ASBESTOS-CONTAINING MATERIALS SURVEY REPORT

FOR

NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR
GOLDEN GATE NATIONAL RECREATION AREA
SAN FRANCISCO, CALIFORNIA

Prepared For:

NATIONAL PARK SERVICE
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SEPTEMBER 28, 2012

MACTEC Project Number 6141-10-0320

MACTEC

engineering and constructing a better tomorrow

September 28, 2012

Mr. Carl Wang
National Park Service
1201 Eye Street NW, 10th Floor
Washington, DC 20006

Subject: **Asbestos-Containing Materials Survey Report**
Golden Gate National Recreation Area
San Francisco, California
MACTEC Project 6141-10-0320

Mr. Wang:

MACTEC Engineering and Consulting, Inc. is pleased to submit this Asbestos-Containing Materials Survey Report for the subject Park. Our services were ordered on September 22, 2010 under requisition number R2420100218 of task order T2420100218 for contract GS-10F-0157K between MACTEC and the National Park Service.

This report presents a general description of the Park, a summary of previous asbestos related data, summary of suspect asbestos-containing materials observed, a summary of bulk sample collection and analyses, a discussion of results and recommendations, and an opinion of asbestos abatement cost.

MACTEC appreciates the opportunity to provide asbestos consulting services to the National Park Service. Should questions arise concerning this report or if we may be of further service please call us.

MACTEC Engineering and Consulting, Inc.

Don E. Harman
Senior Engineer

For Don E. Harman
with permission

Tod A. Dawson
Principal Scientist

Cc: Tony Di Stefano, GOGA

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1.0 EXECUTIVE SUMMARY

The National Park Service (NPS) contracted MACTEC Engineering and Consulting, Inc. (MACTEC) to provide asbestos assessment services at select Parks to assist NPS with establishing an Asbestos Assessment Program (AAP). The intent of the AAP is to evaluate and supplement existing asbestos related data to assist NPS with complying with existing applicable Federal, State and local regulations related to asbestos. The AAP will provide objective data related to the impact of asbestos-containing materials (ACM) for the planning and execution of future maintenance, renovation, construction, and demolition efforts related to Park facilities. Additionally, information obtained through the asbestos assessment and survey effort will be used by the NPS Washington Support Office to compile the necessary data to respond to the Federal Accounting Standards Advisory Board Technical Bulletin 2006-1, *Recognition and Measurement of Asbestos-Related Cleanup Costs.*

The site specific asbestos survey assessment of Golden Gate National Recreation Area, in San Francisco, California was performed between May of 2011 and June of 2012. The asbestos survey and sampling was performed by accredited asbestos inspector from MACTEC. Asbestos surveys were performed on 465 buildings/structures at the Park.

During the interview with the NPS representative, it was learned that the building list provided to MACTEC by NPS included one hundred structures that have either yet to be constructed, no longer at the site or not currently operated by NPS. These one hundred buildings were not surveyed. Thirty-eight structures not on the building list provided to MACTEC by NPS were also included in the survey.

During the survey efforts, 5,657 bulk samples were collected of suspect asbestos-containing materials. These samples were analyzed by a laboratory accredited by the National Voluntary Laboratory Accreditation Program. The samples were analyzed by polarized light microscopy and reported as percent asbestos in each sample.

The survey located asbestos-containing materials in 312 buildings. The asbestos-containing materials were assessed to be either damaged or undamaged during the time of the survey. MACTEC recommends that the materials judged to be damaged be removed. Additionally, it is recommended that due to the likely significant mobilization costs to the site, that all asbestos-containing materials be removed at that time.

Due to the lack of existing data/information, no previous asbestos related expenses were identified. The current asbestos related expenses are $731,255. The opinion of cost for asbestos cleanup is estimated to be $7,291,148.

2.0 BACKGROUND INFORMATION

The National Park Service (NPS) contracted MACTEC Engineering and Consulting, Inc. (MACTEC) to provide asbestos assessment services at select Parks to assist NPS with establishing an Asbestos Assessment Program (AAP). The intent of the AAP is to evaluate and supplement existing asbestos related data to assist NPS with complying with existing applicable Federal, State, and local regulations related to asbestos. The AAP will provide objective data related to the impact of asbestos-containing materials (ACM) for the planning and execution of future maintenance, renovation, construction, and demolition efforts related to Park facilities. Additionally, information obtained through the asbestos assessment and survey effort will be used by the NPS Washington Support Office to compile the necessary data to respond to the Federal Accounting Standards Advisory Board Technical Bulletin 2006-1, *Recognition and Measurement of Asbestos-Related Cleanup Costs.*

The scope of work for this project included asbestos related survey and assessment efforts to evaluate existing survey information and perform supplemental sampling as necessary to comply with established sampling guidance and protocols. The asbestos survey process included a review of existing asbestos survey information (if provided), an interview of appropriate Park site personnel, visual surveys of readily accessible interior and exterior areas of the various structures to locate suspect ACM, and the collection and laboratory analyses of bulk samples of located suspect ACM.

Following identification, delineation, and quantification of ACM within structures at the Park, an opinion of abatement cost was prepared for each structure where ACM was located and summarized for the Park as a whole. To the extent possible, the opinion of costs included asbestos-related costs incurred by the Park to date when documentation of the expenditure of funds was provided for review. However, when documentation of actual costs was not provided, these expenditures were not reported.

