks), and other reasonable places in proximity to the intersection but not within the intersection itself.

3.2.1.3 Traffic Data

Two sources of traffic data were used in the localized mobile source CO analysis. The FDA Master Plan Technical Traffic Report (TTR) provided traffic volumes and level of service for the study area's intersections (Stantec 2017). A total of 27 intersections were included in the study. Traffic data was also field-collected. Straughan timed intersection movements to obtain signal type, average cycle length, average red time length, and verified the location of air quality sensitive receptors.

Worst-Case Intersections

The impacts of mobile source emissions of CO associated with the implementation of the proposed action were assessed by analyzing mobile source CO emissions at four intersections. These intersections were the worst-case scenarios for CO impacts based on the analysis of traffic data. They are:

- US 29 at Industrial Parkway,
- US 29 at Tech Road,
- US 29 at Musgrove Road, and
- US 29 at Fairland Road.

The TTR indicates these intersections carry between 8-9,000 vehicles and operate at LOS F during the afternoon peak hour (Table 3-1).

Table 3-1. Levels of Service and Traffic Volumes by Alternative, PM Peak Hour

Alternative	Intersection			
	US 29 at Industrial Parkway	US 29 at Tech Road	US 29 at Musgrove Road	US 29 at Fairland Road
Level of Service				
No Action	F	F	F	F
Action	F	F	F	F
Traffic Volumes				
No Action	8,088	9,354	9,176	9,495
Action	8,150	9,445	9,445	9,745

Source: Stantec FDA Master Plan Traffic Technical Report, 2017
Note: According to the American Association of State Highway and Transportation Officials (AASHTO), Level of Service (A through F) describes flow characteristics at intersections, with A representing free flow traffic and F representing severely congested traffic. LOS F indicates a long traffic delay (more than 80 seconds for a signalized intersection; more than 50 seconds in an unsignalized intersection).

3.2.1.4 Emission Factors

The mobile source emission factors used in the CAL3QHC model for the prediction of ambient CO concentrations were estimated using the EPA Motor Vehicle Emission Simulator model version 2014a (MOVES2014a) (EPA 2015). MOVES2014a calculates emission factors or emission inventories for both onroad and nonroad vehicles. In the modeling process, the vehicle types, time periods, geographical areas, pollutants, vehicle operating characteristics, and road types are specified. MOVES2014a then uses this information to perform calculations reflecting the vehicle operating processes and ultimately estimate total emissions or emission rates per vehicle or unit of activity. MOVES2014a contains a default database that summarizes the aforementioned emission relevant information for every county in the U.S.

The assumptions and activity data used for this project were obtained from the national database for Montgomery County, Maryland, where the study area is located, for the project horizon year of 2040. MOVES2014a estimated a traveling or free flow CO emission factor of 1.35 grams/vehicle-mile and an idle emission factor of 45.11 grams/vehicle-hour. The MOVES 2014a calculated results are available on the attached DVD.

3.2.1.5 CAL3QHC Analysis

The CAL3QHC program requires modeling roadways as segments known as links. Links can be either free-flow links for vehicles moving at a constant speed or queue links for idling vehicles. Each can be one of four types of links based on the roadway geometry – at-grade, fill, bridge, or depressed. A free-flow link is defined as a straight segment of roadway having a constant width, height, traffic volume, travel speed, and vehicle emission factor. The required inputs for free-flow links are the endpoints, traffic volume, the emission factor, source height, and mixing zone width. A queue link is defined as a straight segment of roadway with a constant width and

emission source strength, where vehicles are idling for a specified time period. Required inputs for queue links are the endpoints, approach traffic volume, emission factor, average cycle length, average red time length, number of travel lanes, clearance lost time, source height, signal type (pre-timed, actuated, or semi-actuated), and arrival rate. The CAL3QHC input and output files are available on the attached DVD.

CAL3QHC also requires the input of meteorological data. These data are average timing, surface roughness coefficient, settling velocity, deposition velocity, wind speed, mixing height, stability class, and wind angle range. The CAL3QHC inputs are included in Table 3-2.

Table 3-2. CAL3QHC Input Data and Assumptions

Input Variable	Assumption and/or Value for Roadways				
	US 29	Industrial Pkwy	Tech Rd	Musgrove Rd	Fairland Rd
Averaging Time (minutes)	60 min	60 min	60 min	60 min	60 min
Background CO Concentrations (ppm)	0 ppm	0 ppm	0 ppm	0 ppm	0 ppm
Surface Roughness	175 cm	175 cm	175 cm	175 cm	175 cm
Settling Velocity (cm/s)	0	0	0	0	0
Deposition Velocity (cm/s)	0	0	0	0	0
Source Height (m)	0	0	0	0	0
Signal Type	1	1	1	1	1
Average Cycle Length (s)	180	152	150	170	180
Average Red Time Length (s)	varies; 67-102	varies; 97-120	varies; 114-139	155	varies; 140-159
Clearance Lost Time (s)	2	2	2	2	2
Arrival Rate	3	3	3	3	3
Wind Speed (m/s)	1	1	1	1	1
Wind Direction (degree)	0	0	0	0	0
Atmospheric Stability Class	4 (D)	4 (D)	4 (D)	4 (D)	4 (D)

Table 3-2. CAL3QHC Input Data and Assumptions

Input Variable	Assumption and/or Value for Roadways				
	US 29	Industrial Pkwy	Tech Rd	Musgrove Rd	Fairland Rd
Mixing Height (m)	1000	1000	1000	1000	1000
Multiple Wind Directions	Yes	Yes	Yes	Yes	Yes
Wind Direction Increment Angle	10	10	10	10	10
First Increment Multiplier	0	0	0	0	0
Last Incremental Multiplier	36	36	36	36	36

[1] See CAL3QHC Output files for Average Red Time Length of specific turning movements.

Air quality receptor locations represent sensitive air quality locations (i.e. areas where people are likely to be exposed to CO) within the study area and are presented in Figures 3-1 to 3-4.

The maximum 1-hour CO concentrations were modeled using the evening peak hour traffic volumes. The maximum 8-hour average CO concentrations were estimated in accordance with EPA *Guidance for Modeling Carbon Monoxide from Roadway Intersections* (1992), which recommends the use of a persistence factor of 0.7 to estimate 8-hour concentrations from 1-hour concentrations.

Figure 3-1
US 29 at Industrial Parkway Intersection
Modeling Area with Receptor Locations

0 100 200 400
Feet

White Oak FDA Campus
U.S. Food and Drug Administration Headquarters 2017 Master Plan

Legend
Air Quality Receptor

Figure 3-2
US 29 at Tech Road Intersection
Modeling Area with Receptor Locations

White Oak FDA Campus
U.S. Food and Drug Administration Headquarters 2017 Master Plan

Figure 3-3
US 29 at Musgrove Road Intersection
Modeling Area with Receptor Locations

0 125 250 500
Feet

White Oak FDA Campus
U.S. Food and Drug Administration Headquarters 2017 Master Plan

Legend
Air Quality Receptor

Figure 3-4
US 29 at Fairland Road Intersection
Modeling Area with Receptor Locations

0 100 200 400
Feet

White Oak FDA Campus
U.S. Food and Drug Administration Headquarters 2017 Master Plan

Legend
Air Quality Receptor

3.2.1.6 Analysis Results

Table 3-3 presents the results of the 1-hour analysis at the intersections of US 29 at Industrial Parkway, US 29 at Tech Road, US 29 at Musgrove Road, and US 29 at Fairland Road. The table presents the receptor where the predicted maximum CO concentrations occurred. CO concentrations at all receptor locations are included in Tables A2 through A4 in Appendix A. The CAL3QHC modeling results indicate that the predicted maximum CO concentrations for the No Action Alternative range from 2.6 ppm to 3.0 ppm. Under the No Action Alternative, there would be no exceedances of the NAAQS for CO, which is 35 ppm for the 1-hour standard. Under the Action Alternatives the predicted maximum CO concentrations range from 2.7 ppm to 3.0 ppm Under the Action Alternatives, there would be no exceedances of the CO 1-hour NAAQS.

