



City of Caribou, Maine

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AGENDA Caribou City Council Regular City Council Meeting 7:00 P.M. Tuesday, October 14, 2014 Caribou City Council Chambers

1. Public Input
2. Declaration of Conflicts of Interest from the City Council regarding any agenda item.
3. Consider authorizing the minutes of the following meetings:
 - a) September 8, 2014 Special Council Meeting 2
 - b) September 8, 2014 Regular Council Meeting 3-5
4. Consent Agenda
 - a) September 2014 Financials
 - b) September 2014 Police Department Report 6-7
 - c) September 2014 Fire Department Report 8-9
 - d) November 2014 Election 10-11
 - e) Board Appointments 12
 - f) Approval of Quit Claim Deeds 13
5. Land & Water Conservation Fund Grant 14-15
6. General Assistance Ordinance Amendments 16-18
7. Ambulance Purchase 19
8. Ambulance Contracts 20-22
9. Fire Contracts 23-25
10. Pellet bids 26
11. Shooting Range Report 27-41
12. Other Business

Upcoming Meeting Dates:

Budget Workshop Thursday October 16, 2014 at 6:00 p.m.
Budget Workshop Monday October 20, 2014 at 6:00 p.m.
Budget Workshop Wednesday October 22, 2014 at 6:00 p.m.
Regular City Council Meeting, October 27, 2014 at 7:00 p.m.



14-21

A special meeting of the Caribou City Council was held 6:15 p.m. on Monday, September 8, 2014 in Council Chambers with the following members present: Mayor Gary Aiken, Deputy Mayor David Martin, Philip McDonough II, Joan L. Theriault, Shane McDougall, and Kenneth G. Murchison, Jr.

Austin Bleess, City Manager and Tony Mazzucco, Assistant City Manager were present.

Council Agenda Item #1: Executive Session to discuss an Abatement Request pursuant to MRSA Title 36 Chapter 105 Section 841 et seq.

6:15 p.m. Motion made by K. Murchison, seconded by P. McDonough, to move to executive session to discuss an Abatement Request pursuant to MRSA Title 36 Chapter 105 Section 841 et seq. (5 yes) So voted.

6:40 p.m. Motion made by D. Martin, seconded by P. McDonough, to move out of executive session.

Motion made by D. Martin, seconded by J. Theriault, to deny the poverty abatement and direct City staff to waive foreclosure on the 2012 taxes. (5 yes) So voted.

Meeting adjourned at 6:40 p.m.

Austin Bleess, City Manager

A regular meeting of the Caribou City Council was held 7:00 p.m. on Monday, September 8, 2014 in Council Chambers with the following members present: Mayor Gary Aiken, Deputy Mayor David Martin, Philip McDonough II, Joan L. Theriault, Shane McDougall, and Kenneth G. Murchison, Jr.

Austin Bleess, City Manager and Tony Mazzucco, Assistant City Manager were present.

Department Managers: Penny G. Thompson, Tax Assessor; Scott Susi, Fire Chief; and Gary Marquis, Supt. of Parks & Recreation.

Natalie De La Garza, representing the Aroostook Republican; and Time Warner covered the meeting.

Council Agenda Item #1: Public Input

a) Caribou Friends of Scouting

Vaughn Keaton, Troop #186 Scoutmaster, stated the North Star District would like to hold the 2015 Winterama in Caribou. The outdoor event would be held February 20-22 in the area of the Scout Hall which is located in the Light Industrial Park. On behalf of Caribou Friends of Scouting, Mr. Keaton requested the assistance of the Public Works Department in moving snow for the event. When these types of events are held, the Katahdin Area Council adds a rider to their insurance to cover any potential liability issues.

Motion made by K. Murchison, seconded by J. Theriault, to allow the Public Works Department to assist Caribou Friends of Scouting in their preparations for the 2015 Winterama to be held February 20-22 in Caribou. (5 yes)

b) Jamie Bell, resident of Grimes Mill Road, discussed safety and noise issues with the shooting range on the Grimes Road. Mr. Bell submitted a petition signed by 27 individuals requesting that the range be shut down. Several questions from the Council were answered by Mr. Bell and the City Manager.

The Mayor recommended that the Council take Mr. Bell's concerns under advisement and turn it over to the City Manager and Police Chief for them to review and to bring back to Council any recommendations.

Council Agenda Item #2: 2013 Audit Presentation

Felch & Company representative Gregory Dickerson briefly reviewed the City's 2013 audit. The City received an unmodified opinion; which is the highest opinion the City could have received.

Council Agenda Item #3: Declaration of Conflicts of Interest from the City Council regarding any agenda item.

None.

Council Agenda Item #4: Consider authorizing the minutes of the following meetings:

- a) August 19, 2014 Special Council Meeting
- b) August 11, 2014 Special Council Meeting
- c) August 11, 2014 Council Meeting
- d) August 25, 2014 Council Workshop

Motion made by K. Murchison, seconded by P. McDonough, to accept the minutes of August 19, 2014 Special Council Meeting, August 11, 2014 Special Council Meeting, August 11, 2014 Council Meeting, and August 25, 2014 Council Workshop as presented. (5 yes) So voted.

Council Agenda Item #5: Consent Agenda

- a) August 2014 Financials
- b) August 2014 Police Department Report
- c) August 2014 Fire Department Report
- d) Approval of Beano or Games of Chance Licenses
Blanket Letters of approval dated January 1, 2015 to December 31, 2017
 - 1. American Legion Post #15
 - 2. Caribou Senior Citizens Bingo
 - 3. Lister-Knowlton VFW Auxiliary
 - 4. Knights of Columbus
 - 5. Lister-Knowlton VFW Post 9389
- e) Proclamation for Caribou Heritage Day
 - 1. Alexander Cochran

Motion made by P. McDonough, seconded by D. Martin, to approve the Consent Agenda with Business Items A, B, C, D, and E as presented. (5 yes) So voted.

Councilor Murchison read the Proclamation for Alexander Cochran into the record.

Council Agenda Item #6: Tax Acquired Property Policy

Motion made by D. Martin, seconded by P. McDonough, to approve the revised Tax Acquired Property policy as presented. (5 yes) So voted.

Council Agenda Item #7: Window Installation Bid

Motion made by D. Martin, seconded P. McDonough, to authorize the installation of new windows, insulation, and trim work around the windows at the Caribou City Office building. (5 yes) So voted.

Council Agenda Item #8: Demolition of Collins St. Property

Motion made by K. Murchison, seconded by P. McDonough, to award \$4,500 in demolition work to MJ Ouellette and Daughters, Inc. for the removal of two buildings on Collins Street. (5 yes). So voted.

Council Agenda Item #9: Sharing Services with Woodland

Motion made by P. McDonough, seconded by J. Theriault, to authorize the City Manager to sign a Contract allowing the City of Caribou to provide Code Enforcement Services for the Town of Woodland. (5 yes) So voted.

Council Agenda Item #10: Recreation Trail grant

Last spring, former Supt. Mazzuchelli addressed the Council about writing a recreation trail project grant to increase and fix the trails off from York Street, Armco Avenue, Lower Lyndon Street, and Broadway Street to connect with the existing B&A trail. Current Supt. Marquis presented updated costs for the proposed grant application. The plan is to apply for the maximum grant which is \$100,000. If approved, the split would be 80/20 with 20% being the City's share. The total cost of the project is estimated to be \$161,397.50. Supt. Marquis suggested that the City's share could come out of the Land Acquisition/Easement, Recreation Collins Pond, Rails to Trails Program, TIF Funds plus in-kind services. The grant application is due November 14th.

Supt. Marquis answered several questions from the Council.