2.1 FACILITY DESCRIPTION

The Golden Gate National Recreation Area (GOGA) is located in San Francisco, California. NPS initially reported to MACTEC that 527 structures were present at the Park. During the interview with the Tony Di Stefano, it was learned that one hundred structures were either yet to be constructed, no longer at the site or not currently operated by NPS. Assessments and surveys were not performed for these one hundred structures. Thirty-eight structures not on the building list provided to MACTEC by NPS were also included in the survey. Therefore, 465 structures were surveyed for ACM. Appendix A provides a summary of the buildings included in the survey.

3.0 SUMMARY OF REVIEW OF EXISTING DATA AND INTERVIEW OF ON-SITE PERSONNEL

MACTEC requested and, when provided by NPS, reviewed general types of asbestos information as follows:

1. Information related to the construction of facilities and structures at the site. The intent of this review was to gain an understanding if asbestos was specified and/or installed during construction.

2. Existing asbestos survey data, asbestos Operations and Maintenance Programs, and other asbestos related information. The intent of the review was to gain an understanding of the scope and extent of previous survey efforts including locations, quantities and condition of previously located ACM and non-ACM. The purpose of reviewing this information would be to assess the need for supplemental sampling and analyses.

3. Previous asbestos abatement actions or monitoring. The purpose of reviewing previous asbestos abatement efforts and evaluation of replacement materials was to assess the need for supplemental sampling and analyses.

4. Information related to any previous expenditure of funds related to asbestos for the above referenced information. The purpose of reviewing this information was to provide NPS with a summary of past asbestos-related costs.

5. Information obtained from interviews of onsite personnel familiar with the history of the Park's construction and operation. The purpose of the interviews was to obtain pertinent information related to building construction/materials, previous and current uses, and previous or planned renovations/modifications to the facilities.

3.1 INTERVIEW OF ONSITE PERSONNEL

MACTEC interviewed Tony Di Stefano, while onsite. During a review of the list of Park buildings, Mr. Di Stefano stated that the Eickenhorst House (14418), Conte House (14420), Jones House (14421), Conrati House (14422), Building 1100 Marine Mammal Center FC-1100 (42009), Building 1101 Marine Mammal Center FC-1101 (42010), Building 1103 Marine Mammal Center FC-1103 (42011), Building FB-511 (42083), Garage FB-691 (42120), Quarters 500 FB-500 (43260), Quarters 504 FB-504 (43261), Quarters 508 FB-508 (43262), Quarters 512 FB-512 (43263), Quarters 516 FB-516 (43264), Quarters 520 FB-520 (43265), Quarters 521 FB-521 (43266), Quarters 524 FB-524 (43267), Quarters 525 FB-525 (43268), Quarters 528 FB-528 (43269), Quarters 532 FB-532 (43270), Quarters 535 FB-535 (43271), Quarters 536 FB-536 (43272), Quarters 539 FB-539 (43273), Shed FB-515 (43292), House at Ranger Station – Bettencourt House (43386), Winkelmans House (43427), Building 1132 Marine Mammal Center FC-1132

(59438), Banducci Ranch Arbor #2 (80677), Quarters 540 FB-540 (87488), Quarters 544 FB-544 (89522), Quarters 548 FB-548 (89780), Building 555 FB-555 (92156), Building 538 FB-538 (92160), Quarters #12 SB-14 (14431), Quarters #13 SB-15 (14432), Shed 817A (87911), Shed 817B (87912), Quarters 817 FA-817 (89158) structures had been removed from the site or demolished. Additionally, Mr. Di Stefano stated that the Slide Ranch Commons (80793) was under current construction at the time of the survey. During the interview, Mr. Di Stefano stated that there were no other immediate plans for renovation or demolition at the GOGA Park.

3.2 REVIEW OF PREVIOUS ASBESTOS-RELATED INFORMATION

No asbestos related documents were provided. MACTEC was informed by NPS personnel that no previous asbestos related data or information for the Park exists.

4.0 SURVEY OF SUSPECT ASBESTOS-CONTAINING MATERIALS SCOPE

The United States Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA) have published regulations, guidelines, and recommendations regarding inspection and sampling for installed ACM. These regulations, guidelines, and recommendations were adhered to as appropriate within the scope of this survey. Further, the California Division of Occupational Safety and Health (Cal/OSHA) has promulgated a state regulation that defines asbestos-containing construction material (ACCM) as any manufactured construction material that contains more than one-tenth of one percent (0.1%) asbestos by weight. MACTEC's survey addressed the requirements of OSHA's Asbestos Standard for Construction and USEPA's Asbestos Standard for Demolition and Renovation, which are contained in the National Emission Standards for Hazardous Air Pollutants (NESHAP), as well as applicable requirements for the State of California.

Current EPA and OSHA guidelines allow accredited asbestos Inspectors to categorize certain materials as non-suspect asbestos-containing materials based on visual evaluation. Examples of these non-suspect ACM include fiberglass, rubber, Styrofoam©, cork, foam glass, wood, concrete, glass, and metal. MACTEC did not inventory, sample, or otherwise assess these non-suspect materials when encountered.

Current EPA and OSHA guidelines allow accredited asbestos Inspectors to assume suspect materials contain asbestos. MACTEC's survey protocol relative to NPS facilities included sampling and analyses of composite shingled roof materials, where safe access could be obtained. However, in order to preserve the integrity of roofing systems, when roofing materials other than composite shingled materials were observed, these suspect materials were assumed to be ACM.

