Environmental Quality Indicators 2008

Clark County, Washington

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CLARK COUNTY: ENVIRONMENTAL QUALITY INDICATORS

What has been the effect of Clark County's rapid growth and urbanization on environmental quality? As shown on the cover page of this report, we have mixed trends: from environmental improvements in county fleet operations to decreasing stream health; and from no-better, no-worse hazardous waste disposal to uncertainty about septic system failures. During the ten year period, 1998 through 2007, Clark County's population grew 26 percent to 415,000. The population is expected to grow over the next twenty years to 585,000,[a] bringing more pressure on the environment.

Recognizing these issues, Clark County joined voices with regional concerns for the environment and sustainability on October 16, 2007, when the Board of Commissioners passed the Clark County Sustainability Policy (full text in Appendix A) .

The policy states a commitment to fostering a safe, secure future that conserves natural resources while meeting basic human needs including clean water, air, and food, along with shelter, education, and employment. Sustainability is to be a key consideration in making public policy, developing public programs, operating public facilities, and delivering public services.

In conjunction with this effort, this report presents (1) indicators related to county internal operations, (2) indicators for which the county has a significant regulatory or planning role, and (3) general environmental indicators, such as for air quality. The report identifies trends that show whether the indicators are improving, declining, or are neutral over time. In some cases, trends could not be identified because of insufficient data.

The following environmental quality indicator categories were selected for inclusion in this report. The categories cover a variety of indicators on the county's water, air, and land resources.

<u>Internal Operations/Significant County Role</u>

- Energy Use
- Green Purchasing
- Fuel Use
- Septic Systems
- Solid Waste
- Stream Health
- Hazardous Waste

[a]Environmental Impact Statement for the Growth Management Plan, 2007

General Indicator Categories

- Energy Use (county-wide)
- Drinking Water Quality
- Tree Canopy
- Air Quality

The county's sustainability policy is far-reaching, covering social and environmental areas. This report is limited to a discussion of environmental indicators. Social indicators have been published every three years by the nonprofit group Community Choices. Their "report card" includes poverty, education, health care, voter participation, safety, and more. Readers can find the report at www.clarkcommunitychoices.org.

Opportunities

Most pages contain a section called "Opportunities" where we might describe activities in other jurisdictions. We don't mean to imply that Clark County is doing poorly by comparison. Rather, these sections are meant to inspire, to compare, or to confirm if Clark County is on track with other active governments.

Data Sources

This report does not contain audited information. Data was abundant in some areas and limited in other areas. When many alternate trends could have been reported, Audit Services staff relied on expertise from many county departments and other resources to present the best measures.

Specifically, we would like to thank staff of the following county departments:

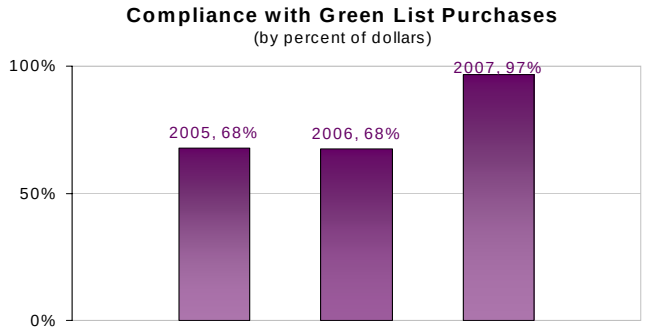
Public Works: Solid Waste; Fleet Management (shops); Clean Water
Public Health: Environmental Health
General Services: Facilities; Purchasing
Clark/Vancouver Parks

Appendices give more information:

A - Clark County sustainability policy
B - Endnotes and information resources
C - Sustainability: links to other organizations' reports
D - Greenhouse gas, a discussion

Trend: ^

Green purchasing reduces solid waste and energy use. Compliance with green purchasing reduces the county's direct impact -- from its own operations -- on the environment.



Green versus non-green purchasing began improving in late 2006 when "green" paper towels and tissues became available at no extra cost.

The County adopted a policy in late 2004 for environmentally responsible purchasing[6]. The objective is to reduce negative impacts to human health and the environment, including greenhouse gases, air pollution, water contamination, manufacturing waste, and packing waste.

The objective of the policy is written into contracts with vendors. Although the policy is labeled "purchasing," it includes end-of-life monitoring for products to assure recycling or reuse.

The policy seeks to increase:
1) water and energy efficiency;
2) renewable energy sources;
3) use of products with recycled content;
4) product durability; and
5) use of products that can be recycled, reused, or composted at the end of their life cycles.

The county "Green Team" creates and revises the green purchasing list.[7] Examples of categories and products: office (copy paper made from 30 percent recycled content), facilities (cleaning products, Green Seal certified), fleet (motor oil, 85 percent re-refined), and grounds maintenance (pesticides).

Waivers must be reviewed by the team if an item not on the list is to be purchased. For example, printers that only make one-sided prints are not on the green purchasing list. A waiver was granted for an area that prints legal documents (which are always printed one-sided).

Status

The green purchasing annual report explains products added or removed from the green list; details compliance with the policy in five major categories; and creates a watch list. The watch list identifies possible additions to the list, or re-evaluation of the criteria or targets for a product. The Green Team also watches expiring contracts so they can try to get green product use and specifications into the new contracts.

If the county had used virgin paper instead of paper with 30 percent recycled content in 2006, we would have used 61 more cords of virgin wood, or 4 to 6 acres of forest.

Opportunities

The Green Team sets clear targets, and continually looks for cost-effective greener alternatives to use in the county's daily operations.

Other organizations have similar targets, and some have had longer experience with green purchasing programs.