Table 3-3. One-Hour Analysis for CO (ppm) at Worst-Case Intersections

Intersection of US 29	Maximum Predicted Concentration	Background Concentration	Total Concentration	Receptor Location
No Action				
Industrial Pkwy	0.9	1.7	**2.6**	R 158
Tech Rd	1.2	1.7	**2.9**	R 19
Musgrove Rd	1.3	1.7	**3.0**	R 24
Fairland Rd	1.2	1.7	**2.9**	R 38
Action				
Industrial Pkwy	1.0	1.7	**2.7**	R 158
Tech Rd	1.2	1.7	**2.9**	R 19
Musgrove Rd	1.3	1.7	**3.0**	R 24
Fairland Rd	1.3	1.7	**3.0**	R 38

Table 3-4 presents the results of the 8-hour analysis at the intersections of US 29 at Industrial Parkway, US 29 at Tech Road, US 29 at Musgrove Road, and US 29 at Fairland Road. Under the No Action Alternative, modeling results indicate that the predicted maximum CO concentrations for the No Action Alternative range from 1.8 ppm to 2.1 ppm. Under the No Action Alternative, there would be no exceedances of the NAAQS for CO, which is 9 ppm for the 8-hour standard. Under the Action Alternative the predicted maximum CO concentrations range from 1.9 ppm to 2.1 ppm. Under the Action Alternative, there would be no exceedances of the CO 8-hour NAAQS.

Table 3-4. 8-Hour Analysis for CO (ppm) at Worst-Case Intersections				
No Action				
Intersection of US 29	**Maximum Predicted Concentration**	**Background Concentration**	**Total Concentration**	**Receptor Location**
Industrial Pkwy	0.8	1.0	**1.8**	R 158
Tech Rd	1.0	1.0	**2.0**	R 19
Musgrove Rd	1.1	1.0	**2.1**	R 24
Fairland Rd	1.0	1.0	**2.0**	R 38
Action				
Industrial Pkwy	0.9	1.0	**1.9**	R 158
Tech Rd	1.0	1.0	**2.0**	R 19
Musgrove Rd	1.1	1.0	**2.1**	R 24
Fairland Rd	1.1	1.0	**2.1**	R 38

3.2.1.7 Fine Particulate Matter (PM2.5)

The Washington DC-MD-VA Region is in attainment of the NAAQS for $PM_{2.5}$, meeting the 2012 $PM_{2.5}$ standards in 2014 after years of trending downwards. A maintenance plan was prepared in 2014, and a project hot spot analysis is required for all non-attainment and maintenance areas. Projects that require hot spot analysis for $PM_{2.5}$ are those projects that are Projects of Air Quality Concern as enumerated in 40CFR93.123 (b)(1) and restated below:

- New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
- Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
- New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
- Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and
- Projects in or affecting locations, areas, or categories of sites which are identified in the PM_{10} or $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The following analysis concerning $PM_{2.5}$ has been developed for the Proposed Action:

- The Proposed Action does not meet the criteria set forth in 40 CFR 93.123(b)(1) as amended to be considered a Project of Air Quality Concern primarily because the Proposed Action does not include improvements to project area roadways or highways, and vehicles added to area roadways would primarily be gasoline rather than diesel powered vehicles.
- The Proposed Action does not have a significant increase in diesel vehicles due to construction of the project. In accordance with FHWA guidance, "40 CFR 93.123(b)(1)(i) should be interpreted as applying only to projects that would involve a significant increase in the number of diesel transit busses and diesel trucks on the facility". The percent of trucks is not expected to change between any of the Master Plan Alternatives and 2006 Master Plan conditions.

Based on the preceding review and analysis, the Proposed Action meets the CAA and 40 CFR 93.109 requirements. These requirements are met for particulate matter without a project-level hot-spot analysis, since the project has not been found to be a Project of Air Quality Concern as defined under 40 CFR 93.123(b)(1). Since the project meets the CAA and 40 CFR 93.109 requirements, the project will not cause or contribute to a new violation of the $PM_{2.5}$ NAAQS or increase the frequency or severity of a violation.

3.2.1.8 Mobile Source Air Toxic (MSAT) Analysis

The Federal Highway Administration (FHWA) Interim Guidance on Air Toxic Analysis in NEPA Documents requires analysis of MSATs under specific conditions. The following language is taken from this guidance. The EPA has designated six prioritized MSATs, which are known or probable carcinogens or can cause chronic respiratory effects. The six prioritized MSATs are: Benzene; Acrolein; Formaldehyde; 1,3-Butadiene, Acetaldehyde; and Diesel Exhaust (Diesel Exhaust Gases and Diesel Particulate Matter). The Proposed Action would not increase capacity on local roadways and is not likely to meaningfully increase emissions of air pollutants. Therefore, the project would be considered a Project with Low Potential MSAT Effects.

The qualitative assessment presented is prepared in accordance with the FHWA Updated Interim Guidance on Mobile Source Air Toxic Analysis found at: **https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/**. FHWA guidance provides specific language to use for Projects with Low Potential MSAT effects which is used here, amended with project specific data:

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by FHWA entitled A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives, found at:

https://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.cfm.

Exposure Levels and Health Effects

Shortcomings in current techniques for exposure assessment and risk analysis preclude reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis. Research into the health impacts of MSAT is ongoing. For the different MSAT emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses. Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at **http://www.epa.gov/iris**. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.

- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- **Diesel exhaust (DE**) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impact Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in mobile source air toxic MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air

Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, **Integrated Risk Information System**). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). A number of HEI studies are summarized in Appendix D of FHWA's Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI Special Report 16, **Mobile-Source Air Toxics: A Critical Review of the Literature on Exposure and Health Effects**) or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (Special Report 16, **Mobile-Source Air Toxics: A Critical Review of the Literature on Exposure and Health Effects**). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA states that with respect to diesel engine exhaust, "[t]he absence of adequate data to

develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk (EPA IRIS database, Diesel Engine Exhaust, Section II.C. **https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0642.htm#quainhal**)."

There is also lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable (**Integrated Risk Information System - Diesel engine exhaust**).

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based Upon Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted

with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

Project Specific MSAT Discussion

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSAT at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSAT, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the Proposed Action Alternatives.

The FDA project falls into the category of a project that facilitates new development that may generate additional MSAT emissions from new trips, truck deliveries, and parked vehicles. Many of these activities will be attracted from elsewhere in the Washington DC metropolitan region. Thus, on a regional scale, there will be a minimal net change in emissions. Moreover, EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. Based on regulations now in effect, an analysis of national trends with EPA's MOVES2014 model forecasts a combined reduction of over 90 percent in the total annual emissions rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 45 percent. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

3.2.2 Stationary Source Analysis

Development of the FDA Campus under the Proposed Action would increase energy demands and air pollutant emissions from the Central Utility Plant (CUP) and other on-site facilities to accommodate projected demands. Under each of the Proposed Action alternatives, the FDA Campus would be developed to include approximately 1.5 million GSF of office and special use space to support FDA's mission for a total of up to 6,717,734 GSF. Although the operational energy requirements of proposed buildings included in each of the three alternatives has not been developed, increases in electrical generation, cooling, and heating would be required. Energy generation requirements were conservatively estimated to increase in proportion to the square footage increase provided by each development alternative:

- Alternative A: 41.1% increase in energy generation.

- Alternative B: 42.6% increase in energy generation.
- Alternative C: 40.2% increase in energy generation.

The stationary source analyses include a New Source Review Applicability, a NAAQS Screening Modeling Assessment, and a Federal Conformity Analysis to address potential impacts from stationary source emissions related to the proposed 2018 FDA Master Plan. The analyses considered emissions from point sources on the FDA Campus, including stacks associated with boilers, turbines, and generators located within the CUP; five generators located outside of the CUP on the east side of the FDA Campus; and three boilers and two generators operated by the Air Force/Arnold Engineering Development (AEDC) Complex.

3.2.2.1 New Source Review Applicability

The purpose of New Source Review Analysis is to determine whether any of the Proposed Action Alternatives would be considered a new source of emissions. Based upon discussions with Honeywell, the existing CUP sources were designed to accommodate future development and would not need to operate beyond their maximum capacity under any of the Proposed Action Alternatives. Furthermore, the facility conforms to the SIP under each Proposed Action Alternative. Therefore, none of the Proposed Action Alternatives require a New Source Review Analysis.

3.2.2.2 NAAQS Screening Modeling Assessment

The ambient impacts of CO, NO_2, PM_{10}, $PM_{2.5}$, and SO_2 emitted from Proposed Action Alternatives were assessed in order to determine whether they would exceed the NAAQS using the EPA's AERMOD air dispersion model. AERMOD is a modeling system that predicts air dispersion and pollutant concentrations at receptor locations based on:

- Planetary boundary layer turbulence structure and scaling concepts using AERMET, a meteorological data preprocessor;
- Complex terrain using USGS Digital Elevation Data using AERMAP, a terrain data preprocessor;
- Building downwash effects on pollutant dispersion, using the Building Profile Input Program (BPIPPRM) that includes building coordinates, base elevations, and heights; and
- Characteristics of stacks associated with boilers, generators, turbines, and other emitters of air pollutants.