Motion made by K. Murchison, seconded by D. Martin, to authorize the Supt. of Parks & Recreation Gary Marquis to submit on behalf of the City an application for a Recreation Trails Grant. (5 yes) So voted.

Council Agenda Item #11: Other Business

- a. Community Vision – Councilor Murchison complimented management for all the work that has been done on the City’s Comprehensive Plan.

Motion made by K. Murchison, seconded by J. Theriault, to adjourn the meeting at 8:10 p.m. (5 yes) So voted.

Upcoming Meeting Dates:

Regular City Council Meeting, October 14, 2014 at 7:00 p.m.

Budget Workshop Thursday, October 16, 2014 at 6:00 p.m.

Budget Workshop Monday, October 20, 2014 at 6:00 p.m.

Budget Workshop Wednesday, October 22, 2014 at 6:00 p.m.

Regular City Council Meeting, October 27, 2014 at 7:00 p.m.

Jayne R. Farrin, Secretary

Caribou Police Department

SEPTEMBER 2014 MONTHLY REPORT

	OFFENSE	Amount		OFFENSE	Amount
1	Complaints	2399	40	Oper. Wrong Way on a One Way	0
2	Motor Vehicle Accidents	18	41	Viol. Of Title 29 A Sec 2101	0
3	Escorts	5	42	Violation of Permit	0
4	Theft Complaints	11	43	Failure to Stop at Stop Sign	1
5	Crim. Mischief Complaints	7	44	Failure to Stop for Pedestrians	0
6	Animal Complaints	11	45	Passing Stopped School Bus	0
7	Domestic Complaints	7	46	Stops and Checks M/V	1959
8	Burglary Complaints	2	47	Parking Tickets	0
9	Oper. M/V Under the Influ.	1	48	Business Alarms	19
10	Criminal Trespass Comp.	12	49	M/V Permits	6
11	Motor Vehicle Theft	0	50	Handling Prisoners	59
12	Unsecured Doors&Windows	0	51	Running Intoxilyzer	3
13	Motor Vehicle Complaints	26	52	No Insurance	4
14	Missing Persons	1	53	Warrant Arrests	6
15	Harassment Complaints	18	54	Negotiating a Worthless Instrment	1
16	Assault Complaints	6	55	Leave the Scene of Accident	0
17	O.A.S. Arrests	3	56	Failure to Yield the Right of Way	0
18	Juvenile Complaints	8	57	Arson Complaints	0
19	Fight Complaints	0	58	Suicide Complaints	0
20	Noise Complaints	2	59	Disorderly Conduct Complaints	24
21	Criminal Threat Complaints	2	60	Unlawful Sexual Contact	2
22	Lost & Found	6	61	Gross Sexual Contact	2
23	Neg. Worthless Inst. Comp.	1	62	Unattended Death Reports	0
24	Prowler Complaint	0	63	Burglary Arrests	1
25	Criminal Trespass Arrest	1	64	Violation of Probation Arrests	0
26	Assist Other Agencies	21	65	Criminal Records Check	18
27	Assault Arrest	2	66	Refusal to Sign U.T.T.	0
28	Drunk Complaint	0	67	Violation of Liquor Laws	0
29	Litter Complaint	1	68	Violation of Tobacco Laws	0
30	Theft Arrest	2	69	Violation of Drug Laws	0
31	Oper.Unregistered M/V	0	70	Liquor Law Complaints	0
32	Oper M/V Without a License	1	71	Snowsled & ATV Complaints	5
33	Driving To Endanger	0	72	Juvenile Arrests	4
34	Expired Inspection	0	73	Prov. A Place for Minors to Consume Alc.	0
35	Inadequate Exhaust	0	74	Criminal Mischief Arrests	1
36	Unnecessary Noise/Accelerat	0	75	Violation of Bail Conditions	5
37	Eluding an Officer	0	76	Seatbelt Violation	0
38	Speeding	4	77	Disorderly Conduct Arrests	3
39	Fail to Stop for an Officer	0	78	Receiving Stolen Property	4

Caribou Police Department

OFFENSE		Amount	OFFENSE		Amount
79	House Watch Requests	2	91	Resisting Arrest	0
80	Failure to License Dog	0	92	911 Calls	24
81	Truant from School	0	93	Warnings	51
82	Criminal Threatening Arrests	0	94	Domestic Assault	1
83	Terrorizing Arrests	0	95	Check on Well Being/Mental Subje	11
84	Loaded Firearm in a M/V	0	96	Police Information	11
85	Making a False Public Report	0	97	Suspicious Activity/Person/MV	24
86	Child Endangerment	4	98	Civil Case	11
87	Tampering with a Witness	0			
88	Violation Of Protection Order	1			
89	Poss. of a Firearm by a Felon	0			
90	Multi-handgun purchase	3			

Respectively Submitted,

Chief Michael W. Gahagan
Caribou Police Department

**CFAD MONTHLY REPORT
September 2014**

Total Fire/ Rescue Calls	11	Total Amb. Calls 172 inc. Air & Assists	
-Alarms for Fires (33)	1	- Ground Amb.:	163
-Alarms for Rescues (66)		- Air Amb. Flights:	1
-Silent Alarms	10	- Amb. Assist Calls:	8
-Haz-Mat		- ALS Calls	98
-Grass Fires		- BLS Calls	53
-Chimney Fires	1	- No Transport	13
-False Alarms		- Calls Turned Over: 6 = \$10,264	
-10-55's	2	Total Out of Town Amb. Calls	19
-Aid to Police	2	Total Out of Town Fire/Rescue Calls	2
-Public Service		Est. Fire Loss, Caribou	\$44,000
		Est. Fire Loss, out of City	\$
Total Hours Pumped	3.5	Total Est. Fire Loss	\$44,000
Gallons of Water Used	13,800	Total Maint. Hours	8 mhrs
Amt. of Hose used:	700'	Total Training Hours	242.75 mhrs
Ladders Used (in Feet): 35' (75' Ariel)_____		Miles Traveled by all Units	13,344
Thermal Imaging Camera Used: 2		Fire Permits Issued	24
CO2 Meter Used:	1		
Rescue Sled & Snowmobile:		*Color Guard Training	38.75 mhrs
Rescue Boat:			
Jaws Used:	1	Total Fire & Amb. Calls	183

MUTUAL AID TO:

P.I.F.D.
F.F.F.D.
L.F.D.
W.F.D.
Stockholm F.D.
North Lakes FD
Crown Amb
Van Buren Amb. 2 - Intercepts

MUTUAL AID FROM:

P.I.F.D. 1
F.F.F.D.
L.F.D. 1
W.F.D.
Stockholm F.D.
North Lakes FD
Crown Amb

OUT OF CITY FIRES/RESCUES

LOCATION	# OF CALLS	MAN HRS.
Woodland		
New Sweden	1	2.5 mhrs.
Connor	1	1 mhrs.
Westmanland		

Scott Susi, Chief

BREAKDOWN OF FIRES

For September 2014

Situation Found	# Of Incidents	Fire Casualties	Est. Property Damage
1. Private Dwellings inc. Mobile Homes	1		
2. Apartments (3 or more)			
3. Hotels & Motels			
4. Dormitories & Boarding Homes			
5. Public Assembly (Church, Restaurant)			
6. Schools			
7. Institutions (Hospitals, Jails, Nursing Homes)			
8. Stores, Offices			
9. Industry, Utility, Defense			
10. Storage	1		\$24,000
11. Vacant Buildings or being Built			
12. Fires outside structure w/value (crops, timber, etc.)			
13. Fires Highway Vehicles	1		\$20,000
14. Other Vehicles (planes, trains, etc.)			
15. Fires in brush, grass w/no value			

Other Incidents

16. Haz-Mat	
17. False Calls	
18. Mutual Aid Calls	
19. Aid to Ambulance (10-55's)	2
20. Aid to Police	2 (1 - CPD; 1 - Fire Marshal)
21. Investigation (Smoke, CO ₂ or Alarm)	4 (1 - Smoke; 3 - Alarm)
22. Service Calls	

Total Calls for the Month: 11



OFFICE OF THE CITY MANAGER
CARIBOU, MAINE

To: Mayor and Council Members
From: Austin Bleess, City Manager
Date: October 14, 2014
Re: 2014 Elections

In preparation for the upcoming election the Council needs to authorize the following items:

- A. Approval of an 8:00 Opening Time for the November 4, 2014 Elections.
- B. Appointment of Jayne R. Farrin as Election Warden and Kalen Hill as Deputy Election Warden for the Nov. 4, 2014 Elections.
- C. Notice of Municipal Election which is on the following page.