For example, federal government purchasing programs, since at least 1976, consider the environment as well as cost and performance in purchasing decisions. The federal EPA has set its new standard for paper as 100 percent recycled content (minimum 50 percent postconsumer content).[8]

Santa Monica adopted their program in 1994, reducing toxicity of cleaning products while spending 5 percent less, and using re-refined motor oil and less toxic antifreeze in the fleet.[9]

Washington state agencies were ordered to reduce office paper use 30 percent between 2003 and 2009.[4]

Fleet Operation & Maintenance (County Operations)

Trend: /\
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The environmental management system (EMS) is specific to Public Works' shops section, measuring some environmental impacts from the county's internal operations.

Clark County's Public Works Department manages the county's vehicle and equipment fleet. Public Works follows environmental policies which specify commitments to protect, preserve, and restore the natural environment.

In 2003, Public Works implemented an environmental management system in accordance with international standards (ISO 14001). Management and staff evaluate environmental impacts and set objectives, roles, training, documentation, and monitoring requirements for the county's fleet and fleet maintenance shops.

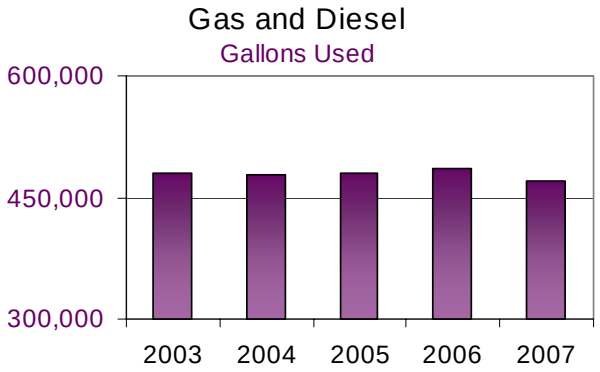
Status

Actions implemented by Public Works as part of the environmental management system plan include:[10]

- Vehicle acquisition: purchased low emission and hybrid vehicles, saving 1,500 gallons of gasoline, and reducing CO_2 emissions 15 tons during 2006.
- Heavy duty vehicles: postponed purchases to wait for cleaner burning technologies as required by federal law in new 2007 models.
- Alternative fuels: switched the diesel fleet from biodiesel to ultra low sulfur diesel in October 2004, ahead of the fall 2007 federal deadline.
- Engine oil drain interval program: pilot program increased oil change interval to 7,500 miles (had been 4,000 miles).
- Fuel use efficiencies: less idling time, more car pooling, lower weight of loads carried.

In addition, before the environmental management system started, Public Works had adopted many practices to reduce environmental impacts, including:[10]

- Using re-refined motor oil
- Draining and recycling oil filters
- Using re-refined antifreeze
- Eliminating aerosol cans and bottles by purchasing in bulk
- Using a closed-loop wash rack for cleaning vehicles
- Recycling car batteries, tires, scrap metal, aerosol cans, plastic bottles, and cardboard.



Public Works reported that the county fleet used 15,000 gallons less fuel in 2007 than in 2006.[11]

Opportunities

Public Works plans to continue to measure results in conjunction with goals established in the environmental management system plan. These goals include (baseline year 2005, except energy use is 2006):

- reducing fossil fuel usage 20 percent by 2011. (Public Works reported that the reduction between 2005 and 2007 was 1.9 percent. Note that an average reduction of 4 percent per year will be required to achieve this goal.)
- reducing particulate matter emissions from diesel equipment 10 percent by 2008.
- reducing energy use 10 percent by 2008.
- complying with the county's green purchasing list on all acquisitions by 2008.

Trend: <=>

When we reduce our energy use, we save money, create less greenhouse gases, and use less of the earth's limited natural resources.

Clark County has not set specific goals for energy conservation, although there have been efforts in this area. Two significant activities have been purchasing renewable energy[1] (since 2003), and retrofitting some buildings for energy savings (completed in 2005).

Renewable energy: The county has purchased 120,600 kWh of renewable energy *every month* since 2003. The "Green Lights" program through the local utility supports development of electricity from non-polluting sources.[2]

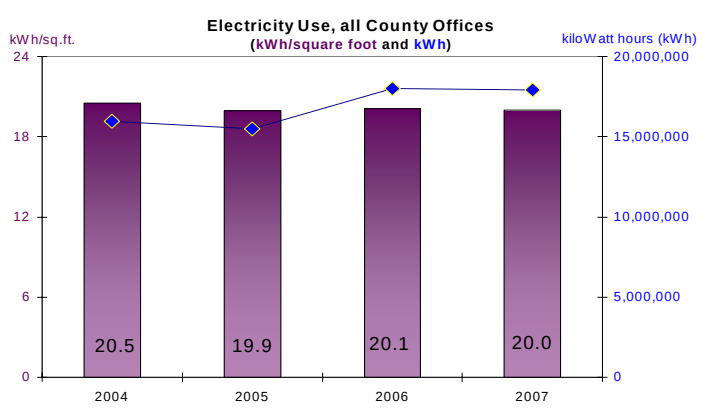
The county had intended to meet all the electrical needs of the new (2003) Public Service Center with green power. But the power use has been greater than predicted, so green power covers about 40 percent of the consumption in the PSC.

Retrofit buildings (2005): In 2002, the county contracted (through the state General Administration Department) for energy savings improvements using Johnson Controls, Inc. The contract goals were to
(1) save energy by optimizing heating, ventilation, and air conditioning (HVAC) controls in seven buildings;
(2) retrofit lighting in seven buildings; and
(3) replace HVAC in one building.

The primary goal was to save enough in energy costs over 12 years to make the bond payments for the improvements to the seven buildings, approximately $3.6 million. The improvements were completed in June 2005 on 480,000 square feet (about one-half) of county office space.