The stacks associated with the CUP and on the AEDC campus were modeled as point sources for each Proposed Action Alternative. The terrain, meteorological, and receptor data input into AERMOD to predict the concentrations of criteria pollutants in locations surrounding the FDA Campus for each Proposed Action Alternative were identical. Building locations, including

heights and elevations provided the only differentiation between alternative modeling scenarios. The AERMOD input and output files are available on the attached DVD.

Maximum modeled impacts of each criteria air pollutant were added to representative background concentrations to determine the total ambient impacts, which were compared with the NAAQS to determine compliance. Background concentrations of pollutants were obtained from the closest air quality monitoring site, in Beltsville, MD. The results of the NAAQS screening modeling for each of the Proposed Action Alternatives are presented in Tables 3-5 through 3-7.

There is little difference among alternatives as each alternative proposes a similar amount of new development (in terms of square feet). **Under the Proposed Action Alternatives, there would be no exceedances of the NAAQS for any criteria pollutants.**

Table 3-5. NAAQS Compliance Summary - Alternative A

Pollutant	Averaging Time	Modeled Maximum Incremental Impact (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS Concentration (µg/m³)
CO	1-hr	1204.48	1977.14	3181.62	40000
CO	8-hr	459.65	1111.11	1570.76	10000
NO_2	1-hr	77.52	75.39	152.91	188
NO_2	Annual	4.28	15.04	19.32	100
PM_{10}	24-hr	23.46	26.67	50.13	150
$PM_{2.5}$	24-hr	2.98	16.63	19.61	35
$PM_{2.5}$	Annual	0.40	7.26	7.66	12
SO_2	1-hr	21.05	24.49	45.54	196
SO_2	3-hour	18.64	22.00	40.64	1300

Table 3-6. NAAQS Compliance Summary - Alternative B

Pollutant	Averaging Time	Modeled Maximum Incremental Impact (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS Concentration (µg/m³)
CO	1-hr	1207.18	1977.14	3184.32	40000
CO	8-hr	407.57	1111.11	1518.68	10000
NO_2	1-hr	89.34	75.39	164.73	188
NO_2	Annual	3.97	15.04	19.01	100
PM_{10}	24-hr	19.55	26.67	46.22	150
$PM_{2.5}$	24-hr	3.01	16.63	19.64	35
$PM_{2.5}$	Annual	0.37	7.26	7.63	12
SO_2	1-hr	21.23	24.49	45.72	196
SO_2	3-hour	18.79	22.00	40.79	1300

Table 3-7. NAAQS Compliance Summary - Alternative C

Pollutant	Averaging Time	Modeled Maximum Incremental Impact (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS Concentration (µg/m³)
CO	1-hr	1202.46	1977.14	3179.60	40000
CO	8-hr	405.22	1111.11	1516.33	10000
NO_2	1-hr	88.68	75.39	164.07	188
NO_2	Annual	3.95	15.04	18.99	100
PM_{10}	24-hr	19.41	26.67	46.08	150
$PM_{2.5}$	24-hr	2.96	16.63	19.59	35
$PM_{2.5}$	Annual	0.37	7.26	7.63	12
SO_2	1-hr	20.92	24.49	45.41	196
SO_2	3-hour	18.52	22.00	40.52	1300

3.2.2.3 General Conformity Analysis

As noted previously, the Washington, D.C. area is classified as marginal nonattainment for the 8-hour O_3 NAAQS. Specifically, Section 51.853 (b)(1) of the General Conformity Regulations stipulates that a general conformity determination is required for marginal O_3 nonattainment areas if O_3 precursors VOC and NO_x emissions exceed 100 tons per year.

As demonstrated in Table 3-8, emissions of all pollutants fall well below the General Conformity emission thresholds. As a result, a conformity determination is not required for any of the Proposed Action Alternatives.

Table 3-8. Annual Emissions of NO_x and VOCs (tpy) in Maintenance Areas

Alternative	NO_x	VOC
Alternative A	56.3	7.9
Alternative B	56.6	8.0
Alternative C	56.1	7.9
General Conformity Emission Threshold	100	100

Note: tpy = tons per year

3.2.3 Greenhouse Gas Analysis

GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases that trap heat in the atmosphere and contribute to global warming and climate change. The largest source of GHG emissions in the US is the burning of fossil fuels. GHGs are emitted by both mobile and stationary sources. Global warming and climate change are anticipated to result in increasing variability in weather, more severe storms, increasing sea level rise and storm surges, and public health effects ranging from heat stroke to respiratory problems and increased risk of Lyme Disease.

Under existing conditions, the stationary emissions sources on the FDA Campus, including the CUP and the boilers and generators on the Air Force/AEDC property, emit approximately 141,507 metric tons of carbon dioxide equivalent ($MTCO_2Eq$) of GHGs. The 2014 CUP expansion was planned to accommodate future growth of the FDA Campus. Although there would be an increase in the amount of space and personnel, no new stationary emissions sources such as boilers, turbines, or generators, would be constructed to support any of the Master Plan Alternatives. The exact power demand to provide heating, cooling, and electricity to the new campus facilities associated with each development alternative have not yet been developed. Without specific power demand data, the same conservative assumptions were made for this analysis as were made for the stationary source criteria pollutant ambient impact analysis; increases in emissions would occur proportionally to the increase in building square footage. In reality, this is not likely to be the case because some portion of the square footage increase would be in the form of unheated/uncooled spaces such as parking garages.

Table 3-9 provides the estimated emissions of GHGs. Greenhouse gas emissions are calculated by adding the carbon dioxide equivalent (Co_2e) of each of the component greenhouse gases (CO_2, CH_4, and N_2O). The GHG emissions under each Action alternative would be similar to those of the No Action Alternative, where no additional development would occur. The increases in GHG emissions from vehicles traveling on the roads around the FDA Campus are

anticipated to be minimal under each Action alternative. Therefore, the implementation of the Master Plan would result in a slight increase in stationary and mobile source GHG emissions.

Table 3-9. Greenhouse Gas Emissions (Co2e) for Proposed Action Alternatives

Alternative	Estimated Emissions (tpy)				
	CO_2	CH_4	N_2O	CO_2e	CO_2e (metric tpy)
No Action	155,659	2.95	0.85	155,662	141,215
Alternative A	216,924	4.12	1.18	216,929	196,795
Alternative B	218,671	4.16	1.19	218,676	198,380
Alternative C	215,611	4.10	1.17	215,616	195,603

Note: tpy = tons per year

Emissions associated with the Proposed Action Alternatives would result in minor overall increases in GHGs. Increases are directly related to consolidation of employees from other FDA facilities. Although data is not available to estimate GHG emissions at these other facilities, overall GHG emissions at FDA facilities are likely to decrease as a result of consolidation of FDA employees at the FDA Campus. These decreases cannot be quantified until design is complete.

By 2025, GSA has a goal to reduce GHG emissions by 73 percent from 2008 levels. To meet this goal in facility development, GSA's 2014 CUP expansion was accomplished using Energy Savings Performance Contracts (EPSCs) and incorporated energy efficiencies including 20 megawatts of cogeneration, integrated plant controls, building automation systems, and 2,100 square feet of solar photovoltaic arrays (Honeywell 2012) that reduce overall energy consumption and GHG emissions associated with the burning of fossil fuels. GSA plans to use alternative "clean" fuels and non-polluting sources of energy whenever possible; minimize power generation requirements; and use green building materials, construction methods, and building designs to the maximum extent practicable. GSA will continue to implement its annual sustainability goals, including GHG reduction through improving building energy efficiency, and installing advanced and renewable energy technologies.

3.2.4 Construction Impacts

Air quality may be temporarily impacted by construction activities. Fugitive dust would be generated during the demolition of existing structures, site grading, construction, wind erosion, and vehicular activities. Emissions from construction equipment including earth-moving equipment, demolition equipment, and paving equipment, would generate criteria pollutants and hazardous pollutants. The intensity, duration, location, and type of construction activity would vary over time. These impacts could be considered significant, even on a temporary basis, if the local construction regulations and best management practice (BMP) control measures are not implemented. GSA would comply with BMPs outlined in the Maryland

regulations during construction, ensuring that there would be minimal temporary construction-related impacts.

3.2.5 Indirect and Cumulative Impacts

Air pollutant emissions associated with the development on the FDA Campus are not anticipated to affect the overall health, welfare, or financial base of the communities within the vicinity of the campus. Therefore, no indirect impacts to air quality would occur under the development alternatives.

Past, present, and future development within the Washington, DC metropolitan region would continue to produce additional traffic and new emission sources, which would cumulatively affect air quality. Development of any of the Proposed Action Alternatives would result in additional emissions. However, newer vehicles and building mechanical equipment operate with cleaner systems reducing overall emissions and the potential effect new sources of emissions would have on air quality.