**CITY OF CARIBOU
NOTICE OF MUNICIPAL ELECTION
TUESDAY, NOVEMBER 4, 2014**

COUNTY OF ARROSTOOK, SS

CITY OF CARIBOU

You are hereby required to notify and warn the inhabitants of the City of Caribou, qualified by law to vote in City affairs, to meet at **the Caribou Wellness and**

Recreation Center at 55 Bennett Drive, in said Caribou, on the 4th day of November 2014, 8:00 a.m. in accordance with the provisions of Title 30-A §2551 of the Maine Revised Statutes, to elect City Officials for the several offices as follows:

Three members of the City Council for three years

One member of the City Council for one year (term ending December 31, 2015)

Two members of the Regional School Unit #39 Board of Directors for three years

One member of the Jefferson Cary Memorial Hospital Fund for three years

Absentee ballots will be processed on Monday, November 3, 2014, starting at 9:00 a.m. or immediately following a requested inspection and on November 4, 2014 starting at 9:00 a.m. The polls shall open at **8:00 a.m. and will close at 8:00 p.m.**

Given under our hands, this 14th day of October, 2014:

Majority of Municipal Officers of
The City of Caribou, Maine

A True Copy
Attested by: _____
Jayne R. Farrin, City Clerk

Date: _____



OFFICE OF THE CITY MANAGER
CARIBOU, MAINE

To: Mayor and Council Members
From: Austin Bleess, City Manager
Date: October 14, 2014
Re: Board Appointments

We have received an application from Philip Bosse for the Nylander Board. He would fill a currently vacant seat until December 31, 2015.

We have received applications for the library board from Ryan Scheiber, Wendy Bossie, and Brian Massie to fill the current vacancies.

Ryan Scheiber will fill a vacancy until the end of 2014, will be appointed to a full term in 2015.

Wendy Bossie will fill a vacancy until the end of 2015.

Brain Massie will fill a vacancy until the end of 2017.

We would need Council approval of these appointments.



OFFICE OF THE CITY MANAGER
CARIBOU, MAINE

To: Mayor and Council Members
From: Austin Bless, City Manager
Date: October 14, 2014
Re: Approval of Quit Claim Deeds

The following property has been redeemed by the owner of record in accordance with the Tax Acquired Property Policy. We will need the Council to authorize these quit claim deeds.

Map 36, Lot 52	Cheryl and Scott Drost
Map 23, Lot 7	Rino and Susan Marquis



CARIBOU PARKS AND RECREATION DEPARTMENT
CARIBOU, MAINE

TO: Mayor and Council Members and City Manager Austin Bleess
FROM: Gary Marquis, Superintendent of Parks and Recreation
RE: Land & Water Conservation Fund Grant
DATE: October 14, 2014

The Caribou Community Pool opened in the summer of 1959. It was constructed by the Caribou Public Works Department with assistance from some local contractors and was then Public Works Director Charlie Huston's first project as Director.

There were surface repairs over the years with the last major repair completed in 1993. That project patched cracks in the pool surface and leaks at the main drain; included installation of a small circulation pump with a basket strainer; and added an addition to the existing bathhouse and upgraded plumbing.

Fortunately at that time the type of repairs proposed did not require review by the Dept of Human Services Division of Health Engineering as it was covered under Section 2663 of Title 22 MRSA which would allow continued use, maintenance and repair of a non-conforming pool constructed prior to 1985.

During the summer of 2013, 20 years later, the pool was losing an estimated 1500 gallons of water per day. That fact combined with diminishing user volume forced closure of the pool for 2014 with the intent that estimates would be gathered for probable repairs for the City Council to review.

This spring, Department officials contacted several commercial pool renovation companies, one of which came to Caribou to assess the facility and provide a probable solution. Brock Commercial Pool Equipment provided an estimate to repairs cracks, remove existing plumbing and install new plumbing and line the pool with a PVC membrane system. This proposed repair was submitted to the Maine DHS Health Engineering Division for review. Based on their experience, Brock submitted a second estimate in anticipation of the State indicating that the project represented substantial change and would thus not be grandfathered as it was in 1993. That estimate contained the original figures plus installation of a complete circulation and filtration system for a combined total of \$685,882.63.

Department officials also contact Lane Construction who had completed the repairs in 1993 and asked them to assess the pool and deck areas and provide an estimate for repairs. Their estimate came in at \$66,105 and would include removing all colored surface areas, grinding the surface, pave prep with miraffi roll, patching existing cracks and repaving the area inside the fence. The estimate did not include painting the surface which would represent an additional \$5000-7000.

Since the last meeting with the council in July, the recreation department has been working with Brock Commercial pool company to design a splash pad and smaller sized pool to allow for swimming lessons. The intent is to build within the existing envelope of the current facility.

With this being said department personnel has been working on writing a grant for \$100,000 through the Land and Water Conservation Fund.

Also the department has been approached by a local charitable organization and they have committed to donate \$75,000 to this project. In addition the department has currently in pool reserves \$40,655, with the anticipation of another \$29,000 to be put into this account through CIP program. The city manager is currently working on writing a grant through Machias Savings Bank in the amount of \$10,000. With this being said if everything falls into place we are looking at securing funding in the amount of \$254,655.

Again, this is purely suggestive and the estimates have been gathered to provide the City Council with information to help make a decision about the future of the outdoor facility only at this time.

So what I am asking of the council is to authorize the recreation department to apply for the Land and Water Conservation Fund grant.

Thank you for your time



GENERAL ASSISTANCE OFFICE
CARIBOU, MAINE

To: Mayor and Council Members, and City Manager
From: Jayne R. Farrin, General Assistance Administrator
Date: October 14, 2014
Re: General Assistance Ordinance Amendment

Below is the proposed 2014-2015 General Assistance Ordinance Appendix B and C. These numbers are updated on an annual basis.

For Appendix B the maximum amounts allowed for food are established in accordance with the U.S.D.A Thrifty Food Plan.

Appendix C is a listing of the maximum levels of assistance for heating (both heated and unheated). These maximum levels were developed by MMA using 2012-2013 HUD Fair Market Rent values that include utility costs. Because the FMR numbers include utility and heating costs, the applicable average utility and heating allowances, as developed by the Maine State Housing Authority (MSHA), are subtracted from the FMR to obtain a pure “housing” cost.

I will be available during the public hearing to answer any questions the Council may have.

Councilor _____ introduced the following ordinance:

Ordinance No. 7, 2014 Series
City of Caribou
County of Aroostook
State of Maine

AN ORDINANCE AMENDING CHAPTER 17 General Assistance

Short Title: An Ordinance Amending General Assistance Guidelines.