Status

Overall, the use of electricity in county office buildings has remained about the same on a per-square-foot basis from 2004 through 2007 (see chart).



The blue line for total electricity use shows an increase in 2006 due to the opening of the Center for Community Health.

As a result, the purple bar gives the best comparison on a kWh-per-square-foot basis.

Johnson Controls reports quarterly on the baseline, guaranteed savings, and actual energy savings. Through August 2007 (just over two years) the contractor reports energy savings are ahead of schedule and have accumulated to $658,000.[3]

Opportunities

The county has opportunities to set specific goals to reduce energy use, increase renewable sources, and/or measure emissions. For example, in other jurisdictions:

- Washington state agencies are under order to reduce energy use ten percent (2003 to 2009).[4]
- Portland set a goal in 2005 to have all of its energy for city operations come from renewable sources by 2010. Negotiations for a wind project fell through in mid-2007, so Portland is requesting solar project proposals in 2008.

In April 2008, the Board of Commissioners approved another energy savings contract with Johnson Controls for $7.8 million in improvements. In addition to HVAC and lighting upgrades, this project will invest about $5 million to capture solar energy for power and for water heating.[5]

[1]Endnotes are in Appendix B

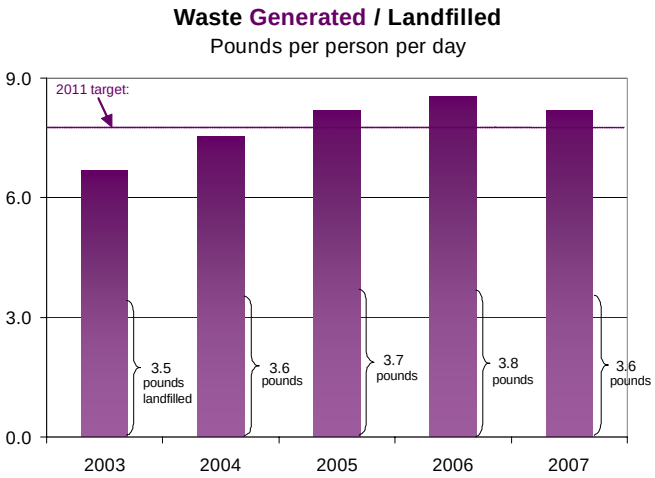
Solid Waste (Community)

Trend: <=>

Clark County citizens are making more waste than ever, but improved in 2007. We can do better in minimizing the amount of waste we generate, use materials efficiently, use less toxic materials, and invest in products that can be re-used instead of thrown away.

Clark County government has a significant role in solid waste management. The county's solid waste management plan is a cooperative effort serving all of the county and its cities. The county priorities are, in order:[28]

* Reduce the amount of waste generated
* Promote reuse, recycling, and composting
* Promote sustainability
* Promote alternatives to toxic materials
* Provide for proper disposal of waste



Purple line: 2011 target, get down to 7.8 pounds of waste generated per person per day
Purple bars: daily waste generated per person
Brackets: pounds to the landfill -- 2007 reversed a growing trend

Every few years, the county does a waste stream analysis -- sorting and weighing garbage samples. The results help the solid waste program focus dozens of programs for education, outreach to businesses, and working with garbage haulers.

Status

One high-level goal is to reduce the daily waste generated per person to 7.8 pounds by 2011 (reducing the 2005 level by 5 percent).

Statewide trends are similar to Clark County: waste generated per person is increasing, while recycling has leveled off.[29]

Statewide, diversion was at 49 percent in 2006 (diversion is recycling and other non-landfilling of waste, like reuse of asphalt or burning for energy). Clark County is ahead of that rate, diverting about 55 percent of all waste 2005 through 2007.

Besides the garbage analysis, the solid waste program gathers data such as pounds of garbage and recyclables from garbage haulers, outreach program attendance, and the results of pilot programs.

One pilot program began when the 2003 waste stream analysis showed 15 percent of the garbage is food waste.[30] The Solid Waste Program approached schools and business to help with start-up costs to divert food to compost. In 2006, just under 300 tons of food waste were diverted to compost, and in 2007 the collection grew to over 500 tons.

In fact, the organic waste section of Clark County's solid waste plan is promoted as an example for other governments on the state Department of Ecology web site.[31]

At Covington Middle School, organic scrap recycling reduced the number of daily lunchtime garbage bags from 18 to four.

Opportunities

Additional diversion of food waste is one opportunity. The Solid Waste Program is looking at ways to expand on the successes of the pilot program.

Additional public information to reinforce recycling and other goals is also an opportunity. Citizens hear ways to reduce and recycle, but it might help to have more progress reports or barometers available to citizens and the media.

Trend: <=>

Hazardous wastes are harmful to the environment and/or human health. Many are persistent in the environment, remaining toxic for a very long time, and some can build up (bio-accumulate) in the food chain.

The Washington State Department of Ecology sets policies on hazardous waste. The state's goal is to move from managing waste to a point where the waste is no longer generated. Businesses with small hazardous waste amounts (less than 220 pounds per month) report to the county; businesses with larger amounts report to the state.

For this report, we have chosen to focus on household hazardous waste. In Clark County, the top three household items collected in 2007 were:

- Paints and solvents
- Computers and electronics
- Motor oil, antifreeze, and filters

Examples of other items are batteries, poisons, pesticides, fluorescent tubes, and sharps (needles).

