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NWCG Work Capacity Test (WCT) Administrator's Guide

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The *NWCG Work Capacity Test (WCT) Administrator's Guide* is intended to aid WCT Administrators in preparing and performing a WCT. By utilizing this guide throughout the assessment process, the WCT Administrator will be able to:

- Properly obtain and complete necessary paperwork pertaining to the WCT.
- Safely and appropriately administer respective job-related field tests.
- Objectively determine a worker's capacity to meet position qualifications.
- Reference the *NWCG Standards for Wildland Fire Position Qualifications*, PMS 310-1.

This publication does not set any standards or mandates; rather it is intended to provide a generalized guideline to ensure the overall WCT process is congruent among nationally recognized wildland fire organizations. The information contained in this document ensures the testing procedures are a safe, efficient, and impartial component when evaluating our nation's wildland firefighters for their assigned duties. By incorporating these guidelines into your organization's WCT process, you are proactively safeguarding the health and wellbeing of those being assessed, as well as their crew, family, colleagues, and community members.

The National Wildfire Coordinating Group (NWCG) provides national leadership to enable interoperable wildland fire operations among federal, state, Tribal, territorial, and local partners. NWCG operations standards are interagency by design; they are developed with the intent of universal adoption by the member agencies. However, the decision to adopt and utilize them is made independently by the individual member agencies and communicated through their respective directives systems.

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Introduction

The *NWCG Work Capacity Test (WCT) Administrator's Guide* is intended to aid WCT Administrators in preparing and performing a WCT. In doing so, the WCT Administrator will be able to complete proper paperwork and administer respective job-related field tests to determine a worker's capacity to meet *NWCG Standards for Wildland Fire Position Qualifications*, PMS 310-1. Tests are developed for arduous, moderate, or light-duty workers (Table 1; see Appendix A for definitions).

Table 1. Tests developed for arduous, moderate, and light duties.

Work Category	Test	Distance (miles)	Pack (pounds)	Time Limit (minutes)
Arduous	Pack	3	45	45
Moderate	Field	2	25	30
Light	Walk	1	None	16

Preparing for the WCT

Individuals are responsible for their physical condition and their health. No amount of health screening or medical examination can ensure an individual's safety during a WCT or fire duties. Individuals uncertain about their health condition, such as being inactive or seriously under or overweight, should consult their physician before taking a WCT or engaging in wildland firefighting duties.

WCTs ensure that persons assigned to fire activities are physically capable of performing the duties of wildland firefighter qualifications that require a fitness level.

Determining Employee's Role

Personnel taking the WCT will only complete the level of testing (arduous, moderate, light) required by the highest fitness level identified for a position on their Incident Qualification Card. To clarify, employees shall not take the WCT unless they have an incident qualification that requires it and only at the fitness level required by that position as identified in this document.

Medical Examination

The agency will instruct the employee when a medical examination or clearance is required. Please check with your fire management organization for guidance. Before training for the WCT or the job duties, an individual must comply with their agency's medical screening procedures.

- Forest Service (FS): <https://www.fs.usda.gov/managing-land/fire/safety/wct>
- Department of Interior (DOI): <https://www.doi.gov/wildlandfire/medical-standards>

The agency may require a medical examination as part of the qualification process. For example, agencies participating in the DOI wildland firefighter medical standards program are required to ensure that a candidate has received medical clearance before the candidate is approved to participate in the

WCT. Once medical clearance is obtained, the WCT may be administered to that candidate.

Test Administration

A federal employee may only participate in a WCT that follows federal guidance within the *Interagency Standards for Fire and Aviation Operations* (Red Book).

- DOI: DOI employees should refer to their specific agency chapters in the *Interagency Standards for Fire and Aviation Operations* (Red Book) for guidance on participating in a WCT administered by non-federal partners.
- FS: A FS employee may not take a WCT administered by a non-federal partner.

Chapter 13 of the *Interagency Standards for Fire and Aviation Operations* indicates that non-federal firefighters will be certified by state or local fire departments or private training providers approved by a memorandum of understanding (MOU) through their local Geographic Area Coordination Center (GACC). Federal agencies will not assist in the administration or sponsor the WCT as the certifying agency for non-federal firefighters due to liability reasons.

A successful or passed WCT is only to be taken once per calendar year. If a situation develops that calls an individual's physical ability into question, retesting may be approved in consultation with an agency medical officer or equivalent upper management.