The City Council of the City of Caribou, County of Aroostook, State of Maine, pursuant to the requirements of the City of Caribou Charter, Section 2.11 (1) does ordain the following:

Appendix B of Chapter 17 of the Caribou City Ordinances is hereby amended as follows:

Appendix B

A listing of the maximum levels of assistance food. These maximum levels shall be the same as the USDA Thrifty Food Plan, which are presumed to be reasonable by regulation of the Department of Health and Human Services, as they may be amended from time to time. Through October 1, 2014 these amounts are

Number in Household	Weekly Maximum	Monthly Maximum
1	\$43.95 <u>45.12</u>	\$189 <u>194</u>
2	\$80.70 <u>83.02</u>	\$347 <u>357</u>
3	\$115.58 <u>118.84</u>	\$497 <u>511</u>
4	\$146.97 <u>150.93</u>	\$632 <u>649</u>
5	\$174.42 <u>179.30</u>	\$750 <u>771</u>
6	\$209.30 <u>215.12</u>	\$900 <u>925</u>
7	\$231.40 <u>237.67</u>	\$995 <u>1,022</u>
8	\$264.42 <u>271.86</u>	\$1,137 <u>1,169</u>

For each additional person \$146 per month will be added.

Appendix C of Chapter 17 of the Caribou City Ordinances is hereby repealed.

Appendix C of Chapter 17 of the Caribou City Ordinances shall read as follows:

A listing of the maximum levels of assistance for housing (both heated and unheated).

Number of Bedrooms	<u>Unheated</u>		<u>Heated</u>	
	Weekly	Monthly	Weekly	Monthly
0		\$362.00		\$461.00
1		\$362.00		\$487.00
2		\$426.00		\$584.00
3		\$575.00		\$770.00
4		\$614.00		\$848.00

This ordinance, being introduced on October 14, 2014 and a public hearing being held on October 27, 2014 was duly passed by the City Council of the City of Caribou, Maine, this _____ day of _____ 2014.

Gary Aiken, Mayor

Kenneth G. Murchison Jr, Councilor

Shane McDougall, Councilor

David Martin, Councilor

Philip J. McDonough II, Councilor

Joan Theriault, Councilor

Attest:

Jayne R. Farrin, City Clerk



OFFICE OF THE CITY MANAGER
CARIBOU, MAINE

To: Mayor and Council Members
From: Austin Bleess, City Manager
Date: October 14, 2014
Re: Ambulance Purchase

The Ambulance Department is asking permission to purchase a new ambulance in the calendar year of 2015.

Chief Susi would like to replace an old, high mileage ambulance that we have in use now. This ambulance has been remounted three times and it is just worn out.

As Council knows we have increased our long distance transfers (over 60 miles), 226 to date, where past years we would only do 170 for a year.

In 2015 we will have \$207,503.03 in the ambulance reserve account, the new ambulance will cost \$174,507.00 leaving \$32,996.03 in the account. The purchase price is inclusive of a \$5,000 trade in for our old ambulance. Right now it is about 6 months for this rig to be built, so we would not receive it until April. We would not pay for it until it is delivered.

This ambulance is a 2014 Chevy G4500 Chief XL and will mirror the last two purchases, lifetime warranty on the box. We have had good luck with these to date and would recommend the same for now.

It comes equipped with the necessary inverters, IV warmers and poles, and oxygen brackets that are required.

We are asking for Council approval on this purchase.



OFFICE OF THE CITY MANAGER
CARIBOU, MAINE

To: Mayor and Council Members
From: Austin Bleess, City Manager
Date: October 14, 2014
Re: Ambulance Contracts

It is time to renew our ambulance contracts with our contract communities. The contracts are the same with the exception of the per capita fee. That fee is being increased by 25 cents per capita. Otherwise the contracts are the same.

So the new contract amounts for each community are:

Woodland	\$13,646
New Sweden	\$6,773
Westmanland	\$698
Stockholm	\$2,846
Connor	\$5,141
Perham	\$4,343
Madawaska Lake	\$1,238

The sample contract is on the following pages.

We will need Council approval for the contracts.

AMBULANCE COVERAGE INTERLOCAL COOPERATION

The Caribou City Councilors, acting in their capacity as Municipal Officers for the City of Caribou, hereinafter referred to as the "City", in accordance with the vote of said councilors at a regular meeting held on _____ 2014 enter into contract with the Municipality of **NAME** in accordance with the vote of said Municipal Officials, hereinafter referred to as the "Municipality", at a regular meeting held on _____ 2014, for Ambulance Coverage.

1. The City agrees to provide 24-hour Ambulance Coverage to the above named Municipality to the Intermediate level permitted to Paramedic level of patient care according to the Rules of Maine Emergency Medical Services. All personnel will be trained to the standards of Maine EMS and be so licensed.
2. When a call for the Ambulance is received at the Caribou Fire and Ambulance Department from any person in the Municipality, the following procedure shall be followed:
 - a. When a call for the Ambulance is classed as an Emergency Call (meaning not a routine transfer), the dispatcher shall immediately notify his / her Superior who shall dispatch, as soon as possible, such force needed in response to the call which the Superior or Officer-in-Charge shall deem necessary and proper under the circumstances, if so warranted to include 1st Responders if available.
 - b. When a call for the Ambulance is classed as Routine Transfer (meaning moving a patient from Point A to Point B non-emergency for, as example, a Doctor's appointment or other non-emergency situation), the dispatcher shall immediately notify his / her Superior who shall dispatch the Ambulance as soon as possible in response to the call. **In no event will the City of Caribou leave the Ambulance Coverage areas unprotected to handle a Routine Transfer.** All such transfers should be scheduled in advance.
3. The ambulance crew or 1st Responders sent to aid and assist, shall at all times be directly under the order and control of the City Fire Chief and / or the Officer-in-Charge of the call however, while within the limits of the Municipality, the force is acting in behalf of, and as agent for the Municipality to call for special equipment or personnel to help with the situation, should the need arise.
4. When in the opinion of the Officer-in-Charge, the services of the City are no longer needed; he / she shall order the ambulance crew to return to the City Fire Station.



OFFICE OF THE CITY MANAGER
CARIBOU, MAINE

To: Mayor and Council Members
From: Austin Bleess, City Manager
Date: October 14, 2014
Re: Fire Contracts

It is time to renew our fire contracts with our contract communities. The contracts are the same with the exception of the fee. That fee is being increased by 3%. Otherwise the contracts are the same.

So the new contract amounts for each community are:

Woodland	\$59,405
New Sweden	\$32,763
Westmanland	\$10,512
Connor	\$26,836

The sample contract is on the following pages.

We will need Council approval for the contracts.

FIRE PROTECTION INTERLOCAL COOPERATION

The Caribou City Councilors, acting in their capacity as Municipal Officers for the City of Caribou, hereinafter referred to as the "City", in accordance with the vote of said Councilors at a regular meeting held on _____ 2014, enter into contract with the Municipality of **TOWN** in accordance with the vote of said Municipal Officials, hereinafter referred to as the "Municipality", at a regular meeting held on _____ 2014, for fire protection to the Township(s) structures, hereinafter described and designated under the following terms and pursuant to Title 30, Section 1953, M.R.S.A..