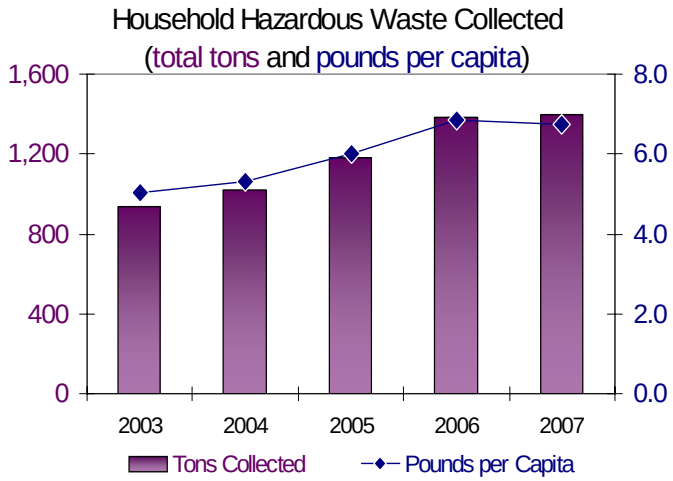
Several Clark County departments cover aspects of hazardous waste from education to enforcement. They include Public Works Solid Waste, Public Health Environmental Health, Community Development Code Enforcement, and the Sheriff's Office.

Status

The county's goal is to recover an additional 50 tons of household hazardous waste materials by 2011. That is an increase of 3.6 percent from the baseline in 2006, which was 1,382 tons. 2007 increased over one percent to 1,398 tons. Activities emphasize reduce, reuse, and recycle:[32]

Reduce

- Promoting the purchase of less or non-hazardous products
- Continuing the re-refined oil program, adding more distribution sites and increasing public awareness



The chart shows hazardous waste collected from Clark County households. The goal is to reach at least 1,432 tons by 2011. What we don't know is whether 2007 was flat because less hazardous material was purchased, or if more was landfilled.

Reuse

- Paint take-back program

Recycle

- Proper collection, transport, and disposal of moderate risk wastes
- Curbside recycling
- Oil collection program

Opportunities

Since 2003, Clark County citizens have increased the collection of household hazardous waste by nearly 50 percent. Rather than putting it in the landfill, they realize they have opportunities to reuse or properly dispose of the waste.

Most of the increase came from computers and electronics, with the Computer REuse And Marketing (CREAM) program. After such a dramatic increase, it may be difficult to find and capture another 50 tons a year.

The 2007 waste stream analysis (described on page 9) will be available by June 2008. Program managers and the public will then have a better idea of what is still being thrown out, and can plan education and collection programs.

Air Quality (Community)

Trend: <=>

Poor outdoor air quality contributes to health risks including respiratory illness, heart disease, and cancer.

In the early 1970's the United States Environmental Protection Agency (EPA) established National Ambient Air Quality Standards to define levels of air quality that protect the public health and welfare from the known adverse effects of air pollutants. Additionally, the passage of the Clean Air Act Amendments in 1990 required greater air quality controls on new development.

Specific standards have been set by EPA for some pollutants ("criteria pollutants") considered harmful to the public's health and the environment.[38] These include carbon monoxide and ozone, two of the primary pollutants related to motor vehicle exhaust. Motor vehicles are the county's largest producer of air pollution, contributing about a 60 percent share.[19]

Clark County is monitored for compliance with EPA standards by the Southwest Clean Air Agency. SWCAA is also responsible for developing programs to reduce pollution from area and point sources.

The following sections discuss two measures of air pollution important to Clark County. These are (1) comparisons of pollutants such as carbon monoxide and ozone to the EPA's National Ambient Air Quality Standards, and (2) the classification of air quality on a daily basis, using EPA's "good air" and "less than good air" categories.

Status: Clark County Continues to Meet National Ambient Air Quality Standards

Community Choices — the nonprofit organization established to study and report upon sustainability issues in Clark County — has published an air quality goal for the county. The goal is for "100 percent of the county's residents to breathe air that meets National Ambient Air Quality Standards."[16]

Clark County has met this Community Choices goal. The county has not violated National Ambient Air Quality Standards for carbon monoxide since 1990, and for ozone since 1998.

This represents substantial progress. In the 1980's, the amount of carbon monoxide in Clark County's air was at times above levels allowed by the EPA. Ozone levels were higher than health standards allowed during both the 1980's and early 1990's.[16]

Status: "Less Than Good" Air Days Increased From 1997 Through 2006

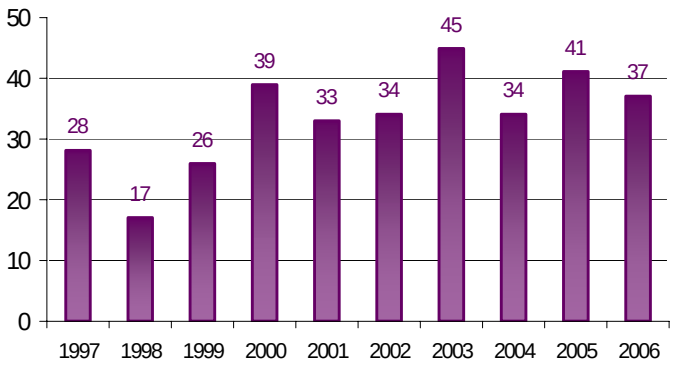
EPA's Air Quality Index is another measure of air pollution. The Index is based upon data gathered at several sites throughout the county. Pollutants such as carbon monoxide, ozone, and smoke particulates (wood-burning stoves and outdoor burning contribute to this) factor into the Index. The Index classifies each day's air quality using the following categories: Good; Moderate; Unhealthy for Sensitive Groups; and Unhealthy.

Clark County's daily air quality during the 1997 - 2006 period was generally classified as "Good."[39] Of the 3,648 days measured during that ten-year period, 3,314 (91 percent) were in this top category. And of the days that were in "less than good" categories, the vast majority were classified as "Moderate" (322 of 334 total). The remaining 12 days were in the "Unhealthy for Sensitive Groups" category. No days were measured to be in the lowest group—"Unhealthy."