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Appendix E – Memorandum of Agreement

MEMORANDUM OF AGREEMENT AMONG THE GENERAL SERVICES ADMINISTRATION, FOOD AND DRU G ADMINISTRATION, THE MARYLAND STATE HISTORIC PRESERVATION OFFICE, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE FOOD AND DRUG ADMINISTRATION CONSOLIDATION PROJECT AT WHITE OAK, MARYLAND

This Memorandum of Agreement (MOA) amends and replaces the Memorandum of Agreement, dated December 5, 2000, for the Food and Drug Administration consolidation Project at White Oak, Maryland. The effective date of this MOA is the latest date of execution by any signatory hereto.

WHEREAS, the General Services Administration (GSA) has received $146 million in Federal appropriations to design and build Phase I and II and to design Phase III of a five phase consolidation of 2.3 million square feet of laboratory and office space for the Food and Drug Administration (FDA) in the greater Washington, D.C. area, including over 6,500 employees, on 130 acres of the former U.S. Navy property currently administered as the Federal Research Center by the General Services Administration (GSA) at White Oak in Silver Spring, Maryland, and will request additional funding to construct subsequent phases of the Project from 2002 through completion (Project); and

WHEREAS, the overall design of the Project including the placement of laboratories, office buildings, and support facilities associated with the Center for Drug Evaluation and Research (CDER), the Center for Devices and Radiological Health (CDRH), the Center for Biologics Evaluation and Research (CBER), Office of the Commissioner (OC), and Office of Regulatory Affairs (ORA), is governed by the FDA Consolidation Revised Master Plan submitted by GSA and FDA to the National Capital Planning Commission for review on June 6, 2002, (attached as appendix 1-A); and

WHEREAS, this undertaking, which is the Project, will be constructed according to the general plan included in the FDA Consolidation Revised Master Plan, dated March 8, 2002, as seen in Appendix 1-A; and

WHEREAS, GSA, in its role as a custodian of the Federal Research Center and manager is assuming historic preservation responsibilities on behalf of FDA under 36 CFR Part 800; and

WHEREAS, GSA has received a separate $10 million Federal appropriation to be used for demolition of buildings within the 130 acre Project area to facilitate construction of the Project; and

WHEREAS, GSA has determined that this undertaking will have an effect on the U.S. Naval Ordnance Laboratory (NOL) Historic District, a property that lies within the Federal Research Center and is eligible for inclusion in the National Register of Historic Places, and has consulted with the Maryland State Historic Preservation Office (MD SHPO) and the Advisory Council on Historic Preservation (Council) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, through additional research and consultation, the planted buffer (1200 feet in depth, from the center line of New Hampshire Avenue to the front of the closest building of the U.S. NOL Historic District), established in 1945 to protect the Naval Ordnance Laboratory from electronic and other incursion, and to protect the surrounding residential community from what was considered an industrial facility, is determined to be a contributing element within the U.S. NOL Historic District, GSA will determine the effect of future Project phases on this buffer, and if the effect is found to be adverse, continue the consultation process to avoid or minimize the Project's effect, if possible, on this contributing element within the historic district. As a result of the Master Plan revisions, two buildings will be located in the historic buffer to create a forecourt with the remaining portion of Building One (the remaining portion of Building One is represented in Appendix 1-B). This forecourt will provide a space for the location of the redesigned circle, outdoor garden in honor of WOL achievements, and flagpole. Consultation with the MD SHPO, the Council, FDA, WOLAA and LABQUEST has been conducted and is the basis for the revisions to this MOA; and

WHEREAS, a number of umbrella citizen and related historic preservation groups, including LABQUEST and the White Oak Laboratory Alumni Association, Inc. (WOLAA) have participated in the consultation and have been invited to concur in this MOA. The LABQUEST Resolution concerning the revised Master Plan is included in this amended MOA as Appendix 3; and

NOW THEREFORE, GSA, FDA, the MD SHPO, the Council, WOLAA and LABQUEST agree that the undertaking shall be administered in accordance with the following stipulations to satisfy GSA's and FDA's Section 106 responsibilities for all aspects of the Project.

STIPULATIONS

The GSA and the FDA will ensure that the following measures are carried out:

I. ADMINISTRATION

A. The GSA shall ensure that in completing the necessary provisions of this MOA that it will employ or contract with the appropriate qualified professionals who meet *The Secretary of Interior's Professional Qualifications Standards* at 36 CFR 61 (Professional Qualifications).

II. RETENTION OF CONTRIBUTING RESOURCES

The GSA will retain the following contributing resources: the remaining portion of Building One as depicted in Appendix 1-B, the fire station portion of Building 100, and the flagpole within a redesigned circle to be located in the new forecourt. It should be noted that the wings of Building One will be not be preserved and will be removed. It should also be noted that the front entrance of the remaining portion of Building One will be modified to provide a visitor's entrance from the basement underneath the current entry steps and decks. The main lobby of Building One will be preserved. The remaining portion of Building One and the Fire House portion of Building 100 are represented in Appendix 1-B.

III. RECORDATION

A. Prior to demolition or alteration of any of the contributing buildings in the NOL Historic District, the GSA shall ensure that each of these buildings are documented to Historic American Buildings Survey (HABS)/Historic American Engineering
(HAER) standards. The GSA will contact the National Park Service (NPS) to determine the level and kind of documentation required:

> Ms. Kathleen Catalano Milley, National Park Service, Philadelphia Support Office, U.S. Custom House, 200 Chestnut Street, 3rd Floor, Philadelphia, PA 19106

B. All documentation must be accepted by the NPS. The GSA will notify the Advisory Council and the MD SHPO of HABS/HAER documentation acceptance, prior to the demolition and/or alteration of the contributing buildings. Copies of the HABS/HAER documentation will be provided to the MD SHPO and to the Montgomery County Historical Society within thirty (30) days of acceptance of the HABS/HAER documentation by NPS.

IV. ARCHITECTURAL SALVAGE

A. Prior to implementation of Project activities involving the demolition of the wings of Building One and the demolition of Buildings 2, 3, and 4 (scheduled for demolition in 2002), and the demolition of Building 5 (scheduled for demolition in 2005), GSA shall determine whether any architectural or decorative elements, such as wood wall paneling, flooring, fireplace mantles, granite stairs and marble may be salvaged for possible re-use.

B. To determine which elements are salvaged, GSA will conduct an on-site inspection of Buildings 1, 2, 3, 4, and 5 with representatives of the MD SHPO to identify elements that may be potential candidates for salvage. The WOLAA has provided GSA and the MD SHPO with an updated candidate list of items to be

considered for architectural salvage. The previous and updated lists are provided in Appendix 4.

C. Prior to the implementation of this MOA it has been determined that such architectural elements do exist. The GSA will submit a salvage plan to the MD SHPO including an inventory of all the elements that it proposes to salvage, the manner in which they will be salvaged, and how they will be stored and eventually used. Within 20 days, the MD SHPO will provide its review comments in writing to the GSA. WOLAA and LABQUEST will be invited to review this plan and provide comments to GSA and WOLAA. GSA shall ensure that any elements that are removed are done so in a manner that minimizes damage. Following their removal, GSA shall further ensure that all salvaged elements are properly secured from vandalism and weather until such time as they can be used.

V. DESIGN REVIEW

A. All design elements of the Food and Drug Administration Consolidation at White Oak will conform to the March 2002 revised master plan as seen in Appendix 1-A, with the understanding that specific design elements may be modified and/or refined over time.

B. GSA will submit to the MD SHPO the proposed design plans for all phases of the project to ensure that the design of the proposed buildings will be compatible with neighboring historic buildings in terms of their height, scale, massing, and materials.

C. GSA shall ensure that the rehabilitation of remaining portion of Building One including its exterior and interior, any new construction added to the building, and all site improvements surrounding the building will adhere to *The Secretary of the Interior's Standards for the Treatment of Historic Properties*. Key character-defining features, as more fully described in Appendix 2, will be retained "in situ." Appendix 2, Character-defining features, has been amended to include notes regarding the exclusion of elements that will no longer be retained due to the removal of the wings of Building One.

D. Prior to any alteration of Building One, GSA will prepare a Historic Building Preservation Plan (HBPP) reflecting these character-defining features, according to GSA's approach described in "Historic Building Preservation Plan – Comprehensive Building Report" (1992). GSA will ensure that the MD SHPO is invited to review and comment on the HBPP and will request comments from LABQUEST and WOLAA that will be forwarded to the MD SHPO.