1. The City agrees to provide auxiliary or supplemental fire protection to the above named Municipality.
2. When a call for aid or assistance from any person in the Municipality is received by the City Fire Station, the following procedure shall be followed:
 - a. When a call for aid or assistance is received, the dispatcher shall immediately notify his / her Superior who shall dispatch such force as needed in response to the call which the Superior or Officer-in-Charge shall deem necessary and proper under the circumstances if so warranted. In no event shall the City of Caribou be left without adequate fire protection.
 - b. The decision to respond shall rest in the discretion of the Fire Chief or Officer-in-Charge at the Caribou Fire Station when any call for assistance is received.
3. A force sent to aid and assist shall at all times be directly under the order and control of the City Fire Department Officers in charge of the forces; however, while within the limits of the Municipality, the force is acting in behalf of, and as agent for the Municipality.
4. When in the opinion of the Fire Chief or Office-in-Charge, the services of the department are no longer needed; he / she shall order the force to return to the City Fire Station. The Officer may, however, leave such equipment as he / she deems advisable for use by the men on standby, if there is a danger of fire breaking out again.
5. The Fire Chief or Officer-in-Charge shall have the power to order the return of a force at any time when in his / her opinion the services of, or the presence of, such forces is required within the City of Caribou.

6. The Maine Forest Service, under Title 12, Chapter 801, Section 8002, Maine Law, has the responsibility to handle suppression of all grass, brush and forest fires, but will reimburse any municipality that fights a grass or brush fire that is a threat to the forest of the municipality. They will also respond to structural fires when, and only when, personnel and equipment are nearby and available, and will do so in recognition of lack of other readily available sources of help or a potential hazard to the forest.

7. The City shall be compensated for standing by and responding to calls for aid or assistance by the Municipality in the amount of **\$AMOUNT** annually. This compensation will be due, even if there is no responses during the year.

8. Invoices will be submitted by the City to the Municipality on a yearly basis. Failure to pay such invoices within Sixty (60) days from date of invoice shall be deemed sufficient cause for cancellation of this agreement at the discretion of the City of Caribou.

9. This agreement shall be in effect from Jan. 1st, 2015 to Dec. 31st, 2015. The City and Municipality shall review this agreement at the end of each period and either the City or the Municipality, by vote of their respective officials, can terminate this contract at any time upon Ninety (90) days written notice to the other party.

IN WITNESS WHEREOF, the parties to those present have executed this Contract, each of which shall be deemed on original on the _____ day of _____ 2014.

1. _____
2. _____
3. _____

_____ Officials of NAME
 Witness to all

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

_____ Caribou City Councilors
 Witness to all

Filed with Fiscal Administrator _____ 2014.



OFFICE OF THE CITY MANAGER
CARIBOU, MAINE

To: Mayor and Council Members
From: Austin Bleess, City Manager
Date: October 14, 2014
Re: Pellet Bids

We have gone out for bids for our wood pellets. We sent the bid forms to companies throughout Maine and into New Hampshire.

We are bidding based upon the specs that are listed in the boiler manual. There are no pellet manufacturers in Maine that produce pellets to that spec. The closest place in New England that produces pellets to that spec declined to bid citing the high cost of transportation.

The only bid we received is from Daigle Oil Company for a price of \$223 per ton delivered in bulk. They can meet most of the specs, but cannot guarantee the no more than 2% fines with the deliveries.

We will need Council action on this.



CARIBOU POLICE DEPARTMENT

25 High Street, Suite 4
Caribou, Me 04736

(207) 493-3301
Fax: (207) 493-4201

October 8, 2014

Caribou City Council
25 High Street
Caribou, ME 04736

Dear City Councilors,

I want to thank you for bringing to my attention the public's concerns regarding the police department's gun range and want to ensure you that safety is our number one priority not only for our officers but also for the public.

Our officers utilize the range to qualify with their weapons, which is required by state law to keep their certification. These weapons would possibly include a .40 caliber, 12-gauge shotgun and possibly a .223 rifle. The city has no other property or "pits" that could be utilize to do this.

To travel elsewhere in Aroostook County would cost thousands of dollars extra in our budget, which is already stretched thin. We would have to pay a range fee per officer and an additional 4 hours of overtime. An estimate of \$2738 would have to be added to the training budget.

We also have contracts with US Border Patrol and US Customs that generate a total of \$3,000 in revenue to the City of Caribou yearly.

I could not provide information to anyone regarding who is using the range, time of use or what weapons are being used because of the contracts we have. This is a safety issue for our officers and would violate the contracts we do have.

Our officers and the others authorized to utilize the range are shooting at reasonable times. They are always done shooting by 8:00pm. If an officer is there shooting off duty, they have been instructed to notify dispatch. A range officer is only required to be present for department training.

Since the last meeting, a gate has been installed along with no trespassing signs. Anyone caught trespassing on the property will be issued a warning or a summons to court. Further efforts to make the range safer would include installing railroad ties that will be used to build a safety wall towards the road. We have contacted the railroad and they are willing to give us enough railroad ties to complete our project.

We have consulted with a range coordinator for the government and he is willing to work with us to further develop the range's safety issues.

The backstop behind the targets is 20 feet high. Beyond the backstop, the land goes uphill to a height of 62 feet and 42 feet higher than the residences on the Grimes Mill Road (see attached diagrams).

A noise level was measured directly across the street from where shooting takes place. At that location, the sound meter showed an ambient sound rating of approximately 20-30 dB, when shots were fired the sound level spiked between 7 and 12 db. Sound measurements were also taken on the Grimes Mill Road, and showed a similar ambient sound rating of 20-30dB. When shots were fired, the meter jumped between 5 and 8 dB with the sound level not exceeding 40 dB. To put this in perspective, a passing car at moderate speed showed a sound level of 55dB or higher.

Nick Archer with DEP was contacted and advised that there would not be any environment issues by shooting into the gravel backdrop.

Regarding the concerns of ricocheting bullets, see attached analysis. Highlights are 1. When a bullet strikes any surface, there is a critical angle at which the bullet will bounce off or ricochet from the surface rather than penetrate. After ricocheting from the surface, the missile will lose a considerable amount of its velocity and, invariable, lose its stability (see attached ricochet analysis figure 4.31). 2. In most cases of bullets ricocheting from a hard surface, the angle of ricochet is considerably less than one angle of incidence (see attached ricochet analysis tables 4.3 and 4.4)

I understand there is concern about the location of this range, but we are trying to go above and beyond to ensure that it is safe. The farmer directly behind the berm had been contacted and has no problems with our activities. Be aware, hunting is also allowed on the farmland which is much closer to the residences on the Grimes Mill Road than our range.

See attached documentation:

1. Photos
2. Overhead Diagrams
3. Trajectories for .40 caliber and the .223
4. Ricochet Analysis Report

Please let me know if you have any further questions or concerns.