The Index data for Clark County are quite positive overall. However, the number of "Less than Good" days, although relatively small in comparison to the total number of days measured, increased during the last five years of the 1997 - 2006 period. As the following graph shows, the annual number of "Less than Good" days shows an upward trend over the ten-year span. It should be noted that some uncontrollable variables, particularly weather patterns, have substantial influence on annual numbers.

(Air quality, continued)

Number of Less Than Good Days



The following table quantifies the trend toward more "Less than Good" air days. The table compares the number of "Less than Good" air days during the 1997-2001 five-year period to the 2002-2006 five-year period.

EPA Air Quality
Data for Clark County

	# Days Less than Good	Total Days	Percent of Days Less than Good
1997-2001	143	1826	7.8%
2002-2006	191	1822	10.5%

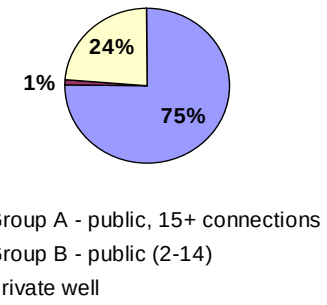
For the first five years of the period, 7.8 percent of Clark County's air days were in EPA's "less than good" category, compared to 10.5 percent over the last five years.

Drinking Water Quality (Community)

Trend: ?

Three-quarters of Clark County's population relies on water from public systems. The remaining one-quarter get water from private wells or small community wells constructed on their property.

Population served by water system types



Status: Drinking Water from Public Water Systems

Washington State law requires that public water systems be routinely tested for various contaminants. Public water systems are defined as those providing water to multiple residents. If the system has more than fourteen connections, it is classified as a Type A system and is subject to annual testing. Systems with from two to fourteen connections are Type B, and are subject to testing less frequently. The remaining systems are private wells.

Community Choices is a nonprofit organization established to study and report upon sustainability issues in Clark County. The organization promotes sustainability goals, one of which is for 95 percent of people served by public water systems to be receiving water that meets the federal health-based Safe Drinking Water Act standards.[16] According to Community Choices 2006 report, testing has shown that this goal is being met for Clark County residents.

Status: Drinking Water from Private Wells

Private well water is the drinking water source for many residents Clark County. According to information put out by the Environmental Public Health section of the county's Public Health Department, there are about 31,000 wells in the county, serving 93,000 residents — about 24 percent of the county's population.[17]

Environmental Public Health officials stated that the 31,000 figure is an estimate, and that there may in fact be a significantly higher number.

Private well water is tested for some contaminants at the time of construction. However, unlike water from public water systems, there is no legal requirement for water from private wells to be tested on a routine basis.

The 2006 Community Choices report stated that the "water quality for residents who obtain drinking water from private wells is generally unknown." County-wide data (and statewide data) on the quality of water in private wells are not available. Testing is done by private labs, and is not reported to any central database.

Since groundwater quality can change over time, testing of private well water is important.

Opportunities

Environmental Public Health has information on its web pages providing private well owners with advice on the necessity to maintain wells and have well water tested. This includes links to Washington State Department of Health information on arsenic and nitrates in drinking water.

A Washington State Department of Health brochure provides additional details on when to get private well water tested. ("Important Information for Private Well Owners," DOH Pub. #331-349, February 2007). A link on the website to this document would provide useful supplementary information.

Another useful link that could be included on the website is www.wellowner.org. This site informs consumers about groundwater quality and water testing.

Trend: ?

One source of groundwater and surface water pollution is high concentrations of nitrogen from failing septic systems.

In 2007, the Washington State Department of Health revised septic inspection, design and installation standards.[26] The new standards are intended to mitigate groundwater pollution problems caused by septic systems. Clark County has adopted code provisions consistent with these State Department of Health standards.

Status

Septic systems are the primary method of sewage disposal in the unincorporated areas of Clark County. Sewer system service is the primary method of disposal in the county's urban areas, although some septic systems are still in use. New developments in urban areas are required to connect to the local sewer system.

Clark County Public Health is responsible for enforcing state and local regulations pertaining to septic system installation and maintenance. These responsibilities include:

- overseeing the septic system operation and maintenance program (for instance, state regulations require septic systems to be inspected either annually, or every three years, depending upon the type of system involved.)
- investigating failing septic systems
- educating owners about best maintenance practices and inspection requirements.

In order to fulfill these responsibilities, Public Health must be able to identify the owners and locations of active septic systems in the county, and must be able to assure that required inspections are being completed.

At present, a substantial number of septic systems are not included in the department's database.[27] The Final Environmental Impact Statement for the county's Growth Development Plan, published in 2007, estimated that there were 40,000 active systems in total in the county.[19] Public Health estimates that there may be as many as 60,000 systems. Using the 40,000 estimate, about 9,000 active systems (23 percent of total) have yet to be identified and included in the database.

Opportunities

Public Health is attempting to update and correct its septic system database with the goal of including all active septic systems in the county, associated with accurate location and ownership information. At present, the database shows a total of 31,000 active systems.[27] From 2003-2007, Public Health has added an average of 567 systems to the database annually. These additions are largely newly built systems and systems that come to the department's attention because they require repair.

Two measures indicate the progress Public Health is making in assuring the county's septic systems are identified and inspected. These are:

(1) The number of systems inspected annually

As a minimum, septic systems are now required to be inspected no less frequently than once every three years.[27] Since there are currently 31,000 systems in the department's database, covering these on a three-year basis would mean completing an average of 10,000 inspections annually. However, for the three-year period from 2005-2007, the department's database shows that an average of 1,312 were completed per year.