E. GSA shall further ensure that the GSA's Project Architect will submit to the MD SHPO for its review and comment complete Project plans and specifications for the rehabilitation of the remaining portion of Building One including its exterior (which includes new entries at the sides and a new basement entry way for visitors under the front of the existing main entrance) and interior (which includes a memorial room for the WOL achievements), any new construction added to the building including plans for the redesigned entrance and canopy, all site improvements surrounding the remaining portion Building One, and the approved commemoration and interpretation plan referenced in stipulation VI.-B. GSA's Project Architect will submit such plans to the MD SHPO at the schematic and at the 30 percent design development levels of completion. GSA will also ensure that the MD SHPO is invited to participate in a multi-agency review of the design at the approximately 75 percent level of design development. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

F. GSA shall ensure that the exterior rehabilitation of the fire station portion of Building 100 will adhere to *The Secretary of the Interior's Standards for the Treatment of Historic Properties*. Prior to any alteration of the fire station, GSA will prepare a Historic Building Preservation Plan according to GSA's approach for the preparation of such reports, as referenced in Stipulation V. C above. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

G. GSA shall further ensure that the Project Architect will submit to the Maryland SHPO for its review and comment Project plans and specifications for the exterior rehabilitation of the fire station portion of Building 100. GSA's Project Architect will submit such plans at the schematic and at 30 percent design development levels of completion. GSA will also ensure that the MD SHPO is invited to participate in a multi-agency review of the design at the approximately 75 percent level of design development. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

H. GSA will also submit a copy of the proposed landscaping plan for the entire Project site to the MD SHPO for review and comment. The GSA will submit these plans for review and comment at a 30 percent and 75 percent level of design development. GSA will request comments from LABQUEST and WOLAA, and such comments if any, will be forwarded to the MD SHPO. LABQUEST and WOLAA will provide such comments to GSA in a timely manner.

VI. COMMEMORATION AND INTERPRETATION/EDUCATION ACTIVITIES

A. Within one month of effective date of this MOA, the GSA shall form a committee to guide the development of a plan for the commemoration and interpretation of the history of the NOL and its personnel. At a minimum, the committee will include representatives of the following: GSA, FDA, the MD SHPO, LABQUEST, and the WOLAA.

B. Development of the commemoration and interpretation plan (Plan) will be guided by principles included in the National Register Bulletin "Telling the Stories: Planning Effective Interpretive Programs for Properties Listed in the National Register of Historic Places" (2000), the NPS's "Planning for Interpretation and the Visitor Experience" (1998), and the National Park Service's Director's Order # 28 "Cultural Resource Management Guideline" (1997). Components of this Plan will be passive, i.e. not staffed, rather than active (i.e., staffed). These components will be limited to indoor exhibits, exterior exhibits and signs, publications (e.g., brochures) and may include indoor exhibits, exterior exhibits and signs, publications (e.g., brochures), and electronic media (e.g., web page).

C. The GSA shall ensure that the Plan will be developed within three to six months of the affective date of the MOA. One portion of the Plan will outline how a commemorative area for the White Oak Laboratory personnel should be developed. The Plan will provide details about an outdoor garden and indoor memorial space, and about the number, type, and content of interpretive panels to be erected in the commemoration. The interpretive section of the Plan will outline how artifacts associated with the property, including salvaged architectural elements, tools, objects, and other historical source materials from the NOL Historic District along with the recordation photographs described in Stipulation III should be incorporated into an interpretive exhibit or exhibits. The Plan will also describe how information about the historic and architectural context of the NOL Historic District will be included in the interpretive exhibit or exhibits. The plan for an indoor memorial space will be prepared to include public access to the remaining portion of Building One.

D. The GSA shall ensure that the Plan incorporates recommendations about how related public education materials about the NOL will be developed including the The Legacy of the White Oak Laboratory book that was written by the White Oak History Corporation, published by the Naval Surface Warfare Center, Dahlgren Division, and printed by the Government Printing Office in 2000.

E. The GSA shall ensure that the Plan incorporates the recommendations of the committee such as in what buildings and spaces the commemorative exhibit or exhibits will be placed, what artifacts and other materials should be exhibited, and

exhibited, and how the public may gain access to the exhibit. GSA will coordinate the commemorative plan with other design programs, such as Art in Architecture.

F. The GSA shall notify the Council of the measures that will be taken to fulfill this stipulation and provide progress updates to the Council as work is completed.

G. The GSA shall ensure that the Plan will be installed prior to the completion of the Project.

VII. DISCOVERY

A. During the course of this undertaking, the GSA will ensure that the MD SHPO is informed of any newly identified potential historic properties discovered within the Project's area of potential effect during the construction. Potential historic properties are herein considered to be any building, structure, object, or archaeological site to which the National Register of Historic Places Criteria of Eligibility (36 CFR 60.4) has not already been applied. The GSA will not take any actions that would adversely affect such properties until such time as it has taken the following actions and resolved or mitigated all of its Section 106 responsibilities regarding such late-identified sites:

1. Upon notification that a potential historic site or object previously unidentified during the course of its Section 106 compliance has been identified within the undertaking's area of effect during the implementation of the undertaking, the GSA will undertake the steps outlined in 36 CFR 800.13(b through d) in order to ensure compliance with Section 106 of the National Historic Preservation Act.

2. In accordance with 36 CFR 800.13(b), the identification of additional, late-identified historic resources discovered during the implementation of the undertaking does not require the GSA to stop work on the overall undertaking, but to make reasonable efforts to avoid or minimize harm to the property until the requirements of 36 CFR 800.13 are met.

VIII. DISPUTE RESOLUTION

A. If the MD SHPO objects within 30 days to any plans and documents required pursuant to the terms of this MOA, the GSA shall consult with the MD SHPO and other Parties to resolve the objection. If the GSA determines that the objection cannot be resolved through consultation, the GSA shall forward all documentation relevant to the dispute to the Council. Within 30 days after receipt of pertinent documentation, the Council will either:

1. Provide the GSA with recommendations, which the GSA shall take into account in reaching a final decision regarding the dispute; or

2. Notify the GSA that it will comment pursuant to 36 CFR Part 800.6(b), and proceed to comment. Any Council comment provided in response to such a request will be taken into account by the GSA in accordance with 36 CFR Part 800.6(b)(2) with reference to the subject of the dispute.

3. Any recommendations or comment provided by the Council will be understood to pertain only to the subject of the dispute; the GSA's responsibility to carry out all actions under this MOA that are not the subject of the dispute will remain unchanged.

IX. REVIEW OF PUBLIC OBJECTIONS

A. At any time during implementation of the measures stipulated in this MOA, if any objection to any such measure or its manner of implementation be raised by a member of the public, LABQUEST, or WOLAA, the GSA shall take the objection into account, notify the MD SHPO of the objection, and consult as needed with the objecting party, the MD SHPO, and the Council to resolve the objection.

X. MONITORING AND REPORTING

A. The MD SHPO may monitor any activities carried out pursuant to this MOA and the Council may review any activities if requested. The GSA will cooperate with the MD SHPO and the Council if they request to monitor or to review Project files or visit Project sites for activities at specific Project sites.

B. The GSA shall provide the MD SHPO, LABQUEST, and WOLAA with a report that summarizes activities carried out under the terms of this MOA six (6) months from the effective date of the MOA's execution and again at one (1) year from the effective date of execution. Thereafter, the GSA shall provide the MD SHPO, LABQUEST and WOLAA with an annual report until completion of the Project. Reports shall include information regarding preservation activities, information on any public objections and their status, any other activities undertaken pursuant to this MOA, and information on overall project funding and construction phases.

XI. RECORD KEEPING

A. The GSA shall maintain records of all activities undertaken pursuant to this MOA which shall become part of the Environmental Review Record for the Project including:

1. All records related to the selection of professionals who perform the work stipulated in the provisions of this MOA, in order to clearly document adherence to the Professional Qualifications (36 CFR 61);

2. All records of correspondence and findings letters provided by the MD SHPO to the GSA;

3. All records indicating all mitigation measures taken in accordance with the provisions of this MOA;

4. All records related to consultations GSA has with the MD SHPO and/or the Advisory Council following the ratification of this MOA;

5. All records of public comments received during public hearings and written or telephonic comments received from the public at all other times; and

6. All of the above records shall be maintained for a minimum of three (3) years after completion of the Project and shall be made available to the general public and additional parties with a demonstrated interest in the undertaking upon request during this time frame.

XII. AMENDMENTS

A. Any party to this MOA may request that it be amended or modified, whereupon the GSA, the SHPO, and the Council will consult in accordance with 36 CFR Part 800.6(c) (7) & (8) to consider such revisions.