For federal agencies, WCT Administrators must confirm medical clearance at the appropriate fitness level through a review of a clearance list by the local Fire Management Officer (FMO), Health Screening Questionnaire (HSQ) Coordinator, or by verifying a certificate of WCT clearance at the time of the WCT. There is no need for the WCT Administrator to collect or retain copies of the certificate of clearance.

Safety

A Risk Assessment (RA) worksheet or a Job Hazard Analysis (JHA) must be developed and approved for each field unit prior to administering a WCT; Bureau of Land Management (BLM) and Bureau of Indian Affairs (BIA) field units must use the RA worksheet. Additionally, a Medical Plan (ICS 206) should be prepared for all WCTs. These forms must be updated annually. (See *Interagency Standards for Fire and Aviation Operations*, Ch. 13, p. 289)

- BIA RA: <https://www.bia.gov/bia/ots/dfwfm/bwfm/safety/risk-assessments>
- Sample RA for BLM and FS: https://gacc.nifc.gov/gbcc/dispatch/ut-rlc/Risk_Assessments_files/RA_Work%20Capacity%20Test.xlsx
- Sample JHA: <https://www.fs.usda.gov/t-d/pubs/htmlpubs/htm03512805/pdf/JHA.pdf>
- ICS 206 (section 3 not required): [https://training.fema.gov/emiweb/is/icsresource/assets/ics%20forms/ics%20form%20206,%20medical%20plan%20\(v3\).pdf](https://training.fema.gov/emiweb/is/icsresource/assets/ics%20forms/ics%20form%20206,%20medical%20plan%20(v3).pdf)

Avoid conducting the test on roads and intersections where traffic is a concern. When testing on roads, use traffic-control devices, and have persons wearing high-visibility vests control traffic as needed.

Check that candidate's footwear is suitable for athletic activity or hiking – footwear with ankle support is recommended for the pack and field tests.

Ensure communication with local dispatch before beginning the WCT.

Encourage participants to stretch and warm up adequately before the test.

Do not test anyone who is tired or has been injured.

Do not conduct tests during conditions that could compromise health or safety.

Monitor participants to identify those having difficulties. Terminate their test if necessary.

At the midpoint, consider terminating candidates who are substantially behind the required pace (22.5 minutes for the pack test, 15 minutes for the field test, and 8 minutes for the walk test) and those with difficulty maintaining the pace.

Participants cannot jog or run to make up time.

Encourage fluid intake and replacement. Provide fluids along the route when conditions contribute to heat stress.

Encourage cooling down with an easy walk after the test. Monitor the recovery of participants, especially those who appear distressed.

If one fails the WCT, recommend several weeks of training before participants retake the test.

Course Requirements

The course must be essentially level, have a firm, relatively smooth walking surface, and allow access to emergency vehicles.

The course length (3 miles) must be accurate, so use a measuring wheel or other proper measuring device to verify course distance. GPS unit/vehicle odometers are not accurate enough.

Loop or out-and-back courses are preferable. Try to avoid one-way courses.

A moderate grade (2 to 3 percent) is acceptable if the course starts and finishes in the same location.

Have lap-counters available for courses that will require more than one lap. Assign course monitors when needed.

Participants must be informed of the course layout with a map or sketch of the course. (See Test Script in Appendix B for an example).

Use distance markers (1.0 or 1.5 miles) to help candidates pace themselves. Use hazard and traffic markers as needed.

Altitude corrections are listed in Appendix C for tests administered over 4,000 feet elevation.

Test Personnel

Two persons can administer the test for small groups of candidates. Three or more persons will be needed for larger groups or when the course is challenging to monitor.

The number of individuals needed to administer the test will depend on the course layout, testing conditions, and the number of candidates being tested. Sometimes, one person will fill multiple roles (e.g., Administrator, Timer, First Aid Specialist, Course Monitor).

The following personnel may be needed for safe and practical testing.

- **WCT Administrator:** The person in charge of administration at the test site must understand test procedures, the RA or JHA, and the local emergency medical and evacuation plan.
- **First Aid Specialist:** A qualified emergency medical services personnel (EMR, EMT, or higher

qualification) will be on-site to observe candidates during and after the test. They are expected to provide appropriate emergency medical assistance if needed.