4.1 Visual Survey

The visual survey consisted of a walk-through of each structure included to be surveyed at the Park to locate, inventory, quantify and document the condition of suspect ACM. The survey efforts included reasonably accessible interior and exterior areas of each structure at the Park. Destructive evaluation was not performed to evaluate for concealed suspect ACM located beneath multiple layers of flooring, within wall/ceiling cavities and/or chases, or other locations that were not readily accessible. Suspect materials observed during the survey were grouped into "homogeneous materials". A homogeneous material is one that appears to be uniform in color and texture and appears to have been applied or installed during the same general time period. Homogeneous materials can be friable or nonfriable. Friable materials are those that when dry can be crumbled, pulverized or reduced to powder by hand pressure. Nonfriable materials are those which when dry cannot be crumbled, pulverized or reduced to powder by hand pressure. Nonfriable materials can become friable when they are disturbed, become deteriorated, or are aggressively contacted.

For reference, MACTEC developed room designations during our visual survey. Each room, area, or groups of rooms were assigned a unique (arbitrary) number. For the purposes of this survey effort, a room is a discrete area within the surveyed structure that may correspond to physical rooms (e.g., doors and walls), a discrete space (e.g., mezzanine or roof), or other identifiable space such as a department, suite, or group of rooms. When drawings for a building/structure were not provided by NPS, MACTEC may have designated an entire building as a single room and referenced areas/rooms within that building/structure based on the physical lay-out of the structure (i.e., northwest office, entrance, storage, kitchen, restroom, etc.).

4.2 Methodology

When supplemental sampling and analyses were performed, representative bulk samples (some with multiple layers) were collected of homogeneous suspect asbestos-containing materials located during the visual survey. The sampling was performed in general accordance with the sampling requirements of the Asbestos Hazard Emergency Response Act (AHERA) regulation [40 CFR 763.86] for each homogeneous material. The bulk samples were sealed in airtight containers, labeled, and delivered to Forensic Analytical Laboratories, Inc. National Voluntary Laboratory Accreditation Program (NVLAP) and California Environmental Laboratory Accreditation Program (ELAP) accredited laboratory in Hayward, California. Samples were analyzed for asbestos content by Polarized Light Microscopy (PLM) in general accordance with EPA method 600/R-93/116.

4.3 Existing Data

There was no existing data or information related to asbestos provided to MACTEC for this Park.

4.4 Supplemental Sample Collection and Analysis

Sampling and analyses of suspect asbestos-containing materials were performed. The asbestos survey and sample collection were performed by Don Harman of MACTEC. Mr. Harman is an accredited asbestos Inspector and California Certified Asbestos Consultant (CAC); evidence of accreditation is provided in Appendix E. The site evaluation services were performed between May of 2011 and June of 2012.

A total of 5,657 samples were collected from structures at the Park. All samples were analyzed by PLM with limited additional analytical evaluation by PLM Point Count. The additional evaluation identified ACCM in eleven buildings. ACCM included: White Window Glazing (38276, 38295, 42013, 43422, 80489, 80673 and 86027), Tan Resilient Sheet Flooring (38353), Beige Circular Pattern Resilient Sheet Flooring (38353), Gray Resilient Sheet Flooring (38353 and 38371), Brown Resilient Sheet Flooring (38353), Light Gray Window Glazing (38378), and White Plaster (43432).

5.0 FINDINGS

The detailed findings of the survey are provided in the tables, appendices, and attachments following the body of this report. Each of these sections is presented by building name and NPS building identification number and is described below. Refer to these sections for detailed information associated with the materials located during the survey efforts.

Table 1.0 - Summary of Suspect ACM Observed includes the following for each material observed during our survey:

- Homogeneous material identification number;
- A physical description of each suspect ACM observed;
- The associated substrate or component and associated building system;
- The AHERA category (material type), and;
- Suspect Material Classification (previously sampled, sampled, assumed).

Table 2.0 - Summary of Identified ACM includes the following for each ACM material:

- Homogeneous material identification number;
- A physical description of the ACM located;
- The associated substrate or component and associated building system;
- The AHERA category (material type);
- Documentation of friability, and;
- Material classification.

Appendix A – Building Summary:

- Presents a picture of the building/structure (if available);
- Building number and name (as defined by NPS);
- Building use;
- Building size;
- Construction date;
- Reference to ACM;
- Asbestos related costs.

Appendix B – Non-ACM Detail and Photographs:

- Building/structure identification number;
- A representative photograph of the non-ACM homogeneous material;
- The information summarized in Table 1, and;
- Bulk sample information including sample location and sample results.

Appendix C - ACM Detail and Photographs:

- Building/structure identification number;
- A representative photograph of the ACM homogeneous material;
- The information summarized in Table 2, and;
- Bulk sample information including sample location, sample results, homogeneous material locations, quantity and condition.

Laboratory results of bulk samples are included in Appendix D. Inspector and Laboratory Accreditations and Certifications are included in Appendix E.