B. Any resulting amendments or modifications shall be developed and executed among GSA, FDA, the MD SHPO, the Council, LABQUEST, and WOLAA in the same manner as this MOA.

XIII. TERMINATION

FDA, GSA, the Council and the MD SHPO may terminate the MOA by providing thirty (30) days notice to the other Parties, provided that the Parties to the MOA will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination.

XIV. FAILURE TO COMPLY WITH THIS AGREEMENT

In the event that the GSA does not carry out the terms of this MOA, the GSA will comply with 36 CFR Parts 800.4 through 800.6 with regard to individual undertakings covered by this MOA.

XV. SUNSET

Provisions of this MOA will be carried out from the date of execution of this MOA through completion of the FDA Consolidation.

XVI. COMPLIANCE WITH 106

Execution of this MOA by the GSA, FDA, the MD SHPO, and the Council, and the implementation of its terms by GSA, evidence that GSA and FDA have afforded the Council an opportunity to comment on the proposed FDA Consolidation Project and its effects on historic properties, that the GSA and FDA have taken into account the effects of the proposed Project on historic properties, and that GSA has complied with Section 106.

GENERAL SERVICES ADMINISTRATION

By: _____
Anthony E. Costa
Assistant Regional Administrator

Date: 2 July 202

FOOD AND DRUG ADMINISTRATION

By: _____
Jeffrey M. Weber
Senior Associate Commissioner for Management and Systems

Date: 7/2/02

MARYLAND STATE HISTORIC PRESERVATION OFFICE

By: _____
J. Rodney Little
Maryland State Historic Preservation Officer

Date: 7-3-02

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: _____
John Fowler
Executive Director

Date: 7/10/02

CONCURRING PARTIES

LABQUEST

By: M. J. Levin
Meyer J. Levin
Date: 7/02/02

WHITE OAK LABORATORY ALUMNI ASSOCIATION, INC

By: James Trost
M. John Tino
Date: 7/2/02

APPENDIX 1

- **A. Revised Master Plan (May 2002)**
- **B. Site Plan depicting the Remaining Portion of Building One and the Fire Station Portion of Building 100**

APPENDIX 2

- **Character-Defining features-amended**

APPENDIX 3

- **LABQUEST Resolution**

APPENDIX 4

- **WOLAA updated candidate list for architectural salvage**
- **WOLAA original candidate list for architectural salvage**

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APPENDIX F – Listing of Historic Resources within the Naval Ordnance Laboratory

Historic Resources in the FRC

The Federal Research Center encompasses the majority of the former Naval Ordnance Laboratory (NOL)/Naval Surface Warfare Center (NSWC) in Silver Spring, Maryland. In 1997, 662 acres of the 710 acre site were transferred to the General Services Administration, with the balance retained by the Department of Defense. Beginning in 2001, 130 acres of the western portion were redeveloped for the U.S. Food and Drug Administration. The Federal Research Center is surrounded by suburban residential suburbs, with a commercial development located to the northwest.

The landscape of the Federal Research Center is characterized by buildings spatially oriented in clusters around the campus, separated by a variety of pine and hardwood forested areas, wooded stream valleys, and grassy meadow areas. The Navy Department deliberately sited buildings in clusters to provide isolation for testing explosives and magnetic materials. With the exception of the administrative (100) area, this heavily wooded character was maintained throughout the campus' history from its initial development beginning in 1945.

The White Oak campus of the NOL/NSWC was acquired by the Navy Department in 1944. The major construction phase for the facility took place from 1945 to 1954, with other buildings added up to 1994. Below is a summary of the buildings and landscape in each main area of the campus. The area designations are based on their historic numbers and functions.

Area 100: Administration

Also known as the "Front Area," Area 100 was the main administrative area and laboratory complex. It was also the visual landmark for the campus and the most visible area from outside the complex. The main Administration building (Building 1) was the public face of facility, with an approach road centered on the flagpole from the USS Maine. The 100 area had the largest and most close-set group of buildings on the campus, and also the most open area historically. A golf course set between the front of the complex and New Hampshire Avenue provided a physical and visual buffer and also served as a recreational area for employees. The 100 area was redeveloped under the 2000 and 2002 Memoranda of Agreement for the US Food and Drug Administration. Four contributing historic resources remain: Buildings 1 and 100 (the firehouse), the flagpole, and the historic golf course. The majority of the remaining buildings were documented and removed according to the terms of the MOAs. A few non-contributing buildings remain on the eastern end of the 100 area. This area remains relatively open, with scattered trees throughout and more thickly wooded areas at the north and south ends of the golf course.

Facility Number	Facility Name	Year Built	Contributing /Non-Contributing	Documentation	Removed
	Golf Course	1952	C		
1	Administration Building-Lab Base	1945	C	HAER 2003	
2	North Laboratory	1945	C	HAER 2003	Removed - Phase 1
3	South Laboratory	1945	C	HAER 2003	Removed - Phase 1
4	East Laboratory	1945	C	HAER 2003	Removed - Phase 1
5	Cafeteria/Auditorium	1949	C	HAER 2003	Removed - Phase 1

6	Flagpoles	1946	C		
9	Comfort Station	1960	C		
10	Underground Pumping Station	1966	C		Removed - Phase 1
11	Underground Pumping Station	1970	C		Removed - Phase 1
13	Covered Walkway South	1947	C		Removed - Phase 1
14	Covered Walkway North	1947	C		Removed - Phase 1
16	Sentry House	1948	C		Removed - Phase 1
17	Sentry House	1948	C		Removed - Phase 1
19	Construction Office/Sentry House	1949	C	HAER 2003	Removed - Phase 1
20	Materials Laboratory	1946	C	HAER 2003	Removed - Phase 1
21	Security Office	1948	C	HAER 2003	Removed - Phase 1
22	Scale House	1946	C	HAER 2003	Removed - Phase 1
23	Sentry House	1948	C		Removed - Phase 1
24	Magnetic Materials Lab	1950	C	HAER 2003	Removed - Phase 1
25	Technical-Public Works Shop	1947	C	HAER 2003	Removed - Phase 1
26	Rubber Processing Lab	1946	C	HAER 2003	Removed - Phase 1
27	Storage/Packaging	1951	C		Removed - Phase 1
28	Underwater Weapons Assembly	1954	C		Removed - Phase 1
29	Ordnance Assembly Building	1952	C		Removed - Phase 1
30	Explosive Laboratory	1947	C	HAER 2003	Removed - Phase 1
35	Sot Storage Area	1967	C		
36	Storage Pad	1967	C		Removed - Phase 1
40	Fuze-Wave Trace Laboratory	1950	C	HAER 2003	Removed - Phase 1
41	Acoustics Laboratory	1950	C	HAER 2003	Removed - Phase 1
45	Softball Field	1951	C		
47	Tennis Court	1948	C		
70	X-Ray and Plastics Lab	1947	C	HAER 2003	Removed - Phase 1
71	Laboratory-Technical Shop	1946	C	HAER 2003	Removed - Phase 1
72	Lumber Storage	1948	C	HAER 2003	Removed - Phase 1
73	Paint and Oil Storage	1949	C	HAER 2003	Removed - Phase 1
75	Refrigerated Storage	1950	C	HAER 2003	
76	Refrigerated Storage	1950	C		
77	General Storage	1952	C		Removed - Phase 1
78	Solvent Storage Building	1962	C		
90	Underwater Weapons Lab.	1946	C	HAER 2003	Removed - Phase 1
92	Storage	1951	C		
93	Transformer Station for 90	1958	C		Removed - Phase 1
95	Wind Direction Indicator	1972	C		
100	Garage-Fire House	1946	C	HAER 2003	
101	Boiler Plant	1945	C	HAER 2003	Removed - Phase 1
104	Pest Control Office	1945	C	HAER 2003	

108	Incinerator Building	1946	C	HAER 2003	
109	Vehicle-Equipment Shed	1949	C	HAER 2003	Removed - Phase 1
110	Vehicle-Equipment Shed	1949	C	HAER 2003	Removed - Phase 1
111	Equipment Shed	1952	C		Removed - Phase 1
112	Storage Building	1951	C		Removed - Phase 1
113	Storage Building	1951	C		Removed - Phase 1
114	Concrete sand and gravel pits.	1954	C		
115	Storage Shed PW Maintenance	1960	C		
116	Transformer Station for 101A	1949	C		
117	Heating Fuel Pump House	1964	C		Removed - Phase 1
101-A	Storage Building	1949	C	HAER 2003	Removed - Phase 1
T14	Salvage Shed	1946	C	HAER 2003	Removed – Phase 1
T30	Storage Building	1947	C	HAER 2003	Removed - Phase 1
T32	Pest Control Building	1948	C	HAER 2003	
T48	Welding Shed	1960	C		Removed - Phase 1

Area 200: Magnetics Testing

Located west of Area 100, the Magnetics testing area is a small complex of historic buildings and structures flanked by tributaries of the Paint Branch. This area was isolated in order to prevent interference with the magnetic and radio wave testing that took place here. Constructed entirely of earthen blocks to prevent metallic interference, the buildings were designed both for utility in housing equipment and testing functions and to present a uniform appearance. The majority of the historic buildings and structures remain in the 200 area. Historically the area was heavily wooded, with access via one road (Bowditch Road), and it retains this quality, although trees are encroaching farther into the core of the complex than they did while it was a working facility.