(2) The number of active septic systems identified and included in the department's database, compared to the estimated total number of systems in the county.

The department is making progress toward identifying active septic systems for inclusion in its database—an average of 567 per year have been added since 2003. To further this effort, the department is proposing a project which will work with the county's Geographic information System section to identify households which are not hooked up to sewer.

For program management and public information purposes, consideration should be given by the department to reporting measures (1) and (2) annually.

Tree Canopy (Community)

Trend: ?

The amount of tree canopy in our community impacts air and water quality, energy use (by natural cooling), wildlife habitat, and property values.

The largest economic value from trees is increased property values for owners (studies range from three percent to six percent higher value). The higher value is not just for homes, but includes higher occupancy and patronage for commercial buildings[33].

But trees provide environmental value in several areas.

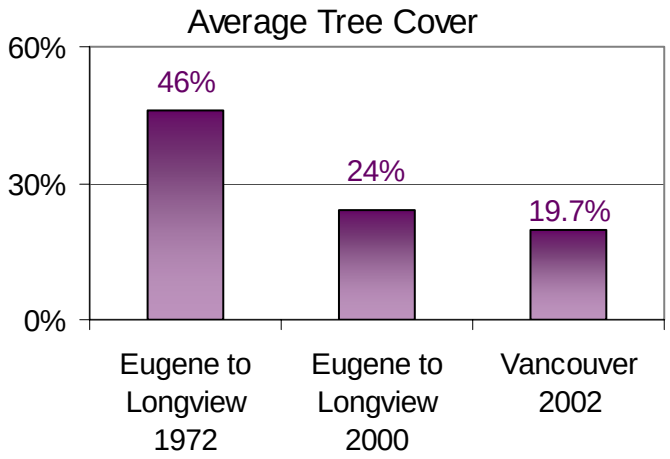
1. Stormwater retention: a 32 foot street tree, for example, retains 327 gallons of water per year (44 cubic feet). This helps prevent erosion, but also has an economic benefit: one estimate for building stormwater systems is $6 / cubic foot in urban areas, and $2 /cubic foot in rural areas.[34] That one tree can save $260 in construction costs for urban stormwater retention.

2. Air quality:
   - sulfur dioxide, carbon monoxide, ozone, nitrogen dioxide, and particulate (smog): filter 120 to 240 pounds per year[33]
   - oxygen: create 240 to 350 pounds per year (average person needs 386 pounds)[33]
   - sequestered carbon: 13 pounds per year for an average tree[35]
   - wildlife (dollar value immeasurable)

3. Energy savings: a 25 foot tree, depending on type and placement, can reduce a home's annual heating and cooling costs by eight to 12 percent.[33]

Status

Satellite data exists for 2002 Clark County tree cover, but the work has not been done to analyze and report on tree canopy. We can take a cue, however, from two other areas.



- City of Vancouver, 19.7 percent tree cover in 2002,[36] Vancouver's goal is to reach 28 percent average citywide tree canopy.

- Willamette/Lower Columbia Region (Eugene to Longview, 2000), 24 percent.[34]

Opportunities

Clark County citizens would have increased economic and environmental assets with an increase in tree canopy. The county has certain landscape codes for new developments, but does not have a policy or goal for tree canopy.

Optimal tree coverage varies. American Forests, a non-profit sponsored by the U.S. Department of Agriculture, recommends these goals for the Pacific Northwest:[37]

- 40 percent canopy overall
- 50 percent for suburban residential
- 25 percent for urban residential
- 15 percent in central business districts

Trend: ↓

When we reduce our energy use, we save money, create less greenhouse gas, and use less of the earth's limited natural resources.

Clark County can influence community behaviors through education, building codes, and pilot projects. County policy requires sustainability be considered in making public policy and developing public programs.

The energy suppliers in the county are Clark Public Utilities for electricity and NW Natural for natural gas. For this report, neither heating oil nor propane are included because the information was not available.

CPU has conservation information and energy savings incentives such as:[12]

- options to purchase energy from renewable sources
- rebates and loans on solar projects
- "Stream Team" (volunteers for tree and native plantings)

Clark Public Utilities handles the low-income weatherization program.[13] The services include free insulation, sealing, and upgrades from single-pane windows.

To reduce their energy bill, some county residents use a fireplace or wood-burning stove for heat. In the past this has led to air quality issues, but many stoves have been upgraded to cleaner-burning models. (Note: wood stove tips are available on sites such as www.woodheat.org.)

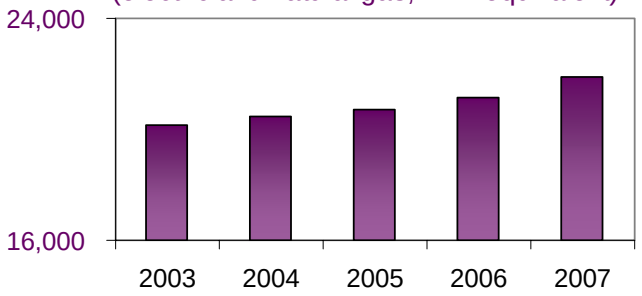
Status

We continue to use more energy in our homes.

Even with the push toward conservation, tighter insulation in new homes, energy-saving appliances, and concerns about rising utility bills, energy use per household continues to increase.[14] From 2003 to 2007, per-household use of electricity and natural gas increased 8.7 percent.

Average Household Energy Use

(electric and natural gas; kWh equivalent)



8.7 percent increase over the five years

Opportunities

Continuing education and incentives (from utility companies and federal tax breaks) can help the community reduce its energy consumption and convert to renewable sources. The trend for gasoline/diesel use could also be measured (or estimated) and reported to the community.