5.1 LOCATED ACM

Asbestos-containing in the following buildings: Garage FB 541 (100405), Battery Spenor Admin Building FB 705a (108224), Battery Spenor Equip Room FB 705b (108225), Battery Spenor Sandy Sat FB 705d (108227), Battery Spenor latrine (108228), Battery Spena Power House FB 705e (108266), Lime Point Fog Signal Station (111054), Lt. Gr Shed @ FM: lay (111242), BADM Building 1003 (116385), BADM #567A (116386), Guard Tower SB-7 (14424), Snack Bar SB (14425), South Restroom SB-8 (14435), Central R/R SB-9 (14438), North R/R SB-10 (14442), Kiosk SB-6 (14446), Healing Arts Center FB-568 (226106), Building 100 FF-100 (38069), Building 01 FF-101Q (38070), LE Offices FF-104 (38072), Building 206 Hang Glider Building (38073), Cliff House (38099), Quarters 21 Octagon House SA-14 (38103), Well House Gazebo SH-007 (38123), OCBE Maint. Office FI304 (38140), Amari Youth Hostel Dorm FM-240 (38234), Bay Grounds Shop FM-112 (38244), Building 33 FM-33 (38248), Building 34 FM-34 (38250), Building 35 FM-35 (38252), Building 36 FM-36 (38254), Building 37 FM-37 (38255), Building 38 FM-38 (38257), Building 39 FM-39 (38258), Building A Lower Ft. Mason FM-308 (38259), Building B Lower Ft. Mason FM-310 (38262), Building C Lower Ft. Mason FM-312 (38263), Building D Lower Ft. Mason FM-314 (38264), Garage FM-5 (38275), GOGA Headquarters FM-201 (38276), GOG SPUG FM-204 (38277), Guard Station FM-303 (38280), Laundry FM-32 (38281), Main Switching Station FM-248 (38286), Officer's Nest Course FM-1 (38289), Pier 1 Shed Lower Ft. Mason FM-317 (38295), Pier 2 Shed Lower Ft. Mason FM-319 (38298), Pier 3 Shed Lower Ft. Mason FM-321 (38300), Projects Offices FM-101 (38305), Quarter #2 – Brooks FM-2 (38307), Quarter #3 – Haskell FM-3 (38308), Quarter #4 – Palmer Fm-4 (38309), Quarter #7 FM-7 (38310), Quarter 41 FM-41 (38311), Quarter #42 FM-42 (38312), Quarter #43 FM-43 (38313), Quarter #44 FM-44 (38314), Quarter #46 FM-46 (38316), Quarter #48 FM-48 (38318), Quarter #49 FM-49 (38319), Quarter #50 FM-50 (38320), Quarters 231 FM-231 (38321), Quarters 232 FM-232 (38322), Quarters 234 FM-234 (38323), Quarters 235 FM-235 (38324), Quarters 238 FM-238 (38325), Quarters 239 Fm-239 (38326), SFCC FM-102 (38337), Barracks AL-64 (38353), Electric Shop Al-89 (38356), Guardhouse AL-22 (38371), Model Industries Building AL-82 (38376), Morgue AL-12 (38377), New Parson Industries AL-84 (38378), Prison/Cell Block AL-68 (38383), Quartermaster AL-79 (38384), Storage Vault AL-218 (38395), Fog Signal Building PB-002 (40751), Lighthouse Point Benito PB-001 (40755), Quarters 17 PB-008 (40758), Quarters 18 PB-009 (40759), Quarters 19 PB-010 (40760), NIKE Test Building FA-963 (40771), American Youth Hostel FA-941 (40772), American Youth Hostel FA-937 (40774), Balloon Hanger FA-905 (40778), Headlands Center for Arts FA-940 (40815), Headlands Center for Arts FA-944 (40816), Headlands Center for Arts FA-945 (40817), Headlands Center for Arts FA-952 (40818), Headlands Center for Arts FA-961 (40820), Headlands Center for Arts FA-962 (40821), Headlands Institute FA-936 (40822), Lift Station Capehart FA-840 (40823), Lift Station Horse Stable FA-841 (40824), Lift Station Rodeo Lake FA-931 (40825), NIKE Paint Storage FA-972 (40831), NIKE Sentry Station FA-970 (40832), Quarters 806 FA-806 (40847), Quarters 810 FA-810 (40854), Quarters 870 FA-870 (40899), Range Building FA-828 (40905), NIKE Generator Building FA-966 (41852), NIKE Sentry Station FA-976 (41857), NIKE Missile Warhead FA-967 (41861), Stable East FA-902 (41879), Stable West FA-