Facility Number	Facility Name	Year Built	Contributing /Non-Contributing	Documentation	Removed
202	Standard Lab	1946	C	HAER 2003	
203	Spherical Field Lab	1946	C	HAER 2003	
204	Long Field Laboratory	1946	C	HAER 2003	
205	Large Projects Laboratory	1945	C	HAER 2003	
206	Model Laboratory	1945	C	HAER 2003	
207	Antenna Range Building	1945	C	HAER 2003	
208	Solenoid Lab	1947	C	HAER 2003	
209	Gradhelm Laboratory	1947	C		
210	Balance Lab	1947	C	HAER 2003	
212	Antenna Range	1952	C		
213	Transformer Station for 201	1945	C		
214	Test Equip Storage Shed	1961	C		
215	Test Equip Storage Shed	1946	C	HAER 2003	

217	Hydroacoustics Facility	1973	C;IE*	HAER 2003	
219	Transformer Station for 217	1973	C		
201-1	Heating Fuel Storage	1945	C		

Area 300: *Explosives Area*

Much of the eastern end of the NOL was occupied by the Explosive Testing facilities. Of the 372 documented buildings and structures on the campus in 1997, just under half (160) were located in the 300 area. These included explosive magazines, fabrication and testing facilities, and various support structures. Two main roads, Isherwood and Monroe Loop, wound through the facility, with spur roads and turnouts along both. Unsurprisingly, the buildings and structures in this area were widely spaced to provide safety while testing was underway. The explosives testing facilities utilized the steeply sloping topography in this area to nestle explosive magazines into hillsides for further protection. Spatially, the area was historically composed of larger open building areas separated by wooded clumps.

The majority of the buildings and structures in the 300 area were removed under the provisions of a 2003 Memorandum of Agreement. Vegetation has encroached into many of the formerly open areas, although traces of roads and building areas are still evident in parts of the landscape.

Facility Number	Facility Name	Year Built	Contributing /Non-Contributing	Documentation	Removed
301	Repetitive Impact Test Facility	1946	C	HAER 2003	Removed under 2003 MOA
302	Storage	1946	C	HAER 2003	Removed under 2003 MOA
303	Temp & Humidity Test Facility	1945	C	HAER 2003	Removed under 2003 MOA
304	Explosives Pressing/Mechanical Properties Lab	1948	C	HAER 2003	Removed under 2003 MOA
305	Explosives Casting/Physical Properties Lab	1948	C	HAER 2003	Removed under 2003 MOA
306	Vibration Test Facility	1948	C	HAER 2003	Removed under 2003 MOA
307	Warheads Operations	1948	C		Removed under 2003 MOA
308	Countermeasure Development	1948	C		Removed under 2003 MOA
311	Explosives Chemistry Lab	1948	C	HAER 2003	Removed under 2003 MOA
312	XPL Quality Control Lab	1948	C		Removed under 2003 MOA
313	Health Physics Building/Receiving	1948	C		Removed under 2003 MOA
315	Bombproof: Detonation Physics/Warhead Research.	1948	C	HAER 2003	Removed under 2003 MOA
316	Charge Assembly Building	1948	C	HAER 2003	Removed under 2003 MOA
317	Bombproof: Fragment Impact Lab	1948	C	HAER 2003	Removed under 2003 MOA
318	Explosives Pressing/Machining	1948	C	HAER 2003	Removed under

	Building				2003 MOA
319	Detonation Research Operations	1948	C		Removed under 2003 MOA
321	Fracture Studies Laboratory	1949	C	HAER 2003	Removed under 2003 MOA
323	Explosives/Warheads Operations	1951	C	HAER 2003	Removed under 2003 MOA
324	Bombproof Detonation Physics	1950	C	HAER 2003	Removed under 2003 MOA
325	Bombproof: Sensitivities Studies	1951	C		Removed under 2003 MOA
327	Bombproof Initiation Research	1984	C;IE*	HAER 2003	
328	Ignition Research lab	1951	C		Removed under 2003 MOA
331	Bombproof booster tests	1950	C	HAER 2003	Removed under 2003 MOA
332	Bombproof: Control Building	1956	C		Removed under 2003 MOA
333	Propellant Research Building	1950	C	HAER 2003	Removed under 2003 MOA
334	Vacuum Tank Facility	1950	C	HAER 2003	Removed under 2003 MOA
336	Explosion Damage/Nuclear Effects Lab	1949	C;IE*	HAER 2003	Removed under 2003 MOA
338	Explosive Magazine	1950	C	HAER 2003	Removed under 2003 MOA
339	Detonator/Lead Test Facility	1950	C	HAER 2003	Removed under 2003 MOA
340	HI Press Physics & Spec Lab	1953	C		Removed under 2003 MOA
343	Chemical Laboratory	1953	C		Removed under 2003 MOA
344	Physical Properties Lab	1953	C		Removed under 2003 MOA
348	Sensitivities Study Operations	1948	C		Removed under 2003 MOA
351	Explosives Magazine	1951	C		Removed under 2003 MOA
352	Explosives Magazine	1951	C		Removed under 2003 MOA
353	Explosives Magazine	1951	C		Removed under 2003 MOA
356	Explosives Magazine	1945	C		Removed under 2003 MOA
357	Explosives Magazine	1945	C		Removed under 2003 MOA
358	Explosives Magazine	1945	C		Removed under 2003 MOA
359	Explosives Magazine	1945	C		Removed under 2003 MOA
360	Explosives Magazine	1945	C		Removed under 2003 MOA
362	Explosives Magazine	1953	C	HAER 2003	Removed under 2003 MOA
363	Fuse Evaluation Facility	1952	C		Removed under 2003 MOA
364	Explosives Magazine	1949	C	HAER 2003	Removed under 2003 MOA
365	Building 365 Transformer Station	1952	C		
366	Explosives Magazine	1954	C		Removed under 2003 MOA

367	Well House	1945	C	HAER 2003	Removed under 2003 MOA
368	Boiler House	1953	C		Removed under 2003 MOA
369	Temp & Humidity Test Facility	1963	C		Removed under 2003 MOA
372	Mechanical Output Test Building	1955	C		Removed under 2003 MOA
373	Control House for 372	1955	C		Removed under 2003 MOA
375	Altitude Blast Chamber	1959	C		Removed under 2003 MOA
379	V T Fuze Instrumentation Lab	1959	C		Removed under 2003 MOA
381	Transformer Station for 301	1946	C		Removed under 2003 MOA
382	Target Preparation lab	1960	C		Removed under 2003 MOA
383	Conical Shock Tube	1961	C		Removed under 2003 MOA
385	Storage Building	1945	C	HAER 2003	Removed under 2003 MOA
386	Charge Assembly & Conditioning Building	1962	C		Removed under 2003 MOA
387	Hi/Gravity/Tank Centrifuge Pit	1963	C		Removed under 2003 MOA
388	Hi/Gravity/Tank Centrifuge Control	1963	C		
389	Hi/Gravity/Tank Centrifuge Storage	1963	C		
390	Explosive Conditioning	1948	C		Removed under 2003 MOA
391	Storage Building	1964	C		Removed under 2003 MOA
392	Firing Shield	1948	C	HAER 2003	Removed under 2003 MOA
304-1	Storage Shed 304	1959	C		Removed under 2003 MOA
304-3	Chemical Storage Shed	1950	C	HAER 2003	Removed under 2003 MOA
304-4	Chemical Storage Shed	1950	C		Removed under 2003 MOA
305-3	Test Equip Storage 305	1965	C		Removed under 2003 MOA
305-A	Boiler House	1948	C		Removed under 2003 MOA
306-A	Storage	1949	C	HAER 2003	Removed under 2003 MOA
306-B	Boiler House	1948	C		Removed under 2003 MOA
307-A	Boiler House	1948	C		Removed under 2003 MOA
308-A	Boiler House	1948	C		Removed under 2003 MOA
309-A	Boiler House	1948	C		Removed under 2003 MOA
310-A	Chemical Laboratory	1948	C	HAER 2003	Removed under 2003 MOA
310-B	Instrument Laboratory	1948	C	HAER 2003	Removed under 2003 MOA
310-C	Chemical Storage/Boiler	1948	C		Removed under