Respectfully,



Chief Michael W. Gahagan





Elevation above sea level



Range elevation: 450 ft

Berm elevation: 470 ft

Difference: 20 ft

Hill in field: 512 ft

Tree elevation: 515 ft

318 Grimes Mill Road elevation: 440 ft

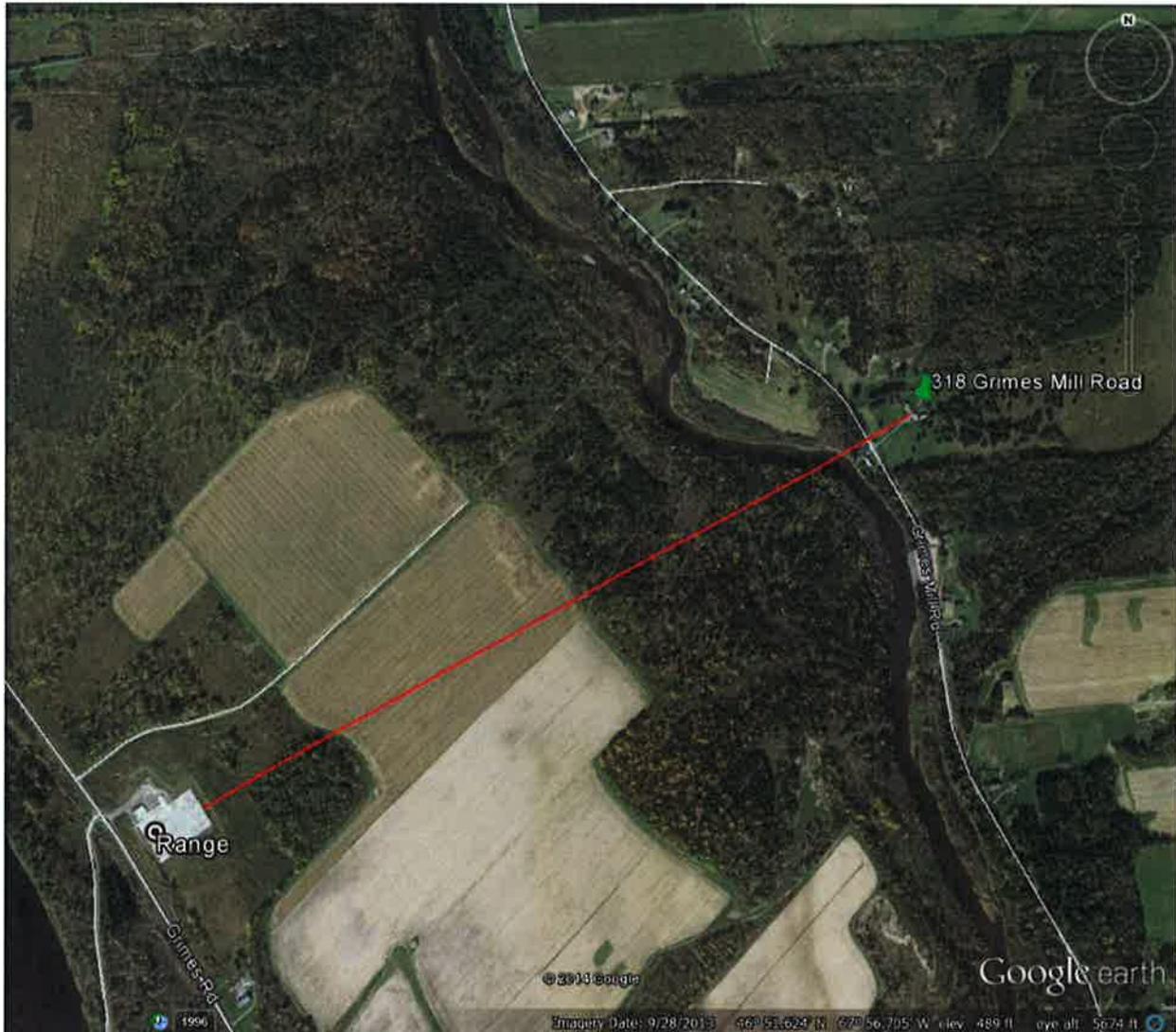
Distance between targets and highest point on the hill is 1,453 feet

Nearest residence



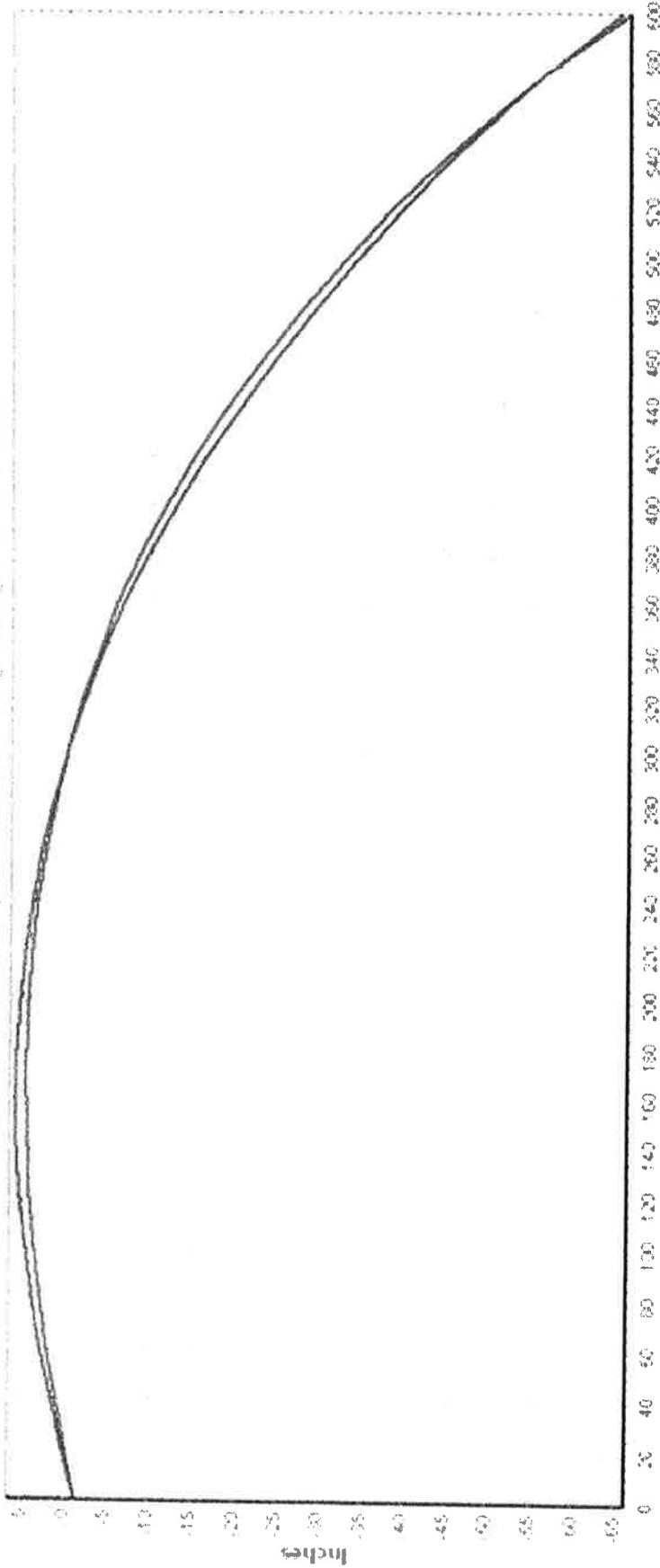
Distance to the nearest residence: 1,070 ft

Distance to 318 Grimes Mill Road from the Range



Distance from the range to 318 Grimes Mill Road: Approximately 4,250 ft

Trajectory for a 300 yard zero with a sight height of 1.5 inches



Gr	Load No	Caliber	Bullet Style	Weight (gr)	B C	Muzzle	100 YDS	200 YDS	300 YDS	400 YDS	500 YDS	600 YDS
<input checked="" type="checkbox"/>	2720	223 Rem (5.56x45mm)	Full Metal Jacket Boat Tail	55	0.269	-1.5	3.6	4.5	0.0	-11.8	-32.7	-66.3
<input checked="" type="checkbox"/>	P1696T	30-06 Spring (7.62x3mm)	Trophy Bonded Tip	180	0.500	-1.5	4.7	5.5	0.0	-12.8	-34.1	-65.2



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.223 Ballistics Chart & Coefficient

191 12 53

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This is a .223 ballistics chart (external) generated using our [ballistic trajectory calculator](#). Based off a standard 55gr bullet leaving the barrel at 3,215fps and follows the bullet trajectory all the way to 1000

yards in steps of 50 yard increments. The charting shows the range, drop (based off a 1.5" scope mount), current velocity, energy, and time in seconds in relation to the bullets movement through space and time. This chart does not account for atmospheric conditions, so if you want to take in to effect these things [check out the calculators official page](#). The Ballistic Coefficient for the .223 Remington, Remington Metal Case, 55gr is 0.202 (in this example) but, but may also range from .185 bc to .257