901 (41882), YMCA Dorm FA-984 (41966), YMCA Dorm FA-986 (41967), YMCA Kitchen FA-983 (41969), YMCA Offices FA-981 (41970), Headlands Int. Dorm FC-1010 (41979), Coast Lab FC-1011 (41980), Headlands Int. Kitchen FC-1012 (41981), Headlands Int. Dorm FC-1013 (41982), Building 1034 Dorm FC-1034 (41984), Building 1045 NPS Fire Station (41986), Conference Room HI FC-1054 (41989), Building 1056 Ranger Office FC-1056 (41991), Antenna Theater FC-1058 (41993), Building 1061 North.Res FC-1061 (41995), Building 1063 USS FC-1063 (41997), Building 1065 MMC FC-1065 (42000), Antenna Theater FC-1067 (42002), Building 1070 MPI B&G FC-1070 (42005), AHAFH Beach House FC-1073 (42007), Building 1104 MMC DC-1104 (42012), Building 1044 MMC Office FC-1044 (42013), Building 1106 FC-1106 (42014), Building 1107 FC-1107 (42015), Building 1111 NPS Storeroom FC-1111 (42016), Lift Station Fire House FA-1043 (42039), Building 1046 Marin Grounds Maint. Shop FC-1046 (42042), Main R&T Building FC-1109 (42048), Quarters 1042 NPS Dorm FC-1042 (42050), BADM Bakery FB-557 (42079), BADM Blacksmith FB-644 (42080), BADM Carpenter & Paint FB-645 (42081), BADM Commissary Storehouse FB-637 (42082), BADM Exhibition Hall BF-562 (42084), BADM Quartermaster FB-559 (42088), BADM Wagon Shed FB-561 (42089), Restaurant FB-602 (42099), Yacht Club FB-619 (42101), Electric Transformer Building FB-526 (42105), Enlisted Barracks FB-601 (42106), Enlisted Men's Barracks FB-507 (42107), Enlisted men's Barracks FB-636 (42108), Garage FB-534 (42116), Garage FB-543 (42117), Garage FB-545 (42118) , Garage FB-564 (42119), Marin B&U Operation FB-513 (43177), Hospital FB-533 (43214), Lift Station Shed yacht Club FB-659 (43217), Mine Cable Building FB-670 (43220), NCO mess FB-405 (43238), Officer Quarters FB-629 (43251), Ordinance Storehouse FB-666 (43252), Post Exchange & Gym FB-623 (43256), Post Hospital Garage FB-556 (43258), Quarters 549 FB-549 (43276), Sentry Station BF-272 (43290), Ship Repair Shop FB-699 (43293), Transformer Substation FB-502 (43298), USCG FB-633 (43300), USCG FB-655 (43301), USCG Pump House FB-671 (43302), Water Res. Building FB-572 (43309), Miwok Residence #1 TV-101 (43390), Miwok Stable TV-107 (43394), Muir Beach Vol. Fire Dept. MB-103 (43422), GG Dairy House MB-101 (43424), GG Dairy Shed MB-105 (43426), Quarters 2 MB-1 (43432), Quarters 11 (43433), Main R&T Flammable (56653), Marina RT Comp & Steam Cleaner FC-1121 (56657), Building 942 Ft. Barry (59437), Fire Station & Transformer FM-309 (63643), Fort Funston Pump House FF-105 (63883), American Youth Hostel FM-241 (65005), Residence @ Shelldance SN-1 (80472), Greenhouse #1 SN-16 (80475), Building at Shelldance SN-7 (80485), Office s @ Shelldance (80489), Garage @ Shelldance SN-5 (80492), Banducci Farm House (80667), Banducci Ranch Bunkhouse #1 (80668), Banducci Ranch Bunkhouse #2 (80670), Banducci Ranch Parking/Cooler (80672), Banducci Ranch Garage/Shop (80673), Banducci Ranch Implement Shed (80675), Slide Ranch Residence #3 (80769), Slide Ranch Residence #6 (80772), Slide Ranch Haybarn House (80787), Slide Ranch Ocean House (80789), Slide Ranch Elf House (80792), Slide Ranch Great Hall (80799), Greenhouse SN-10 (86025), Greenhouse SN-8 (86026), Greenhouse SN-11 (86027), Greenhouse SN-12 (86037), Shed for 800A (87902), Shed for 800B (87904), Shed for 805A (87905), Shed for 805B (87906), Shed for 808A (87907), Shed for 808B (87908), Shed for 809A (87909), Shed for 809B (87910), Shed for 818A (87913), Shed for 813B (87914), Shed for 870 (87915), Shed for 807B (87916), Shed for 816B (87917), Shed for 818B (87918), Shed for 815B (87919), Shed for 804A (87921), Shed for 804B (87922), Shed for 806 (87925), Shed for 807A (87926), Shed for 829B (87927), Shed for 866A (87929), Shed for 866B (87930), Shed for 811A (87933), Shed for 811B (87934), Shed for 818B (87935), Shed for 812A (87936), Shed for 816A (87937), Shed for 810 (87938), Shed for 858A (87939), Shed for 858B (87940), Shed for 862A (87941), Shed for 862B (87942), Shed for 821A (87943), Shed for 821B (87944), Shed for 837A (87945), Shed for 842A (87946), Shed for 842B (87947), Shed for 813A (87948), Shed for 815A (87949), Shed for 854A (87950), Shed for 854B (87951), Shed for 833A (87952), Shed for 834A (87954), Shed for 834B (87955), Shed for 825A (87956), Shed for 825B (87957), Shed for 829A (87958), Shed for 832A (87959), Shed for 832B (87960), Shed for838A (87961), Shed for 838B (87962), Shed for 846A (87963), Shed for 846B (87964), Shed for 850A (87965), Shed for 850B (87966), Shed for 812B (87967), Quarters FA-955 (88000), Quarters FA-956 (88003), Quarters 934 FA-934 (88886), Building 939 FA-939 (88887), Quarters 800 FA-800 (89145), Quarters 801 (89146), Quarters 804 FA-804 (89147), Quarters 805 FA-805 (89148), Quarters 807 FA-807 (89149), Quarters 808 Fa-808 (89151), Quarters 809 FA-809 (89152), Quarters 811 FA-811 (89153), Quarters 812 FA-812 (89154),

Quarters 813 FA-813 (89155), Quarters 815 FA-815 (89156), Quarters 816 FA-816 (89157), Quarters 818 FA-818 (89159), Quarters 821 FA-821 (89160), Quarters 825 FA-825 (89162), Quarters 829 FA-829 (89163), Quarters 832 FA-832 (89164), Quarters 833 FA-833 (89165), Quarters 834 FA-834 (89166), Quarters 837 FA-837 (89167), Quarters 842 FA-842 (89168), Quarters 846 FA-846 (89169), Quarters 850 FA-850 (89170), Quarters 854 FA-854 (89171), Quarters 858 FA-858 (89172), Quarters 862 FA-862 (89173), Quarters 866 FA-866 (89174), Quarters 838 FA-838 (89195), FM249 (Building A), Vacant Building – Hill 88 (Building AA), Vacant Building – Hill 88 (Building AB), Dormitory – Hill 88 (Building AC), MMC West Silo (Building AE), East Silo – Life Support (Building AF), Compressor Building FA-907 (Building AJ), Communications Van (Building G), Van (Building H), Storage Van NIKE (Building I), NIKE Van on Trailer (Building J), NIKE Van (Building K), NIKE Van (Building L), NIKE Van (Building M), NIKE Battery A (Building N), NIKE Battery B (Building O), Battery Spenor Tools & Rammers (Building P), Debris Pile #3 (Building R), Debris Pile Alcatraz #2 (Building S), Debris Pile Alcatraz #4 (Building V), Boathouse (Building X), Guard House – Hill 88 (Building Y). Please see Appendix C for the assessments of the asbestos-containing materials that were evaluated at the time of the survey.