					2003 MOA
310-D	Chemical/Equipment Storage	1948	C	HAER 2003	Removed under 2003 MOA
311-1	Test Equip Storage 311	1949	C	HAER 2003	Removed under 2003 MOA
312-1	Storage Shed	1958	C		Removed under 2003 MOA
312-2	Chemical Chamber-312	1958	C		Removed under 2003 MOA
312-3	Storage Shed	1958	C		Removed under 2003 MOA
312-A	Compressor Building	1948	C	HAER 2003	Removed under 2003 MOA
312-B	Boiler House	1952	C		Removed under 2003 MOA
313-1	Storage	1948	C		Removed under 2003 MOA
313-A	Boiler House	1955	C		Removed under 2003 MOA
314-2	Storage Trailer	1968	C		Removed under 2003 MOA
315-A	Boiler House	1948	C		Removed under 2003 MOA
317-1	Component Fabrication Storage	1948	C		Removed under 2003 MOA
318-1	Explosives Temp Controlled Magazine	1958	C		Removed under 2003 MOA
319-1	Storage Shed	1950	C	HAER 2003	Removed under 2003 MOA
319-A	Boiler House	1948	C		Removed under 2003 MOA
321-1	Test Equip Storage 324	1950	C	HAER 2003	Removed under 2003 MOA
324-1	Storage Shed (503)	1948	C	HAER 2003	Removed under 2003 MOA
324-A	Boiler House	1950	C		Removed under 2003 MOA
328-3	Service Magazine	1951	C		Removed under 2003 MOA
332-1	Chemical Chamber-332	1950	C	HAER 2003	Removed under 2003 MOA
333-1	Office Annex to Building 333	1968	C		Removed under 2003 MOA
335-1	Explosive Processing Bays	1950	C		Removed under 2003 MOA
335-2	Explosive Processing Bays	1950	C		Removed under 2003 MOA
335-3	Inert Storage	1950	C		Removed under 2003 MOA
335-A	Boiler House-335-1-2	1950	C		Removed under 2003 MOA
336-1	Storage for 336	1966	C		Removed under 2003 MOA
339-1	Bottle Storage Shelter-339	1962	C	HAER 2003	Removed under 2003 MOA
339-2	Bottle Gas Storage	1950	C		Removed under 2003 MOA
348-1	Shop	1950	C	HAER 2003	Removed under 2003 MOA
348-2	Sensitivities Study Operations Trailer	C.1970	C		Removed under 2003 MOA

369-1	Hi-Cap Surveillance Barricade	1951	C		Removed under 2003 MOA
387-1	Battery Storage	1963	C		Removed under 2003 MOA
T27	Storage	1947	C	HAER 2003	Removed under 2003 MOA
T28	XPL Preparation/Packing/Gatehouse	1946	C	HAER 2003	Removed under 2003 MOA
T35	Explosives receiving and shipping.	1949	C	HAER 2003	Removed under 2003 MOA

Area 400: *Ballistics Area*

East of the 100 area and north of the 200 area lies Area 400, a densely packed cluster of buildings and structures. Constructed largely between the 1950s and 1970s, this largely intact group of historic resources housed technical facilities related to hydro- and aerodynamic testing, including underwater tanks and wind tunnels. Historically, the area was relatively open between the adjacent Perimeter and Dahlgren Roads. There were wooded areas to the east and south, including the Paint Branch, but to the west an open corridor visually connected this area to the main administrative complex (Area 100). Currently owned and operated by the United States Air Force as the Arnold Engineering Development Center (AEDC)-White Oak, the 400 area remains relatively open at its core, but has lost the visual connection with Area 100 (now the FDA complex) and has more wooded vegetation at its perimeter.

Facility Number	Facility Name	Year Built	Contributing /Non-Contributing	Documentation	Removed
401	1000Ft Hyperballistics Range	1958	C		
402	Supersonic Wind Tunnel Building	1947	C	HAER 2003	
403	Continuous Wind Tunnel Building	1950	C	HAER 2003	
404	Substation Building	1949	C		
405	Combat Systems Integration Lab	1948	C	HAER 2003	
407	HP Vertical Bottle Pit	1955	C		
408	HP Horizontal Bottle Pit	1955	C		
409	Undersea Weapons Tank	1956	C	HAER 2003	
410	Tank Filtration Plant	1956	C		
411	ACFT/Flight RD&T Building	1958	C		
416	Building 406 Transformer Station	1957	C		
417	Air Conditioning Pad	C.1970	C		
418	Air Conditioning Plant for 402 & 40	1946	C		
419	Transformer Station for 402	1949	C		
420	Transformer Station for 403	1950	C		
421	Transformer Station for 409	1956	C		
422	Dahlgren Rd Bridge Steel	1916	C		
423	Bridge Wooden	1945	C		
424	3 Megawatt Arc Tunnel	1961	C		
425	Substation	1949	C	HAER 2003	
426	Transformer Station for 424	1961	C		
427	Hydroballistics Tank	1966	C	HAER 2003	
428	Hydroballistics Water Storage T	1966	C	HAER 2003	
429	Sup Nit Facility Bottle Pit	1965	C		
430	Hypervelocity Wind Tunnel #9	1972	C;IE*	HAER 2003	
431	Tunnel 9 Vacuum Sphere	1970	C;IE*	HAER 2003	
433	Shelter Grass Cutting	1972	C		
435	Substation Building	1970	C	HAER 2003	

Area 500: Hazardous Storage and Disposal

At the extreme northeastern edge of the FRC campus and just north of the 300 area is Area 500. Historically, the NOL used this area for the storage and disposal of hazardous materials and chemicals. The landscape was characterized by several large open areas surrounded by woods; successional growth is now moving into the formerly open areas. Of the five buildings and structures in this area listed on the 1997 DOE, only two buildings were classified as contributing. One was removed soon after, and the second was reclassified as non-contributing due to lack of integrity. There are no historic resources in the 500 area.

Area 600: Shock Testing

The 600 area is located between Area 300 to the east and the Paint Branch just to the west. Its facilities were located in clusters set in small open areas aligned along Kuester Road, the largest of which was at the southern end of the road. The remainder of the area was heavily wooded. Historically, the 600 area was used for shock testing of weapons.

The majority of the approximately 25 buildings and structures in the 600 area were removed under the provisions of a 2003 Memorandum of Agreement. Vegetation has encroached into many of the formerly open areas, although traces of roads and building areas are still evident in parts of the landscape.

Facility Number	Facility Name	Year Built	Contributing /Non-Contributing	Documentation	Removed
613	Hi Energy Materials Process Development	1965	C		Removed under 2003 MOA
614	Transformer Station for 613	1965	C		Removed under 2003 MOA
615	Hazardous Machining/Blending	1966	C		Removed under 2003 MOA
620	Explosives Casting Building	1973	C		Removed under 2003 MOA
613-1	Fuel Storage for 613	1966	C		Removed under 2003 MOA
613-2	Oxidizer Storage for 613	1966	C		Removed under 2003 MOA
613-3	Solvent Storage for 613	1966	C		Removed under 2003 MOA
613-5	Curing Test Equip for 613	1966	C		Removed under 2003 MOA
619-1	Fuels Storage Building	1973	C		Removed under 2003 MOA
619-2	Oxidizer Storage Building	1973	C		Removed under 2003 MOA
620-1	Transformer For Building 620	1973	C		Removed under 2003 MOA
T26	Storage	1947	C		Removed under 2003 MOA

Area 700: Hazardous Storage and Disposal

At the extreme southeastern edge of the NOL campus was Area 700. Like the 500 area, historically the NOL used this area for the storage and disposal of hazardous materials and chemicals. The landscape was characterized by a large open areas surrounded by woods. The buildings and structures in the 700 area were all built after the period of significance and were classified as non-contributing in the 1997 DOE. Most of the 700 area is now outside the FRC boundaries and portions have been redeveloped. There are no historic resources in the 700 area.

Miscellaneous

Several resources were listed in the 1998 inventory as contributing. They do not have facility numbers and it is unclear where they are located and what their current status is. These include:

Facility Number	Facility Name	Year Built	Contributing /Non-Contributing	Documentation	Removed
	"Doghouse"	ca. 1950	C		
	Small Arms Firing Test Range	Unknown	C		
	Pond	1951	C		
	Un-numbered building near Pond	ca. 1950	C		