For future reports, information on renewable versus nonrenewable energy use could be helpful. A kilowatt hour of electricity from coal-burning generation has a high impact on the environment, whereas solar or wind generation has a very low impact.

Many jurisdictions state their energy goals in terms of reducing emissions. For example, Berkeley, California has challenged the community to reduce emissions from natural gas and electricity production sources 20 percent by 2015, and 80 percent by 2050. Emissions-based measures will better reflect the impact or lack of impact on the environment.[15]

Water: Stream Health (Community)

Trend: ↓

We average 40 inches of rain each year, so we might assume that streams will always be clean and fresh. "But pollution, urbanization, and other population pressures challenge this assumption."[18]

See stream health map, next page
Courtesy: Public Works Clean Water Program and Assessor's Office Geographic Information System

The environmental impact statement (completed for the growth management plan update in 2007) states "Replacing floodplains, wetlands, and vegetated areas with impervious surfaces increases the risks of contaminants finding their way into streams and groundwater."[19]

Several programs work to regulate or educate land owners for impacts on streams. These include:

- Federal and state laws: clean water,[20] endangered species,[21] growth management
- County development codes: erosion control while building; stormwater retention
- Public Works: clean water program; fish barrier removal projects
- WSU Extension Service:[22] training watershed stewards for stream monitoring and public education; training programs for small acreage land owners.

In addition, many organizations and volunteers work to improve stream health. Fish health is an indicator of stream health, and each year the county honors people or projects which contribute to salmon recovery.[23] Fifty-six "Sammy Awards" have been given since 2001.

Clark Public Utilities "StreamTeam" was one early recipient of the Sammy Award. Their activities with community volunteers include tree planting (600,000 trees in 15 years), potting, monitoring, and maintenance.[24]

Status

The map to the right presents stream health in 2003. Considering the rapid growth of Clark County's population in recent years, it would be a minor success to prevent streams from becoming worse. But some stream segments have become worse since 2003.

Under the federal Clean Water Act, the state identifies and reports all surface waters (creeks, rivers, lakes) that do not meet water quality standards and that do not support beneficial uses.

The most severely degraded waters are known as Category 5. In 2008, the state proposes to add **49 listings** to Category 5.[25] Seven listings are from degraded conditions, and the other 42 are newly assessed.

Department of Ecology cautions that while there has been more sampling and detection of pollution, this does not necessarily mean there was more pollution in the newly assessed areas (it might have been there before, but we're just finding out or confirming a problem).

With the updated assessments, Clark County will have 132 listings in Category 5 out of 319 listings in all categories.

The most frequent impairment in Clark County is temperature (50 segments), followed by bacteria (specifically, fecal coliform, 38 segments), dissolved oxygen (26), and pH (10).

Opportunities

Malfunctioning septic systems and farm animal waste may be two leading factors in water quality problems. (See page 8 for opportunities on septic systems.)

Another opportunity to improve water quality is with tree canopy (see page 11 for more information). A sufficient tree canopy keeps streams cooler by keeping pavement cooler, so rain water is not heated before it runs into the streams. Trees also shade streams and prevent erosion.

Observed and Probable Stream Health 2003

Stream Health Ratings	Description
Excellent	Pristine, superior, or unsurpassed condition; minimal human disturbance
Good	Healthy enough to support aquatic life and recreation
Fair	Degraded but may support aquatic life and recreation
Poor	Inferior health; poorly suited for aquatic life and recreation
Very Poor	Severely degraded health; unsuitable for aquatic life or recreation
Unassessed	No data collected
●●● Probable	Predicted stream health*

*Based on interpretation of satellite imagery

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APPENDIX A

Clark County Sustainability Policy

Clark County is committed to fostering a safe, secure future that conserves natural resources while meeting basic human needs, including clean water, air, and food, along with shelter, education, and employment. This commitment to a sustainable future will be a key consideration in making public policy, developing public programs, operating public facilities, and delivering public services.

All employees must therefore recognize and respect the connections between economic, environmental, social, and health systems in meeting their explicit and implied responsibilities to current and future generations. Our goals are to:

- Lead by example;
- Encourage innovation in both public and private pursuits;
- Promote and demonstrate efficient and effective use of renewable and consumable resources;
- Collaborate with public and private partners on projects aimed at sustainability;
- Continuously enhance our perspective and expertise in making sustainable choices on behalf of the citizens and communities of Clark County; and
- Identify and pursue new opportunities that promote sustainable practices.

To implement this policy and monitor its impacts, the County Administrator will convene a sustainability advisory committee to prepare an annual inventory of the county's sustainability efforts, report on progress related to the stated policy goals, and recommend a biannual budget to the Board of County Commissioners aimed at funding sustainable choices.

APPENDIX B

Endnotes

Every effort was made to ensure internet links worked at the time of publication. The electronic version of this report is not maintained for updated links. Our apologies if the information moves!

1. Leadership in Energy and Environmental Design (LEED) certification documents, 2003

2. Clark Public Utilities (CPU) www.clarkpublicutilities.com/ourenvironment/greenLights

3. Johnson Controls, Inc., measurement and verification report, October 2007 (covering June 1 through August 31, 2007)

4. Washington Governor Executive Order 05-01, "Establishing Sustainability and Efficiency Goals for State Operations"

5. Board of Clark County Commissioners, "2008 Energy Conservation Supplemental Appropriation," public hearing April 22, 2008

6. Clark County General Services, Purchasing Division, Policy P-250 www.clark.wa.gov/general-services/purchasing/erp/documents/Policy.pdf, December 2004

7. Clark County Green Purchasing List, www.clark.wa.gov/general-services/purchasing/erp/documents/Green%20Purchasing%20List.pdf, February 2008