- Course Monitor: The WCT Administrator will determine the number of persons needed to monitor participants during the test.
- Lap Counter: Someone who records the laps completed by each candidate, if necessary.
- Timer: Someone who keeps the time during the test.

All persons involved in the test must understand the instructions, safety considerations, and their roles and responsibilities.

A briefing for everyone involved is recommended before the test.

Weather Conditions

When planning a test, check the weather a week in advance and attempt to test in ideal conditions to mitigate potential injury. It is required to administer the test during reasonable weather conditions, as defined below:

- Rain: No significant rain (measurable ≥ 0.10 inch per hour).
- Lightning: No lightning within five miles; wait at least 30 minutes after the last observed lightning.
- Hail: No hail forecasted or reported within 25 miles.
- Wind Speed: Maximum wind allowed ≤ 15 mph sustained, or ≤ 20 mph gusting.
- Cold Stress: A minimum temperature of 34°F is recommended but may be as low as 25°F if the path is dry and personnel can stay warm before and after the test is conducted. WCT Administrators must evaluate the risk of conducting a test below 34°F and mitigate risk accordingly. No testing to occur below 25°F.
- Heat Stress: Do not test in “Danger” or “Extreme Danger” conditions as specified in Appendix C. When administering the WCT, regardless of ambient temperature, promote hydration before, during, and after participant activity.

Recommended Equipment

- Medical Equipment: Medical equipment should be on scene, particularly an Automated External Defibrillator (AED).
- Packs: Use a comfortable, well-fitted pack or a commercially available weight vest with a gross weight of 45 pounds for the pack test or 25 pounds for the field test. Load packs with gear, sandbags, water, or other materials to achieve the required weight.
- The WCT Administrator must ensure the correct weight of the pack.
- Safety vests: As needed.
- Route markers: As needed.
- Distance markers: Use mile and midpoint markers to help participants maintain the proper pace.
- Stopwatches: Have two watches to provide backup timing.

- Vehicles: Bicycles, all-terrain vehicles, or other vehicles may be utilized to monitor participants on the course.
- Radios: Use radios and cell phones for monitoring and safety purposes.
- Scale: A calibrated, hanging-style spring scale is recommended for weighing packs.

Test Completion

Verify the name and test status on the WCT completion form with HSQ Coordinator (see Appendix D).

Retesting

Except in emergency hire situations, those who do not pass a test may be provided another opportunity to take the WCT.

Employees must wait at least 48 hours before retaking the WCT.

If an employee sustains an injury during the test and it is verified by a licensed medical provider, the test will not count as an attempt.

Once an injured employee has been released for full duty, the employee will be given <4 weeks to prepare for the test.

Consult agency-specific guidelines for retesting policies.

The number of retesting opportunities for federal agencies varies among agencies and employment classifications. The variations are defined below.

- Permanent employees: Three opportunities are provided to pass a WCT for fire program duties.
 - BIA employees: Employees who fail two WCTs will develop an appropriate physical fitness plan with their supervisors to ensure accountability before the third test is administered.
- Temporary employees: One opportunity is provided to pass a WCT. A second chance may be provided at the discretion of fire management.
 - Temporary BIA employees: A second test may be authorized by the local unit after 14 days to allow the individual to train for the WCT. A failed second test will result in a 90-day suspension without additional testing during that period.
 - Temporary FS employees: A second and third chance may be provided at the discretion of fire management.
- Casual Hires/AD employees: One opportunity is provided to pass a WCT. A second chance may be provided at the discretion of fire management.
- FS permanent and temporary employees who do not perform fire assignments as a recurring part of their position, but who are authorized to perform such duties, may be provided two additional testing opportunities at the discretion of fire management.

Appendix A: Definitions

1. Arduous

"Duties involve field work requiring physical performance, calling for above-average endurance and superior conditioning. These duties may include an occasional demand for extraordinarily strenuous activities in emergencies under adverse environmental conditions and over extended periods. Requirements involve running, walking, climbing, jumping, twisting, bending, and lifting more than 50 pounds; the pace of work typically is set by the emergency condition," as defined in the *NWCG Standards for Wildland Fire Position Qualifications*, PMS 310-1.