6.0 OPINION OF ABATEMENT COSTS OF LOCATED ACM

6.1 PREVIOUS ASBESTOS-RELATED COSTS

Previous asbestos related data was not located or provided for the Park.

6.2 CURRENT ASBESTOS-CONTAINING MATERIAL CLEANUP AND MANAGEMENT

The cost to perform this survey at this Park, including analytical efforts, reporting, expenses, and management, is $731,255. This expense is provided in Appendix A and has been allocated proportionally by square feet per building/structure area.

6.3 FUTURE ASBESTOS-CONTAINING MATERIAL CLEANUP COSTS

The total estimated cost for the removal of ACM identified at this Park is $7,291,148. These expenses are provided by building in Appendix A. This total cleanup cost includes asbestos removal and disposal. The cost does not include management of the ACM prior to removal.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on findings presented in this report, MACTEC offers the following conclusions and recommendations:

1. Avoid disturbance of ACM presented in this report. Inadvertent or improper disturbance of ACM can create exposures to asbestos at or above the permissible exposure limits established by OSHA. MACTEC has recommended that the ACM at the site be managed in place. They should be included in an Asbestos Operations and Maintenance Program (O&M), which provides policies and work practices for the performance of work on or around asbestos-containing materials presented in Table 2. The O&M Program should contain the necessary elements to comply with and document compliance with the OSHA Asbestos General Industry Standard [29 CFR 1910.1001] and the OSHA Construction Asbestos Standard [29 CFR 1926.1101].

2. Prior to disturbing concrete masonry unit wall sections, MACTEC recommends that an accredited asbestos Inspector evaluate the wall system for the presence of vermiculite within the section of the wall to be disturbed. If vermiculite is located, representative bulk samples should be collected and appropriately analyzed to evaluate for asbestos in the vermiculite.

3. Prior to disturbing materials assumed to be ACM, MACTEC recommends that an accredited asbestos Inspector evaluate the materials and collect representative bulk samples if applicable to be appropriately analyzed to evaluate for asbestos content.

4. If any suspect materials are discovered that have not been addressed in this report, MACTEC recommends that work activities that may disturb the materials be halted and the materials be assumed to be asbestos-containing until an appropriate evaluation (which may include sampling and analysis) of the materials is performed by an accredited asbestos Inspector to confirm or rebut the presence of asbestos.

5. Due to the non-destructive nature of the survey performed by MACTEC, it may be necessary to perform additional destructive evaluations of areas of the facility prior to renovation and/or demolition activities. The additional evaluations should focus on locating materials that were concealed and not accessible during these survey activities.

6. Regulations require that ACM be removed and properly disposed of prior to demolition or renovation activities that disturb RACM. NESHAP Regulations also require a notification to be submitted 10 working days prior to any demolition project, regardless of the presence or absence of ACM. The OSHA Construction Standard and the EPA-NESHAP require that contractors have a "competent person" on site to identify and properly address unreported suspect asbestos that is discovered during renovation or demolition.

7. We recommend that the asbestos-containing materials be removed and disposed of prior to disturbance during the demolition/renovation efforts. The ACM removal should be performed by a qualified and licensed asbestos abatement contractor under controlled conditions. We recommend that the abatement be designed and monitored by a qualified asbestos consulting firm, not retained by the abatement contractor, to represent the builder's interest.

TABLES

TABLE 1.0 - SUMMARY OF SUSPECT ACM

Building 100405 - Garage FB 541

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.100405.001a	Window Glazing, White	Windows	Building Exterior	Misc.	Sampled
GOGA.100405.002a	Rolled Roofing, Red	Roof Deck	Roof	Misc.	Assumed ACM

Building 108224 - Battery Spenor Admin Bldg FB 705a

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.108224.001a	Flooring Adhesive, Brown, Residual	Concrete	Floor	Misc.	Assumed ACM

Building 108225 - Battery Spenor Equip Room FB 705b

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.108225.001a	Built-Up Roofing System Materials, Black	Roof Deck	Roof	Misc.	Assumed ACM

Building 108227 - Battery Spenor Sandy Sat FB705d

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.108227.001a	Built-Up Roofing System Materials, Black	Roof Deck	Roof	Misc.	Assumed ACM

Building 108228 - Battery Spenor Latrine

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.108228.001a	Built-Up Roofing System Materials, Black	Roof Deck	Roof	Misc.	Assumed ACM

TABLE 1.0 - SUMMARY OF SUSPECT ACM

Building 108266 - Battery Spena Power House FB 705e

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.108266.001a	Built-Up Roofing System Materials, Black	Roof Deck	Roof	Misc.	Assumed ACM

Building 108469 - Stovehouse Fort Baker (FB569)

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.108469.001a	Roofing Tar, Black	Wood	Roof	Misc.	Sampled