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Create Your Free Custom Ballistic Report



.223 Remington, Remington Metal Case, 55gr

.223 Remington, Remington Metal Case, 55gr

Range	Drop (inches)	Velocity	Energy	Time (milliseconds)
	A	A	A	A
0	-1.4944	3239	1281	0
50	-0.2598	2992	1093	49
100	0.0017	2759	929	101
150	-0.8818	2537	786	157
200	-3.1190	2326	661	219
250	-6.9673	2125	551	287
300	-12.7464	1934	457	361
350	-20.8563	1755	376	442

Handgun Ballistics

Caliber	Bullet Wt. Grs	Bullet Type	Velocity (feet per second)			Energy (foot-pounds)			Mid-Range Trajectory (inches.)		Barrel Length
			Mzl	50 yd	100 yd	Mzl	50 yd	100 yd	50 yd	100 yd	
25 Automatic	35	Glaser Safety Slug	1150			103					2.5
25 Automatic	45	Expanding Point	815	729	655	66	53	42	1.8	7.7	2
25 Automatic	50	Full Metal Jacket	760	707	659	64	56	48	2	8.7	2
30 Luger (7.65mm)	93	Full Metal Jacket	1220	1110	1040	305	255	225	0.9	3.5	4.5
30 Carbine	110	Hollow Soft Point	1790	1601	1430	783	626	500	0.4	1.7	10
32 Smith & Wesson	85	Lead-Round Nose	680	645	610	90	81	73	2.5	10.5	3
32 Smith & Wesson Long	98	Lead-Round Nose	705	670	635	115	98	88	2.3	10.5	4
32 Short Colt	80	Lead-Round Nose	745	665	590	100	79	62	2.2	9.9	4
32 Automatic	55	Glaser Safety Slug	1200			176					3.5
32 Automatic	60	Hollow Point	970	895	835	125	107	93	1.3	5.4	4
32 Automatic	71	Full Metal Jacket	905	855	810	129	115	97	1.4	5.8	4
38 Smith & Wesson	145	Lead-Round Nose	685	650	620	150	135	125	2.4	10	4
380 Automatic	70	Glaser Safety Slug	1350			283					3.5
380 Automatic	85	Jacketed Hollow Point	1000	921	860	189	160	140	1.2	5.1	
380 Automatic	95	Full Metal Jacket	955	865	785	190	160	130	1.4	5.9	
38 Special	80	Glaser Safety Slug	1500			400					6
38 Special	110	Jacketed Hollow Point	945	894	850	218	195	176	1.3	5.4	4
38 Special	158	Lead-Round Nose	755	723	693	200	183	105	2	8.3	4
38 Special	158	Lead-Semi Wad Cutter	755	721	689	200	182	167	2	8.4	4
38 Special + P	80	Glaser Safety Slug	1650			484					6
38 Special + P	95	Jacketed Hollow Point	1100	1002	932	255	212	183	1	4.3	4
38 Special + P	110	Jacketed Hollow Point	995	926	871	242	210	185	1.2	5.1	4
38 Special + P	125	Jacketed Hollow Point	945	898	858	248	224	204	1.3	5.4	4
38 Special + P	125	Jacketed Hollow Point	945	898	858	248	224	204	1.3	5.4	4
38 Special + P	158	Lead-Semi Wad Cutter	890	855	823	278	257	238	1.4	6	4
38 Special + P	158	Lead-Semi Wad Cutter	890	855	823	278	257	238	1.4	6	4
9mm Makarov	75	Glaser Safety Slug	1300			281					3.75
9mm Luger	115	Full Metal Jacket	1155	1047	971	341	280	241	0.9	3.9	4
9mm Luger	115	Jacketed Hollow Point	1225	1095	1007	383	306	259	0.8	3.6	4
9mm Luger	147		1010	962	921	333	302	277	1.1	4.7	4

		Jacketed Hollow Point									
9mm Luger +P	80	Glaser Safety Slug	1650			484					5
38 Super Automatic	80	Glaser Safety Slug	1700			513					5
38 Super Automatic+P	125	Jacketed Hollow Point	1240	1130	1050	427	354	306	0.8	3.4	5
38 Super Automatic+P	130	Full Metal Jacket	1215	1099	1017	426	348	298	0.8	3.6	5
357 Magnum	80	Glaser Safety Slug	1800			575					6
357 Magnum	110	Jacketed Hollow Point	1295	1095	975	410	292	232	0.8	3.5	4
357 Magnum	125	Jacketed Hollow Point	1450	1240	1090	583	427	330	0.6	2.8	4
357 Magnum	145	Jacketed Hollow Point	1290	1155	1060	535	428	361	0.8	3.5	4
357 Magnum	158	Lead-Semi Wad Cutter	1235	1104	1015	535	428	361	0.8	3.5	4
357 Magnum	158	Jacketed Hollow Point	1235	1104	1015	535	428	361	0.8	3.5	4
357 Magnum	158	Jacketed Soft Point	1235	1104	1015	535	428	361	0.8	3.5	4
357 SIG	80	Glaser Safety Slug	1650			484					5
40 Smith & Wesson	115	Glaser Safety Slug	1550			613					4
40 Smith & Wesson	155	Jacketed Hollow Point	1205	1096	1018	500	414	357	0.8	3.6	4
10mm Automatic	115	Glaser Safety Slug	1650			695					5
10mm Automatic	175	Jacketed Hollow Point	1290	1141	1037	649	506	418	0.7	3.3	
400 Cor-Bon	115	Glaser Safety Slug	1650			695					5
41 Remington Magnum	175	Jacketed Hollow Point	1250	1120	1029	607	488	412	0.8	3.4	4
41 Remington Magnum	210	Jacketed Hollow Point	1300	1162	1062	788	630	526	0.7	3.2	4
44 Smith & Wesson Special	135	Glaser Safety Slug	1350			546					6
44 Smith & Wesson Special	200	Jacketed Hollow Point	900	860	822	360	328	300	1.4	5.9	
44 Smith & Wesson Special	246	Lead-Round Nose	755	725	695	310	285	265	2	8.3	
44 Remington Magnum	135	Glaser Safety Slug	1850			1026					6
44 Remington Magnum	210	Jacketed Hollow Point	1250	1106	1010	729	570	475	0.8	3.5	4
44 Remington Magnum	240	Hollow Soft Point	1180	1081	1010	741	623	543	0.9	3.7	4
45 Automatic	185	Jacketed Hollow Point	1000	938	888	411	362	324	1.2	4.9	5
45 Automatic	185	Full Metal Jacket-	770	707	650	244	205	174	2	8.7	5
45 Automatic	230	Full Metal Jacket	835	800	767	356	326	300	1.6	6.8	5
45 Automatic +P	145	Glaser Safety Slug	1350			587					5
45 G.A.P.	185	Jacketed Hollow Point	1090	970	890	490	385	325	0.6	8.3	5
45 Colt	145	Glaser Safety Slug	1350			587					6

Bev Fitchett's Guns Magazine » Ballistics

Ricochet Analysis Introduction

Wed, 29 Jun 2011 00:45:25 | Ballistics

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When a bullet strikes any surface, there is a critical angle at which the bullet will bounce off or ricochet from the surface rather than penetrate. After ricocheting from the surface, the missile will lose a considerable amount of its velocity (anything up to 35% in test firings) and, invariably, lose its stability. This is contrary to the popular belief that a ricocheting bullet will carry further than one fired at the elevation for maximum range.