The pack test is a job-related test of the capacity for arduous work. It consists of a 3-mile hike with a 45-pound pack over level terrain. Completion in a time of 45 minutes approximates a relative oxygen consumption value (a measure of aerobic fitness) of $22.5 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ while performing the activity. For more detailed information on oxygen consumption values and aerobic fitness, refer to *Publication, Fitness, and Work Capacity*, PMS 304-2 (<https://www.nwcg.gov/publications/304-2>).

The energy cost of the test represents the energy costs occurring on the job, as evidenced by numerous field studies. The following link provides access to the most recent field study regarding aerobic intensities during wildland firefighter (WLFF) hiking activities in training and on large incidents (<https://www.sciencedirect.com/science/article/pii/S1080603218300607?via%3Dihub>).

Specifically, the arduous WCT correlates to physical performance measures in field tasks such as working with hand tools or carrying loads over rough terrain and with aerobic and muscular fitness measures. The length of the test evaluates participants' physical capacity to perform prolonged arduous work under adverse conditions, with a reserve to meet emergencies. Overall, the intensity and duration of the test predict a maximal oxygen consumption of $45 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ which is representative of high-intensity tasks that occur during WLFF activities and coincides with long-term health benefits.

2. Moderate

"Duties involve fieldwork requiring complete control of all physical faculties and may include considerable walking over uneven ground, standing for long periods, lifting 25 to 50 pounds, climbing, bending, stooping, squatting, twisting, and reaching. Occasional demands may be required for moderately strenuous activities in emergencies over long periods. Individuals usually set their own work pace," as defined in the *NWCG Standards for Wildland Fire Position Qualifications*, PMS 310-1.

The field test is a job-related test of work capacity designed for those with moderately strenuous duties. It consists of a 2-mile hike with a 25-pound pack. In 30 minutes, the passing score approximates a relative oxygen consumption value of $20 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ while performing the activity.

For more detailed information on oxygen consumption values and aerobic fitness refer, to *Fitness and Work Capacity*, PMS 304-2, <https://www.nwcg.gov/publications/304-2>.

3. Light

"Duties mainly involve office-type work with occasional field activity characterized by light physical exertion requiring basic good health. Activities may include climbing stairs, standing, operating a vehicle, and long hours of work, as well as some bending, stooping, or light lifting.

Individuals almost always can govern the extent and pace of their physical activity," as defined in the *NWCG Standards for Wildland Fire Position Qualifications*, PMS 310-1.

The walk evaluates an individual's fitness level to support the performance of light duties. It consists of a 1-mile test with no load approximating a relative oxygen consumption of approximately $17.5 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$. A time of 16 minutes, the passing score for the test evaluates an individual's ability to meet the physical demands of emergencies and evacuate to a safety zone. For more detailed information on oxygen consumption values and aerobic fitness, refer to *Fitness and Work Capacity*, PMS 304-2, <https://www.nwcg.gov/publications/304-2>.

The instructions for the pack test also apply to the field and walk tests. Test requirements for a given position may change. Consult the latest version of *NWCG Standards for Wildland Fire Position Qualifications*, PMS 310-1, for the current requirements.

Appendix B: Test Script Template

To be read to participants before they take the pack, field, or walk tests:

Welcome.

You are about to take a job-related Work Capacity Test (WCT) to determine your fitness for duty. The requirements of the job have determined the test you are taking.

You should have completed the Health Screening Questionnaire (HSQ) or a medical exam before today and have a designation ready to test or a DOI medical qualification certificate before continuing.

The course is [].

- Describe the local course and any safety issues, such as traffic and heat.
- Encourage candidates not acclimatized to the heat to delay testing until conditions are more favorable or until they have become acclimated by exercising for at least one week in the heat.

You should stretch and warm up before and cool down after the test.

- If heat stress conditions exist, explain that water will be available at the [] point on the course.

The test begins when I say go and finishes when you complete the required distance. We will announce the elapsed time when you pass the [] (1- or 1.5-mile point) of the course. You can stop the test at any time, for any reason. To stop the test, notify the course monitor of your intentions. The course monitor will have you stop the test if you are having difficulties or are substantially behind the pace required to pass the test.

The test requires a fast-walking pace. Jogging or running is not allowed and will lead to disqualification.

When you finish the course, remove your pack and keep moving until you cool down. Pack weight may be checked before or after the test. Your test score is the time required to complete the course.

At this elevation, [] feet, you will receive an altitude correction of [] (minutes: seconds), so you must complete the course within [] (minutes: seconds) to receive a passing score.