Building 111054 - Lime Point Fog Signal Station

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.111054.001a	Plaster Base Coats, Gray	Brick	Wall	Surfacing	Sampled
GOGA.111054.001b	Plaster Finish Coat, White	Brick	Wall	Surfacing	Sampled
GOGA.111054.002a	Floor Coating, Gray, Rust	Concrete	Floor	Misc.	Sampled
GOGA.111054.003a	Window Glazing, Light Gray	Windows	Building Exterior	Misc.	Sampled
GOGA.111054.004a	Rolled Roofing, Gray	Roof Deck	Roof	Misc.	Assumed ACM
GOGA.111054.005a	Stucco Material, Gray	Brick	Building Exterior	Surfacing	Sampled
GOGA.111054.006a	Roof Shingles, Gray	Roof Deck	Roof	Misc.	Assumed ACM

Building 111242 - Lt. Gr Shed @ FM: lay

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.111242.001a	Cement Board Siding, Light Green	Perimeter Wall	Building Exterior	Misc.	Sampled

TABLE 1.0 - SUMMARY OF SUSPECT ACM

Building 116385 - BADM Bldg 1003

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.116385.001a	Wallboard, White	Wall Studs	Wall	Misc.	Sampled
GOGA.116385.001b	Wallboard Joint Compound, White	Wall Studs	Wall	Misc.	Sampled
GOGA.116385.002a	Covebase, Beige	Wallboard	Wall	Misc.	Sampled
GOGA.116385.002b	Covebase Mastic, Beige	Wallboard	Wall	Misc.	Sampled
GOGA.116385.003a	Covebase, Dark Brown	Wallboard	Wall	Misc.	Sampled
GOGA.116385.003b	Covebase Mastic, Beige	Wallboard	Wall	Misc.	Sampled
GOGA.116385.004a	Sealant, Gray	Duct	HVAC	Misc.	Sampled
GOGA.116385.005a	Resilient Sheet Flooring, Beige	Wood	Floor	Misc.	Sampled
GOGA.116385.005b	Sheet Flooring Adhesive, Gray	Wood	Floor	Misc.	Sampled
GOGA.116385.006a	Covebase, Brown	Wallboard	Wall	Misc.	Sampled
GOGA.116385.006b	Covebase Mastic, Beige	Wallboard	Wall	Misc.	Sampled
GOGA.116385.007a	1' x 1' Ceiling Tile (Glued), White	Metal Grid	Ceiling	Misc.	Assumed ACM
GOGA.116385.007b	Ceiling Tile Adhesive, Concealed	Metal Grid	Ceiling	Misc.	Assumed ACM

Building 116386 - BADM # 567A

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.116386.001a	Wallboard, White	Wall Studs	Wall	Misc.	Sampled
GOGA.116386.001b	Wallboard Joint Compound, White	Wall Studs	Wall	Misc.	Sampled
GOGA.116386.002a	Stucco Material, Gray	Metal Grid	Building Exterior	Surfacing	Sampled
GOGA.116386.003a	Built-Up Roofing System Materials, Concealed	Roof Deck	Roof	Misc.	Assumed ACM

TABLE 1.0 - SUMMARY OF SUSPECT ACM

Building 14424 - Guard Tower SB-7

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.14424.001a	Wallboard, White	Wall Studs	Wall/Ceiling	Misc.	Sampled
GOGA.14424.001b	Wallboard Joint Compound, White	Wall Studs	Wall/Ceiling	Misc.	Sampled
GOGA.14424.002a	Resilient Sheet Flooring, Light Gray, Square Pattern	Wood	Floor	Misc.	Sampled
GOGA.14424.002b	Sheet Flooring Adhesive, Beige	Wood	Floor	Misc.	Sampled
GOGA.14424.003a	1' x 1' Ceiling Tile (Glued), White, Pindot	Wallboard	Ceiling	Misc.	Sampled
GOGA.14424.003b	Ceiling Tile Adhesive, Dark Brown	Wallboard	Ceiling	Misc.	Sampled
GOGA.14424.004a	Resilient Sheet Flooring, Beige	Wood	Floor	Misc.	Sampled
GOGA.14424.004b	Sheet Flooring Adhesive, Gray	Wood	Floor	Misc.	Sampled
GOGA.14424.005a	Covebase, Beige	Wallboard	Wall	Misc.	Sampled
GOGA.14424.005b	Covebase Mastic, Beige	Wallboard	Wall	Misc.	Sampled
GOGA.14424.006a	Stair Tread, Light Gray	Wood	Floor	Misc.	Sampled
GOGA.14424.006b	Stair Tread Mastic, Off White	Wood	Floor	Misc.	Sampled
GOGA.14424.007a	Resilient Sheet Flooring, Gray, Terrazo Pattern	Wood	Floor	Misc.	Sampled
GOGA.14424.007b	Sheet Flooring Adhesive, Light Gray	Wood	Floor	Misc.	Sampled
GOGA.14424.008a	Covebase, Black	Wallboard	Wall	Misc.	Sampled
GOGA.14424.008b	Covebase Mastic, Beige	Wallboard	Wall	Misc.	Sampled
GOGA.14424.009a	Built-Up Roofing System Materials, Gray	Roof Deck	Roof	Misc.	Assumed ACM
GOGA.14424.010a	Cement Board, Gray	Perimeter Wall	Building Exterior	Misc.	Sampled
GOGA.14424.011a	12" x 12" Floor Tile, Dark Brown	Wood	Floor	Misc.	Sampled
GOGA.14424.011b	Floor Tile Mastic, Beige	Wood	Floor	Misc.	Sampled