8. Environmental Protection Agency (EPA), www.epa.gov/opptintr/epp

9. EPA, "The City of Santa Monica's Environmental Purchasing, Case Study," March 1998, www.epa.gov/opptintr/epp/pubs/case/santa.pdf

10. Clark County Public Works, "Environmental Management System Annual Performance Report 2006," March 2007

11. Clark County Public Works Fleet Operations Database, 2003 - 2007

12. CPU conservation programs www.clarkpublicutilities.com/yourhome/conservation

13. CPU low-income weatherization programs www.clarkpublicutilities.com/yourhome/conservation/wx/Weatherization

14. Usage and number of households from CPU and NW Natural, March 2008

15. City of Berkeley, California: www.ci.berkeley.ca.us/sustainable

16. "Community Choices 2006 Report Card" www.clarkcommunitychoices.org/report_card.htm

17. Clark County Public Health, "Drinking Water in Clark County," www.clark.wa.gov/health/environmental/documents/drinking%20water%20brochure.pdf

18. Clark County Public Works, Clean Water Program (streams) www.clark.wa.gov/water-resources

19. Clark County Growth Management Plan 2007, Final Environmental Impact Statement, www.clark.wa.gov/longrangeplan/review/documents/Volume1_FEIS_CD.pdf

20. Washington Department of Ecology, Water Quality Program, www.ecy.wa.gov/programs/wq/wqhome.html

21. Endangered species act regulations: wdfw.wa.gov/recovery.htm

22. WSU Extension Service: clark.wsu.edu/natural

23. Clark County ESA, "Sammy Awards," www.clark.wa.gov/esa/sammy.html

24. CPU Stream Team www.clarkpublicutilities.com/ourenvironment/streamTeam

25. Department of Ecology database www.ecy.wa.gov/programs/wq/303d/2008/index.html

26. Clark County Public Health, "New Septic System Regulations" www.clark.wa.gov/health/environmental/septic/faq.html

27. Clark County Public Health, Environmental Public Health database, January 2008

28. Clark County Public Works, Solid Waste Program: www.clark.wa.gov/recycle

29. Department of Ecology, Progress Report March 2007 www.ecy.wa.gov/beyondwaste/bwprogress_report.html

30. Clark County Public Works, "Waste Stream Analysis 2003," www.clark.wa.gov/recycle/documents/Waste%20Stream%20Analysis%20Final%20Report.pdf

31. Ecology, www.ecy.wa.gov/beyondWaste/pdf/ClarkOrganics.pdf

32. Clark County Public Works, Solid Waste Program, Moderate Risk Waste Plan, 2000
www.clark.wa.gov/recycle/documents/11%20Moderate%20Risk%20Waste.pdf

33. University of Washington, Center for Urban Horticulture: 74 percent of the public prefer to patronize retailers with trees and other landscaping; in a study of 30 variables, landscape amenities had the highest correlation with occupancy rates, higher even than direct access to arterial routes; homes with equivalent features but with trees had a 3.5 percent to 6 percent increase in value.

34. American Forests, "Regional Ecosystem Analysis for the Willamette/Lower Columbia Region of Northwestern Oregon and Southwestern Washington State," October 2001, www.americanforests.org/download.php?file=/rea/AF_Portland.pdf

35. USDA Forest Service compilation, "Twenty-nine Reasons for Planting Trees," www.treelink.org/docs/29_reasons.phtml

36. Clark County GIS and Vancouver-Clark Parks and Recreation, "City of Vancouver Canopy Report," March 2005, www.cityofvancouver.us/parks-recreation/parks_trails/urban_forestry/docs/canopyreport.pdf

37. American Forests, "Setting Urban Tree Canopy Goals,"
www.americanforests.org/resources/urbanforests/treedeficit.php

38. Southwest Clean Air Agency, "2005 Annual Report," (page 20), www.swcleanair.org/pdf/anrpt2005.pdf

39. EPA, Air Quality Index Reports for Clark County, Washington (1997-2006), www.epa.gov/air/data

APPENDIX C

Other Resources

Sustainable Washington: www.ofm.wa.gov/sustainability

Sustainable Vancouver: www.cityofvancouver.us/sustainability.asp

Sustainable Oregon: www.sustainableoregon.net

Natural Step (sustainability framework): www.naturalstep.org

Green Building:

Florida www.floridagreenbuilding.org
LEED Leadership in Energy and Environmental Design www.usgbc.org
Living Building Challenge www.cascadiagbc.org/lbc
EPA www.epa.gov/greenbuilding/

Carbon Footprint:

www.ecofoot.org

Government Finance Officers Association recommended practice:

www.gfoa.org/downloads/budget-sustainability.pdf

Tree Canopy:

City of Portland 2007 report:
www.portlandonline.com/shared/cfm/image.cfm?id=171829

APPENDIX D

About Greenhouse Gas

One currently popular measure for impacts on the environment, coupled with concerns of climate change, is greenhouse gas emissions. A rough estimate of the emissions from Clark County's internal operations is 16,000 metric tons in 2006.[b] This includes energy (gasoline, diesel, electricity, natural gas), solid waste, and employees' commutes to work. It excludes airline miles/fuel for travel on county business. We also have not tried to calculate indirect greenhouse gas, such as from purchases (created when our paper or computers were made) or end-of-cycle (if we landfilled rather than recycled our used paper).

The indicators in this report that can impact greenhouse gas include:

- Energy use
- Green purchasing
- Fleet operations
- Solid waste
- Tree canopy
- Air quality

Beyond greenhouse gas, there are other environmental impact measures. Toxic materials and clean water are also important, but would be absent in a report on greenhouse gas alone.

[b] A metric ton is about 2,200 pounds. The calculation was provided by a Public Works employee.

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