The actual degree at which a bullet will ricochet from a surface is called the critical angle. Predicting this critical angle for any bullet/surface configuration is, however, extremely difficult. Factors such as bullet shape, construction, velocity and ricocheting surface all have a pronounced effect on the outcome (Figure 4.31).

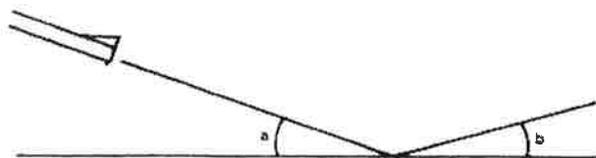


Figure 4.31 Ricochet nomenclature: a = incident angle; b = ricochet angle.

A case illustrating how variable this can be involved the shooting at a taxi in central London by a terrorist group. The weapon involved was a 0.357" Magnum revolver which was loaded with semi-jacketed bullets, some of which had a hollow point and others which had a solid round nose.

The front windscreen of a British taxi is only angled back by approximately 15 ° and under normal circumstances, such a low angle would not be expected to support a bullet ricochet.

The first round fired at the front windscreen had a hollow-point bullet which cleanly ricocheted from the screen leaving a stripe of lead up the glass. This bullet was located at a later stage and was found to have a mirror-like flat

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surface on the lead portion of the nose. The second bullet fired was a round-nosed fully jacketed bullet which cleanly penetrated the glass narrowly missing the driver.

In this instance, the angle of the screen was clearly insufficient to support a ricochet with a round-nosed bullet. The hollow-point nose did, however, collapse on impact, effectively increasing the angle and allowing the bullet to ricochet from the glass.

Considering the number of times in the investigation of armed crime that incidents of ricocheting bullets are encountered, it is surprising how little literature there is on the subject. Probably the most authoritative work was by Lucien Haag (1975). Several other papers (Jauhari and Mohan, 1969; McConnell, Triplett and Rowe, 1981; Hartline, Abraham and Rowe, 1982; Rathman, 1987) have also investigated the effects of shotgun pellets ricocheting from steel and concrete.

The parameters affecting the potential to ricochet are so diverse, however, that it is difficult to lay down any firm and fast rules as to ricochet potential. Empirical studies should, therefore, be carried out for each individual case.

There are, however, a few generalizations which can be applied.

1. In most cases of bullets ricocheting from a hard surface, the angle of ricochet is considerably less than the angle of incidence (Tables 4.3 and 4.4).

As can be seen from the following tables, with hard-jacketed, high-velocity missiles striking a frangible material such as stone or concrete, it is not always the case that the angle of ricochet is less than the angle of incidence.

Table 4.3 Ricochet angles vs. incident angle for various bullets on smooth concrete.

Ricochet angle at incident angle of

Ricochet angle at incident angle of

Table 4.3 Ricochet angles vs. incident angle for various bullets on smooth concrete.

Calibre	Bullet type	Velocity (ft/s)	10 °	30 °
0.22" LR	RN	1100	1.33	1.88
0.22" LR	HP	1100	1.3	1.19
0.38" Spl	RN	650	1.02	1.5
0.357" Mag	SJHP	850	1.3	1.7
7.62 x 25 mm	FMJ	1300	2.0*	12-35*
7.62 x 39 mm	FMJ	2700	3.5*	2-25*
* Indicates severe cratering leading to variable results and, in some cases, disintegration of				
bullet.				

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- Browning Silver
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- Antique Rifling Machine 2
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- Demolition Materials TM 9 1946
- Sniper Training
- Sako 85
- Small Arms Identification Series
- Surefire Weaponlight 2002
- ARMY Machine Gun 40mm MK19 Mod 3
- Browning FCS 25
- Browning GP Sport Vigilante
- Carl Zeiss Classic Dialat T
- Sako Triace
- Sub Machine Guns
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- Ruger Model 77 22 77 22 Magnum
- ARMY M47 Dragon Med Antitank
- Beretta UGB25 Xcel
- Calr Zeiss Victory Diarange M
- Walther SSP Cal .22LR
- ARMY Browning MG Caliber 50 HB M2
- Browning European Classic
- Guns 01 1959
- Ruger 2004
- Bren Light Machine Gun
- Shoulder Launched Munitions
- Walther Weapons

Table 4.4 Ricochet angle for 0.45 ACP FMJ bullet from various surfaces at various

Incident angles.				
		Ricochet angle at incident angle of		
Material	Calibre	15 °		25 °
Glass	0.45 ACP	Broke glass		Broke glass
Concrete	0.45 ACP	2"		3 °
Steel plate	0.45 ACP	2.5 °		4 °
Wood	0.45 ACP	17 °		17"
Sand	0.45 ACP	Penetrate		Penetrate

It would appear that if sufficient cratering of the surface occurs on bullet impact, the exit plane of the crater will be of greater angle than the incidence angle. This equates to the bullet striking the surface at a greater incidence angle and therefore a greater ricochet angle.

2. The critical angle for a soft or hollow-point bullet is lower than that for an equivalent fully jacketed bullet. In this instance, it would appear that the collapsing hollow-point bullet nose increases the incidence angle, thus increasing the propensity for ricochet.

3. The critical angle for a given bullet type/target medium is not velocity dependent. This effect is illustrated by Table 4.5.

4. Bullets will invariably lose their gyroscopic stability and tumble after ricocheting. This tumbling gives rise to a distinctive whine or whirring noise as the tumbling bullet passes through the air.

5. Bullets which have ricocheted from glass, steel, concrete or wood have a very distinctive flat spot which is characteristic of the material where the contact has been made. This contact point will often have paint, wood fibres or

Table 4.5 Critical angle vs. velocity for various calibres fired at water.

Calibre	Velocity (RN bullet) (ft/s)	Critical angle (degree)
0.22"	850	8
0.22"	1000	8
0.22"	1250	8.50
0.38" Spl	650	8 °
0.38" Spl	800	8 °
0.357" Mag	900	8 °
0.357 Mag	1050	8 °

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NB. Some of the bullets used in this test were hollow-point. The nose was, however, filled with epoxy resin and shaped to give the desired round-nosed profile.

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concrete adhering to it for easy identification. If the material was glass or polished steel, the mirror-like surface is quite distinctive.

This is not, however, the case with a bullet which has ricocheted from water. Even with hollow-point bullets, it is unlikely that it will be possible to differentiate between a bullet which has ricocheted from water and one which has not.

6. Wounds produced by bullets ricocheting from hard surfaces will generally be easy to identify due to the bullet ' s tumbling action. If the bullet does happen to strike point first, the misshapen bullet will leave a distinctive entry hole generally with ragged edges. Once it enters the body, the bullet will, due to its inherent unstable condition, tumble end over end, leaving a large irregular wound channel. Jacketed bullets tend to break up on ricocheting, peppering the skin with jacket and lead core fragments.

7. High-velocity bullets with a thin jacket, for example, 0.223" or 0.220" Swift, will invariably break up before ricocheting. This applies even to water.

It is interesting to note that when round shot was used by naval vessels, ricocheting missiles from the water were a recognized form of tactics in sea warfare. By skipping a missile across the water at hull height, it was much easier to hit an enemy ship than to try and calculate the correct elevation for the missile to strike the ship during its trajectory.

This method worked well with round shot where the angle of incidence and the angle of ricochet were approximately the same. However, modern projectiles which are spin stabilized and have an aerodynamic shape do tend to rise at a greater angle after ricocheting from water, and the technique was found to be of little use.

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