If you do not pass, you are encouraged to train before you retake the test. Retests will be possible [] (indicate when).

Before we begin, do you have any questions about the test, the course, or related matters?

(Answer questions.)

Complete your warmup. The test will begin in 5 minutes.

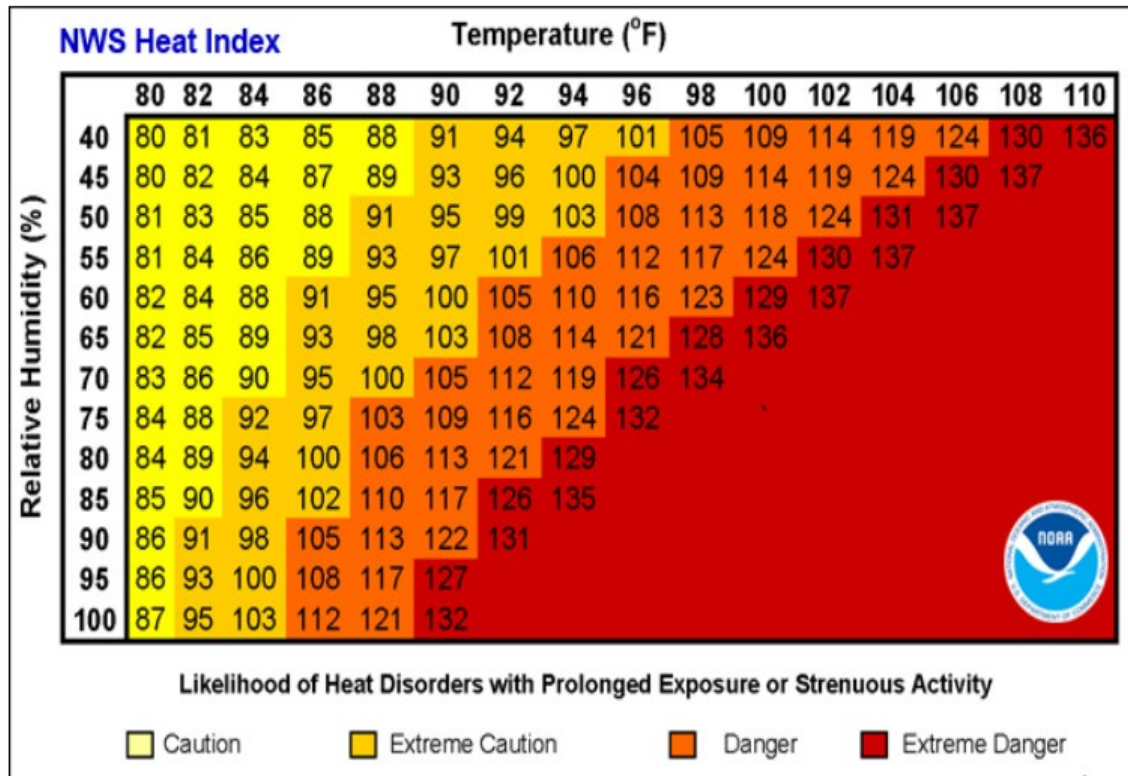
Appendix C: Altitude Corrections and Heat Stress Chart

Altitude: Use the chart below to adjust for tests administered above 4,000 feet elevation:

Table 2: Altitude corrections for the Work Capacity Test (WCT). Add the correction to the required test time.

Altitude (feet)	Pack Test (seconds)	Field Test (seconds)	Walk Test (seconds)
4,000 to 5,000	30	20	10
5,000 to 6,000	45	30	15
6,000 to 7,000	60	40	20
7,000 to 8,000	75	50	25
8,000 to 9,000	90	60	30

Figure 1: Heat Index Chart. Adapted from the National Weather Service website (<https://www.weather.gov/ama/heatindex>; 2023).



Appendix D: Sample Work Capacity Test (WCT) Data Sheet

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The *NWCG Work Capacity Test (WCT) Administrator's Guide* is developed and maintained by the Risk Management Committee, under the direction of the Executive Board, an entity of the National Wildfire Coordinating Group (NWCG).

Previous editions: 2003.

While they may still contain current or useful information, previous editions are obsolete. The user of this information is responsible for confirming that they have the most up-to-date version. NWCG is the sole source for the publication.

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