TABLE 1.0 - SUMMARY OF SUSPECT ACM

Building 14425 - Snack Bar SB

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.14425.001a	Wallboard, White	Wall Studs	Wall/Ceiling	Misc.	Sampled
GOGA.14425.001b	Wallboard Joint Compound, White	Wall Studs	Wall/Ceiling	Misc.	Sampled
GOGA.14425.002a	Resilient Sheet Flooring, Gray, Terrazo Pattern	Concrete	Floor	Misc.	Sampled
GOGA.14425.002b	Sheet Flooring Adhesive, Light Gray	Concrete	Floor	Misc.	Sampled
GOGA.14425.002c	Leveling Compound, White	Concrete	Floor	Misc.	Sampled
GOGA.14425.003a	Covebase, White	Wallboard	Wall	Misc.	Sampled
GOGA.14425.003b	Covebase Mastic, Beige	Wallboard	Wall	Misc.	Sampled
GOGA.14425.004a	1' x 1' Ceiling Tile (Glued), White, Pindot	Wallboard	Ceiling	Misc.	Sampled
GOGA.14425.004b	Ceiling Tile Adhesive, Behind Existing Finishes	Wallboard	Ceiling	Misc.	Assumed ACM
GOGA.14425.005a	1' x 1' Ceiling Tile (Glued), White, Smooth	Wallboard	Ceiling	Misc.	Sampled
GOGA.14425.005b	Ceiling Tile Adhesive, Behind Existing Finishes	Wallboard	Ceiling	Misc.	Assumed ACM
GOGA.14425.006a	Roof Shingles, Red	Roof Deck	Roof	Misc.	Sampled
GOGA.14425.007a	Built-Up Roofing System Materials, Gray	Roof Deck	Roof	Misc.	Assumed ACM

Building 14427 - Maint. Shop/Office SB-3

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.14427.001a	Wallboard, White	Wall Studs	Wall/Ceiling	Misc.	Sampled
GOGA.14427.001b	Wallboard Joint Compound, White	Wall Studs	Wall/Ceiling	Misc.	Sampled
GOGA.14427.002a	1' x 1' Ceiling Tile (Mechanically Applied), White, Fissured	Wood	Ceiling	Misc.	Sampled
GOGA.14427.003a	Window Glazing, White	Windows	Building Exterior	Misc.	Sampled
GOGA.14427.004a	Roof Shingles, Gray	Roof Deck	Roof	Misc.	Sampled
GOGA.14427.005a	Plaster, White	Lathe	Wall	Surfacing	Sampled

TABLE 1.0 - SUMMARY OF SUSPECT ACM

Building 38099 - Cliff House

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.38099.001a	Wallboard, White	Wall Studs	Wall	Misc.	Sampled
GOGA.38099.001b	Wallboard Joint Compound, White	Wall Studs	Wall	Misc.	Sampled
GOGA.38099.002a	12" x 12" Floor Tile, Gray	Concrete	Floor	Misc.	Sampled
GOGA.38099.002b	Floor Tile Mastic, Brown	Concrete	Floor	Misc.	Sampled
GOGA.38099.003a	Covebase, Black	Wallboard	Wall	Misc.	Sampled
GOGA.38099.003b	Covebase Mastic, Beige	Wallboard	Wall	Misc.	Sampled

TABLE 1.0 - SUMMARY OF SUSPECT ACM

Building 38099 - Cliff House

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Suspect Material Classification
GOGA.38099.004a	Covebase, Tan	Wallboard	Wall	Misc.	Sampled
GOGA.38099.004b	Covebase Mastic, Off White	Wallboard	Wall	Misc.	Sampled
GOGA.38099.005a	Wallboard, White, Older	Wall Studs	Wall	Misc.	Sampled
GOGA.38099.005b	Wallboard Joint Compound, White, Older	Wall Studs	Wall	Misc.	Sampled
GOGA.38099.006a	Spray Applied Fireproofing, Gray	Metal	Ceiling	Surfacing	Sampled
GOGA.38099.007a	1' x 1' Ceiling Tile (Lay-in), White	Metal Grid	Ceiling	Misc.	Sampled
GOGA.38099.008a	Stucco Material, Gray	Metal Grid	Building Exterior	Surfacing	Sampled
GOGA.38099.009a	Built-Up Roofing System Materials, Gray	Roof Deck	Roof	Misc.	Assumed ACM
GOGA.38099.010a	Spray Applied Fireproofing, Beige	Metal	Ceiling	Surfacing	Sampled
GOGA.38099.011a	Plaster, White, Older	Masonry	Wall	Surfacing	Sampled
GOGA.38099.012a	Roofing Mastic, Black	Various Roof Surfaces	Roof	Misc.	Sampled

TABLE 2.0 - SUMMARY OF IDENTIFIED ACM

Building 38099 - Cliff House

Homogeneous Material ID	Suspect Material Description	Substrate/Component	Associated Facility System	Material Category	Friability	Suspect Material Classification
GOGA.38099.009a	Built-Up Roofing System Materials, Gray	Roof Deck	Roof	Misc.	Non-Friable	Assumed ACM

APPENDIX A - BUILDING SUMMARY

Building 38099 - Cliff House

Building Use: Cliff House

Building Size: 29418 SF

Construction Date: 1909

ACM Assumed

Previous Expense: $0

Current Expense: $13,290

Future Asbestos Clean-up Costs: $14,450